

Lincoln University Digital Thesis

Copyright Statement

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

This thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- you will use the copy only for the purposes of research or private study
- you will recognise the author's right to be identified as the author of the thesis and due acknowledgement will be made to the author where appropriate
- you will obtain the author's permission before publishing any material from the thesis.

Adoption of Quality Assurance Systems in Dairy Processing Firms in Vietnam

A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Doctor of Philosophy in Agricultural Management

at

Lincoln University

by

Nguyen Chi Trung

Lincoln University

2013

Abstract of a thesis submitted in partial fulfillment of the requirements for the
Degree of Doctor of Philosophy in Agricultural Management

Abstract

Adoption of Quality Assurance Systems in Dairy Processing Firms in Vietnam

By

Nguyen Chi Trung

Internationally, concerns over food safety and quality have been increasing as a result of a number of food safety scares. Governments worldwide have responded to these concerns through encouraging or mandating firms in the food industry to use quality assurance systems (QAS's), such as HACCP, ISO 9000 and ISO 22000. In emerging economies, such as Vietnam, the importance of these systems is now being recognized. The dairy industry in Vietnam is small, but dairy production is increasing dramatically in line with growing consumption of dairy products. To address the increasing demand for milk quantity and quality, QAS's are now being adopted by dairy processing firms.

The purpose of this research was to gain an understanding of quality processes and adoption of QAS's in dairy processing firms in Vietnam in the context of their wider supply chains. Five dairy processors and their associated supply chains were selected along with three QAS's (HACCP, ISO 9000 and ISO 22000). A case study method was employed to explore and gain a greater understanding of quality at the processor and chain level and the adoption of QAS's at the processor level. This was done by constructing and utilizing a model that linked processors' motivations to adopt, factors that influenced adoption, and perceived outcomes from adoption, within the context of their wider supply chain environment.

It was observed that quality management was fragmented along supply chains, with different QAS's in place at different stages of the chain to different degrees. Quality assurance was

observed to be weakest at the collector level, and the distributor and retail level. Also, it was seen that larger farmers had quality management than small farmers. Quality assurance was likely to be better throughout the chain when the processor had integrated forward or backwards. In addition, QAS's were met to minimum standards necessary for certification and inspection for compliance could be infrequent.

It was found that legal factors were a strong influence on processing firms in adopting QAS's. Market pressure was also a strong influence for larger firms. Related to this factor was competition between dairy firms to position themselves in the growing market. External support had an important impact on the decision of small firms to adopt, and firm size did not emerge as a factor that had an impact on this decision. However, top management support was found to be an important factor. These factors influencing adoption varied across QAS's, but overall trends were observable.

The research showed that there were differences in perceived organisational outcomes from the adoption of QAS's by processing firms. However, in general, the impact was perceived to be positive. This was particularly so for business performance and this was observed for both HACCP and ISO 9000, which have been operating in these companies for some time. This indicates that firms place importance on market positioning and that QAS's are an important device in this market positioning.

Insights that emerge from these results increases the understanding of quality processes and the adoption of QAS's in food industries in emerging economies. Quality assurance in food industries in such countries is at an early stage, with fragmentation of quality assurance along the chain, but a willingness to adopt QAS's to position favourably in a growing market. Processors could be well-positioned to take a lead role in improving quality, and along with government agencies, which also have a key role, could work towards diffusing quality up and down the chain.

Keywords: quality assurance systems, QAS's, adoption, agribusiness processors, dairy firms, supply chains, Vietnam, emerging economies.

ACKNOWLEDGEMENT

At the outset of this report of a research endeavour conducted as a partial fulfilment of a PhD in Agricultural Management, first and foremost, I would like to thank my supervisor, Associate Professor Dr Sandra Martin, for her help, guidance, and generous support throughout the course of my PhD study.

Also, I would like to thank my associate supervisors, Dr Jeff Heyl and Dr Peter Nuthall. Dr Heyl gave me rich knowledge of quality and operational management, and methodology approaches, and Dr Nuthall, who gave me more understanding of farm management and research techniques. My thanks also goes to Dr Michael Lyne. I would like to thank Dr Mark Wilson for his invaluable advice for approaches and methods in research of quality management system in the initial research stage.

Several organizations contributed financially to my research, and without them it would be been virtually impossible to complete this thesis. I would especially like to express my gratitude to Lincoln University for its financial support to enable me to do field work and collect data and information for this thesis and to the graduate administrative staff in the Faculty of Commerce for their administrative support and help.

Special thanks goes to organizations' experts, academicians, directors, and managers in Vietnam, who gave me time, and necessary support in terms of administration, paperworks, and provided secondary data. These include the National Institute of Agriculture Planning and Projection (Dr Chinh, Dr Linh, Mr Hung, Ms Hoa), the National Productivity Center Vietnam (Mr Anh), the Strategic Institute for Industry Development Policy (Dr Duc), the Division of Food Safety and Hygiene, Department of Science and Technology of Ministry of Industry and Commerce (Ms Nga), the Institute for Policy and Strategy for Agriculture and Rural Development (Dr Phong), Department of Livestock Husbandry of Ministry of Agriculture and Rural Development (Dr Son, Dr Giao), the Vietnam Dairy Association (Dr Pho), office of website of Vietnamdairy.com (Dr Vang), dairy companies, plants, Moc Chau company (Mr Nhan, Mr Cuong), Vinamilk company (North and South plants, head office HCMC) (Mr Dai, Mr Thang), Dutch Lady Vietnam (FrieslandCampina Vietnam) Company (North and South plants, Head Office in Binh Duong) (Mr Tan, Mr Hung), IDP Milk

Company (Mr Khai), Hanoi Milk Holdings company (Ms Hong). I would also like to thank all persons participating in interviews. These were smallholding farmers, collectors, managers, senior experts of companies and plants, wholesalers and retailers.

I sincerely thanks go to my lecturers, colleagues, and friends in Lincoln University for giving me support, encouragement, and sharing knowledge, especially Mr Quan, Mr Hieu, Mr Hung, Mr Huy, Ms Van (Vietnam), Mr Mahendra, Mr Salil (Nepal), and Ms Ludia (Indonesia).

Finally but most importantly, I devote the most deep gratitude to my family Dad and Mum, and parents-in-law in Vietnam, and brothers-in-law in New Zealand, for their unfailing love, spirit, encouragement and support. More thanks to my Dad who always encourages me to go overseas to study and to get into scientific research. You are my pride, and give me advice and wisdom. Warm love and affection goes to my wife, Ms Hong, and two daughters Ms Anh (Emily) and Ms My (Hamy) for their patience, support and going with me throughout the difficult period of doing research and writing a thesis.

Lincoln University, January 2013

Nguyen Chi Trung

BA (Economics), MSc (Agriculture Systems)

Contents

Abstract	ii
Acknowledgement	iii
Contents	vi
List of tables	viii
List of figures	ix
Abbreviations	xii
Chapter 1 Introduction.....	1
1.1 Quality concerns and Quality Assurance Systems	1
1.2 Study Context	4
1.3 Rationale and Research Objectives	13
1.4 Thesis Structure	15
Chapter 2 Literature Review	16
2.1 Quality Definition and QA Systems	16
2.1.1 What is quality?	16
2.1.2 Quality assurance systems in the food sector	18
2.1.3 Supply chains and quality management	25
2.1.4 Conclusion	26
2.2 Motivation to Adopt QAS's by Firms	26
2.2.1 External motivations	26
2.2.2 Internal motivations	28
2.3 Adoption of QAS's and the External Environment.....	31
2.3.1 Introduction	31
2.3.2 Legal and regulatory forces	33
2.3.3 Market factors	35
2.3.4 External support.....	36
2.4 Organizational Characteristics and Adoption of QAS	37
2.4.1 Introduction	37
2.4.2 Size of firm	38
2.4.3 Top management support	39
2.4.4 Organisational structure.....	40
2.4.5 Nature of firm and product	41
2.5 Impact of an Adoption of QAS's on Organisational Outcomes.....	42
2.5.1 Introduction	42
2.5.2 Adoption of QA systems and firm's performance.....	43
2.5.3 Adoption QA systems and product performance	45
2.6 Chapter Summary	47
Chapter 3 Theoretical Framework and Methodology.....	49
3.1 Theoretical Framework	49

3.2	The Case Study Research Method.....	53
3.2.1	Choice of case study method	53
3.2.2	Philosophy	53
3.2.3	Criticisms	54
3.3	Operationalizing the Case Study Method.....	55
3.3.1	Case selection and design	55
3.3.2	Procedures	57
3.3.3	Data triangulation	60
3.3.4	Data analysis and case presentation.....	61
3.3.5	Ethical considerations.....	63

Chapter 4 Result 1- Moc Chau Dairy Company case- Description and Analysis.....65

4.1	Description	65
4.1.1	Overview	65
4.1.2	Governance structure	66
4.1.3	Supply chain structure	69
4.1.4	Business strategy and QA systems	71
4.1.5	Supply chain stakeholders	71
4.1.6	Conclusions	85
4.2	Analysis	86
4.2.1	Introduction	86
4.2.2	Perceived factors influencing adoption of QAS's	87
4.2.3	Perceived impacts of QA systems on organisational outcomes	98
4.2.4	Conclusions	103

Chapter 5 Results 2- Large firms: Dutchlady Vietnam and Vinamilk cases – Description and Analysis.....107

5.1	Dutch Lady Vietnam (DLM).....	107
5.1.1	Overview	107
5.1.2	Governance structure	109
5.1.3	Supply chain structure	110
5.1.4	Business strategy and QA systems	113
5.1.5	Perceived factors influencing adoption of QAS's	114
5.1.6	Perceived impacts of QA systems on organisational outcomes	118
5.1.7	Conclusions	122
5.2	Vinamilk (VNM).....	123
5.2.1	Overview	123
5.2.2	Governance structure	126
5.2.3	Supply chain structure	127
5.2.4	Business strategy and QA systems	129
5.2.5	Perceived factors influencing adoption of QAS's	130
5.2.6	Perceived impact of QA systems on organisational outcomes	133
5.2.7	Conclusion	136
5.3	Chapter Conclusion	136

Chapter 6 Result 3- Small Firms: Hanoimilk and IDP cases-Description and Analysis138

6.1	Hanoimilk Company (HNM)	138
6.1.1	Overview	138

6.1.2	Governance structure	140
6.1.3	Supply chain structure	142
6.1.4	Business strategy and QA systems	143
6.1.5	Perceived factors influencing adoption of QAS's	145
6.1.6	Perceived impacts of QA systems on organisational outcomes	147
6.1.7	Conclusion	151
6.2	International Dairy Products Joint Stock Company (IDP)	152
6.2.1	Overview	152
6.2.2	Governance structure	153
6.2.3	Supply chain structure	154
6.2.4	Business strategy and QA systems	157
6.2.5	Perceived factors influencing the adoption of QAS's	158
6.2.6	Perceived impact of QA systems on organisational outcomes	161
6.3	Chapter Conclusion	163
Chapter 7 Cross-case Analysis, Discussion and Conclusions.....		164
7.1	Discussion on the Main Findings	164
7.1.1	Characteristics of supply chains, processes and QA systems.....	164
7.1.2	Processing firms and QA systems	172
7.1.3	Key motivations for adopting different QA systems.....	175
7.1.4	Key factors influencing the adoption decision	179
7.1.5	Impacts of QA systems on organisational outcomes.....	189
7.2	Key Insights.....	197
7.2.1	Emerging economies and food quality management.....	197
7.2.1	The lead role of processing companies in quality assurance.....	198
7.2.2	Assurance of quality and perceived organisational outcomes.....	199
7.3	Conclusions	199
7.3.1	Research contribution	199
7.3.2	Limitations of the research	203
7.3.3	Suggestions for future research	204
7.3.4	Implications of the research.....	204
Appendix A Protocol questions for interview		228
A.1	Appendix A.1 Protocol Questions for interviewing small farm producers	228
A.2	Appendix A.2. protocol questions for interviewing collectors.....	231
A.3	Appendix A.3. protocol questions for interviewing processors/plants.....	233
A.4	Appendix A.4. protocol Questions for Interviewing distributors.....	237
A.5	Appendix A.5. Protocol questions for interviewing retailers	239
Appendix B Questionnaire form for post surveying.....		241
Appendix C Major dairy companies in Vietnam		249
Appendix D Schedule time		251
Appendix E Dairy processing in Moc Chau milk plant.....		252

List of Tables

Table 1-1 Dairy cows and milk output by provinces in 2009.....	7
Table 2-1 Eight dimensions of product quality.....	17
Table 2-2 Differences between QA systems.....	25
Table 3-1 Number of interviewees and respondents by company.....	60
Table 3-2 Identification codes used for the respondents	62
Table 4-1 Typical dairy farms –MCM case.....	73
Table 4-2 Characteristics of input providers for farms-MCM case.....	74
Table 4-3 Main features of collection point – MCM case.....	77
Table 4-4 Main features of milk processing plants – MCM case.....	79
Table 4-5 Motivations for seeking QAS's – MCM case	88
Table 4-6 Perceived environmental factors influencing adoption of QAS's-MCM case.....	94
Table 4-7 Perceived organisational factors influencing adoption of QAS's-MCM case	95
Table 4-8 Realised business performance - MCM case.....	99
Table 4-9 Perceived impacts of QA systems on business performance – MCM case.....	100
Table 4-10 Perceived Impacts of QA systems on operational performance-MCM case.....	101
Table 4-11 Perceived impact of QA systems on quality performance – MCM case.....	102
Table 5-1 Motivations for seeking QA systems – DLM case.....	115
Table 5-2 Perceived factors influencing adoption of QAS's – DLM case	117
Table 5-3 Perceived impacts of QA systems on business performance – DLM case.....	119
Table 5-4 Perceived impact of QA systems on operational performance – DLM case.....	120
Table 5-5 Perceived impact of QA systems on quality performance- DLM case	121
Table 5-6 Motivations for seeking QAS's – VNM case.....	131
Table 5-7 Perceived factors influencing adoption of QAS's- VNM case	133
Table 5-8 Perceived impacts of QA system on business performance- VNM case	134
Table 5-9 Perceived impact of QA systems on operational performance – VNM case	135
Table 5-10 Perceived impact of QA systems on quality performance – VNM case	136
Table 6-1 Motivations for seeking QA systems – HNM case	145
Table 6-2 Perceived factors influencing the adoption of QAS's -HNM case.....	147
Table 6-3 Perceived impact of QA systems on business performance – HNM case.....	149
Table 6-4 Perceived impact of QA systems on operational performance – HNM case	150
Table 6-5 Perceived impact of QA systems on quality performance – HNM case	151
Table 6-6 Motivations for seeking QA system -IDP case	158
Table 6-7 Perceived factors influencing adoption of ISO 22000 – IDP case	160
Table 6-8 Perceived impact of QA systems on business performance.....	162
Table 6-9 Perceived impact of QA system on operational performance	162
Table 6-10 Perceived impact of QA system on product performance.....	163
Table 7-1 Characteristics of supply chains	165
Table 7-2 Supply chain processes and processor activities	167
Table 7-3 Quality processes.....	169
Table 7-4 Quality systems and standards adopted by actors in supply chains	171
Table 7-5 The adoption of QA systems by dairy firms	173
Table 7-6 Motivations for adopting HACCP.....	175
Table 7-7 Motivations for adopting ISO 9000.....	176
Table 7-8 Motivations for adopting ISO 22000.....	177
Table 7-9 Perceived factors influencing adoption of HACCP.....	179

Table 7-10 Perceived factors influencing adoption of ISO 9000	180
Table 7-11 Perceived factors influencing adoption of ISO 22000	181
Table 7-12 Organisation context factors in analysed cases	187
Table 7-13 Perceived impacts of HACCP on organisational outcomes	190
Table 7-14 Perceived impacts of the ISO 9000 on organisational outcomes	193
Table 7-15 Perceived impacts of the ISO 22000 on organisational outcomes	195
Table 7-16 Comparison of results of current study with some previous research.....	201

List of Figures

Figure 1-1 Map of dairy production and processing plants in Vietnam.....	6
Figure 1-2 Typical dairy chain and QA systems in Vietnam	10
Figure 1-3 Thesis structure.....	15
Figure 2-1 Seven principles of HACCP	19
Figure 2-2 ISO 9000 certification process	21
Figure 2-3 Business environment and organization	32
Figure 3-1 Theoretical model	50
Figure 3-2 Factors influencing the adoption of QAS's	51
Figure 3-3 Impact of QAS's on organisational outcomes and measures	52
Figure 4-1 Governance structure of MCM.....	67
Figure 4-2 Supply chain structure and QA systems adopted - MCM case	70
Figure 4-3 Perceived factors influencing the adoption of QAS's -MCM case	104
Figure 4-4 Perceived impacts of HACCP system on organization outcomes –MCM case ..	105
Figure 4-5 Perceived impacts of ISO 9000 system on organisation outcomes-MCM case ..	106
Figure 5-1 Trend in revenue and profit (2005-2010) – DLM Vietnam.....	108
Figure 5-2 Governance Structure - DLM Vietnam	110
Figure 5-3 Supply chain structure – DLM Vietnam.....	111
Figure 5-4 Market share (%) by products – DLM Vietnam.....	112
Figure 5-5 Growth of turnover and profit (2005-2010) -VNM case	124
Figure 5-6 Major products – VNM case	125
Figure 5-7 Management board structure- VNM case.....	126
Figure 5-8 Dairy supply chain – VNM case.....	128
Figure 6-1 Trend in turnover, and profit in 2005-2010 – HNM case.....	139
Figure 6-2 Major products – HNM case	140
Figure 6-3 Governance structure – HNM case.....	141
Figure 6-4 Supply Chain Structure – HNM case	143
Figure 6-5 Governance structure of IDP	154
Figure 6-6 Supply Chain of HNM.....	156

Abbreviations

QAS's	Quality assurance systems
QA	Quality assurance
ASQ	American Society of Quality
FAO	The United Nation Food and Agriculture Organisation
WHO	World Health Organisation
GMP	Good manufacturing practice
HACCP	Hazard analysis of Critical Control Points
GHP	Good Hygiene Practice
WFP	World Food Program
CAC	Codex Alimentarius Commission
NACMCF	National Advisory Committee on Microbiological Criteria for Foods
ICMSF	International Commission on Microbiological Specifications for Foods
CCP	Critical Control points
ISO	International Standardization Organisation
ISO/TC 176	ISO Technical Committee 176
PRP	Prerequisite programs
EurepGAP	European Good Agriculture Practice
BRC	British Retail Consortium
SQF	Safe Quality Food
SCQM	Supply Chain Quality Management
VND	Vietnamese Monetary Unit
UHT	Ultra High Temperature
MOH	Vietnam Ministry of Public Health
VPC	Vietnam Productivity Center
R&D	Research and development
VND	Vietnamese monetary unit (1,000 VND=49cent US)
STAMEQ	Directorate for standards, metrology, and quality
QUARCERT	Vietnam Certification Center
GMP	Good manufacturing practice
GHP	Good Hygienic Practice
GDP	Gross Domestic Products
GSO	General Statistical Office
DLH	Department of Livestock Husbandry
NIAPP	National Institute of Agricultural Planning and Projection
USDA	US Department of Agriculture
MARD	Ministry of Agriculture and Rural Development
MOI	Ministry of Industry and Commerce

Chapter 1

Introduction

This study focuses on quality assurance in the dairy industry in Vietnam. This Chapter introduces the study. It begins with a discussion of quality concerns in the agri-food industry and the increasing importance of quality assurance systems in the industry (Section 1.1). The context for the study, the Vietnamese dairy industry and adoption of QAS's, is then introduced in Section 1.2., and aims and specific research objectives are outlined in Section 1.3, and finally, the structure of the thesis is presented in Section 1.4.

1.1 Quality concerns and Quality Assurance Systems

Concerns with food safety and quality have been on the agenda of policy-makers and managers concerned with food production and processing for some time. This interest in quality and safety has increased with recent changes in agri-food systems internationally (Krieger *et al.*, 2007). Despite these efforts to address quality and food safety, consumers have become increasingly concerned about these issues as food-borne illness and outbreaks continue to occur and are widely publicised. For example, it is estimated millions of people in OECD countries get ill every year from food contamination (Rocourt *et al.*, 2003). There is also evidence that confidence in food supply has been affected by health concerns linked to incidents such as *Salmonella* in poultry, *Bovine Spongiform Encephalopathy* (BSE) in cattle, and a rise in reported food poisoning incidents, which increased from less than 15,000 in 1982 to over 100,000 by 1998 (Baines & Manley, 1999). Such concerns are not only happening in developed economies, but also emerging economies. For example, the milk contamination melamine scandal, which affected a number of companies, including the Sanlu group, one of China's largest baby milk powder manufacturers, caused 6,244 babies to fall ill with 158 having acute kidney failure and 4 deaths (Zhang, 2008).

As a result, consumers have become very critical about food safety and food quality due to these food contamination incidents, which have received a great deal of media attention (Redmond & Griffith, 2003; Rocourt *et al.*, 2003). In response to these concerns, governments have introduced stricter legislation related to food control to force enterprises to ensure quality and safety of products, and to encourage them to apply voluntary, or even

mandatory, quality assurance systems (QAS's), particularly in developed economies. In the United States, European countries, and many other such developed countries, these concerns about the efficacy of food safety controls in the food supply chain (Henson & Holt, 2000), have led to mandate QAS's in their food sectors (Deohar, 2003).

Food quality management has become increasingly challenging due to a number of factors, such as changes in consumption patterns, developments in technology, increasing legislative requirements and changing environmental conditions (Motarjemi & Kaferstain, 1999; Motarjemi & Mortimore, 2005; Luning & Marcelis, 2006, 2007; Luning *et al.*, 2008). One of the ways to ensure quality and safety of product is to adopt quality/safety assurance systems within individual firms, and even across the entire food chain. These efforts can bring more safe food "from farm to table". As a result, the food supply chain has responded to the demand of quality through the introduction of more sophisticated quality management systems (Caswell *et al.*, 1998). Examples in the area of food safety include HACCP and statistical process control (Caswell & Hooker, 1996; Sumner, 2003). ISO quality management systems have also received considerable support from firms seeking to improve their competitiveness in changing markets (Zaibet & Bredahl, 1997; Fouayzi *et al.*, 2006; Nguyen T *et al.*, 2003).

There has been a move from the old end of line product inspection approach towards the newer approach to quality assurance, where links in the food chain assume responsibility for safety through control of their own processes (Trienekens & Zuurbier, 2008). This means that quality assurance is required at each step in the food production chain to ensure safe food and to show compliance with regulatory and customer requirements (Trienekens, 2006). Such QAS's have become important in terms of assuring safety and quality in the food sector (Aggelogiannopoulos *et al.*, 2007).

QAS's range from food safety systems to complete quality assurance systems, and are usually constructed by various quality organizations. QAS's can be classified by level and scale including international or global, national, local, and even private scales for product or service quality (Trienekens & Zuurbier, 2008). The most common QAS's operating in the agri-food industry are Good Manufacturing Practice (GMP) and Good Hygienic Practice (GHP), Hazard Analysis of Critical Control Points (HACCP), which originated from *Codex Alimentarius Commission* (CAC, a joint initiative by FAO and WHO initiative), and the ISO

series, consisting of the ISO 9000 family, ISO 14000, and ISO 22000 from the International Standardisation Organisation (Briz *et al.*, 2005; Trienekens & Zuurbier, 2008).

With respect to legal enforcement or otherwise, quality systems are of two types - obligatory and voluntary. HACCP is obligatory in developed countries for food sectors to ensure safe products to consumers. Other quality management systems, such as ISO, can be used in enterprises on a voluntary basis (Sikora & Strada, 2006). However, many food processing and packaging companies are trying to move towards world class quality by building a solid structure using a number of systems together, such as GMP, HACCP, and the ISO family, on a voluntary basis (Surak & Simpson, 1994). These QA systems focus on processes; i.e. process organisation, process control and process improvement (Krieger *et al.*, 2007). Such systems (for example, HACCP and ISO management systems, or their equivalent) are increasingly being adopted (Baines & Manley, 1999).

Emerging economies are recognising the importance of quality assurance, and in particular food safety assurance. According to Fueller *et al.*, (2006), one of the key approaches to building brand equity among Chinese dairy companies is establishing a reputation for supplying products that have high quality and are safe. Chinese companies have not relied solely on their reputation, but have also pursued certifications related to food safety on a voluntary basis. For example, Yili attained HACCP certification for a number of milk products in 2002 and 2003, several years before it was required by the government. However, the recent melamine milk contamination scandal illustrates one of the challenges in controlling and monitoring quality in procurement of raw milk and processing in emerging economies.

It is generally agreed that food firms have become increasingly concerned about food quality and are applying QAS's (Mamalis *et al.*, 2009). A wide range of studies utilising disciplines in economics and business have attempted to provide a plausible explanation for the underlying reasons driving a business to adopt QAS's (Tsekouras *et al.*, 2002). The motivation for food suppliers to undertake food safety controls operates at two levels (Caswell & Henson, 1997). First, controls can be market-driven, for example, demand-side shifts due to enhanced reputation linked to certification or labelling, or supply-side shifts due to improvements in efficiency. Second, controls can be mandated by direct public regulation of production processes or end-product safety or liability standards (Henson & Northern, 1997). Thus, regulation can also provide a motivation for adoption by firms (Baron &

Baron,1980; Cole & Sommers,1981; Rugman & Verbeke, 1998; Henson & Heasman, 1999). The decision to select business counterparts has been shown to be positively influenced when the supplier has an ISO 9000 registration (Deloitte & Touche, 1994) and many buyers often use the list of ISO-registered suppliers as their only source for identifying potential suppliers. Marketing provides another major explanation for the adoption of ISO 9000. Juran (1995) posited that the major reason for seeking certification is maintenance or expansion of markets. QAS's can also be instrumental in achieving efficiency gains in a food chain by reducing coordination costs and increasing compatibility between links in the chain. In particular, large firms may have strong internal incentives to adopt QAS's, which can be seen as a means for increasing the efficiency of operations (Holleran *et al.*, 1999). Furthermore, agri-food business firms around the world are increasingly using QAS's to improve their product and production processes (Capmany et al., 2000; Ebrahimpour et al., 2007).

Adoption of any innovation is affected by external and internal factors. Adoption of QAS's is influenced by environment factors (Wang, 2008; Hashem & Tann, 2007), political forces (Chau & Tam,1997; Tornatzky & Fleischer, 1990), culture (Kaynak, 2003; van der Spiegel, 2004), top management, firms characteristics (Aggelogiannopoulos et al.,2007), governance structure (Damanpour, 1987), initial costs, firm size, and profitability (Tsekouras et al., 2006).

Evidence of the benefits that QAS adoption bring businesses is mixed and unclear. Operational aspects of performance can be enhanced in ISO 9000- registered companies; however, market position and competitiveness seems to be less strongly related to registration (Sun, 1999). Performance is thought to improve through increases in revenue, and accessing new markets or customers (Corbett et al., 2005; Terlaak & King, 2006), and financial performance is also thought to be improved from ISO 9000 (Corbett et al., 2005; Terlaak & King, 2006; Heras et al., 2002). However, it has also been shown that, though operational efficiency is improved, this may not translate into improved financial performance (Naveh & Marcus, 2005). Thus, a positive and clear association between ISO 9000 and superior business performance has still to be demonstrated through field research.

1.2 Study Context

Vietnam has a livestock resource that forms an integral part in its agricultural system, and is an important part of livelihoods for the rural and semi urban population in much of the

country. Livestock is used for many purposes, and includes the provision of draught power, food supply, source of income, means of transportation, and an alternate energy source. In milk production areas, it provides a source of income, social prestige, and plays a role in hunger alleviation and poverty reduction. With regard to the national economy, livestock production is significant, contributing approximately 27% of agriculture's share of GDP (DLH Department of Livestock Husbandry, 2010; NIAPP National Institute of Agricultural Planning and Projection, 2010).

The number of dairy cows and volume of milk production is increasing in Vietnam. In 2009, the country had 115,000 dairy cows and milk output was 278,000 tons. The country set a goal of increasing dairy cow numbers to 500,000 in 2015, and of producing 1.9 million tons (MOI Ministry of Industry and Commerce, 2009). Collection and processing segments are growing and many companies are entering this segment. The number of processing companies increased dramatically from 13 in 2000 to 72 in 2008 (GSO General Statistical Office, 2009). The gross value of dairy sector product was 7,000 billion VND (700 million USD), which accounted for 5% of gross food and beverage output value, or 1% of gross industrial output value (MOI, 2009).

Dairy farming is mainly concentrated in the South of the country, which accounts for 83% of dairy cow numbers. Ho Chi Minh City at 73,328 head accounts for 64% of total dairy cows, and this is followed by other provinces such as Long An, Son La, and Ha Noi (GSO, 2010; DLH, 2010). The country has 5 traditional dairy farming districts where dairy cows are concentrated, these being Ba Vi, Phu Dong (Ha Noi), Moc Chau (Son La), Da Lat (Lam Dong), and the suburbs of Ho Chi Minh City (NIAPP, 2009). A visual representation is shown in the Dairy Production and Processing Plants map (Figure 1-1), and the number of dairy cows and milk output by province is shown in Table 1-1.

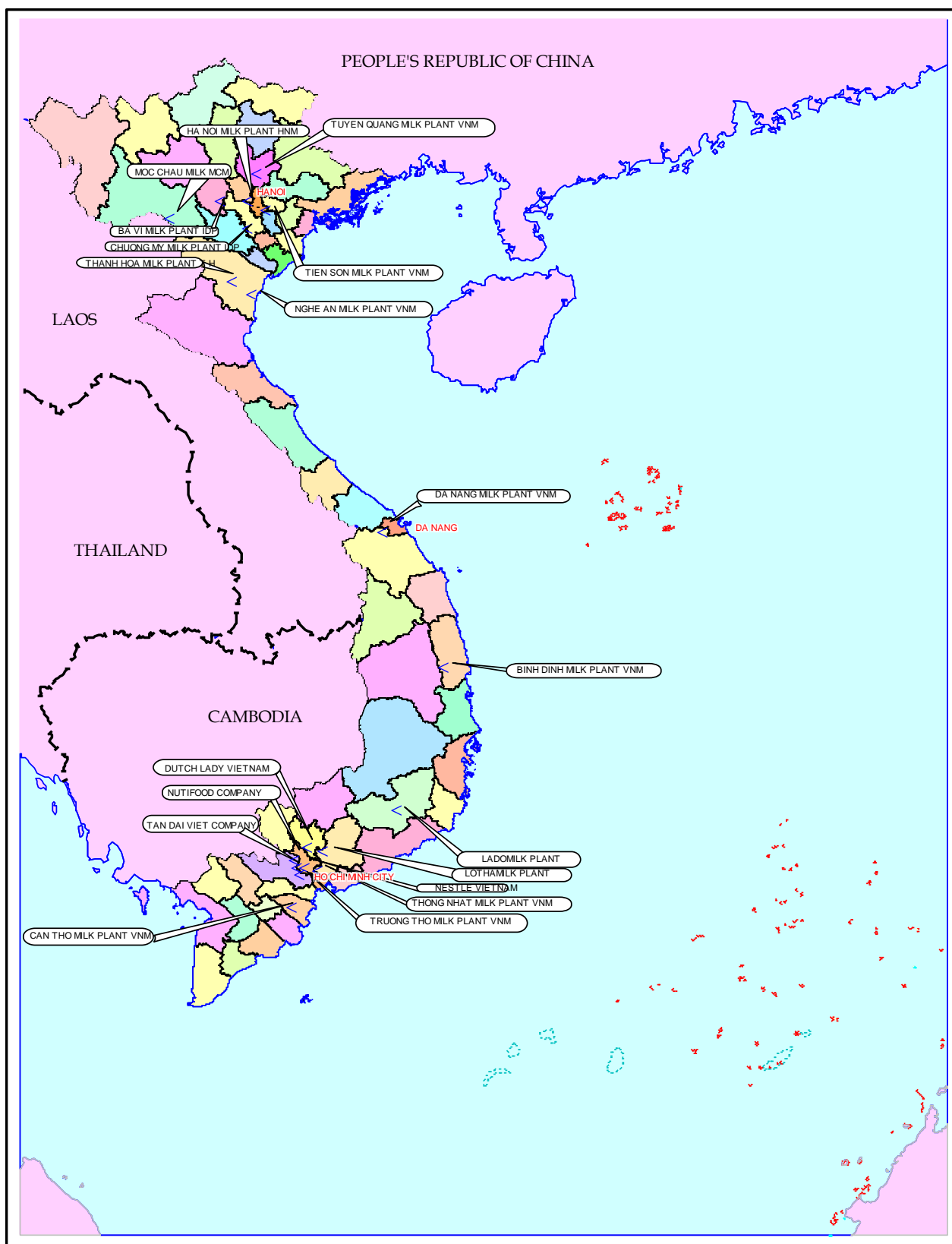


Figure 1-1 Map of dairy production and processing plants in Vietnam

Source: Department of Husbandry Livestock, MARD, 2009

Over 95% of dairy cows are reared on smallholder farms. The country has 19,639 dairy farming households, averaging 5.3 cows per household. The south has 12,626 households, averaging 6.3 head per household, while the North has 7,013 households, averaging 3.7 head per household. This small scale production limits innovation that can occur and constrains investment into dairy production. Milking machines are not used a great deal, and mainly appear on large farms. On small farms, milking machine usage is 10% (DLH, 2009). However, in specific production areas, the use of milking machines is 90%; for example, in the Moc Chau milk area (Moc Chau Company, 2009). In addition, other innovations, such as new cow breeds, automatic watering systems, cooling systems, ear tagging, and new grass species, have been introduced to dairy farms and contribute to improving productivity and quality of milk (DLH, 2009).

Table 1-1 Dairy cows and milk output by provinces in 2009

Locations	Dairy cows (head)	Milking cows (head)	Milk output (ton)
The country	115518	67946	278190
A.The North	16992	12043	37344
Main provinces			
- Ha Noi	5865	5117	12406
- Vinh Phuc	1172	865	1863
- Tuyen Quang	1748	1188	3106
- Son La	5136	2740	16887
B.The South	98526	55903	240846
Main provinces			
- Lam Dong	2833	2712	6089
- Tay Ninh	1707	1454	6540
- Binh Duong	2351	2146	9824
- Dong Nai	1670	1436	3257
- Ho Chi Minh	73328	40406	200010
- Long An	6104	4450	10784
- Tien Giang	3371	741	1869
- Soc Trang	862	509	778

Source: GSO, 2010

Dairy cows in Vietnam are mainly Holstein Friesian- hybrid cross, with 85% of the total dairy cow herd having 50% or more Holstein Friesian bloodlines. The proportion of pure Holstein Friesian is 14% of the total cow herd, and the remaining is other breeds, such as Ayrshire, Brown Swiss, Jersey, etc. Demand for dairy breeds in the country cannot be satisfied domestically. To satisfy this demand, the import of dairy cows is three times the export of dairy cows (Dinh, 2008).

In line with the growth of the economy and the increase in incomes, demand for fluid milk is rapidly rising. However, annual raw milk production only meets 20-30% of the demand for consumption and the remainder is imported (Nguyen, 2009; Dinh, 2008). Despite this situation, Vietnam showed the highest percentage of milk production growth worldwide, with a 10% production increase in the year 2004. This is followed by similar growth in other emerging economies, such as China, Thailand, Lebanon and Jordan. This growth results from the fact that dairy development has been strongly promoted by the Vietnam government since October 2001 (Akey, 2004). However, this dairy industry growth has focused more on increased quantity and there is now recognition that it is time to focus more on quality in dairy production (*Dairyvietnam*, 2009).

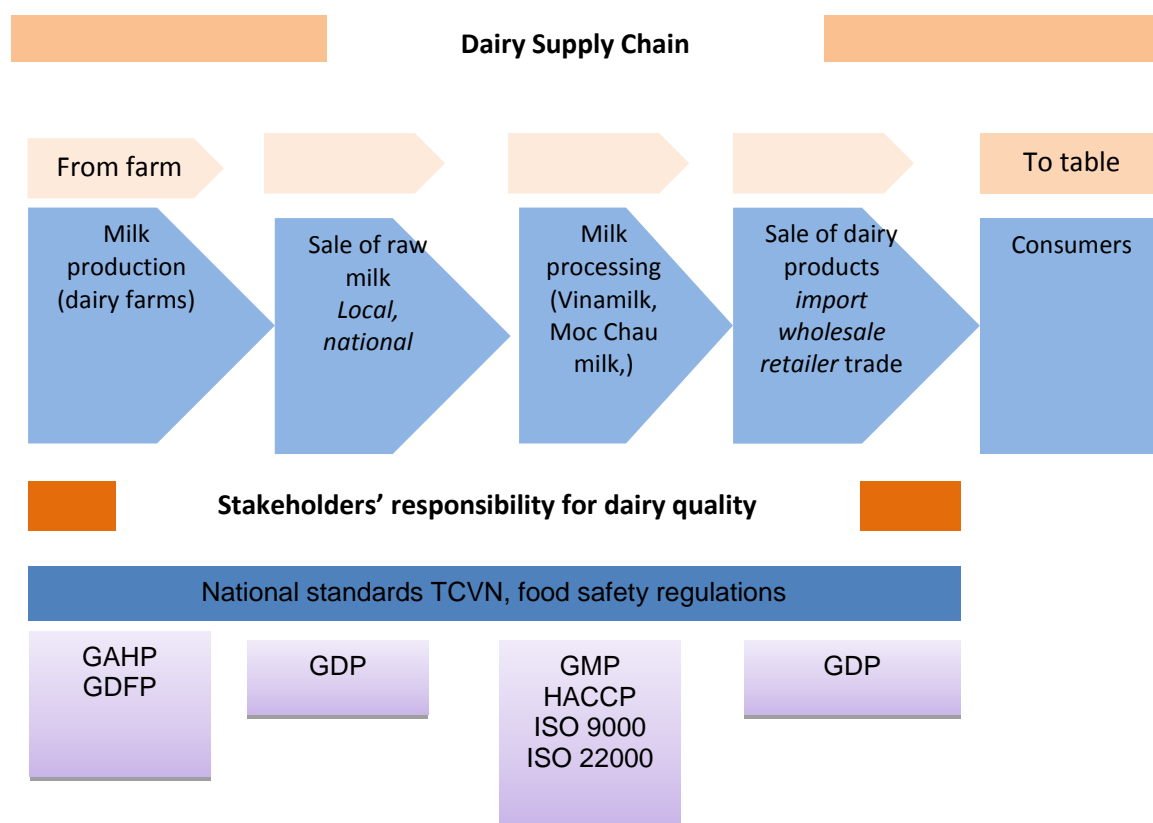
As well as this growth in production, the consumption of dairy products in Vietnam has been growing significantly over recent decades, despite being still low in comparison to other ASEAN countries. It is estimated that the per capita consumption of dairy products is around 9 kg per annum (USDA, 2004) and that only 10% of the population in Vietnam consumes dairy products (MARD Ministry of Agricultural and Rural Development, 2009). The increase in both production and consumption is driven by changes in consumption patterns that result from high economic growth as well as the effects of population growth (Faye & Loiseau, 2002). This growth creates larger markets for dairy companies.

Milk is a highly perishable product, and needs to be processed to lengthen its shelf-life. Processing also makes possible a range of diversified products, such as UHT, pasteurized and sterilized milk, fresh milk, powdered milk, and flavoured milk. In Vietnam, in response to the growth of dairy herds, milk processing plants have been established and are in operation. There are now 72 establishments and businesses involved in the production, marketing, and processing segments (MOI, 2009). With respect to processors, Vinamilk has the largest share in the distribution and milk procurement market, followed by DutchLady Vietnam and Hanoimilk (Habubank Securities, 2009).

The main products produced by the dairy sector are condensed milk, powdered milk, UHT milk and yoghurt. As well, other products such as nutrition milk powder, ice cream, cheese, soymilk, juice, milk cake, and candy are also produced by processors. Up to 2008, the processing and manufacturing capacity of dairy companies was 154,000 tons of condensed milk, 46,000 tons of powdered milk, 439,000 tons of fresh sterilised and UHT milk, and 80,000 tons of yoghurt (MOI, 2009). Both Vinamilk and DutchLady Vietnam occupied a large proportion of processing; particularly, 87% of condensed milk and 76% of powdered milk.

In this sector, dairy supply chains are formed and the main actors that are involved in these chains are input providers, dairy farmers, collectors, processors/companies, distributors, and retailers. This is shown in Figure 1-2. Input providers are mainly foreign companies, such as TetraPak and Delco, and domestic dairy companies, such as Vinamilk, Moc Chau company, Dutchlady Vietnam, and other private companies. Foreign companies supply machines and equipment for production and processing, such as packaging lines, cooling systems, and milking machines, while dairy companies provide veterinary services, credit services, grass forages. Other private companies supply hand tools and equipment, such as tanks, milk testers, and milking machines.

Dairy farmers, the core units for producing raw fresh milk, rear and milk cows for income, or have a mix of on-farm and off-farm income sources. They are categorised into private (smallholders), ex-State farm, company workers, and joint-stock farmers (who are shareholders in dairy companies). Farms mostly use family labour, especially smallholders, while hired labour is used on large farms, and workers are employed in farms owned by dairy companies. Farmers produce milk and sell raw milk to processors, either directly or indirectly via collectors/intermediaries. Five percent of volume is withheld to use for the family and to rear calves, and is processed on-farm into products, such as yoghurt and cakes. Milk is brought to collection points and plants by means of transportation, such as vans, trucks, and mostly motorbikes; and is kept in milk containers, such as tanks made of plastics, aluminium or stainless steel, depending on the farm. Collectors or intermediaries are diversified in ownership and levels of involvement in chains, and include dealers, collectors-cum-farmer, collecting staff of companies, and cooperatives. These various collection methods mean quality is controlled in different ways.



GAHP Good animal husbandry practice
 GDFP Good dairy farming practice
 GDP Good distribution practices
 GMP Good manufacturing practice

Figure 1-2 Typical dairy chain and QA systems in Vietnam

Most of the dairy processors in Vietnam are medium to small, according to the Vietnamese classification¹. Seventy two companies and businesses are involving in processing, manufacturing and trading dairy products (MOI, 2009). They produce a relatively diverse range of products, including fresh, UHT milk, condensed milk, cheese, butter, powdered milk, and yoghurt. There are two large companies, Vinamilk and Dutch Lady Vietnam. Vinamilk, which is State controlled, has 15 plants (Vinamilk, 2007), and Dutch Lady Vietnam, which is foreign owned, has 2 plants. These companies have 50 percent and 25 percent of the share in the procurement market, respectively (Dinh, 2008). Other small companies, such as Hanoimilk, Anco, Moc Chau, Nutifood, Elovi, Hancofood, Lothamilk, Vixumilk, H&T, S&N, and Dalatmilk, are joint ventured or in private ownership, and these and other small companies cover the remaining distribution and procurement markets

¹ Firm size, considered by capital registered and number of employees, less than 100 billion VND or under 300 employees, are indicators of small and medium size (VinaSME, 2009).

(Nguyen A.P., 2007; Phan, 2007). (See Appendix C for more detail on milk companies in Vietnam).

Distributors distribute the final products to consumers, via marketing channels, such as wholesalers, who are company branches and monopoly distributors, and under them, there are agents, shops, and corner-shops for distributing directly to consumers. In this segment, milk is packaged and transported, and its quality relates to the conditions in the distribution chain. As such, it will be affected by conditions of package, storage and transportation. Depending on companies, their distribution systems are different in size, type of products, level of control, and targeted and focused marketing areas. For example, Vinamilk has good distribution systems, with 9400 major agents, and 15,000 shops, and retailer shops throughout provinces in Vietnam (Vinamilk, 2010).

Milk quality and quality management is a ‘hot’ issue in Vietnam, with increased concern by consumers after incidences related to quality occurred in domestic and foreign milk products, such as low protein, and melamine contamination (MOI, 2009). Quality issues of dairy products are continuing to appear in public media and in workshops on improving the quality and safety of these products (Dang, 2009). Examples include “quality is not assured in Vietnam” (Asia Business News, 2009, p2), “large recalls of milk that has contaminated content that causes allergies” for consumers (VTCnews, 2010, p1). As a result, the importance of quality and quality assurance systems is now being recognised in this very significant industry. Responding to the situation, the dairy companies has been to comply with requirements of national standards, and international quality systems, such as the ISO series.

In Vietnam, there are certain standards that food processors are obligated to follow that come from national regulation. However, there is not the same presence of international QAS’s for other actors/players in the upstream and downstream stages of the food chain, such as producers (farmers) and retailers. Since being introduced for the first time in 1998, a few of the QAS’s (i.e. HACCP and ISO) have been implemented by manufacturing and processing food companies (VQSC, 2008). In the dairy industry, some companies, such as Dutchlady Vietnam and Moc Chau Company, are applying ISO 9001:2000. It is common that large companies with reputation brands and modern processing technology have been certified to international standards, for example, Vinamilk and Dutch Lady Vietnam. However, other actors in the supply chain comply with national standards, or private standards (Figure 1-2).

There are some large food processing companies that are applying two QAS's (HACCP and ISO 9000), such as Nestle Vietnam (a joint ventured enterprise) (Le, 2007; STAMEQ, 2008), and Vinamilk, the largest milk corporation. Vinamilk has recently renovated technology and changed from quality management that was product-based to quality management that is process-based by applying both HACCP and ISO 9000 quality assurance systems (MOI, 2008). However, the proportion of firms obtaining a quality certification is still relatively low. One study suggests that fewer than 10% of total food processing firms in the entire country are quality certified, and the diffusion process for QAS's is relatively slow (STAMEQ, 2008). This situation applies also to the dairy industry. Forty percent of large and medium firms apply both HACCP and ISO quality assurance systems while small percent of small firms also apply both. Other small firms have been applying an individual QAS, either HACCP or ISO, or even only GMP or GHP (MOI, 2009; STAMEQ, 2008). GMP/GHP is considered the lowest level of certification, or a prerequisite to other quality assurance systems.

The absence of quality standards in some segments of the food chain and the inadequate application of QA systems in dairy factories are thought to be reasons for poor quality in the dairy supply system. Milk quality is considered a major bottleneck in the absence of any standardized milk quality testing scheme for the country with no independent quality control agency carrying out regular checks at farms, collecting centres and processing factories (Nancy *et al.*, 2007). As a result, the safety and quality of dairy food products are not reliably assured.

Food processors and manufacturers in Vietnam, especially small- and medium-sized food processors, are starting to consider QAS's as a key attribute to compete on domestic and global markets and have begun to adopt these systems (Le, 2007). In addition, they are satisfying requirements of national regulations in agriculture products (STAMEQ, 2008; MOI, 2009). Enforcement of quality regulations is controlled by different public authorities, including Ministry of Public Health, Ministry of Agriculture and Rural Development, and Ministry of Technology and Science (Ambhanoi, 2009). The government mandates some QA systems in specific sub-sectors in the food industry. For aquatic production, HACCP is mandatory and there are plans to mandate HACCP for the remaining sub-sectors in the food industry (Vietnam Government, 2006). Vietnamese regulatory agencies try to improve the quality perception of food processing industries and to enhance the diffusion of these quality

assurance systems through encouraging and supporting firms to apply new quality assurance systems, such as ISO 9001:2000, ISO 14001 and HACCP through specific support programs. Furthermore, many certifying companies and third party certifiers, ranging from State to private and from joint-ventured to foreign owned, have been established to support access to quality certification. As a result of such efforts, the number of food companies adopting quality assurance systems has increased. About 600 enterprises, including 200 food processing establishments, are certificated for individual QAS (that is ISO 9000).

The adoption of QAS's to improve quality may be affected by firm size and regulation enforcement. Small sized firms may not apply quality assurance systems on a voluntary basis since certification and inspection costs are high and a heavy burden for such type of firms. Large firms can more easily access quality assurance systems and adopt them on a voluntary basis, since the cost burden for implementation (investment, technology, human training) and obtaining certification is relatively small for this type of firm. At the firm level, low capital budgets for improving machines, technology, and for improving quality can pose a challenge, while at the food chain level, loose integration and relationships among participants/actors may make it more difficult to monitor and guarantee dairy quality. The relationship between dairy producers and processing enterprises is often governed by verbal contracts, with the exception of some dairy workers who belong to joint-ventured dairies and have written contracts (Dinh, 2008). Thus, low resources at firm level and loose governance in the food chain can cause difficulties in improving quality.

The above discussion shows interrelationships between the adoption of QAS's, motivations, external and internal factors influencing adoption, and product quality. There appears to be a need to have greater insight into these linkages in Vietnam conditions, which may contribute to a greater understanding of successful adoption of QAS's and diffusion of these systems in the dairy industry, and ultimately, may lead to quality improvement.

1.3 Rationale and Research Objectives

In summary, concerns about food safety and quality by governments, businesses and consumers have been increasing globally. Governments in developed countries encourage or mandate businesses to adopt particular QAS's, and quality assurance has changed from end product inspection to process control, and is moving from plant based application to application along the supply chain. Following the trend in developed countries, QAS's are

now becoming important in emerging economies, and is becoming a tool for assurance of food safety and building brand reputation.

Various motivations have been put forward for adopting QAS's, which can be driven by maintenance or expansion of market, a vehicle for assessing supplies and improving processes or efficiency. A range of internal and external factors may be associated with adoption; e.g. the environment in which firms operate, firm characteristics, and so on. Despite motivations and high expectations from the adoption of QAS's, there is not a lot of evidence on the operational outcomes that may occur.

Vietnam's dairy industry has been growing rapidly, which is shown through the dramatically increasing number of dairy processing firms, number of cows and milk output. But constraints in production also exist, such as small scale production, and low level of technology. Satisfying the high demand for fluid milk, changes of consumer demand, and reducing dependence on imports, means that it is a good time for the dairy industry to develop an orientation towards quality. In this regards, processing, which transforms perishable milk into a range of products with longer shelf-life becomes a very important segment in the chain. It is a big challenge for quality improvement and adoption of QAS's in a situation where there are some big companies, but most small companies, and raw milk is supplied by mostly small farms.

Along the Vietnamese dairy supply chains, products flow through many actors before reaching consumers. This includes farmers, collectors, processors, and distributors. In relation to this, a multitude of standards are applied, such as different standards at different stages in the chain, and different standards by different firms.

The fundamental purpose of this research is to gain an understanding of quality processes and adoption of QAS's in dairy processing firms within the context of the broader supply chain. More specifically, there is a need to investigate linkages between motivations for the adoption of QAS's in Vietnam dairy processing firms and their supply chain environment, as well as internal and external factors influencing such adoption. There is also a need to investigate what perceived organisational outcomes have resulted from this adoption of QAS's. To attain this, four interconnecting research questions are posed.

1. What quality processes and systems are used by dairy processing companies and their associated supply chains?

2. What were the motivations of dairy processors in Vietnam for adopting particular QA systems?
3. What role is played by different contextual factors in the adoption of particular QA systems in the Vietnam dairy industry, which is a developing country context?
4. What were the perceived organisational outcomes resulting from the adoption of these QA systems?

1.4 Thesis Structure

The structure of the remaining part of this thesis is shown in Figure 1-3. Literature is outlined in Chapter 2, research gaps are then identified. Based on this, the Research Framework and Methods are shown in Chapter 3. Results are presented and within-case analysis discussed in Chapters 4-6. Cross-case analysis and discussion is done in Chapter 7, along with the conclusion of the thesis.

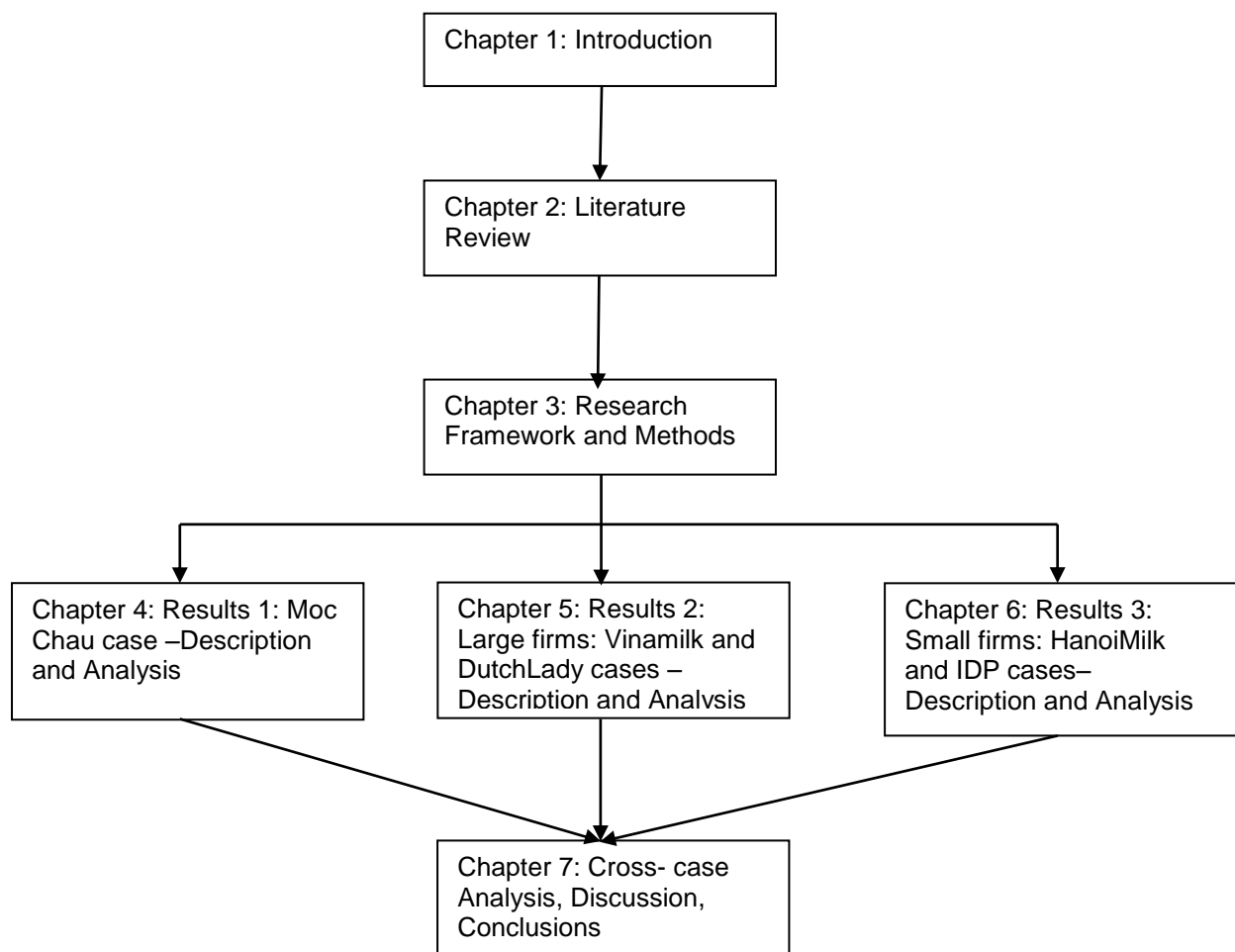


Figure 1-3 Thesis structure

Chapter 2

Literature Review

Chapter 1 highlighted issues related to a range of quality management issues, including the importance of safe food, and the background context of the dairy sector in Vietnam. It then introduced the research questions. This Chapter reviews some recent international literature on issues related to quality, quality assurance system adoption, and their impacts on organisational performance. In Section 2.1, quality is briefly defined and some quality assurance systems (QASs) are described. This is followed in Section 2.2 with literature on the motivations for adopting QAS's by firms, including internal and external motivations. In Section 2.3, factors in the external environment that can influence the adoption of QAS's are identified, and in Section 2.4, internal organisational factors that can affect the adoption of QAS's are discussed. Finally, in Section 2.5, literature on the impact of QAS's on organisational outcomes is discussed.

2.1 Quality Definition and QA Systems

2.1.1 What is quality?

The understanding of what quality means and its definition has changed and become broader over time. Some earlier definitions were narrower, stressing uniformity about a correct target (Deming, 1986), product excellence measured in terms of a set of specifications to be met within set tolerance levels (Kramer & Twigg, 1962) and conformance to requirement (Crosby, 1980). However, it was also recognized that the definition is broader than this, including fitness of purpose (Juran & Gryna, 1970). More recently, it has included measures of product excellence, such as taste, appearance and nutritional content, and those characteristics relevant to determining consumer acceptance (Portter & Hotchkiss, 1995).

A further aspect of product quality took into consideration its dimensions, which include strategic as well as operational aspects that play an important role in characterising the product presented to customers. In this context, there are two broad aspects of quality. The first is design quality – meeting or exceeding the needs and expectations of customers; the second is conformance quality – the extent to which a process is able to meet design

specifications. With respect to conformance quality, Garvin (1987) came up with eight dimensions of product quality to link customer requirements to engineering design: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. These are described in Table 2-1.

Table 2-1 Eight dimensions of product quality

Quality dimension	Descriptions
Performance	A product's primary operating characteristics
Features	The 'bell and whistles' of products and services that supplement basic functioning
Reliability	The probability of a product malfunctioning or falling within a specified time period
Conformance	The degree to which a product's design and operating characteristics meet established standards
Durability	The amount of use one gets from a product before it deteriorates
Serviceability	The speed, courtesy, competence, and ease of repair
Aesthetics	How a product looks, feels, sounds, tastes, or smell
Perceived quality	Reputation

Source: Garvin (1987, pp. 101-109)

Garvin (1984, pp. 25-28) also notes that there are five approaches to defining 'quality'. These are:

- (i) A transcendent definition: Quality is universally recognizable; it is related to comparison of features and characteristics of products.
- (ii) A product based definition. Quality is based on features or attributes of the product that enhance quality.
- (iii) A user based definition: The user determines the quality of the product.
- (iv) A manufacturing based definition: Quality is conformance to specifications. Manufacturing engineering specifies the product characteristics, and the more closely

manufacturing can conform to those requirements, the better the quality of the product.

- (v) A value based definition: The element of price is introduced into the definition of quality. Quality is the degree of excellence at an acceptable price and the control of variability at an acceptable cost. Value comprises price and quality of product and service.

More recent formal definitions take into account many of the features of previous definitions, and have been standardized by regulatory bodies; for instance, ISO 9000: 2000 quality management systems - fundamentals and vocabulary. Recently FAO/WHO publications defined quality as the degree to which a set of inherent characteristics fulfils requirements as a product or service. With this updated definition, the implication is that quality is relative to what something should be and what it is (FAO/WHO, 2003) . The American Society of Quality (ASQ) defines quality as “the totality of characteristics of a product or service that bear on its ability to satisfy a given need” (ASQ, 2002, p.56). Both definitions are widely accepted in food quality management nowadays and will be used to guide this research.

2.1.2 Quality assurance systems in the food sector

The most common QA systems operating in the agri-food industry are Good Manufacturing Practice (GMP), Hazard Analysis of Critical Control Points (HACCP), and the International Standards Organisation (ISO) series. Good Manufacturing Practice (GMP) and Good Hygiene Practice (GHP) are interrelated. GMP contains ten principles that introduce employees to critical behaviours to maintain good manufacturing practices in plants (WFP, 2008). GHP is a subset of this, and refers to procedures that must be undertaken and hygiene conditions that have to be fulfilled and monitored at all stages of production or trade in order to guarantee food safety (Knaflawska & Pospiech, 2007). GHP denotes all the actions that must be undertaken and conditions to be fulfilled in order to ensure that production of food, wrapping materials and other materials expected to be in contact with food, is executed in a proper way to guarantee safe end products and safe food for human consumption.

2.1.2.1 HACCP

HACCP (Hazard Analysis of Critical Control Point) is a food safety program that was developed nearly 30 years ago for NASA, based on regulations of the United Nations *Codex*

Alimentarius Commission (CAC) (Sperber *et al.*, 1998) to ensure the safety of food products that were to be used by the astronauts in the space program (WFP, 2008). HACCP is a systematic approach to the identification, evaluation, and control of steps in food manufacturing, which are critical to product safety (Codex Alimentarius, 1997; NACMCF, 1992; Trienekens & Zuurbier, 2008; Sumner, 2003). It identifies risks in the production processes that can lead to unsafe products, and designs measurements to reduce these risks to an acceptable level (FAO, 1998; Sumner, 2003). The HACCP system establishes process control through identifying points in the production process that are most critical to monitor and control. HACCP's preventative focus is seen as more cost effective than testing a product and then destroying or reworking it (ICMSF, 1988). The system can be applied to control any stage in the food system, and is designed to provide enough feedback to direct corrective activities. HACCP is guided by seven principles, which are outlined in Figure 2-1.

Figure 2-1 Seven principles of HACCP

- PRINCIPLE 1 Identify the potential hazard(s) associated with food production at all stages, from growth, processing, manufacture and distribution, until the point of consumption. Assess the likelihood of occurrence of the hazard(s) and identify the preventive measures for their control
- PRINCIPLE 2 Determine the points/procedures/operational steps that can be controlled to eliminate the hazard(s) or minimize its likelihood of occurrence – (Critical control point (CCP)). A step means any stage in food production or manufacture including agricultural practice, raw material receipt, formulation, processing, storage, transport, retail and consumer handling
- PRINCIPLE 3 Establish targets and tolerances which must be met to ensure that each CCP is under control
- PRINCIPLE 4 Establish a monitoring system to ensure control of CCP by scheduled testing or observations
- PRINCIPLE 5 Establish the corrective action to be taken when monitoring indicates that a particular CCP is not under control
- PRINCIPLE 6 Establish procedures for verification which include supplementary tests and procedures to confirm that the HACCP system is working effectively
- PRINCIPLE 7 Establish documentation concerning all procedures and records appropriate to these principles and their application

Source: Adapted from Joint FAO/WHO Codex Alimentarius Commission 1993. Guidelines for the application of hazard analysis critical control point (HACCP) system. In training consideration for the application of the HACCP system to food processing and manufacturing, p 17-18. Geneva: World Health Organisation, WHO/ FNU/FOS/93.3

By focusing inspection at Critical Control Points (CCPs), HACCP improves the scientific basis for safety and control processes. A CCP is any point in the chain of food production from raw materials to finished product where the loss of control could result in unacceptable food safety risk (Pierson & Corlett, 1992). Monitoring of CCPs is done best by using indicators that can be measured easily.

HACCP is widely recognised in the food industry as an effective approach to establishing good production, sanitation, and manufacturing practices that produce safe foods (Pierson & Corlett, 1992). It is becoming internationally recognised as a tool for controlling food borne safety hazards (Mayes, 1998).

HACCP was originally developed as a quality control tool in food processing, where branded product liability creates industry incentives for hazard control. It was intended to be flexible enough to adapt to different firms, plants, or processes within plants. Its application as a regulatory standard to an entire industry or sector, or at different stages in the supply chains, is necessarily different.

2.1.2.2 ISO 9000 series

The ISO 9000 series of quality management standards was developed by the ISO Technical Committee 176 (ISO/TC 176) convened in 1979. It set out to create a framework of the fundamental generic elements that would form the basis for a series of internationally recognized quality management standards, which it completed in 1982 and published in 1983 (ISO, 2008). The ISO 9000 series of standards represents the essential requirements that every enterprise should address to ensure the consistent production and timely delivery of its products and services to the market. It is aimed at meeting customer's expectations and maintaining customer loyalty. It is applied widely in food and non-food sectors. Steps in the ISO certification process are outlined in Figure 2-2.

ISO 9000 is a family of standards and guidelines on how to develop a quality management system to manage the processes that affect products or services (Quazi *et al.*, 2002). The family is made up of five separate standards or guidelines: ISO 9000, ISO 9001, ISO 9002, ISO 9003 and ISO 9004 (Wayhan *et al.*, 2002). ISO 9001, 9002, 9003 are conformance standards for quality assurance systems and relates to the development of quality systems within the company (Ragothman & Korte, 1999). ISO 9001 applies to firms that design, develop, produce, install and service their own products. ISO 9002 applies to firms that provide goods or service consistent with the specification furnished by the customer. ISO 9003 applies to final inspection and test procedures only. In respect to content, ISO 9001 is governed by 20 quality system elements and covers activities from product design and development through production, inspection, installation or delivery, and product servicing.

ISO 9002, which is governed by 18 of these 20 elements, excludes design and development activities as well as after-market service. ISO 9003, which is governed by 12 of the 20 elements, includes only quality assurance of final product inspection and testing.

Figure 2-2 ISO 9000 certification process

1. Decision making and commitment of top management
2. Allocation of the available resources
3. Initial assessment of the organisation's structure
4. Identification and analysis of the organisation's processes
5. Documentation of the system
6. Training personnel
7. Trial of the system for a short period
8. Internal audit
9. Certification audit

Source: Adapted from Agglogiannopoulos *et al.*, 2007, p2

When discussing any QA system, such as the ISO series, it is necessary to take into account the interrelationship between QA systems. HACCP certification enables organizations to demonstrate commitment to food safety and customer satisfaction and it focuses on analysing risk and taking precautions. GMP/GHP is more focused on how to control quality and assure safety, whereas the ISO 9001 is more holistic, since it relates to all aspects of the business with the ultimate aim of satisfying the needs of the customer.

In the food industry, food safety principles and practices have always been integrated into activities identified within quality assurance or quality control, or within quality management systems; therefore, such systems can address both food quality and food safety simultaneously. Consequently, safety systems and quality systems (QAS's) are interdependent. The application of HACCP for the identification of hazards and control of risks is directly related to the quality planning and preventive actions required by ISO 9001. Once the critical points have been identified, the principles of ISO 9001 can be used for control and monitoring. Procedures for conducting a HACCP study can easily be documented within ISO 9001:2000 quality management system. The application of a safety system within a quality management system conforming to ISO 9001 can result in a more effective food safety system than the application of either system alone, thus leading to enhanced customer satisfaction and improved organizational effectiveness.

The ISO 9001 requirements have had three revisions since it was originally issued by ISO. These are ISO 9001: 9004, ISO 9001: 2000, ISO 9001: 2008 (ISO, 2008). The meaning of quality used in the context of ISO 9000 was concerned with the totality of characteristics that satisfy needs, but in the 2000 version, this meaning was changed. Quality in ISO 9000:2000 was defined as the degree to which a set of inherent characteristics fulfils requirements. The former definition focused on a product or service, but this new definition implies that quality is relative to what something should be compared to what it is. However, when comparing ISO 9001: 2000 and ISO 9001: 2008, ISO 9001: 2008 has been developed in order to clarify the existing requirements of ISO 9001: 2000, and to improve its compatibility with another ISO standard, ISO 14001: 2004. ISO 9001: 2008 does not introduce extra requirements or change what the intention of the ISO 9001: 2000 standard is. Certification to ISO 9001: 2008 is not deemed to be an upgrade, and organizations that are certified to ISO 9001: 2000 may be given the same status as those who have already received a new certificate for ISO 9001: 2008 (ISO, 2008). There are also small differences in content of ISO versions. For example, in regard to ISO 9001: 1994 and ISO 9001: 2000, version 2000 reduces the 20 quality standard elements shown in version 1994 into only four groups which include responsibility of top managers, resource management, product creation, and measurement, analysis and improvement.

In the different ISO series, - ISO 9000, ISO 9001, and ISO 9004 version 2000 - there are different purposes of application. The ISO 9000: 2000 has its focus on the quality management system- fundamentals and vocabulary; ISO 9001:2000 on the quality management system- requirements; ISO 9004:2000 on the quality management system – guidelines for performance improvements. ISO 9001 and ISO 9004 are quality management systems that have been designed to complement each other, but can also be used independently. ISO 9001 specifies requirements for a quality management system that can be used for internal application by organizations, for certification, or for contractual purposes. It also focuses on the effectiveness of the quality management system in meeting customer requirements as mentioned previously. ISO 9004 gives guidance on a wider range of objectives of a quality management system than does ISO 9001, particularly for the continual improvement of an organisation's overall performance and efficiency, as well as its effectiveness. ISO 9004 is recommended as a guide for an organization whose top management wishes to move beyond the requirements of ISO 9001 in pursuit of continual

improvement of performance. However, it is not intended for certification for contractual purposes.

As noted previously, prior to 1994, the ISO 9000 series consisted of five separate standards: ISO 9000, 9001, 9002, 9003, and 9004. The 2000 version of the ISO 9000 family of standards replaced the 1994 version of several of these standards. This included ISO 8402: 1994 (later subsumed under ISO9000), quality management and quality assurance – vocabulary; ISO 9000-1: 1994, quality management and quality assurance standards - part 1: guidelines for selection and use; ISO 9002: 1994, quality systems - model for quality assurance in production, installation and servicing; ISO 9003: 1994 quality systems- model for quality assurance in final inspection and test; ISO 9004-1: 1994, quality management and quality system elements-part 1: guidelines. ISO 9001:2000 now consolidates the former ISO 9001/9002/9003 in the old standards into a single document and is the only standard to which certification is now assessed (Briz *et al.*, 2005). The ISO 9001:2008 standard does not divide into separate standards, in the same way as ISO 9001: 2000 did, and is the only standard that defines the ISO 9001: 2008 quality management system- requirements (ISO, 2008).

2.1.2.3 ISO 22000: 2005

ISO 22000 is an international, auditable standard that specifies the requirements for a food safety management system by incorporating all the elements of GMP and HACCP together with a comprehensive management system (Pillay & Muliyl, 2005). Food safety experts have found that well functioning prerequisite programs (PRPs) simplify and strengthen the HACCP plan. Hence ISO 22000 is a HACCP-type standard and fits very well with ISO 9001: 2000, having been especially developed to assure food safety. ISO 22000 combines the HACCP principles and application steps with prerequisite programs, using hazard analysis to determine the strategy to be used to ensure hazard control by combining the prerequisite programs and a HACCP plan (Faergemand & Jespersen, 2004). The new standards offer an alternative to food enterprises that do not implement ISO 9001 and want to have an effective food safety management system (Aggelogiannopoulos *et al.*, 2007). It combines a series of advantages, involving quality management, external and in-house communications, designating responsibility, implementing crisis management, continual improvement, good health practice and differentiating between prerequisite program (PRP) and critical control points (CCP) (Talbot, 2007).

In summary, the basic QA systems are GMP, HACCP and ISO series and these have been described in some detail. Universal definitions of quality are accepted and have been widely used in food quality management systems. The key feature of these definitions is satisfying and exceeding expectations of customers shown in the requirement in the quality assurance systems.

2.1.2.4 Other systems and comparisons of QA systems

In addition to these key systems, there are other QA certifications in the food industry. These include EurepGAP, BRC, and SQF. Some of these certifications combine some of the key systems previously discussed.

EurepGAP, now GLOBALGAP, is a common standard for farm management practices created in the late 1990s by several European supermarket chains and their major suppliers. GAP is an acronym for Good Agricultural Practices. The aim was to bring conformity to different retailers' supplier standards, lack of which had been creating problems for farmers. It is now the world's most widely implemented farm certification scheme. Most European customers for agricultural products now demand evidence of EurepGAP certification as a prerequisite for doing business. The standard was developed using the HACCP guidelines published by FAO, and is governed according to the ISO Guide 65 for certifications schemes (Globalgap, 2012).

In 1998, the British Retail Consortium (BRC) with participants, such as TESCO and Sainsbury, took the initiative to define common criteria for the inspection of suppliers of food products. The inspections are carried out by certified inspection organisations. Before BRC was introduced, retailers carried out inspections separately; however, joint inspections reduce costs. Retailers in other European countries now also demand inspections according to BRC rules and for accompanying quality reports from their suppliers. The norms of the BRC are converging with HACCP norms, although more attention is paid to a documented quality management system, factory environment and facilities, product and process control and personnel (Trienekens & Zuburbier, 2008).

Safe Quality Food (SQF) aims at quality assurance from a total supply chain perspective. The SQF program is based on the principles of HACCP and ISO 9000 series norms. SQF has two norms. SQF 1000 focuses on primary producers, and all other companies are certified

according to SQF2000. SQF was developed in Australia and is internationally well accepted. An advantage is that SQF can be included in the product label (Trienekens & Zuburbier, 2008; van de Spiegel, 2004).

A comparison of different QA systems is shown in Table 2-2. This compares aims, methods, location in supply chain, and perspectives.

Table 2-2 Differences between QA systems

Characteristics		GMP	HACCP	ISO 9001-3:1994	ISO 9001:2000	EUREP-GAP	BRC	SQF
Aim	Food safety	X	X			X	X	X
	Product quality	X	X	X	X	X	X	X
	Organisation quality			X	X		X	
	Environment, and health and safety at work					X		
	Total quality							
Method	Plan of steps		X					X
	Checklist			X	X	X	X	
	Guidelines	X				X		
	Awards / Self-assessment							
Perspective	Technology	X	X			X	X	X
	Management			X	X	X	X	X
Location in supply chain	Agricultural sector	X				X		X
	Manufacturing sector	X	X	X	X		X	X
	Retail							X
Composition	Combination of QA systems	-	-	-	-	-	GMP HACCP ISO	HACCP ISO

Source: Adapted from Spiegel, 2004, p5.

2.1.3 Supply chains and quality management

There is growing attention to global supply chain management (Lin et al., 2005). One of definitions of supply chain management is that it is a holistic and a strategic approach to demand, operations, procurement, and logistics process management (Kuei *et al.* 2002). The effective management of technology and quality is a key to gaining an increased quality and enhanced competitive position in today's global environment. Kuei and Madu (2001) define supply chain quality management (SCQM) as consisting of three simple components as follows:

- (i) SC: a production – distribution network;
- (ii) Q: meeting market demands correctly, and achieving customer satisfaction rapidly and profitably; and
- (iii) M: enabling conditions and enhancing trust necessary to achieve supply chain quality.

Some articles offer insights on the critical success factors for traditional quality in a broader supply chain quality context. Saraph *et al.*, (1989) reported that eight critical factors could be used for traditional quality management assessment. These factors are the role of top management leadership, the role of the quality department, training, product/service design, supplier quality management, process management, quality data and reporting, and employee relations. Kannan *et al.*, (1998) laid emphasis on supplier evaluation, supplier involvement, and decentralization of purchasing to enhance supply chain quality. Krause *et al.*, (1998) identified five factors for supplier selection: quality, delivery, cost, flexibility, and innovation. Wong *et al.*, 1999, conducted a study on the interaction between manufacturers and suppliers, and found that factors such as cooperation, trust, and long term relationships enhance quality among supply chain members. Krause *et al.* (2000) reported that supplier performance would determine the long term success of the purchasing firms. Many purchasing firms have indicated that the critical supplier improvement areas include quality, delivery, cost reduction, new technology adoption, financial health, and product design.

2.1.4 Conclusion

This Section introduces basic knowledge about quality and quality assurance is the first step to exploring further areas, such as supply chain and quality management along the chain. These concepts provide a context for discussing the motivations of firms for adopting QA systems, external and internal factors influencing adoption, and outcomes firms gained after adoption.

2.2 Motivation to Adopt QAS's by Firms

2.2.1 External motivations

The term 'motivation' is used in this research to refer to the driving forces behind the adoption of QASs by firms. Motivations are categorized into two types, namely external and internal ones. External and internal motivation for adopting QAS are indicated in a number of research studies; for example, motivations to adopt ISO 9000 in the agri-food sector (Holleran & Bredahl, 1997; Turner *et al.*, 2000; Lloyds Register Quality Assurance, 1995) and motivations to adopt HACCP (Henson & Northen, 1997; Henson & Holt, 2000) . External motivations identified include satisfying legal requirements established by national governments in domestic markets (Henson *et al.*, 1999) or rules imposed by international customers (that is, HACCP certification is obligatory when exporting food products to

developed countries), or requirements of players in the food chain. For example, retailers often insist that their suppliers have quality system certifications in order to increase assurance of the supply of safe foods. Therefore, satisfying a legal regulation and customer's requirements are external motivations to adopt QASs that was identified in previous research.

The motivation for adopting a QAS differs among individual firms according to regulatory and market factors associated with their own particular circumstances. For example, certain manufacturers may implement HACCP regardless of government regulation, perhaps because it is the industry norm or is required by major buyers of their products. Others may not be induced to implement HACCP even if legally required to do so (Henson & Holt, 2000). Henson & Holt indicate four motives for adoption of a QAS, such as internal efficiency, accreditation, direct external requirement, and recommended good practice. They noted that customer requirement is the most important motive for businesses to adopt HACCP in the dairy sector of the UK. In another study of motivations for seeking a quality system by beef producers in the UK, Spriggs *et al.* (2000) report that the reasons for adopting a QAS are to ensure compliance with government regulations, to ensure compliance with supermarket regulations, to convince consumers of quality, and to protect large specialist producers.

A reason identified for adopting ISO 9000 is that it was externally imposed by international and national customers who do not identify high quality suppliers by self-auditing their production and quality processes. This argument is confirmed by a study among US businesses which show that the decision to select counterparts is positively influenced when suppliers have an ISO 9000 registration (Deloitte & Touche, 1994). Ferguson (1996) argues that many industrial buyers often use the list of ISO registered suppliers as their only source for identifying potential suppliers. Thus, despite the opinion expressed by early researchers on quality management that adoption of ISO is not externally mandated or controlled (Deming, 1986; Ishikawa, 1986; Juran, 1982), the reason for adopting ISO 9000 certification more recently may be related to a safe way of doing business with suppliers.

Maintaining existing markets and expanding new markets can be motivations for business firms in competitive global markets to adopt QAS's. Hobbs *et al.* (2002) argue that maintaining access to the US and other foreign markets are important reasons for Canadian businesses to make a decision to adopt HACCP. They noted that Canadian firms wishing to

export meat, for example, to the United States must have a HACCP system in place although it is not yet mandatory under Canadian regulations. This situation is also referred to in a study of Nguyen *et al.* (2003) on obtaining HACCP and ISO for satisfying requirements of export.

Marketing advantage can provide a major explanation for the adoption of the ISO9000 system. In fact, Juran (1995) argued that the major reason for seeking certification is maintenance or expansion of markets. ISO9000 certification can be an important marketing cue, building up trust with industrial customers, and final customers. Research shows that anticipated marketing advantage, and specifically, increasing market share and providing access to new markets, have been critical factors that encourage the pursuit of ISO 9000 (Capmany *et al.*, 2000) . In one study, the ability to sustain or increase market share was ranked fourth and sixth among the top 10 anticipated benefits of ISO 9000 certification (Skrabec *et al.*, 1997). This finding is also confirmed in the research of Briz *et al.* (2005) on motivations for applying ISO 9000 in the SME food industry in Spain, with ‘increase market share’ and ‘access new markets’ considered as motivations that were ranked highly. Unnevehr & Jensen (1998) indicated that firms have incentives for HACCP adoption to prevent losses of market share when an outbreak occurs.

There are further motivations to adopt a QAS, such as enhancing a company’s reputation and image (see Hassan *et al.*, 2009; Khatri & Colins, 2007; Ebrahimpour *et al.*, 1997), increasing competitive ability and becoming a leader among competitors (see Rao *et al.*, 1997 ; Briz *et al.*, 2005; Capmany *et al.*, 2000), being mandatory and recommended by corporates, trade and business (Turner *et al.*, 2000 ; Deohar, 2003) . While these motivations are highlighted in these articles, they are not considered as fully as the other motivations mentioned above.

2.2.2 Internal motivations

Internal motivation for firms to adopt a QAS that have been highlighted by some authors are cost reduction, and improvement of product quality (Ebrahimpour *et al.*, 1997; Deohard, 2003; Hassan *et al.*, 2009; Withers & Ebrahimpour, 1996; Jin *et al.*, 2008). In particular, motivations of reducing costs and gaining efficiencies in operation have been documented in a number of studies (Ebrahimpour *et al.*, 1997; Carlsson & Carlsson, 1996; Khatri & Colins, 2007; Seddon *et al.*, 1993). However, it has been noted that ISO 9000 registration can result in non-value added costs if it is adopted solely on the basis of marketing (Curcovic & Pagell,

1999). ISO 9000 registration can be leveraged into a competitive advantage when it is made consistent with a firm's strategic direction (Curcovic & Pagell, 1999). Thus, the willingness to adopt ISO 9000 can occur if it is perceived by the firm's management as important to competitive success (Withers & Ebrahimpour, 2000).

The adoption of ISO requires the production of extensive documentation, including manuals specifying who is responsible for quality and how quality is to be achieved, job instructions explaining how QAS tasks are performed and records proving that the system works (Curkovic & Pagell, 1999). Also, the production process is documented and then audited to ensure the process is followed. By following ISO 9000 procedures, an ISO 9000 certified firm can improve its operational efficiency by reducing product failure rates, improving management control of the firm activities, familiarizing staff with production, processes, and through establishing corrective action procedures. Internally driven reasons to adopt ISO 9000 (e.g., to improve operational efficiency or to reduce error rates, wastage, and costs) are shown in research by Turner *et al.*, (2000). Seddon *et al.*, (1993) studied ISO 9000 firms and found the internal motivation of cost reduction as one the often cited adoption benefits.

Others argue that lowering the transaction costs between business partners in the value chain would be an advantageous internal motivation to adopt QAS (Caswell *et al.*, 1998; Holleran *et al.*, 1999). This has the potential of reducing transactions costs by serving as the seller's guarantee of quality. In particular, transaction costs involved in an exchange between a customer and supplier may include supplier identification, contract negotiation and contract verification and enforcement. Some or all of these types of transactions costs may be potentially reduced, thereby increasing firm and/or sector competitiveness (Holleran *et al.*, 1999). However, sometimes high costs related to adoption of ISO 9000 may serve as a barrier to entry, excluding from commerce those firms that can not incur the registration cost or are uncertain of recouping it (Tsekouras *et al.*, 2002). Several studies have shown that food producers adopt HACCP in order to satisfy downstream customers in the food chain (Mazzoco, 1996; Henson *et al.*, 1998).

Finally, profitability is an important factor in the decision for SMEs to invest in a QAS. Glancey (1998) argues that small firm entrepreneurs typically rely on retained profits as their primary source of capital for expansion so as to avoid external lenders having a stake in the

firm. This implies a positive relationship between profitability and the decision to undertake further investment. Thus, profitability is expected to have a positive relationship to the decision to adopt ISO 9000 as a new investment, at least in SMEs (Tsekouras *et al.*, 2002).

Improving quality of product is also an internal motivation to adopt a QAS (Withers & Ebrahimpour, 2000; Henson & Holt (1999; 2003); Turner *et al.*, 2000; Jin *et al.*, 2008; Mandonado-Siman *et al.* 2009; Mazzoco, 1996; Bredahl & Zaibet, 1995; Deohar, 2003). Bredahl & Zaibet (1995) show that most firms who adopt a QAS have seen not only a decline in transactions cost, but also have experienced improvements related to their production processes and final product. Fearne *et al.* (2001) argue that motivations to adopt QAS's are to obtain goals such as a safety and quality guarantee. In this regard, it was found in recent research in India and China that improving product quality is an important motivation to adopt HACCP by firms in the agri-food sector (Deodhar, 2003; Jin *et al.*, 2008). Conversely, research in the UK found that firms seeking to improve operational efficiency may view a QAS, such as ISO 9000, as a tool to improve internal operations (Holleran *et al.*, 1999). Walgenbach (2007) in his qualitative interviews found that internal motivation is enhancing business processes. Ebrahimpour *et al.*, (1997) indicated that 'improving product quality' motivation is ranked high among motivations to adopt ISO 9000. Further, other internal reasons for firms to adopt a QAS are improving operational efficiency and reducing production costs (Henson & Northen, 1999; Henson & Holt 1999; Turner *et al.*, 2000; Lloyd Register Quality Assurance, 1995; Madonadon-Siman *et al.*, 2009; Nguyen *et al.*, 2004) and being recognized as employing "best practice", a 'good system', and new technology and innovation (Henson & Holt, 1999; Herath & Henson; Deohar, 2003; Miles *et al.*; Jayasinghe-Mudalige & Henson; Mandonado-Siman, 2009).

Studies on QA systems and quality assurance devoted to the dairy industry are very few, even in developed countries. For example, in the EU, there are studies on dairy supply chain and coordination regimes, the role of foreign direct investment (FDI) with changes of chains (Dries *et al.*, 2004), but not specifically in quality management. In the UK, an exemption was Henson and Holt (2003), who studied the motivation of dairy firms to adopt HACCP, which indicated that four broad motivations - internal efficiency, accreditation, direct external requirement and good practice existed-for the adoption of QAS's. With respect to the dairy industry, Beekhuis-Gibbon *et al.*, (2011) studied implementation of a HACCP based-system to prevent and control mastitis in dairy herds in Ireland; Karaman *et al.*, (2012), studied

barriers and benefits of the implementation of HACCP in the Turkish dairy industry, but at more technical level, not managerial approach. In New Zealand, one study on HACCP/RMP and export performances for meat sector was undertaken by Cao (2007).

Thus, in summary, motivation to adopt quality assurance systems may be external or internal, with major external motivations including satisfying legal regulations, and maintaining and expanding markets, while major internal motivations are reduction of costs, and improvement of quality. Adopting a QAS can also provide a means of selecting high quality suppliers and reducing the transaction costs of dealing with them. However, motivations to adopt QAS's are diverse and they may differ between individual firms, across countries, as well as sectors within the food industry. Much of the research reported here is focused on individual QAS's, and there is not a comparison between QAS's, so it is difficult to draw conclusions. Furthermore, many of the results report evidence from the developed economies such as the US, Canada, and UK, and it is not clear how these results apply to emerging economies, such as Vietnam.

Although these previous studies have provided a good insight into the motivations for food processors to adopt QASs, they are subject to some limitations. They often disregard the context within which a firm operates (Manchester Business School, 1996). In the following section, literature on these context factors is explored more fully.

2.3 Adoption of QAS's and the External Environment

2.3.1 Introduction

The term 'business environment' or 'organizational environment' is often used interchangeably in strategic management literature to mean the macro environment, industry environment, and internal environment (see Figure 2-3) (Worldwide Learning Limited, 2007); or the macro environment, and intermediate environment (Worthington & Britton, 2006).

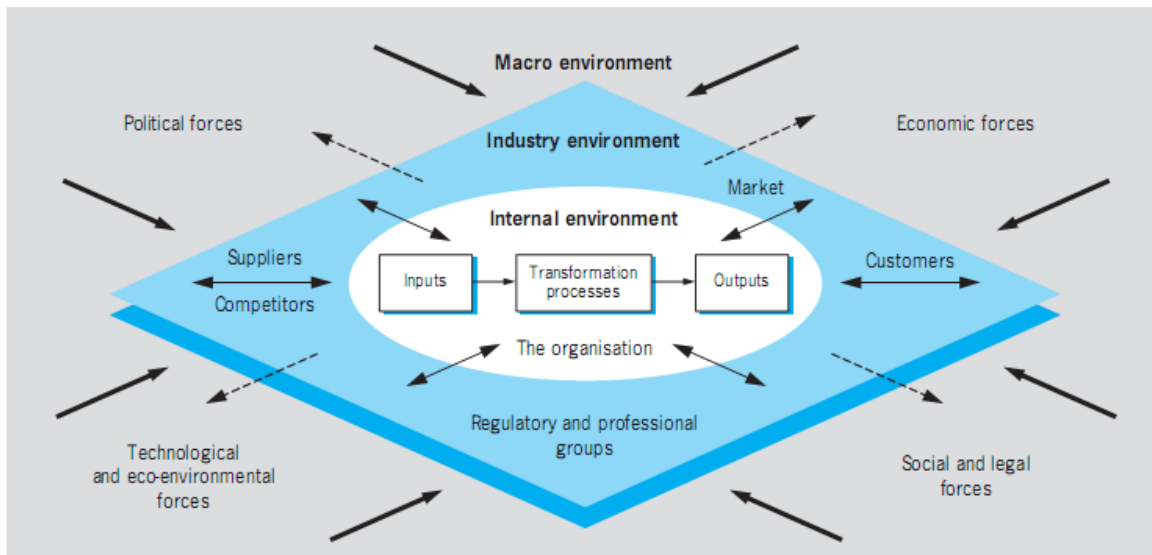


Figure 2-3 Business environment and organization

Source: Adapted from Worldwide Learning Ltd 2007, p.2.

In detail, the macro environment may comprise a wide range of influences (economic, demographic, social, political, legal, technological, and so on) which affect business activity in a variety of ways and which can impinge not only on the transformation process itself but also on the process of resource acquisition and on the creation and consumption of output (Worthington & Britton, 2006). The operational environment or industrial environment, the closest external environment (Worldwide Learning Ltd., 2007) for most firms, includes suppliers, competitors, labour markets, financial institutions and customers, and may also include trading organizations, trades union and possibly a parent company.

There is some research on the existence of the link between business environmental factors and manufacturing strategy content (William *et al.*, 1995; Ward *et al.*, 1995) that has been gaining interest in recent years. For instance, Badri *et al.*, (2000) examined the relationships among operations strategy, environment uncertainty and performance among manufacturing firms in the UAE. Ward *et al.*, (1995) did similar research in Singapore. These studies utilised various environment variables such as business costs, labour availability, competitive hostility, environment dynamism (Ward *et al.*, 1995; Badri *et al.*, 2000) political environment and government laws and regulation (Ward *et al.*, 1995). Johnson & Scholes (1993) show the importance of external environment in formulating competitive strategy in an uncertain environment. Porter & Keteis (2003) found results that showed that the relationship between

firms and the local business environment depends on synergy between social and economic objectives and is influenced by factors from the external environment.

Along with this relationship between elements of strategic management and environment factors, research has focused on the relationship between environmental factors and adoption of QAS's. In the following section, the literature on the influences of external environment factors on the adoption of QAS's is presented.

The environmental context is the domain in which an organization operates, involving factors related to competitors, industry sector, governmental agencies, and environmental uncertainty. These factors may encourage or impede innovation adoption (Chau & Tam, 1997; Tornatzky & Fleischer, 1990). In another perspective, Holleran *et al.*, (1999) comment that market power of suppliers and customers, the legal environment, and the degree of involvement in international markets are forces affecting a firm's decision to seek certification for a quality assurance system. Further, Anderson *et al.*, (1999) have investigated the economic and political forces that influence a manager's decision on QAS's. For instance, he noted that ISO 9000 is a better quality management tool for some industry and competitive situations than for others.

2.3.2 Legal and regulatory forces

The legal environment is a force affecting a firm's decision to seek certification to a QAS. Another important force is the degree to which regulations are enforced. For instance, the 1990 Food Safety Act (FSA) significantly affected QAS diffusion in the UK food sector (Holleran *et al.*, 1999).

In regulating businesses by way of public legislation, Stigler (1971) noted that governments force businesses to operate within certain constraints. For example, with certain legislation related to food safety, business firms often demonstrate a commitment to their assurance of safe products (Unnevehr & Jenson 1999), thus satisfying a public policy goal that places food safety enhancement as a top priority to avoid loss to society. However, in practice, firms strive to maintain or improve both safety and quality attributes together and such efforts are closely interrelated and most likely are managed as the whole (Herath *et al.* 2007).

Regulation has become a major element of the environment in which firms operate. This element constrains a firm's strategic behaviour. Marcus (1984) reports three main strategic choices faced by a firm in general in its response to regulations (i) stonewalling –where the firm attempts to ignore the problems created by the regulation; (ii) opportunity seeking-where the firm sees the regulation as an opportunity to gain competitive or other advantages; (iii) a mixed strategy-where new product development and heavy marketing might characterize a firm's response, which may be in a new area for the firm.

With respect to quality, firms' intentions to obey regulations controlling safety and quality of product can depend on a range of factors. According to Pelzman (1976), firms may attempt to adapt the regulatory process in an attempt to gain strategic advantage. In this regard, Hooker *et al.*, (2002) examine meat processing firms operating in Texas in the USA, and argue that firms were restructuring the facility and staff to comply with HACCP regulations of the USDA. According to Rugman & Verbeke (1998), a response of firms to be in compliance with regulation depends on the expected economic benefits. They suggest that a firm may choose to comply voluntarily with regulation if it is triggered by 'market –based incentives' such as first mover advantage. However, in many cases, compliance with regulation depends on the strength of the enforcement authorities, i.e. regulatory incentives. In the case of the food processing sector, Henson & Heasman (1999) show that enforcement could play a very different role in the regulatory process for assuring safety of food.

The regulatory environment in a particular country may provide an incentive for firms to adopt a particular QAS so that legal obligations can be met (Holleran et al 1999). For example, European public policy can influence the external business environment and consequently anything related to the adoption and application of QAS's in small food enterprises. The level of public interest in human health and quality of life, social welfare, employment, and competitiveness can determine the type and intensity of measures, including public policy. Because these issues are influenced by the application of QAS's in enterprises, governments have a strong incentive to pay attention to this fact and to contribute to the diffusion of QAS application in a larger number of small food enterprises (Antle, 1996). Firms within the processing sector can also find that they are subject to different regulations at the federal, provincial and/or municipality levels (see Wolf 1986, 1979).

Studies of firms' compliance to governmental regulation have found conflicting results (Cole & Sommers, 1981; Baron & Baron, 1980). Many of these studies have only focused on the impact of food safety legislation on food processing firms operating in developed countries (Caswell & Johnson, 1991; Henson & Heasman, 1999). However, the interrelationship between regulation activities of government and the strategic behaviour of firms, including their adoption of QAS's, is not well researched in the literature in the context of processing sectors in emerging economies.

2.3.3 Market factors

Some studies indicate that there is an association between the markets a firm serves and quality assurance system adoption. Dumicic *et al.* (2005), in his study of implementing ISO as a QAS in firms in Croatia, argue that market structure and implementation of QAS are related, and that firms having foreign markets are more ready to adopt and implement QAS than other firms having domestic and regional markets. Similarly, HACCP is used by Canadian firms exporting their products to the US (Hobbs *et al.*, 2002), and by exporters in developing countries exporting to the EU (Jaffee & Masakure, 2005). In addition, domestic market characteristics, such as level of income, patterns of consumption, consumers' educational levels, consumers' perception of safety and quality of products may lead to an incentive to adopt a QAS, and so be of interest by firms if they wish to conquer such markets. There is no doubt that food and agribusiness firms have, increasingly, to deal with competitive markets in which meeting customer requirements for produce and services, and efficiency and reliability of their delivery becomes a key aspect for competitiveness. As a result, it has been observed that firms are implementing QAS, i.e. ISO 9000, TQM, (Ziggers & Trienkens, 1999). Market specific characteristics can influence the adoption of QAS, and firms serving province, inter province, or foreign markets may pay different attention to whether to adopt a QAS or not (Jayasinghe-Mudalige & Henson, 2004).

Business partners' pressure is another factor that can influence adoption of a QAS in a firm. When a firm operates in the food chain environment, they have competitors and partners, including suppliers and retailers. Partnership can be either transactional or cooperative, and can be characterised as a 'regulatory' system in order to establish an efficient and reliable flow of transactions (Ziggers & Trienkens, 1999). Thus, major and large business partners often recommend or request their suppliers to have a particular QAS, because they are not

able to trace the quality and safety of products firms supply. Therefore, most QAS's have the status of 'a license to operate' in most businesses (Walgenbach, 2007). This factor has been termed 'pressure of customer' in previous research (Terziovski *et al.*, 2003; Chow-Chua *et al.*, 2003; Maritnez-Lorente & Martinez-Costa, 2004). In this regard, one study notes that, since the incidence of food borne diseases and food risks is perceived to have increased, quality awareness of customers is also increasing. That leads to high demand for quality and safe products. As a result, the supply chain linkage has changed, as retailers require suppliers to guarantee quality and safety and request suppliers to have a QAS; for instance, HACCP (Spiegel, 2002). In contrast, Taylor and Kane (2005) found that lots of small food industries are poorly encouraged by their customers to apply the HACCP system, because their food market is basically small scale with local clients and a high number of retailers.

The degree to which contracts are enforced also influences the decision to adopt a particular quality assurance system. Such contract pressures force firms to demonstrate the safety of their products on an on-going basis, necessitating the internal analysis of raw materials and of the products (Holleran *et al.*, 1999).

In developing countries, production systems tend to be extremely diverse, and often have many small scale, unorganized producer and informal markets. The food sector is rapidly evolving in these countries. The food processing industry is often fragmented, and there is little purchasing power in terms of consumer demand for food considered safe (FAO, 2003). However, growth of supply chain partnerships may lead to customers having safe food, by increasing coordination and tightening relationships, thus gradually changing quality assurance to reduce transaction costs.

2.3.4 External support

External support refers to factors outside of firms, such as government and related organizations' and agencies' support, for training and resources, etc. This factor may encourage or impede adoption of a QAS in firms (Premkumar & Robert, 1999). Cole (1985) concluded that the Japanese government was a key player in the diffusion of quality systems. In other examples, the Indian government has supported companies that want to obtain quality systems certification, through subsidizing a part of setting-up costs when a business registers to adopt a quality assurance system. A QAS will be easier for a firm to adopt in the

country where the government offers encouragement. For instance, in Singapore, government offered support for ISO 9000, and in Greece, the Greek Ministry of Development, via a blueprint for an increase of competitiveness in small and medium Greek enterprises, financially supported SMEs with implementing and certifying a QAS, according to ISO 9000 requirements (Aggelogiannopoulos *et al.*, 2007). This type of external support may be relevant for dairy food businesses in Vietnam, since most dairy firms are small and medium sized with limited resources, both financial and human. External support might come from trading associations as well as government. Variable degrees of trading association support were highlighted in a study of Deodhar (2003). More recently, Jouve (1994) considered as very important, the trade association's role in supporting and promoting a HACCP system for small businesses.

In summary, external environment factors, including legal and regulatory forces, market factors, and external support may be important variables to research with respect to their influences on the adoption of QAS's in firms.

2.4 Organizational Characteristics and Adoption of QAS

2.4.1 Introduction

Generally speaking, 'organizational characteristics' is a broad term referring to all firm-related characteristics, but the term is used differently in different research. However, the term 'organisational characteristics' commonly includes discussion on firm size, goods produced, the nature of the business, type of production system, ownership structure and firm location (Fouayzi *et al.*, 2006; Jayasinghe-Mudalige & Henson, 2004), and financial characteristics (Herath *et al.*, 2007). It can also include managerial characteristics and organisational structure (Damanpour, 1987).

In a more general sense, a number of the authors have identified organizational characteristics that encourage innovation adoption within an organization (Rogers, 1995). While much research has examined the influence of organizational characteristics, it has been argued that there remains a gap relating to the lack of consensus regarding the role of specific variables in facilitating or impeding innovation adoption (Damanpour, 1991). Therefore, further research

on the association between organizational characteristics and innovation adoption in the form of quality assurance systems, would be useful.

2.4.2 Size of firm

In the literature, there is some evidence of a relationship between firm size and the adoption of a QAS. For example, recent studies indicated that incentives for ISO 9000 adoption differ depending on firm size (Holleran & Bredahl, 1997; Lloyds Register Quality Assurance, 1995; Seldon *et al.*, 1993), and for HACCP adoption (Antle, 1996; MacDonald *et al.*, 1996; Anderson & Lee, 2001; MacDonald & Crutchfield, 1996).

Small firms have often been slow to adopt QA systems (Brown & Loughton, 1998; Yusof & Aspinwall, 2000). Firm size directly affects certification costs, which, in turn, affects the ability of a firm to undertake certification. One of the main criticisms of ISO 9000 certification is that it really addresses large companies that have not only the required financial resources, but also the skilled workforce and the competent management able to document the scheme, carry out changes and audit the new processes (Tsekouras *et al.*, 2002). Likewise, Celaya *et al.* (2007) found firm size had a favourable influence on HACCP adoption when consisting of firms that had more than 50 employees in relation to firms with less than 50 employees.

Small firms' resources are more limited than those of large firms. Small firms may not have a quality assurance office, so staff resources may need to be diverted to QAS adoption to complete the paperwork, implement the systems and maintain the system. Implementing ISO 9000 typically forces small firms to allocate proportionately more resource to implementation of this system than large firms (Holleran *et al.*, 1999). As a result, it is not surprising to find study results that indicated that larger firms are more likely to adopt QAS than small firms in the dairy sector in Poland (Pieniadz & Hockmann, 2007).

However, some studies on the relationship between firm's size and adoption of QAS's indicate contrasting results. As expected, several authors have suggested that the implementation of QAS is size dependent (Ghodbadian & Gallea, 1996; Seldon *et al.*, 1993, Holleran *et al.*, 1999) and others note that ISO is positively linked to firm size (Adam, 1999; Garr *et al.*, 1997). However, results from another study did not find significant differences in

seeking ISO 9000 in terms of firm size (Briz *et al.*, 2005). Thus, research to determine whether this association holds in the Vietnamese dairy processing sector would be useful.

2.4.3 Top management support

In addition to the firm size factor, another factor that possibly affects the adoption of quality assurance systems is top management support. To obtain quality results, it has been noted that the initiative must be taken at the highest managerial levels (Vasconcellos, 2004). Top management support and commitment has a vital role when adopting a quality system, since they will be responsible for identifying the main process needed for a quality system and its application throughout the organization (Aggelogiannopoulos *et al.*, 2007). They will also establish suitable performance indicators for each of the main processes of the organization in order for them to be monitored and measured (Geraedts *et al.*, 2001).

Top management commitment is also important for the success of a quality initiative that has been implemented. For instance, according to the guide for implementing ISO 9001: 2000, the top management (managing director or chief executive) must demonstrate a commitment and a determination to implement the quality system in the organization. Without such top management commitment, no quality initiative can succeed.

Commonly, decision making starts from top managers on the basis of a cost-benefit analysis of adopting a QAS. Top managers will have a good understanding of the expected and potential benefits of adopting such a system (that is increase in sales, less rejects/product out of specification/rework product, and so on) (Khatri & Collins, 2007). Management support may take several forms, such as providing strategic vision and directing various levels of the organization towards the importance of an innovation (Ramanurthy & Premkumar, 1995), and also refers to “the continual active and enthusiastic approval of senior executives for a proposed innovation” (Sultan & Chan, 2000, p. 111).

In this regard, Kaynak (2003), and Spiegel (2002) indicated that successful implementation of quality assurance systems also require an effective change in organisational culture, which is almost impossible without concentrated management support. The management of firms can show such support by establishing both organizational and technical systems to communicate internally and externally about their quality performance (Beulens *et al.*, 2003).

Thus, top management support is a critical issue in innovation adoption and deployment (Teo *et al.* 1998). They do this through providing a supportive climate and adequate resources (Premkumar & Robbers, 1999; Rogers, 1995; Sultan & Chan, 2000; Zmud, 1984).

Characteristics of top management can also affect the decision to adopt a new QAS. For instance, previous studies identified the educational level of top managers, their skills and awareness, and their ability to manage risks after a decision (Papadakis & Barwise, 2002) as important factors. There are also research studies on the impact of the top manager on strategy decision making (Kauer *et al.*, 2007; Papadakis & Barwise, 2002). Thus, human characteristics pertaining to the management of a firm like age, level of education, and risk tolerability, and so on, are thought to have an impact on the decision of a firm, both implicitly and explicitly, to adopt a QAS or not (Caswell *et al.*, 1998).

2.4.4 Organisational structure

Three properties of organisational structure - formalization, centralization, and complexity – have been identified in previous business organization research (Choi, 2002; Damanpour 1991). Formalization refers to the degree to which decisions and working relationships are governed by formal rules, standard policies and procedures (Holsapple & Joshi, 2001). It includes ‘the degree to which an organization emphasizes following rules and procedures in the role performance of its members (Rogers, 1995, p.380), and implies that all procedures for a quality standard is written, and unit responsibility is assigned to divisions or departments. If this occurs, the potential of adopting a QAS become easier. For instance, if the firm has a quality division and has experience in a particular QAS, it is easier to implement another QAS. Most innovation research reports formalization to be positively associated with the adoption of innovation (Moch & Morse, 1977; Zmud 1982).

Centralisation refers to the place in the organization where decisions are made, and defines the groups that have the power to contribute to the decision making process (Neil, 2006). That is, it identifies which organization members participate in decisions associated with strategies, policies and allocating resources (Hage & Aiken 1967). Likewise, it is ‘the degree to which power and control in a system are concentrated in the hands of relatively few individuals (Rogers, 1995, p.379). This can also be referred to as the locus of decision authority and control within an organizational entity (Caruane *et al.*, 1998). Concentration of

power in a group of persons may contribute to a fast decision to adopt a new innovation such as a QAS. Prior research findings vary with regard to the influence of centralization on innovation adoption (Rogers, 1995; Zmud, 1982). While some authors have found a negative influence (Damanpour 1991; Grover and Goslar 1993; Moch & Morse, 1977), others have found an insignificant relationship between centralization and adoption of innovation (Lai & Guynes, 1997).

Complexity entails “division of labor, job titles, multiple divisions, and hierarchical levels” (Hall, 1992, p. 50). In a complex organization, tasks are divided (horizontal complexity), supervised (vertical complexity), and dispersed to field or branch offices (geographical complexity). Complexity is comprised of horizontal and vertical differentiation, where horizontal differentiation refers to the number of different positions and different sub units in the organization and vertical differentiation refers to the number of job positions between the top layer and those involved with the actual production of output and the greater the number and diversity of occupations, the greater the complexity.

The influence of organizational structure on decisions has been shown in studies of relationship knowledge management and organizational structure, and organizational performance (Choi, 2002); adoption of new innovations and organizational structure (Damanpour, 1991), and quality and firm performance and firm structure (Spiegel, 2004). Specific research on the impact of this factor on the adoption of QAS’s would be useful.

2.4.5 Nature of firm and product

The financial situation of a firm may be seen as a factor that affects a decision whether to adopt a QAS or not, and one study does indicate that the financial status of a firm will have an impact on its decision to adopt a QAS (Antle, 1996). Commonly, investing in obtaining and maintaining QAS’s in a firm is acknowledged to be a strategic instrument in both food marketing and production (Achterbosch & van Tongeren, 2002), which indicates a long term perspective. For a company with an adequate financial budget, investment in a QAS is a small item, but for other firms lacking financial resources, investment in a QAS becomes more difficult. Specific variables related to a firm’s financial status that are used commonly in the studies on impact of organizational factors on the adoption of a QAS are fixed assets

value, ratio of turnover per fixed assets value (see Herath, 2007; Hassan *et al.*, 2009), and average annual revenue (Teo *et al.*, 2009).

Production processes have a number of specific characteristics that affect product quality and quality assurance; for instance, dairy products require cooling, storage and transport. Where product has a high risk of being unsafe, then measures for addressing this would receive more attention and be rapidly introduced. In addition, quality variations can appear among producers and different lots of produce (Trienkens & Zuurbier, 2008). This can create issues in adopting a QAS, since factors related to product quality and safety variations have to be addressed. Research has been conducted on exploring differences in adopting and implementing QAS's across sub-sectors in the food industry, such as fruit, vegetables, cereal, and wine (see Canavari *et al.*, 1998); and food processing and services (Jin *et al.*, 2006), or with particular products of firms (Jayasinghe-Mudalige & Henson, 2004).

Other characteristics are also important factors such as age of firms, experience in alternative QAS application. Type of production activities (Herath *et al.*, 2007; Hassan *et al.*, 2009; Cao, 2008), type of ownership (Ebrahimpour *et al.*, 1997; Henriques & Sadorskey, 1996; Jayasinghe-Mudalige & Henson, 2004; Salahedin, 2007), and customers of firms (Jayasinghe-Mudalige & Henson, 2004) are shown in studies on relationships between firm characteristics and adoption of QAS.

In conclusion, organisational characteristics variables that are highlighted in previous studies are very diverse. However, major variables such as firm size, top management, organisational structure, and financial and product nature have been shown to affect the adoption decision of firms to a greater or lesser degree. A study integrating all these variables in the decision to adopt a QAS would be useful.

2.5 Impact of an Adoption of QAS's on Organisational Outcomes

2.5.1 Introduction

The definition of successful business performance is a controversial issue in management, largely due to the multidimensional meanings and goals that have been assigned to this term (Murphy *et al.*, 1996). Financial performance is at the core of organisational effectiveness (Chakravarthy, 1986), while operational performance measures such as product quality and

market share define a broader conceptualization of organisational performance by focusing on factors that ultimately lead to financial performance (Hofer & Sandberg, 1987).

One of the challenges in measurement of firm performance is that measured performance on the basis of firm specific objectives means that performance measures are difficult to compare. Most measures of performance tend to focus on enterprise shareholders' profits. In order to control for firm size, profits are related to sales, assets, or equity. The majority of empirical studies (Hatten & Hatten, 1985; Strandskov, 1999) use return on assets (ROA), and within industry, return on sales, as an established measure of profitability (Vorhies & Morgan, 2005). However, profitability has the disadvantage of neglecting dynamic aspects of firm success. Some studies, therefore, use growth indicators such as change in sales (CIS) (Morgan & Strong, 2003; Strandskov, 1999), or value of total sales, and thus, growth of total sales (Havnes & Senneseth, 2001). Anderson & Sohan (1999), in a study examining the impact of TQM application on business performance of furniture companies in Australia, used four measures for business performance: sales variance, return on assets, sales volume, and market share. Martinez- Costa et al (2008) used two variables for examining performance, which are ROA and productivity of firms, before and after adopting ISO 9000. Some other studies using measures for financial performance such as sales (Corbett *et al.*, 2005), market share (Forker et al 1996), ROA or ROS (Corbett *et al.*, 2005; Forker *et al.*, 1996), return on equity (Staw & Epstein, 2000), return on investment (Forker et al 1996), income (Easton & Jarell, 1998), and income over assets and over sales (Lima et al., 2000).

Often research on the impact of adoption of a QAS on organisational outcomes has aimed at assessing the financial performance benefits for firms from QAS's, such as ISO 9000 adoption, and a body of literature that studies the effects of ISO 9000 share the general assumption that ISO 9000 adoption will improve an organisation's financial performance (Naveh & Marcus, 2005; Simmons & White, 1999). Prior research highlights two possible sources of performance improvements from ISO 9000. One of these is from cost reduction, and another is from quality improvement (Withers & Ebrahimpour, 2000; Curkovic, 1999).

2.5.2 Adoption of QA systems and firm's performance

There are a number of studies on the impact of adoption of a QAS on a firm's performance (Rayner & Porter, 1991; Ebrahimpour *et al.*, 1997; Askey & Dale, 1994; Anderson *et al.*,

1999 ; Meagan & Taylor, 1997; Withers & Ebrahimpour, 2000) . However, there is still no general agreement regarding the effects of any particular QAS, such as ISO 9000, on firms' performance. One perception seems to be that it has no positive influence (Simmon, 1999; Terziovski *et al.*, 1997; Wayhan *et al.*, 2002). However, there are also some optimistic views Romano, 2000 ; Withers & Ebrahimpour, 2001. In particular, Naser *et al.* (2004) found that there is association between ISO 9000 certification and the financial performance of Malaysian companies. The experience in Singapore shows that ISO 9000 certification has provided significant benefits to companies, and many organizations trying to adopt TQM have chosen ISO 9000 as a stepping stone towards TQM (Quazi & Padibjo, 1997).

Some authors studied costs and benefits of certification and claim that investment in a QAS may be a burden without adequate returns for some firms (Martin & Anderson, 2000; Antle, 1999). Others examine whether the effects of adopting a QAS are significantly different for companies in different sectors or of different sizes (Caswell *et al.*, 1998). However, if consumers reward firms for supplying safe products, then one would expect a positive correlation between the adoption of a QAS and firm's performance.

Guilhon *et al.*, 1998 surveyed 42 French firms regarding ISO 9000 certification and reported that the quality program had improved organizational performance (commitment and process quality) but had not significantly improved financial performance (sales, market share, and profit). However, they noted that a large proportion of the sample was in the process of certification and this could have accounted for their findings. Anderson & Sohal (1999) surveyed 670 small businesses in Australia, and reported that quality practices and procedures were perceived to have the highest impact on the overall competitiveness of the business, followed by sales, market share, employment levels, and cash flow.

Recent empirical studies have concluded that the most important benefits sought from ISO 9000 are profit improvement, and marketing benefits (Wayhan *et al.*, 2002; Eklof *et al.*, 1999). Buttle (1996) surveyed 1,220 certified UK companies, and found that improving operations and marketing gains were claimed by most of the firms following quality certification. Similar findings were found by Casadesus *et al.*, (2000) in the study of 500 Spanish firms. Moreover, financial benefits have been found in certified companies; they had a significantly higher rate of return than before they were certified (Heras *et al.*, 2002).

Similarly, Capmany *et al.*, (2000) surveyed 325 firms and results showed that the key changes for agribusiness and the other industries were increases in customer satisfaction, product traceability, information quality, and sales. Turner *et al.*, (2000) surveyed 32 agri-firms in South Africa and concluded that certification had a positive impact on document process, overall firm performance, and quality of output. In this regard, Uyar (2008) studied 102 industry enterprises in Turkey, and his findings indicated that implementing a QAS correlated significantly positively with profitability, with companies that implement QAS being more likely to have higher profitability ratios than companies that do not implement a QAS.

Hassan *et al.*, (2009) provides some evidence that the adoption of food safety and quality systems is positively associated with a firm's performance. In particular, their results suggest that adoption intensities and market shares are closely linked. In this regard, Hassan *et al.*, (2009) noted that QAS adoption is positively associated with market share and productivity level. Caswell *et al.*, (1998), and Holleran *et al.* (1999) discuss the importance of lowering transaction costs that resulted from adoption of QAS's, i.e. ISO 9000 and HACCP. Khatri & Colins (2007) found that, when HACCP was adopted in Australian businesses, it had a positive impact on market share.

Bocker *et al.* (2003) investigated whether ISO 9000 certification does affect firm's performance. The quality manager of a sample of 27 British agribusiness firms rated a set of 13 performance indicators. Most firms rated the impacts of certification positively. The authors also concluded that the adoption of quality assurance systems is of key importance for the competitiveness of agribusiness firms. In another agribusiness study, Maza & Ramirez (2003) examine the effects of ISO 9000 certification on the Spanish agribusiness sector. They concluded that the adoption of ISO 9000 impacted positively on the quality of units produced and profit margins.

2.5.3 Adoption QA systems and product performance

There are some studies on the impact of QAS's on product quality itself. Rayner and Porter (1991) reported that 75 percent of the UK firms in their study claimed product quality had improved. Other studies indicate that ISO 9000 results in the perception of higher quality (Zhu & Scheuermann, 1999; Sissell, 1996), but it is argued that this outcome would seem to imply only that the certification effort has served as a public signal that quality management

is being practiced (Anderson *et al.*, 1999). In this context, Sun (1999) investigated ISO 9000 certification in Norwegian companies and found that it was significantly correlated with quality results, especially the reduction of defective products and customer complaints. Further, Turner *et al.*, (2000) also found that ISO 9000 certification by African agribusinesses has an impact on quality of output, and a decrease of error rates.

Withers & Ebrahimpour (2000) discuss adoption of ISO 9000 by businesses in the manufacturing sector in the US and its effect on the firm's product quality using eight dimensions suggested by Garvin (1987) and a five point scale for assessing. They found mixed results with some dimensions of quality much improved, but some had not improved after adopting ISO 9000.

There is not much research on the impact of HACCP and GMP on product quality improvement, although Khatri & Colins (2007) are exception to this. Their results show that the benefits of food safety systems incorporating HACCP within the meat industry in Australia have been widespread and significant. In particular, Australian firms reported a reduction in rejects/rework/out of specification products, reduction in customer complaints and an increase in improved product hygiene.

Product quality is also included in some other studies, and it is measured in different ways. Some measure performance with a combination of different operative results obtained by the firm, together with financial and product quality measurements. In this sense, Teriovzski *et al.*, (1997) use operating performance (product quality, timeliness, and productivity), customer satisfaction, employee morale, and business performance.

In summary, some prior studies have examined the impact of QAS adoption on business performance. However, most of them focus on the ISO 9000 scheme rather than other QAS's, such as HACCP, and there appears to be no research that compares and contrasts outcomes from adopting particular QAS's. Studies have considered the relationship between adopting QAS's and firm performance, rather than emphasizing the adoption of QAS's and outcomes related to product quality improvement. Therefore, a study conducted with different quality assurance systems will be useful, especially for the Vietnamese food industry, and particularly, the dairy processing sector.

2.6 Chapter Summary

The QAS's applied in the agri-food industry are diverse, but those related to quality and safety management are GMP, HACCP and the ISO series. The universally accepted definition of quality incorporated into ISO and ASQ focuses on satisfying and exceeding expectations of the customer.

These QAS's have been applied in various sectors aiming at assuring quality and safety of a product or service. Much research has attempted to find motivations for firms to adopt a QAS and these can be categorized into external and internal drivers. The major external motivations are satisfying legal regulations and maintaining and expanding markets, and major internal motivations are reduction of costs, and improvement of quality, efficiency in operations, and as a consequence, enhancement of the competitive ability of firms. Motivations to adopt QAS's by individual firms are diverse and could vary across countries, as well as sectors, within the food industry.

Although prior studies have provided a good insight into the motivations for food processors to adopt QASs, they are subject to some limitations in the context of this particular study. Much of the research is focused on separate QAS's, and there is little comparison between QAS's, so it is difficult to draw conclusions. Furthermore, results are more applicable to developed economies such as the US, Canada, and UK, and it is not clear how these results apply to emerging economies, such as Vietnam. Finally, much research has been conducted at the firm level, but there is very little information on the impact chain level factors on the firm.

Therefore, there is a need for a study that takes greater account of all factors (i.e. internal and external) that impact on the outcomes of dairy processors decisions to adopt of particular QAS. The context within which a firm operates can underlie motivation and so impact on the decision to adopt a QAS. External environment factors, including legal and regulatory forces, market factors, and external support may be important variables to research with respect to their influences on adoption of a QAS by firms. Research on such factors has been undertaken in other fields, such as manufacture, IT, service, but is sparse in the food industry in emerging economies.

The influence of organizational characteristics on the adoption of QAS's has been highlighted in past studies, but more work would be useful. Organizational characteristics variables that are used in previous studies are very diverse; however, major variables used are firm size, top management characteristics, organizational structure, financial characteristics and product characteristics. Of these variables, firm size has been studied most in previous research. A study investigating all these variables in the relationship to adopting QAS's would be useful.

Prior studies have documented the impact on organizational outcomes after adopting a QAS, but most of them focus on ISO 9000, rather than other QAS's, i.e. HACCP, or a combination of QAS's. They also do not compare and contrast outcomes gained by adopting a particular QAS. They also tend to consider the relationship between adopting a QAS and general firm performance, but there is little more detailed information on adoption of QAS's and outcomes related to product performance. Therefore, a study conducted with different QAS's in association with both firm and quality performance will be useful, especially for the Vietnamese food industry, and particularly, the dairy processing sector.

Finally, most research is limited to one part of the process within a firm at a particular point in a chain, i.e. either motivation, or the implementation process itself, or outcomes. This makes it difficult to integrate findings and to assess the implications of adopting QAS's for firms operating within supply chains in emerging economies. This suggests the need for a more holistic study.

Chapter 3

Theoretical Framework and Methodology

Chapter 1 outlined an increasing focus on quality and quality assurance, and identified research questions. Chapter 2 overviewed previous research on a range of quality management issues, and identified approaches and gaps in the literature. This Chapter begins by reiterating the research questions, since the type of research questions will suggest what research methods are most appropriate for the study. The research questions were:

1. What quality processes and systems are used by dairy processing companies and their associated supply chains?
2. What were the motivations of dairy processors in Vietnam for adopting particular QA systems?
3. What role is played by different contextual factors in the adoption of particular QA systems in the Vietnam dairy industry, which is a developing country context?
4. What were the perceived organisational outcomes resulting from the adoption of these QA systems?

The literature review was based on these research questions, and a theoretical framework is now formulated in Section 3.1 to tie these objectives and the literature together. The preferred research method, case study research, is introduced in Section 3.2, and how the case study method was operationalized is shown in Section 3.3.

3.1 Theoretical Framework

As noted in Chapter 1, QAS's commonly employed in the food industry are GMP/GHP, HACCP, and the ISO series. In this research, three QA systems, HACCP, ISO 9000, and ISO 22000 will be studied. The focus is on dairy processors, but these are observed within the wider context of their supply chains. A theoretical model that emerges from the literature and the research questions is constructed in Figure 3-1.

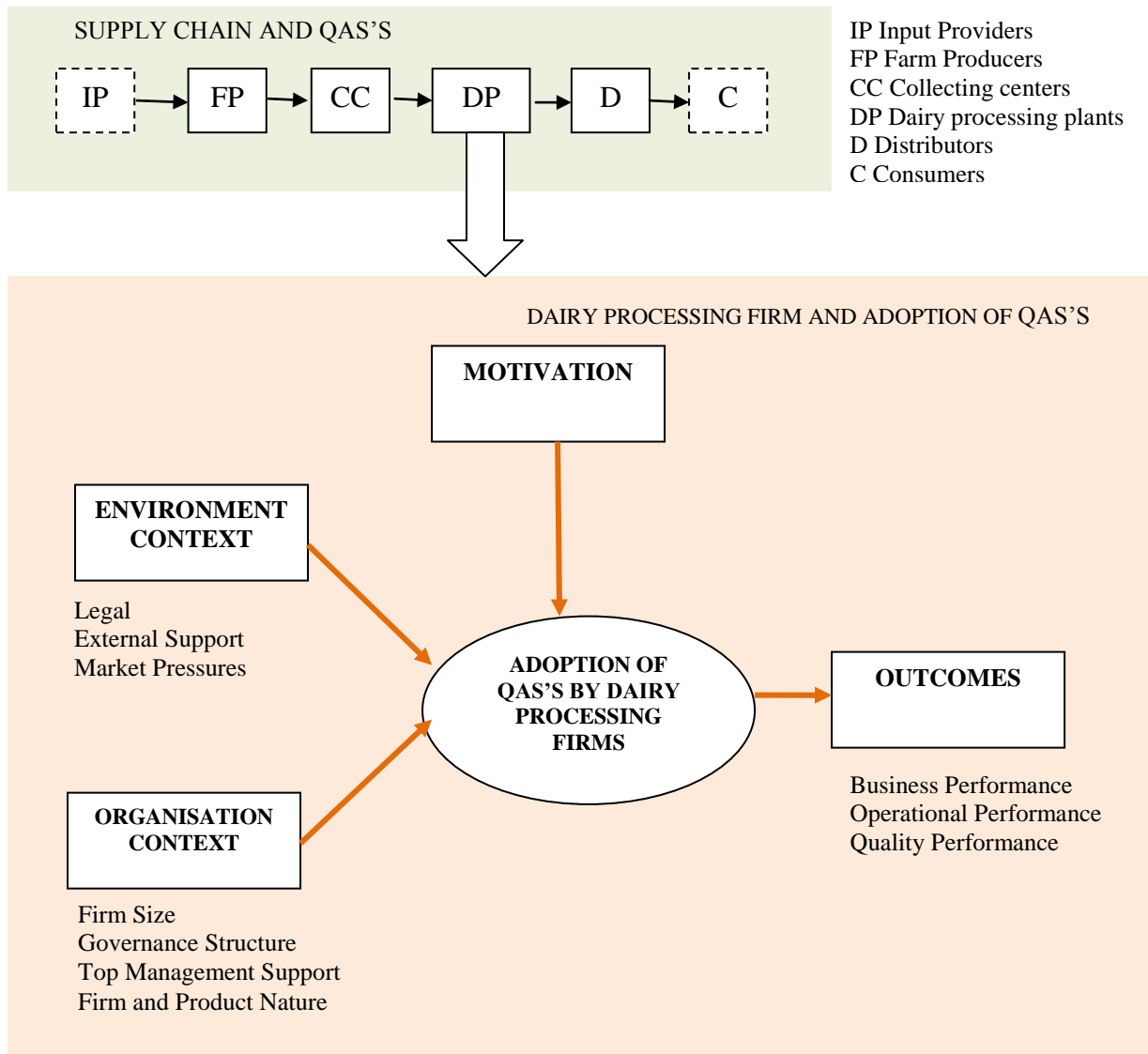


Figure 3-1 Theoretical model

In this model, the supply chain is first identified, which is shown in the top box. The chain actors are input providers, farmers, collectors, processors, distributors, and consumers. However, input providers and consumers are not covered in this research because of the limitations of time and resources. But some information on consumers, including their need for quality products is obtainable indirectly from distributors in associated supply chains. Along the supply chain, QAS's have been adopted by these actors. QAS's may vary according to each actor along the supply chain. The research will identify QAS's - both formal and informal - that have been set up. Quality processes will be described and analysed to further gain a greater understanding of quality management practices that actors have adopted.

The big box shown in this model focuses in more depth on the processor. Adoption of QAS's by processors will be described and analysed. This will include motivations for adoption, factors that have influenced adoption, and organisational outcomes. Adoption of QAS's by firms may vary and include single or multiple QAS's. Where multiple QAS's are adopted by firms these QAS's will be analysed separately. The motivation for adopting QAS's identified in the literature included factors such as production and quality improvement, image improvement, and enhancing their competitive advantage. Factors influencing adoption are also described and analysed. These factors include external environmental factors for the adoption of QAS's, such as legal and national regulations, external support, and market pressures, while internal organisational factors are firm size, organisation structure, top management support and the nature of the firm and product. These factors emerged from the literature review. Outcomes that emerged from the adoption of QAS's will be identified and analysed according to three features: business, operational and quality performance. Outcomes explored in this study are both perceived and unrealised outcomes; however, some data about realised outcomes related to their business activities may be obtained from secondary data sources, and these perceived outcomes captured are used to consider consistency with the realised outcomes, particularly business data from the milk companies.

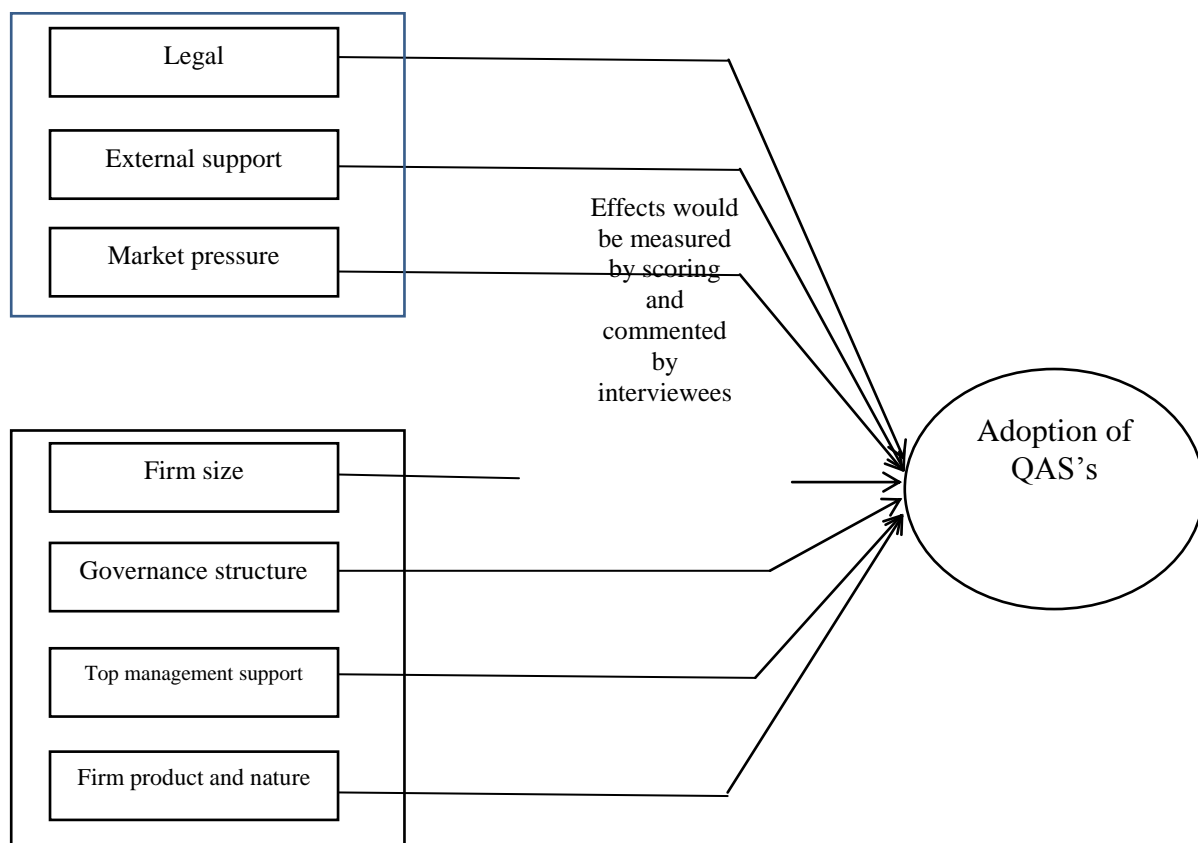


Figure 3-2 Factors influencing the adoption of QAS's

Figures 3-2 and 3-3 illustrate how the model has been operationalised. Figure 3-2 shows relationships between factors that possibly affect the adoption of QAS's. These factors were assessed through scoring, as well as statements from interviewees. These statements and scores were used to triangulate to reach more precise and in-depth assessments. The results identified if the factors influenced the adoption of QAS's, as well as the strength of the factor.

Figure 3-3 identifies the association between the adoption of QAS's and the respondents' perceived outcomes. These outcomes were captured by their perceptions through a postal survey, which sought their opinions of the benefits, either direct or indirect, resulting from individual QAS's. They were also used to consider consistency with data from other sources, particularly data on trade and business of the companies. Also, comments from interviewees about the benefits of these QAS's in general were a helpful source to the author in providing better assessments of perceived outcomes.

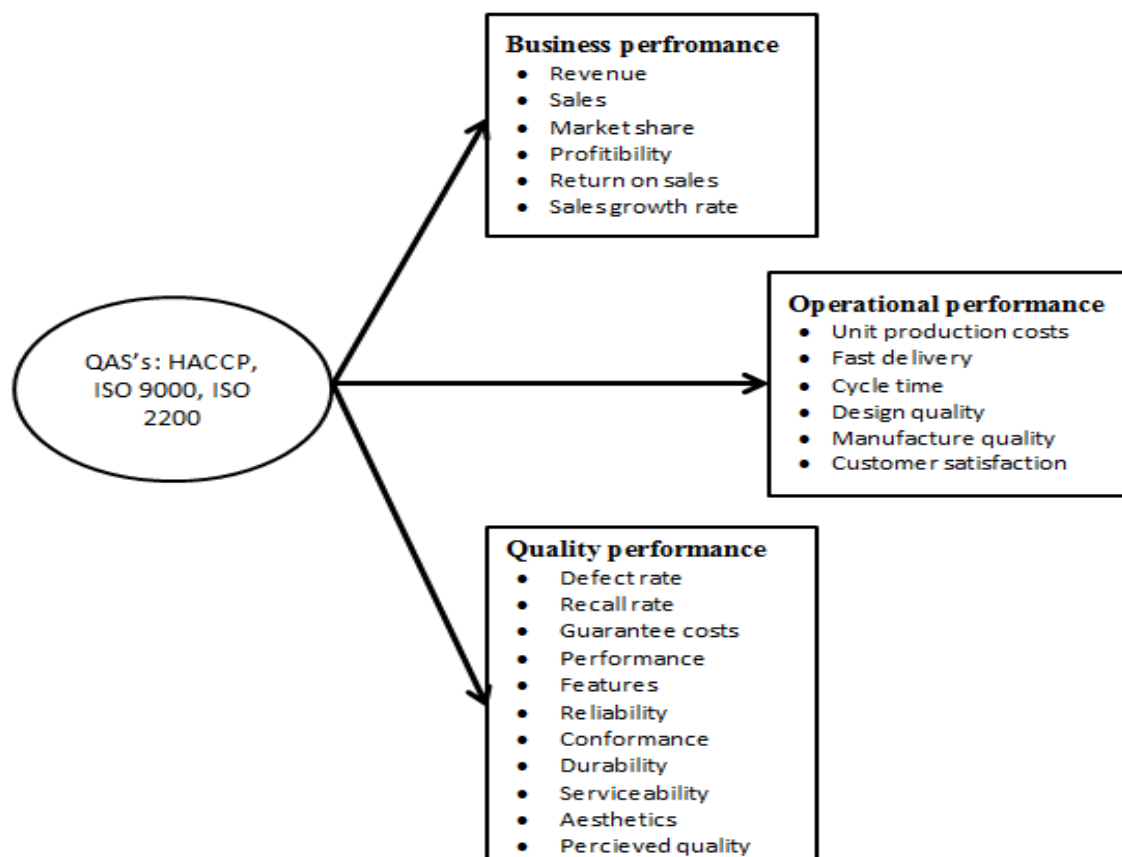


Figure 3-3 Impact of QAS's on organisational outcomes and measures

3.2 The Case Study Research Method

3.2.1 Choice of case study method

The selection of an appropriate method for answering the research questions is an important step in any research (Billones, 1999; Williams, 1997). According to Holbert and Speece (1993), the research method and design is about considering how the researcher goes about assessing what is needed. The choice of research method depends on the type of research questions to be answered, the degree of control the researcher has over the subject to be investigated, and whether the focus is on contemporary or historical events (Yin, 2009). After taking account of these three factors, researchers then choose the most appropriate research method, which may include experiments, surveys, archival analysis, history and case study (Yin, 1994). This study aims to gain a greater understanding of quality processes and adoption of QAS's along the supply chain, and to elicit experiences from respondents on adoption of QAS's at processing plants. These are 'What' questions, and imply an exploratory type of research. This kind of research question can be answered by adopting anyone of the five methods cited above.

Another important point to consider when choosing research methods is the complexity of the phenomenon to be studied. The case study strategy is useful in situations where the researcher wants to know how about the context, and how the evolution of the phenomenon of interest affects the outcome. For these sorts of complex situations, it is preferable to other methods (Yin, 1994). Such complexity involves the observation of several variables in order to characterise the phenomenon. The large number of variables and the relationships between them would make it difficult to perform any kind of quantitative statistical sampling (Yin, 1994). This situation applies in this study. Furthermore, in this study, the total population of interest is 72, of which less than 25 companies have adopted QAS's, so meaningful quantitative analysis would be difficult with such a small sample. Additionally, since this research has a key exploratory element, qualitative data collection methods are considered more appropriate.

3.2.2 Philosophy

A case study is 'an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not

clearly evident' and it 'relies on multiple sources of evidence' (Yin, 1994, p.13).

Case study research is usually associated with the main types of qualitative research, such as action research, ethnography and grounded theory (Myers, 2009). Although considered as qualitative methods, some authors argue that case studies, as with other qualitative methods, can include quantitative evidence (Yin, 1994). The case study method allows investigators to gain a holistic and meaningful understanding of processes and interrelationships (Yin, 2003). Case study focus groups and in-depth interviews can yield very useful information on potentially complex phenomena (De Ruyter & Scholl, 1998; Gummesson, 2005).

Qualitative research is an inductive approach which involves intensive fieldwork. The researcher gathers information directly from the people who are experiencing the phenomenon (Creswell, 1994). Qualitative research is an especially useful approach when the variables and theory base are weak or unknown (Morse, 1991). The researcher builds a rational explanation through the interpretation of details and the collection of data, both of which involve some degree of subjectivity (Locke et al., 1987). This introduces a drawback of the method, which is the limited generalizability of findings – though this is reduced by cross-case comparison – and limitations in replicating the study (Yin, 1994).

Qualitative research can be exploratory, both exploratory and explanatory, or explanatory only. Exploratory research is aimed at describing phenomena, and is not particularly concerned with understanding why behaviour is the way it is. This type of research is very useful for setting out baselines of how we think the world is. It is also starting point for research into phenomena of which is little known. Explanatory research is deeper in the sense that it describes phenomena and attempts to explain why behaviour is the way it is (John et al., 2007). Research that is a combination of exploratory and explanatory, aims to do both to some extent. This type of approach is becoming more popular (Yin, 2003; Miles & Huberman, 1994).

3.2.3 Criticisms

The case study method allows investigators to gain a holistic and meaningful understanding of processes and interrelationships (Yin, 2003) and can provide useful information on potentially complex phenomenon (De Ruyter & Scholl, 1998; Gummesson, 2005). The key

strengths of the qualitative method include data richness and a more holistic representation of reality.

However, this qualitative method also has its limitations, which must be acknowledged. Criteria for assessing research quality in quantitative research are well established, involving validity, generalisation, reliability, and objectivity (Lincoln & Guba, 1985). These same criteria are inappropriate when assessing qualitative work. One of reasons for this is that qualitative research is specific to a time and place (Silverman, 2001). Consequently, they cannot be precisely replicated, unlike laboratory experiments in the quantitative tradition.

The case study is often seen as a method that is not rigorous enough and is biased. Yin (1994) argues that this perception was formed because some researchers in the past have been untidy and swayed by equivocal evidence that influenced their research findings and conclusions. Therefore, Yin (2009) proposes techniques and tools, which aim to improve case study documentation, ensure greater transparency, and the ability to replicate, and therefore increase confidence in case study findings and conclusions. Such tools include the case study protocol, which outlines sampling procedures, construction of interview questionnaires, interviewing techniques, case analysis and reporting, and cross-case analysis.

A more pragmatic limitation is that the case study is also said to be too long and produces an unreadable document. Yin (2009) admits that the composition of long case study reports has happened in the past, and suggests alternative techniques for writing case studies in order to avoid the traditional long narrative. Case study labelling is very time consuming and this strategy is commonly confused with methods of data collection that take a long time, such as ethnography or participant observation (Yin, 2009).

3.3 Operationalizing the Case Study Method

3.3.1 Case selection and design

The sample selected for qualitative research should be purposive, based on theoretical underpinnings and aimed at gaining theoretical understanding (Eisenhardt, 1989; Miles & Huberman, 1994). The logic underlying the selection of multiple case studies is the same as the replication logic used in experiments (Yin, 2009). In this research, both theoretical and literal replications were employed. Yin (2009) notes that literal replication allows insight

from cases to be confirmed. Theoretical replication allows theoretical insights to emerge by reconciling differences in cases. The number of cases to be studied depends on the focus of the research question. Single cases can provide for in-depth investigation and rich descriptions, whereas multiple case designs allow both literal and theoretical replication to take place and cross-case comparisons to occur.

There is no ideal number of cases. (Yin, 2009) suggests that more replications give greater certainty. Eisenhardt (1989) suggests that both single case and multiple case designs can be adopted for explorative research. Where explanatory research is undertaken, a single case may provide the basis for developing explanations of why a phenomenon occurs, and these may then be further investigated by applying them to additional cases with other features. When multiple cases are used, the number of cases can be determined by the principle of saturation; that is, new insights are no longer gained by studying new cases.

The aim of this study is to gain an understanding of quality processes and adoption of QAS's in dairy processing firms in Vietnam within the context of their broader supply chains. Selected case studies will include dairy companies and plants that have adopted different QA systems. In this study, five companies (out of 72 dairy companies) were selected, of which two larger sized companies (VNM and DLM) occupy a large market share in the distribution of end products and procurement of raw milk from farmers (60% market share milk products and 80% volume of raw milk from farmers nationally), and three small sized companies (market share of each these companies 3%). The selection of particular cases within the size categories was based on different types of QAS's that were used by dairy processing firms, as well as different firm features, such as ownership. Advice from quality experts in Vietnam, and from the Vietnamese Dairy Association, was used to assist the selection process. It also considered the traveling and likely field work duration. Specific characteristics of dairy companies, such as whether its plants were in the same place, or located in different places, were considered. In the North 3 companies (working with 5 plants) were selected. Two companies were selected in the south. State ownership was another criteria to consider to help depict an overview of quality assurance in each sector of the dairy industry. This selection of five cases can be categorized into ownership, two State owned, two private, and one foreign owned, into size, two large sized, and three small sized, so may attain rich comparison and contrast across cases in respect to size and ownership.

In summary, the cases were chosen to ensure both literal and theoretical replication of factors to be explored (Yin, 2009). That is, there were similarities between some of the companies with respect to their characteristics, which allowed emerging insights to be confirmed. However, there were also differences, which allowed more theoretical insights to emerge. The broad unit of analysis is the supply chain, within which processing firms operate. Hence, the key unit of analysis is the processing firm, which forms an embedded unit of analysis within the broader chain (Yin, 2009).

3.3.2 Procedures

Reports and documentation were collected at the interview stage. An assessment of information sources was conducted to review existing data and conditions pertaining to the dairy industry. Contact was made with NIAPP (National Institute of Agricultural Planning and Projection), the researcher's former employer. A letter of introduction was then provided by NIAPP to obtain the necessary official permission to approach and organise a meeting with the director of the board of the companies. These letters were posted. Fortunately, two companies, Moc Chau and Vinamilk, were familiar with, and used to working with, NIAPP on past projects, and three other companies responded favourably. Meetings followed regulations on the right to share information internally within government organisations for research purposes.

Each introductory interview lasted 45-60 minutes, and secondary documents also were collected at this stage. After this meeting, a letter of introduction from these five companies permitted visiting and contacting other actors in their supply chains. For two of the companies, farmers, collectors and some retailers who were near processing plants were visited and voluntarily participated in interviews, while for other distributors and retailers within other supply chains, interviews were mainly organised in the urban cities Ha Noi and Ho Chi Minh after receiving permission from the companies to begin interviewing. Distributors and retailers outside the company management were randomly selected and asked for permission to obtain data and information with a condition that their participation in the research was voluntary.

A small postal and email survey was organised to obtain some preliminary information and data from respondents within plants, including directors, vice directors, plant managers, and

employees. This occurred from June to September, 2010 either before or after face-to-face meetings and interviews for research. (See details Time schedule in Appendix D).

Semi-structured questions were used for interviews with the actors in the supply chains. These included a description of production, processing, technical requirements, perceptions, and institutional issues for dairy farms. For collecting centres, it included processes, technical requirements, price formulation, and perceptions). For distributors, it covered processes, governance, and perceptions. For the processor, it was more complex and in two parts: part A covered processes, and part B dealt with QAS's and motivation, environmental context, organisational characteristics context, and organisation outcomes (See Protocol semi-structured questions in Appendix A1, A2, A3, and A4).

While primary data constituted the main source of information for this study, secondary sources were also relied upon for information. This related to evolution, areas of implementation, international trends, motivation, and the future development of QAS's.

After the interview, a further mail survey was sent to processors to gain more precise information and to gain further information to supplement the interview (see Questionnaire form in Appendix B). This was considered an effective tool with low costs. Before this mail survey, the questionnaire was designed and pre-tested. Questionnaires were filled in by company directors, plant managers, senior quality staff who had a responsibility for quality management or related work in this field, as well as employees in the 5 companies. The questionnaire was constructed in English and Vietnamese. All respondents were asked if their company was certified with particular QAS's. In addition, the reasons for certification were solicited, and possible factors that influenced the decision to adopt QAS's were covered. The outcomes resulting from QAS's were also requested. These questions were aimed at obtaining perceptions, and respondents were asked to rank their answers on a Likert 5- point-scale.

The research package was mailed and consisted of two copies of the study questionnaire, a letter of explanation, an informed consent form and a self-addressed stamped envelope for returning the survey instruments. A code number for tracking purposes only was assigned to the survey instruments to monitor returns. Two mailings were included in this study: the original questionnaire and subsequently a follow-up notice to all participants to thank them

for participation and to serve as a reminder to complete the survey. The follow-up notice was intended to increase the response rate and was sent out two weeks after the initial mailing. In addition, the name and telephone number of the researcher was included in the survey packet for respondents to contact if they had any questions.

The companies selected in this research and their key parameters are listed below.

1) The Moc Chau milk company which is located in the Moc Chau district, Son La province. It specialises in supplying dairy products and cows. It is a State-owned business under the Livestock Corporation of the Ministry of Agriculture and Rural Development. The company has its own farms and also purchases milk from private farms. The company has two small plants, and the main products it produces are fresh and UHT milk, milk cake, and yoghurt. Total turnover is approximately 370 billion VND (US\$16.5 million). QAS's adopted are HACCP and ISO 9000.

2) The DutchLady Vietnam company, now FrieslandCampina Vietnam, which is located in the Thuan An district, Binh Duong province, and has two plants. One plant is in Binh Duong province, and another is in Ha Nam province. It is foreign owned, and the dairy products it produces include fresh and UHT milk, flavoured milk, and powdered milk. Total turnover is approximately 5,800 billion VND (\$US290 million). QAS's adopted are HACCP, ISO 9000 and ISO 22000.

3) The HanoiMilk company which is privately owned, and is located in the Me Linh district, Ha Noi. It has one plant and produces dairy products, such as fresh and UHT milk, and yoghurt. Its total turnover is approximately 350 billion VND (\$US17.5 million). QAS's adopted are HACCP, ISO 9000 and ISO 22000.

4) The Vinamilk company which is located in Ho Chi Minh City. The State has a large share in its ownership. It has 15 plants and is involved in many activities, and produces dairy products, including fresh and UHT milk, flavoured milk, powdered milk, condensed milk, yoghurt, ice cream, butter and cheese. Total turnover is 16,000 billion VND, (US\$800 million). QAS's adopted are HACCP and ISO 9000.

5) The International Dairy Product company which is a private company, and is located in the Chuong My district, Ha Noi city. It specialises in producing dairy products such as fresh and UHT milk, and yoghurt. Total turnover is approximately 85 billion VND (\$US4 million). The QAS adopted is ISO 22000.

The number of interviewees for each company and its supply chain, and the number of respondents in postal survey are shown in Table 3-1.

Table 3-1 Number of interviewees and respondents by company

Case	Number of interviewees in each company	Number of interviewees in company supply chains	Number of respondents in the postal survey
MCM	2	6	8(2)
DLM	2	7	8 (5)
HNM	2	8	8 (3)
VNM	2	8	8 (5)
IDP	2	6	8 (5)
Total	10	35	40 (20)

Note: * Number in parenthesis is number of questionnaire packages that were received and usable for this research.

3.3.3 Data triangulation

Collecting data from multiple sources supplements the primary data collected from the interviews and postal survey, and is an important basis for data triangulation in this research. Findings are more dependable when they can be buttressed from several independent sources (Miles & Huberman, 1994). Patton (1999) lists four kinds of triangulation which can contribute to the quality of analysis: (i) Check out the consistency of findings generated by different data collection methods, that is method triangulation; (ii) Examining consistency of different data sources within the same method, that is, triangulation of sources; (iii) Using multiple analysts to review findings, that is, analyst triangulation; and (iv) Using multiple perspectives or theories to interpret the data, that is, theory/perspective triangulation.

3.3.4 Data analysis and case presentation

The purpose of qualitative inquiry is to produce findings through analysis, interpretation and the presentation of the findings. The key task of data analysis is to make sense of large amounts of data, reduce the quantity of information, identify patterns, and construct a framework for communicating what the data reveals (Patton, 1990). Data analysis is an unstructured part of qualitative research (Miles & Huberman, 1994), and many different approaches are used.

The approach for analysing the semi-structured interviews undertaken in this study followed some of Miles and Huberman's (1994) suggestions for analysis. This included:

- a) Assigning codes to the material obtained from interviews and secondary sources;
- b) Adding comments to the material;
- c) Sorting the material to identify similar patterns and themes;
- d) Identify generalisations that explain the data;

Case analysis follows suggestions of Miles and Huberman, (1994) and Yin (1993) and consists of the three stages within-case analysis, data reduction, and cross-case analysis.

Within-case analysis

Within case analysis involves organising the data by specific cases for in-depth study. It is necessary to reduce the volume of data (Eisenhardt, 1989). The steps used in this study were adapted from Patton (1990). These involve:

- 1) Organising the raw case data including interview transcripts, notes from observations, secondary documentation on the organisation, and other material about the case.
- 2) Summarising case data and organising it into files for each company and its supply chain.
- 3) Editing and summarising case information. Data was organised by theme relating to research questions.

With respect to the presentation of the cases, an in-depth discussion to fully capture the context of Vietnam dairy supply chains and their associated context was created. Therefore,

the first step was to describe and analyse the Moc Chau Case (Chapter 4) in some detail. The remaining cases were then grouped into Chapters dealing with large and small firms. These cases were presented in an abridged form, with an emphasis on the differences to the in-depth description of the Moc Chau case. The large firms, Dutch Lady Vietnam and Vinamilk, are described and analysed in Chapter 5. The small firms, Hanoimilk and IPD cases, are described and analysed in Chapter 6. The cross-case analyses at the supply chain and firm levels are presented in Chapter 7. These explore the similarities and differences between the cases.

Qualitative data gained from the interviews are presented in the text and are organised into themes and issues selected for presentation in the case reports chapters.

Table 3-2 shows the identification codes used for respondents to whom quotes are attributed in the case report.

Table 3-2 Identification codes used for the respondents

Supply chain cases	Stakeholders	Labels
MCM	Farmer supplier Collector Processor Wholesaler Retailer	MCM-f1, MCM-f2 MCM-c1 MCM-p1, MCM-p2 MCM-w1 MCM-r1, MCM-r2
DLM	Farmer supplier Collector Processor Wholesaler Retailer	DLM-f1, DLM-f2 DLM-c1, DLM-c2 DLM-p1, DLM-p2 DLM-w1 DLM-r1, DLM-r2
HNM	Farmer supplier Collector Processor Wholesaler Retailer	HNM-f1, HNM-f2 HNM-c1, HNM-c2 HNM-p1, HNM-p2 HNM-w1, HNM-w2 HNM-r1, HNM-r2
VNM	Farmer supplier Collector Processor Wholesaler Retailer	VNM-f1, VNM-f2 VNM-c1, VNM-c2 VNM-p1, VNM-p2 VNM-w1, VNM-w2 VNM-r1, VNM-r2
IDP	Farmer supplier Collector Processor Wholesaler Retailer	IDP-f1, IDP-f2 IDP-c1 IDP-p1, IDP-p2 IDP-w1 IDP-r1, IDP-r2

The survey data was assessed and presented in various ways. For example, motivation was rated on the 1-5 Likert scale representing from strongly unimportant to strongly important. The most important motivations were then ranked, and presented for each case. A similar process was followed for the factors influencing the adoption of QAS's. Each factor was rated on a 1-5 scale from unimportant/no effect to very important/high effect. These answers were clustered into low influence (1-2), moderate influence (3), high influence (4-5). Likewise, organisational outcomes that resulted from implementation of QA systems were rated for individual QA systems using a list of measures on a 1-5 scale with attributes from 'no increase' to 'strong increase', which was clustered into L (1-2) no increase, M (3) some increase, H (4-5) large increase.

Cross-case analysis

As noted previously, evidence from multiple cases is considered more compelling than single case studies with the overall study being more robust (Herriott & Firestone, 1983). Comparing and contrasting cases can determine differences and similarities between cases, and so provide defensible answers to research questions as well as higher-level insights (Yin, 1994). The basic technique for comparing across cases was in this study pattern matching. The cross case analysis strategy was performed at the supply chain and company levels.

As noted, the presentation of the cross-case analysis is in Chapter 7. In this Chapter the quality processes and QAS's adopted by actors is described (Research Question 1). At the company level, the motivations, the factors perceived to have influenced adoption of particular QAS's, and organisational outcomes perceived to have resulted from the adoption are compared (Research Questions 2-4).

3.3.5 Ethical considerations

The data required for this research are all concerned with the business activities of these chains. The principles and guidelines of the Lincoln University Human Ethics Committee (HEC) states that interviews with professionals in the areas of their duties and competence, and non-interactive observation of these people in the course of everyday life, do not come under the scope of HEC. Therefore, HEC approval for this research was not sought. However, the collection of data and information followed Vietnamese regulations on the right to share information in internal official organisations for research purposes. Interviews were

conducted and followed official protocol questions (prior to conducting the fieldwork). At the beginning of every interview, it was clearly explained that the interview was voluntary, and that participants were free not to answer any of the questions in the course of the interview. To maintain the privacy of these interviewees, their actual names have not been revealed in this thesis.

Chapter 4

Result 1- Moc Chau Dairy Company case- Description and Analysis

Chapter 4 describes and analyses the case study of the Moc Chau dairy company in respect of its development stages (Section 4.1.1.), governance structure (Section 4.1.2), its supply chain structure (Section 4.1.3) and business strategy (Section 4.1.4). Further discussion in depth on stakeholders in the supply chain with respect to production and quality processes is presented in Section 4.1.5. The analysis of the case is presented in Section 4.2 with respect to factors impacting on adoption decisions (Section 4.2.2), and perceived outcomes the company achieved after implementing QA systems (Section 4.2.3). Finally, findings are presented in Section 4.2.4. This particular case study is presented in depth so that the context and processes within Vietnam's dairy industry can be fully explored.

4.1 Description

4.1.1 Overview

The Moc Chau cow breeders and dairy company (MCM), a subsidiary of the Vietnam Livestock Husbandry Corporation, is located in the Moc Chau State Farm town, Moc Chau district, Son La province. It is 194 km North West from Hanoi with a land area of 1,600 hectares, of which 969 hectares is agricultural land. Dairy cow numbers at MCM are over 5,500. The company has gone through a number of development stages: establishment (1958-1960), initial growth and cooperative farm changes (1961-1982), enlarging scale (1983-1987), further reform (1987-1998) and a subsequent growth period (1998 – 2010). The company carried out 'equitisation' (partial privatization) in 2005, and now has joint ownership with the State holding 51% and other shareholders, including private investors and farmers, holding 49% of the legal registered capital of 17 billion VND (Moc Chau company, 2010).

Regarding its capital assets, the MCM has two milk processing plants and one feed production plant. The two plants each have an office for conducting regular meetings and other purposes and each has a building that houses milk processing facilities. The plants have a cream separator and complementary facilities such as filling, pasteurizing and automatic

packing facilities. One milk processing plant began operation in 1994 and another in 2003. The assets are currently valued at approximately 80 billion VND (equivalent 4 million USD).

The MCM is one of the smaller-sized businesses producing and processing dairy products in Vietnam. Currently, 140 employees work for the company. The company reports a remarkable growth in turnover from 91 billion VND in 2006, to 230 billion VND in 2007, to 320 billion VND in 2008, and to 360 billion VND in 2009 (Moc Chau Company, 2010).

The MCM focuses on serving domestic markets with liquid milk and has a market share of 3% nationally (Mekong Securities, 2009). Its major market is in the Northern provinces in Vietnam. The company has a strategy of product diversification, but, as noted, its main products are fresh and UHT milk produced from fresh milk sourced from the Moc Chau plateau, where cool weather suits cow and pasture development. The company's milk products, such as the 'Thao Nguyen' brand of fresh milk and the 'Moc Chau' brand of UHT milk, have received national awards, such as first prize for quality in exhibitions, competitions, and trade-fairs. In summary, MCM is growing rapidly in the Northern market in Vietnam, where it is pursuing market leadership.

Currently, MCM's competitors in the market for liquid dairy products are the International Dairy Products Company (IDP) and the Hanoi Milk Holdings Company (HNM). However, the competition does not seem to be strong, since each company targets different niche markets for its products. For example, IDP has the Ba Vi brand of drinking yoghurt, HNM has the IZZI brand of fresh milk packaged in small boxes of 110ml, while MCM's strong point is its Moc Chau brand with different kinds of fresh, sterilized and UHT milk packaged in milk bags and packs of 180ml and 110ml with various fruit flavours. Traditional milk cake is also sold.

4.1.2 Governance structure

The majority shareholding of MCM is held by the government's Livestock Corporation Vietnam. MCM has an Administrative Council, a Management Board, an Internal Auditing Board, and functional departments (See Figure 4-1).

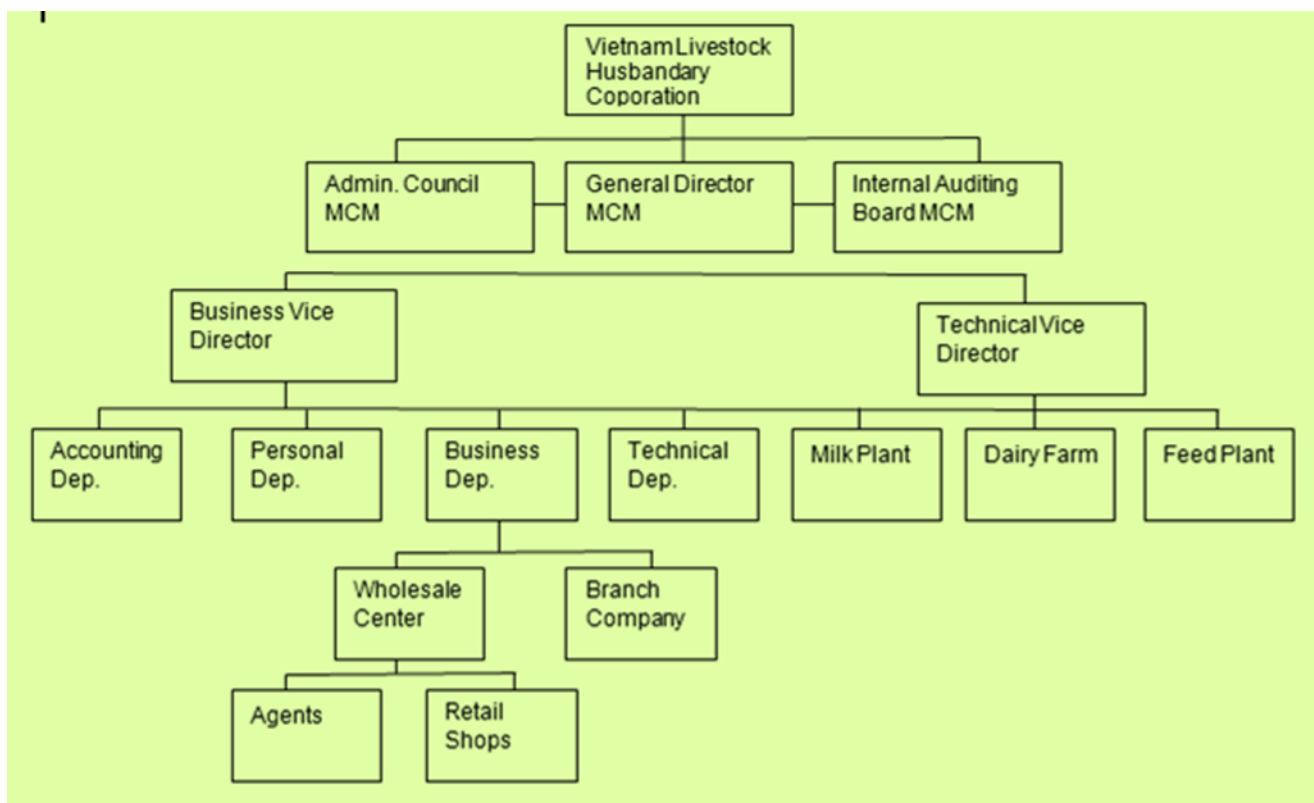


Figure 4-1 Governance structure of MCM

Source: Adapted from Moc Chau company, 2010.

The Administrative Council decides all issues that are associated with the aims and benefits of the company, and has the authority to decide on the development strategy, finance and investment alternatives, and to appoint or dismiss directors and senior managers. The Internal Auditing Board includes 3 members elected by the shareholders' meeting. Its activities are to supervise and assess the implementation of measures agreed to by the shareholder's meeting and to report to the Administrative Council.

The General Director (GD) is the top manager in the company, and has the responsibility to organize, lead, and gain the trust of company members. The general director is responsible for the general management and has the right to administer all the company's activities in business aspects, formulation and implementation of production plans, including monthly, quarterly, and yearly, based on meeting the market demand. Currently, the company regulations on tasks, management, product quality, techniques, labour practices, training, and the recruitment of researchers working on improving product quality and creating new products are the responsibilities of the general director through his vice-directors. He is also responsible for organizing managerial work, financial and accounting business plans, and

signing contracts (business, employment), and inviting advisory experts to the company (if necessary). He is also responsible through his vice directors for all legal aspects and has responsibility to the State for all their requirements.

There is a vice director for business activities, whose role is to lead and control the departments and production workshops concerned with purchasing, repairing, and storing all material, spares, equipment and construction materials needed for meeting the production demand and its marketing, organizing product sales, and managing other tasks delegated by the general director. There is another vice director for technical factors whose role is to manage the production departments and dairy farms to ensure adequate and stable supplies of high quality milk and product. This vice director also has responsibility for administering and monitoring contracts, and making a production plan, and any other responsibilities assigned by the general director.

The Personnel Department manages the human resources of the company, recruiting labour, monitoring records and information on the households allocated cows to rear, and managing associated documents. The Business Department must make plans (monthly, quarterly, yearly, and long-term plan of 5- 10 years) for the company and dairy households. This department conducts market research to assist in accurate planning and ensures that it is aligned with the business, production needs and regulations of the company. The Accounting Department has the role of managing assets and capital funds assigned by the State, and contributions of private participants, and assuring that these funds are utilized efficiently. The department makes financial plans (short, medium, and long term), and monitors these monthly, quarterly and annually for the company, and helps the company to report both on time and accurately. In addition, it also draws up and negotiates contracts. The Technical Department has the responsibility of looking at the technical aspects of the plans for dairy production, research on improving quality, and new products. This department must also manage production, equipment, machines, electricity, water, industrial safety and hygiene, as well as manage the herds of the households in the company. He must also supply technical services (veterinary and disease treatment) for herds on the family farms.

The milk processing plant produces and processes of milk products from raw milk and must complete production and business plans monthly, quarterly, and yearly. The feed processing plant produces and sells various kinds of animal feed for dairy production and fertilizers for

pastures. The dairy farms have contracts to supply milk to the company, and are under the management of the company when deciding on farm management practices. The company decides cow numbers and land areas.

The company branch acts as a wholesale centre and its agents are involved in the distribution stage of the products, and in market research. This company branch is in Ha Noi. The director of the company branch must report the business and sales situation to the company monthly, quarterly and yearly. Through the wholesale centre, the company's dairy products are distributed to the markets. The wholesale centre has a warehouse for storing dairy products before distributing to retail shops and agents in the Northern provinces in Viet Nam (Moc Chau company, 2008).

4.1.3 Supply chain structure

The company has a predominantly vertically integrated structure along the supply chain (Figure 4-2). Private suppliers sell milk to the company, but they are also shareholders through contributing capital to the company according to the value of their cow herds. In addition, there are dairy farms owned by the company who hire labour to run them. Dairy smallholders sell most of the fresh milk they produce to the milk processing plants of the company via collection systems owned by the company, and receive payment. They also receive technical support and assistance from the company such as veterinary services, training services, breeds from the company, input materials, machines, equipment, cow insurance, and credit for buying cows. Currently, there are 700 farms supplying MCM.

Fresh milk is processed in the two milk processing plants of the company. The total annual capacity of the two plants is approximately 20-25 million litres. Processed milk products are distributed through the company's distribution systems, including wholesale outlets and agents, retailing shops in schools in Ha Noi, and retail outlets and corner shops in provinces from the Northern provinces to Quang Ngai province. At present, the company has a wholesale shop in Cat Linh and 250 sale agents, and 2,000 retail shops, mainly in urban cities (Moc Chau Company, 2009).

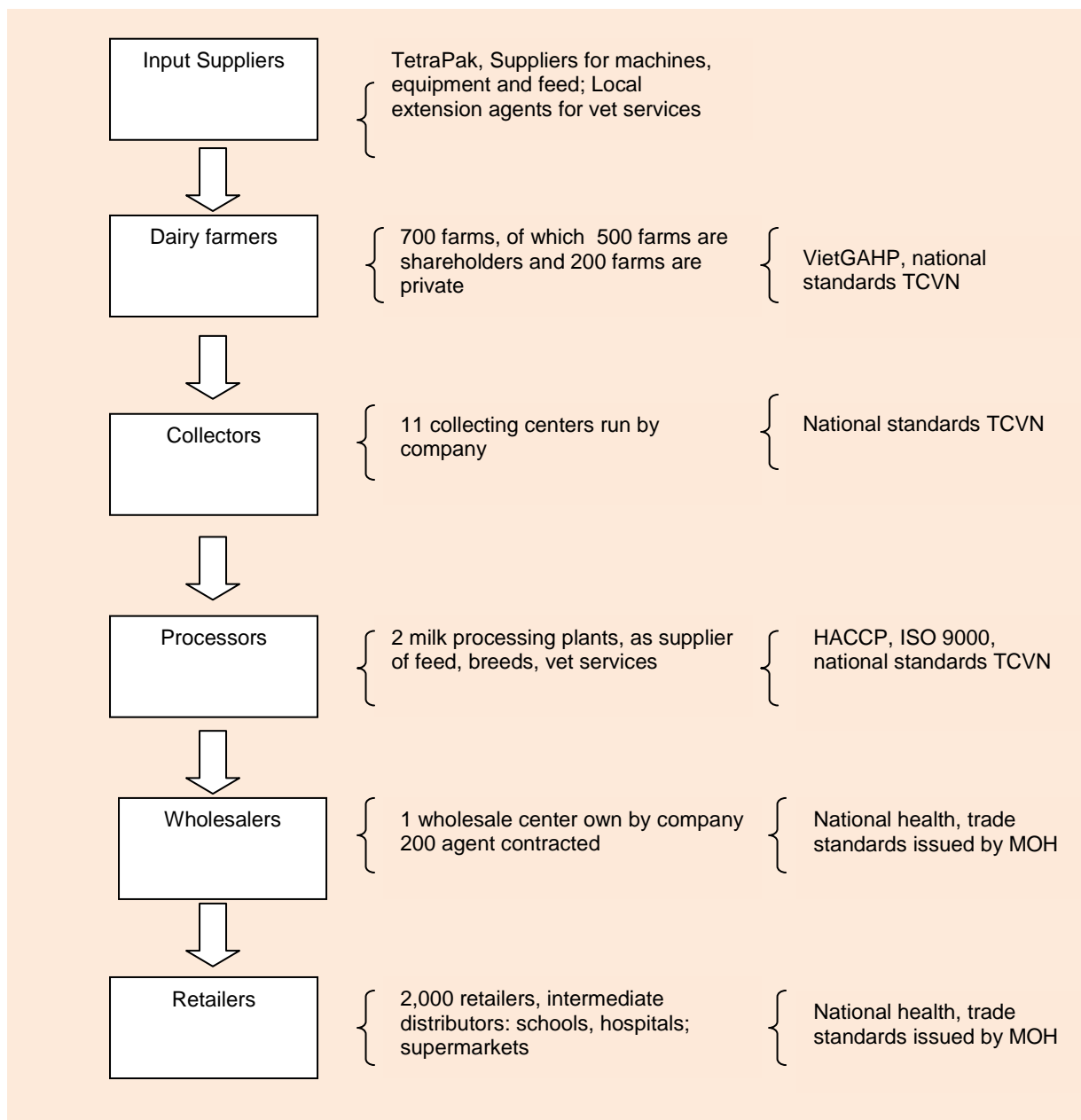


Figure 4-2 Supply chain structure and QA systems adopted - MCM case

Source: Adapted from Moc Chau Company, 2009

Major input providers are Tetra Pak, which is responsible for supplying dairy processing machines, packages, and milking machines, and local extension centres, which are responsible for supplying technical and training services. Tetra Pak is a Swedish company that supplied cooling systems for pilot projects in this area. Two large farms have been technically assisted and supplied with modern cooling tanks that contribute to improving the quality of raw milk after milking. Another input provider is the bank, which supplies credit and loans for farmers to buy cows. As a result, cow numbers per farm have recently

increased. Over the years, the banks have lent farmers around 20 -30 billion VND (1-1.5 million USD) (Vietnamnet, 2009). MCM itself provides inputs to farmers such as alfalfa and other hay for supplementary feed, which is imported from countries such as USA and Australia, and has close relationships with breeding and scientific centres in the country that supply materials and provide needed training courses to farmers. The company also provides veterinary services at low cost and sells genetically improved cows to farmers.

4.1.4 Business strategy and QA systems

The MCM has a long-term strategy for development of products and their quality. The company's target is to be in a leading position in regional milk markets, especially for pasteurized and UHT milk in the Northern markets. The company has a commitment to assure high quality milk to consumers. The MCM has acquired two international quality certifications, ISO 9001:2000 and HACCP. The company adopted HACCP in 2001 and obtained certification for ISO 9001:2000 in 2003 (VPC Vietnam Productivity Centre, 2010).

4.1.5 Supply chain stakeholders

4.1.5.1 Dairy farms

General Information

Milk production is one of the most important activities in the Moc Chau region, which is a traditional milk production area in the country, and generates the main income for farmers in this region. Average annual farm income is VND90-100m (US\$4 -5 thousand). There are 700 farms in this area. Most farms in Moc Chau are small scale. Herd size varies from 15 dairy cows on small and medium farms to over 35 dairy cows on large farms. Farm milk production is influenced by the number of cows, the availability of natural pasture and water, and type of cow breed. Milk production also depends on the natural environment, and the better the environment, the better the milk production and vice versa. The Moc Chau region has good weather for dairy production and is very suitable for rearing dairy cows (NIAPP, 2007).

Two farmers were interviewed and the farms visited. These were originally in the Moc Chau State Farm, which sold cows to farms as part of the privatization process. Some farms

became private after they had finished paying the company the value of the cow herd, and farms that have not achieved this are under the management of the company.

Farm 1 is in private ownership. The owner has over 30 years of experience in raising cows. This is a medium scale farm, and has a mix of cultivation activities and milking cows. Cows are raised using a combination of indoor and outdoor modes. It has 40 cows, of which, 32 are milking, and has crop and pasture land of 5 ha granted by the company. Most land of the farm is for growing pastures, which are the main source of feed for cows. The owner also buys feed supplements from the company. This farm has Holstein Friesian cows that have high milk productivity. Length of lactation of a cow varies from 250 to 280 days. Average yield per cow ranges from 13 to 14 kg per day. Volume of milk sold daily to the factory is 400-500 litres.

Farm 2 is privately owned and the farmer is a shareholder of the company. The owner of farm 2, an ex- worker of the State Farm, has 28 years experience in raising cows. This is a commercial farm specializing in dairy production. Cows are raised using both indoor and grazing modes. The owner buys feed supplements (alfalfa hay) from the company, and also makes feed, such as corn silage. One source of feed for cows is from the 5 ha land of crop and pasture granted by the company. Besides this source, the owner has rented 8 ha more for growing grass and pasture, in order to have enough feed for the cow herd. For growing and looking after pastures, the owner hires three labourers with a salary of VND1.7 -1.8 million per month. The farm has 78 cows of which 63 are milking cows, mainly crossbred Holstein Friesian. The length of lactation per cow varies from 240 to 260 days. Milk productivity per cow on this farm is 16 -17 kg per day. The milk volume sold daily to the factory is around 800-1000 litres.

Both farms use family labour for cow husbandry, feeding, and milking. Farmers also hire labour in the seasonal peaks for planting and harvesting grass, and for feeding cows. Despite its larger size, farm 2 hired less labour at the time of the survey than farm 1 because it has more modern and mechanized machines for production. Farm 1 has facilities such as an animal house, 2 mini milking machines with 4 teats, milk tanks, and containers, hand tools for milking, and a grass mowing machine. Farm 2 has a modern cooling system, bales that allow 4 cows to be milked at the same time, 3 mowing machines, and water reserve ponds for irrigating grass and bathing cows. Table 4-1 summarises features of these farms.

Table 4-1 Typical dairy farms –MCM case

Category	Farm 1	Farm 2
a. Ownership	Private	Private and shareholder in company
b. Type of farm	Mixed cultivation and dairy, Plants maize, pasture Medium herd size	Plants pasture Large herd size
c. Experience - years in cows farming (yrs)	30	28
d. Breeds	Holstein Friesian HF	crossbred Holstein Friesian HF F2, F3
e. Number of cows	40	78
f. Milking cows	32	63
g. Lactation length per cow average (days)	270	265
h. Milk volume per cow average per day (kg)	14-15kg	16-17 kg
i. Family labour (full time equivalent)	4	2
j. Hired labour in season (full time equivalent)	6	4

Source: Survey, 2010

The input providers for the farms are Tetra Pak for cooling systems, and the company for veterinary service, imported alfalfa hay, pasture hay, milking machines, credit for buying cows, fertilizers for pastures, and the irrigation system. Also farms outside the company supply pasture. Both farms are very similar in this respect, except farm 1 has no cooling system, does not use imported hay and buy extra pasture for feeding. Hence, the company is the main input provider for the operations of these farms. The company supplies services at no or little cost. In return, the farmers have a close relationship with the company, which supplies inputs to them, or introduces the farmers to a third party company having supply capabilities that they may lack.

Table 4-2 Characteristics of input providers for farms-MCM case

Category	Farm 1	Farm 2
a. Input providers (equipment, concentrated feeds, veterinary services)	MCM	MCM, Tetra Pak
b. Technical services and support		
• Through company technical staff visits	Yes	Yes
• Buying imported alfalfa, hay from company at low prices	No	Yes
c. Providing credit, loan sources	MCM	MCM, banks

Source: Survey, 2010.

Milking processes

Cows are milked twice a day on both farms, once in the morning and again in the afternoon. Farms endeavour to follow hygienic and safe procedures in milking such as washing hands using drinking water, using clean containers and clean cloths, and buckets with covers for containers so excluding flies, insects, and other matter. Both farms have permanent places for milking with a cement floor and iron roof.

Both farms have milking machines, but a different number of milking machines because of differences in the volume of milk produced. Farm 1 uses 3 mini milking machines with 4 teat cups. During a milking, 3 cows are milked at a time, each for 3-4 minutes. The milk is cooled by well water in vats for 20-30 minutes before delivery to collection points. Farm 2 uses milking bales with 16 teats, and during one milking, 4 cows are milked for 4-5 minutes. Milk is cooled in the refrigerated cooling system run by electricity. It has a 400 litre capacity tank installed by Tetra Pak under the pilot project.

Time stored after milking affects quality of milk, so after milking, milk needs to be brought as soon as possible to collection points. Both farms are not far from collection stations. Farm 1 is 3 km from a collection point, and farm 2 is 700 m to the nearest collection point. The company itself has 11 collection points for collecting milk from farms, and tries to shorten the time from farms to collection points. The time that milk is stored on farms at present is up to 3-4 hours, but may be up to 5-6 hours for farms having modern cooled systems. Such systems are equipped under the pilot project of the Tetra Pak. The company recommends that after milking they should bring the milk to collection points as quickly as possible.

QA system and quality concerns

There are no international QA systems, such as HACCP, applied at the farm level in Viet Nam. Application of HACCP principles for farms has been discussed, but not considered feasible. As an alternative to HACCP, the formulation of good agricultural practice GAP and good dairy farming practice GDFP has been proposed in many countries, including Vietnam.

The dairy farms are applying Vietnamese Good Animal Husbandry Practice (VietGAHP). Both farms surveyed in the Moc Chau area are the same with respect to the adoption of a QA system in terms of starting time and the procedures they learnt from training courses. As mentioned above, the company is a subsidiary of the Vietnam Livestock Husbandry Corporation that is under the management of the Ministry of Agriculture and Rural Development (MARD). These farms have had a trial application of a QA system, the VietGAHP, as decreed by the MARD. This has been the ministerial standard for dairy production since 2009 when MARD introduced a program to encourage the production of clean and safe milk. The objectives of GAHP are to assure good conditions for feeding, planting clean grass, and practicing hygiene procedures on farms that focus on animal welfare, diseases treatment, especially mastitis, breed, and environmental conditions (MARD, 2008).

The content of VietGAHP is far-reaching, and includes selecting an appropriate site for dairy cow husbandry, designing cow housing, and equipment management, breed genetics and breed management, hygiene of cow housing, milking hygiene management, feed, drinking water, bathing water, cow herd management, disease management, preservation and use of veterinary drugs, waste water and environment management, employee management, record keeping, document storage, internal auditing (MARD, 2008). There are a number of indicators for monitoring the QA system. For example, in the breed management section, indicators such as the clear origin of cow and the historical documentation of cows received by the farmer when buying a cow and the quality of breeds must meet contemporary requirements. In the husbandry hygiene section, equipment must be assured to be hygienic, separate vehicles used for transporting milk and feed on the farm, and disinfecting milk cans used to transport milk (MARD, 2008).

In practice, the indicators are often not achieved in conditions where dairy production is less developed in Vietnam; for example, with animal welfare indicators, such as the monitoring and treatment of *mastitis*. This condition is a concern in dairy production throughout the world, including Vietnam. This condition causes decline of milk productivity and quality (Khai, 2010) and it requires antibiotics for treatment. This condition occurs often in cows in the area. Residue from mastitis treatment is one of reasons for rejecting milk by the company. Furthermore, hygienic conditions may also not be met. These include dirty floors, not enough clean cloths for milking, and re-using cloths, which can result in milk that is not hygienic. As a result, rejects in collecting milk from farms still occur. For example, on farm 1, the number of the rejects in the previous year was 4, whereas for farm 2 with its higher number of cows, the number was 6. Generally, outcomes from the adoption of this QA system by farmers are not clear at this time because this system has been only implemented for a year.

Quality testing

Controlling and inspecting milk quality through tests on farms does not occur at present. Most fresh milk is checked at the collection point or on reception by the factory if farmers deliver milk there; that is, testing milk is only done by the company when it receives milk. As a result, farmers do not have any information about milk quality that is produced by them, except grades of their milk. Some writers have commented that milk quality in Vietnam is poorly managed and handled on farms, especially small farms, because of lack of testing and checking equipment, and poor farming practices applied by farmers (Tuyen, 2007; Nancy et al., 2007).

4.1.5.2 Collectors

General information

Collectors are intermediaries who collect raw milk from farmers. In other dairy production areas in Vietnam, there are dealers in milk collection; but in Moc Chau area, there are only collectors of the company. The explanation for this is the company was originally an ex-State farm in the past, so other dealers and traders have not entered business in this area. To collect milk from the farms and be convenient for dairy farmers, the company has 11 collection points within 12-13 km diameter close to production areas. This assures that, after milking,

farmers bring their milk to these points as fast as possible. Daily collection from all points is 40-50 tons of fresh milk.

One collection point was surveyed and visited. This collection point has four staff who are responsible for weighing milk and testing quality. It has equipment (tester, chemical content), a stainless steel vat with storage capacity of 1-2 tons each. This collection point collects milk from 40 farms, and 5 tons milk is collected per day. Some features of the collection point are summarised in Table 4-3.

Table 4-3 Main features of collection point – MCM case

Category	Collector
a. Number of staff	4 (weighing, quality control and tester)
b. Tester, equipment	Yes
c. Collection capacity	5 tons per day
d. Number of supplying farms	30-40 farms
e. The length of time milk stored at collecting point	3-4 hrs
f. Farmer bring to collecting point	Yes
g. Transport means for fresh milk from farms to collection point	Motorbikes, bikes
h. Storage means for bringing milk from farm to collection point	Plastic cans of 10, 20, 50 litres capacities
i. Vehicle for bringing milk to milk processing plants	Hauler and truck with milk tank

Source: Survey, 2010.

Farmers use their vehicles, mainly motorbikes, for transporting their milk in plastic cans with capacities of 10, 20, or 50 litres to collection point. Then, milk is stored at the collection point for 3-4 hours. After that, tank trucks and haulers of the company will transport milk from the collection point to milk factories for further processing.

QA systems and quality concerns

At the surveyed time, there was not any QA system applied in the collection point, but quality tests were done when collecting milk from farmers. The MCM has a strict and stringent quality policy regarding intake of raw milk. At this stage, quality tests are conducted to ensure that only fresh milk of the highest quality is accepted at the plant premises. Internationally recognized tests are used to check for adulteration, microbiological contamination and adequacy of nutritional content. Milk is easily spoiled and perishable after a short time, so processors need to be compliant to strict procedures in collecting to lengthen its shelf life (FAO, 2009).

At MCM, quality is tested daily against requirements at collection points and again at inception into the factory. At the factory, the compositions of incoming milk are tested for dry% ratio, protein, fat% ratio, and water by tests and visual inspection. Furthermore, periodically, milk samples are taken randomly. Every day, quality staff takes 2 random samples. In total, 14 samples a week are sent to a lab of the company for testing specific parameters. These tests are for residues (chemical, metal, etc.) and additives. Tests used are methylene blue colourless, alcohol, pH test, and other tests.

4.1.5.3 Processor

General information

As mentioned above, the company has two milk processing plants. One has a designed capacity of 80 tons per day and another 40 tons per day. The number of employees in plant 1 is 165 and plant 2 is 138. Plant 1 produces sterilized, fresh milk, milk cake, and butter, and plant 2 produces UHT milk and butter (Table 4-4).

The plants are short of milk supplies in the off-peak months during winter when milk yields per cow are low and cows are being dried off. The time that the plants are not operating is due to a lack of milk. This period is not as long as in other areas since Moc Chau area is very suitable for milk production.

Table 4-4 Main features of milk processing plants – MCM case

Category	Plant 1	Plant 2
a. Operation starting time	1994	2003
b. Capacity (tons/day)	80	40
c. Products	Sterilized and fresh milk, milk cake, butter	UHT milk, butter
d. Number of operation days/year	290	320
e. Number of employees and staff	165	138
f. Peak output (days)	180	180
g. Off-peak output (days)	30-60	30

Source: Moc Chau Milk Company, 2010

QA systems and quality concerns

Quality concerns

After testing at reception into the factory, if the milk meets requirements, it proceeds to processing. The raw milk undergoes preliminary heat treatment (65°C) on arriving at the plant and before storage in vats. This treatment is known as thermisation that is different from ‘pasturisation’ that involves heating milk at higher temperature (71°C), which renders inactive psychotropic microorganisms. These organisms produce heat stable enzymes like lipases and proteinases at low temperatures, and are responsible for spoilage of dairy products.

In processing, various technologies are applied, depending on a range of products. (see processing diagrams in MCM for pasteurised milk and UHT milk in Appendix E). These technologies impact on product quality, which is enhanced by applying QA system procedures.

QA systems in place

The plants have applied two international QA systems, HACCP and ISO. As noted above, HACCP was first adopted in 2001 and ISO 9000 in 2003. Both certifications have been issued by QUACERT, the State standards certifying organization; and plants must comply with the requirements of these systems in order to gain certification. For example, in plant 1, the milk is unloaded from haulers and is pumped into storage tanks, then filtered to separate solid and other material; and in going through these stages, each process is identified for Critical Control Points CCPs. For each type of milk product, different technology is applied, so identification of CCPs is more complicated. During milk processing procedures, hazards can occur at any stage from receiving the input milk to the storage phases.

According to feedback from respondents, the factors that affected the final milk products are the quality of raw milk, the processing technology and processing techniques, storage capability, and the inventory time for the final products. To keep final products free from hazards and to ensure safety and quality, HACCP procedures and principles are crucial tools. At present, MCM applies HACCP, as well as other measures associated with changes in management and human resources needed to adapt to specific conditions. Validation of the HACCP system shows through antibiotic testing methods, pasteurization parameters, product formulations, product cooling rates, and raw material specifications. The plant manager illustrated the difficulty and complications in applying of the HACCP in the plant:

‘[...] Any change in the product formulation or process, such as changes in procedures on the line, changes in equipment, change in raw materials supplier or specifications, changes in cleaning processes and changes in testing method technology, leads to changes of procedures to identify CCPs’(MCM-p2).

The company encountered difficulties in the implementation of HACCP in the plants. Such difficulties were identified by the plant manager:

‘in implementation of this system [HACCP], we are lacking of capital to invest in modern technology and testing equipment; a lack of experts or specialists with high capabilities and skills in quality management, supply chain management and statistical knowledge; the low level of employee quality control awareness and the intransigence of quality control behaviour. The intransigence caused a lack of CCPs monitoring verification. For example, lack of holding tubes, pH probes, lab control cultures, and a lack of validation of processing

parameters for innovative products, excessive document and record keeping that leads a tick mentality and mindlessly filling form' (MCM-p2).

Another QAS, the ISO 9000, is adopted within the plants. The requirements of ISO have been complied with by the company. However, similar to HACCP, the requirements of the ISO 9000 system have not been implemented completely in the plants of the company, but only to minimal level requirements. Within ISO implementation, some steps are difficult to do, which leads to varying degrees of implementation of ISO between the two certified plants. One of reasons for this is lack of commitment of all employees to implementation. The manager commented:

‘...though commitment of top managers is there but understanding and participation of employee for it [ISO] is limited’ (MCM-p1).

Other difficulties are document development and control for this system. The company has a team for ISO, but staff have a mix of activities or responsibilities, so efficiency is not high. Furthermore, documentation for the ISO system are many and complicated (manual, 6 required procedure documents and 20 records). Internal auditing is necessary for trial operation before external auditing. In the internal auditing process, considering documents for improvement needs professional level of quality staff. Furthermore, duration and frequency of training is a problem. The duration of training for employees to have an understanding of ISO 9000 is short, normally 2-4 days, with basic knowledge of ISO requirements and implementation steps. This does not result in thoroughly understanding ISO. Quality staff and managers participate in training courses organized and provided by quality agencies, but number of courses is small.

‘...our team limit in quality knowledge because of lack of training courses and professional in quality management ‘ (MCM-p1).

4.1.5.4 Wholesaler

General information

Manufactured and processed dairy products are distributed to consumers through the wholesale and retail systems of the company. As mentioned above, the company has a

wholesale centre in Hanoi where products are distributed to retailers and agents in the northern provinces of Vietnam.

QA system and quality concerns

Quality control in this segment mainly focuses on transport, storage, and warehouse conditions. Dairy products are transported from milk processing plant to the wholesale centre by refrigerated vehicles that assure product is of good quality. Then products are stored in warehouses equipped with cooling systems to prolong shelf-life of milk products. However, in summer, the temperature is high, which also affects milk quality, especially products that are displayed and sold directly to consumers at milk shops.

While international QA systems implementation could improve quality in distribution stage, there is not an international QA system applied in this stage, though HACCP or ISO, in principle, can be extended to apply for this segment, as in other countries. Conditions for the adoption of such systems at wholesale level are favourable because this wholesaling function is part of the company. A QA system is in the planning stage and under consideration at the wholesale level. The wholesale manager commented:

‘ I have no ideas about this [QA system], and am waiting for decision from the company, ...’
(MCM-w1).

4.1.5.5 Retailer

General information

Distribution of final dairy products is done with agents (contracted) in urban cities, and metropolitan areas. Quality issues to be addressed in this segment of the chain are assuring quality via good storage and hygienic practices in shops that sell directly milk products to consumers, and managing by-date products.

Surveyed retailers are located in different areas that have different customers. One is near the company, and another is selling milk product in an urban area. They have equipment to assure dairy products have proper storage, one has a fridge to store milk and ice cream, another has two, one fridge –freezer and one fridge. MCMr1 is selling only dairy products

and MCMr2 is doing dairy products, cakes, and derived fruit juice, cakes, and breakfast serving. In general, retailers' facilities are still poor, and hygienic practices are not in place; for example, acts such as keeping the floors and tables clean, and utensils, glasses, spoons sterilized, are not done frequently, and do not follow any procedures.

The retailers have a contract with the company, and mainly order goods from the wholesale centre by phone when goods are sold out. Two retailers are small size, and so each time, they order 2-3 boxes of 24 milk packs for selling.

In sum, poor facilities are shown for two retailers, and hygienic practices are not done properly and frequently. That leads storage conditions for products are often near minimal standards that are fresh milk is kept one day, pasteurised milk 7 days, and UHT 3 months.

Quality processes

Two factors affecting quality in distribution are transportation and storage conditions. In the MCM chain, therefore, transportation from wholesaler to retailer, or from company to retailer, and storage conditions in shops and sale outlets are considered. One retailer is not far from the company and another retailer is in an urban area and far from the company. Quality reduction through transportation and storage for the retailer near the company is lower than for the other retailers further away from the company. Dairy products are transported from wholesale to retailer mainly by motorbikes. As indicated by the wholesale manager:

‘...we have warehouses equipped with good facilities to store [dairy] products before distribution. However, quality problems may appear in following stages, in particular, transport from wholesale to retail shops and agent by motorbikes, if what does occur when it is summer, milk quality is sure to be reduced’ (MCM-w1).

There are not international QA systems for these retailers. Reasons for not adopting international QA systems, such as HACCP, ISO, BRC, are limited knowledge and understanding of retailers about these systems. One retailer knew the name of these systems, but did not know reasons why they do not apply them in practice.

‘Yes, we know some quality programs, that are HACCP and ISO...Not clear reasons, but I guess that we have not searched for any program that may apply in distribution stage...’ (MCM-r1).

Another retailer did not know anything about these systems, but hoped to have one to increase their sales.

‘...we have no idea about it [QA system]...we don’t know [reasons]. If having a quality program that makes sales better, we may apply’ (MCM-r2).

In addition, it is noted that there is not motivation for distributors in this chain to adopt QA systems. For example, with respect to market pressures and competitive environment for this MCM case, the decision making process and power leadership in the chain to apply QA systems depends on the company.

Competition among chains is one factor that may lead to the adoption of QA system. However, chains seem to be quite optimistic in the retailing segment, and this is one of the reasons retailers do not adopt any QA system. Distributors, especially retailers, and even agents, are selling milk products from different producers, even when an agent, according to contract, only has permission to sell milk products from the company. Entry conditions for agents are regulated but contract conditions may in practice be broken. A retailer said that:

‘...we are selling some milk products from other suppliers to have more cash’ (MCM-r2).

Furthermore, another reason is that consumers themselves do not insist on food quality and safety certifications. One retailer stated that:

‘They [consumers] never require us to have any QA system like a proof of quality assurance of dairy products that we are selling’ (MCM-r2).

Though there is no international QA system applied to retailers, a national standard for food safety has been applied. This certification is issued by the Ministry of Public Health (MOH) for food shops having conditions for food safety and hygiene. The objective of this regulation is to enforce all sellers to sell safe food products to consumers. This is compulsory for all food shops, including milk shops. That is also the reason why the standard that shops are applying is popular in practice.

4.1.6 Conclusions

In this section, the MCM was described in terms of its historical and development process, governance structure, its relationships and support to suppliers and distributors, and quality processes in the food chain.

MCM, a joint stock company, has a long history with over 50 years in dairy production and business. The company is small size and has two plants where milk is processed and manufactured into final products, such as fresh milk, pasteurised milk, drinking yoghurt, and milk cake. As a result of diversifying its range of dairy products and developing its source of raw milk for production, in recent years, its turnover has seen remarkable growth. The company produces dairy products to meet domestic demand, and its major market is Northern provinces in Vietnam, where competition in distribution among competitors is not strong. Its competitors in the North are IDP, HNM, Elovi company, Ba Vi company, VNFuture company, and Phu Dong company, of which, HNM is larger company, and the remaining ones are as small as MCM. These competitors have 6-7 years experience in dairy production and business.

Regarding the MCM's supply chain, the company has a predominantly integrated structure with 700 dairy farmers as suppliers producing milk on their farms, selling milk to the company, and receiving technical support from company. The milk sourced from farmers is then processed further in two plants into final products, which are then distributed to the market through wholesale and retail channels in urban cities. Involved in the supply chain are input suppliers and support organisations that play an important role in maintaining MCM's production. These main input suppliers are Tetra Pak, MCM itself, banks and local extension agents. Tetra Pak supplies machines and apparatus for farmers and the company; the MCM supplies concentration feed and supports technical services to farmers; and the banks supply credit to farmers to buy cows, feed, and machines. Support organizations, such as local extension agents, provide veterinary services and extension training.

Some stakeholders in the chain have been adopted QA systems at different levels and at different times for specific purposes. Farms have applied a QA system, VietGAHP, since 2009. This application is a trial of a clean milk program by MARD. The objective of this

system is to assure milk production is hygienic and safe through implementing good practices in raising cows, milking, storage and transportation, as well as disease prevention and control.

The next actor in the chain is the company/processor, which is considered the chain leader in quality management and developing QA systems throughout the chain. MCM has implemented ISO 9000 and HACCP within plants. ISO9000 began to be implemented in 2003 and HACCP in 2001. Other actors in the chain, collectors and wholesalers, do not apply international QA systems, but comply with national standards and regulations. Collectors are under the company's management, and are important intermediaries who collect milk from farmers. Their functions are storing and testing quality at the first reception point.

Wholesalers have a vital role in distribution as well as quality management, from which end-products are stored and transported to retailers. Retailers then distribute dairy products to the market. Although application of international QA systems is not applied at this stage, a national QA system, such as the food hygienic and safe certification for retailers and industrial standards and procedures for storages and departure facilities for wholesalers, is enforced. The wholesaler centre of the MCM has complied with the requirements of national food certification since 1996 and industrial standards since 1997. In respect to food retailers, once opening shops, retailers must comply with requirements of a national QA system, and this system is mandatory. The two surveyed retailers have conformed to the national food hygiene certification since 1995 and 1993, respectively.

In summary, implementation of these QA systems has occurred at different degrees and times. Factors leading to these results are discussed further below.

4.2 Analysis

4.2.1 Introduction

As described in Chapter 3, one component of this study is to consider adoption of QA systems by actors in the chain and factors influencing on this adoption process. These factors include environment context, organisation characteristics context, and motivations/reasons for adoption. Regarding environment context, three main factors identified by the literature

were legal, external support for firms in the chain, and market pressures. Organization characteristics include firm size, top management, structure, and the nature of the firm's products. Finally, motivations/reasons for the adoption of QA systems may be both internal and external.

4.2.2 Perceived factors influencing adoption of QAS's

4.2.2.1 Motivation

As mentioned above, MCM has two milk plants and one feed plant, of which the two milk plants have obtained quality certifications, HACCP and ISO. Motivations for the adoption of these systems were explored through interviewing a vice director. The two QA systems were adopted separately at different times and are not integrated. The HACCP is often adopted first by the food processors, and MCM is one example of this. The MCM gives reasons for seeking HACCP certification, and these are related to quality improvement and meeting international standards in order to maintain their existing customer base. The Vice director, who was the Planning Department's head when the company adopted this system, recalls:

"I participated in meetings of directorate board that time when they [director and managers] recognised that likely approaching international quality system that was popular in food industry on the world was necessary if company desired to have high quality milk products and preserve existing customers. HACCP system that they considered was their one of choices then" (MCM-p1).

Prior to the adoption of QA systems by MCM, their competitive situation among dairy processors was not strong in the Northern market; therefore, raising competitive advantage through the adoption of them was not the primary reason that was considered by the MCM.

"In reality, up to 2005, the company did not have competitors in the Northern market. Most milk companies, such as Elovi, Phu Dong, IDP, have been established since then" (MCM-p1).

It therefore appears that the MCM considered quality improvement as a motivation for becoming certified HACCP. Motivations for adopting the HACCP system are different from those for ISO 9000. ISO 9000 targets customer satisfaction through proper and efficient management regimes, which leads to cost reduction and indirectly lead to quality

improvement. The company considered ISO 9000 system to be vital for entering new markets. As commented by the vice director of the MCM:

“ISO 9000 system may bring us costs reduction and less error products in production and [...] our company also applies ISO 9000 with expectation of expanding markets to the Central and Southern provinces where consumers may know more of this quality system” (MCM- p1).

The vice director identified factors that motivated ISO certification. These were to ensure uniformity between two plants, retain existing customers, improve efficient utilization of facilities and machines, and improve skills and attitude of employees towards quality. As noted above, it appeared that the MCM become QA systems certified for both internal (firm driven) and external (customer driven) reasons. Primary reasons for adoption of HACCP and ISO 9000 are also different. While the primary motivation for the company to become HACCP certified is primarily quality improvement, primary motivations of the company to become ISO 9000 certified are expanding new markets and become more efficient, and so reducing costs. This conclusion is consistent with opinions of interviewees assessed by a five-point-scale in the survey’s questionnaire and shown in Table 4-5:

Table 4-5 Motivations for seeking QAS’s – MCM case

Top five motivations	HACCP	ISO 9000
1	Improving product quality (I)	Expanding market (E)
2	Improving company’s image through QA systems (E)	Improving company’s image through QA systems (E)
3	Expanding markets (E)	Improve quality (I)
4	Raising competitive advantages over competitors	Raising competitive advantages over competitors
5	Improving skills of employee, staff toward quality (I)	Improving skills of employee, staff toward quality (I)

Note: I internal; E external

Once the managers were motivated to adopt a QA system, they considered factors, such as the costs of QA systems and perceived benefits once the QA system was in place when deciding to adopt. In particular, they considered the costs of initial set up and maintenance of these systems. When the company began the process, it lacked information of these QA systems and expected high benefits. However, the MCM, as a smaller company, indicated

that high fixed costs were associated with the implementation and maintenance of QA system, and these were a bigger problem than setting up costs.

According to Vietnam Productivity Centre (VPC), setup costs such as hiring external auditors, documentation, training courses for QA systems in Viet Nam is not high in comparison with other countries. For instance, the auditing fee, not including training courses and documentation, is around VND98 million (USD4,300) for a HACCP certificate, and is VND76 million (USD3,800) for an ISO 9000 certificate (Dau, Q.A., personal communication, July 5, 2010). However, investment in upgrading machines and equipment may be high because machines and technologies in the two plants are old and out-of-date. As a result, the ability to comply with requirements that are set by HACCP or ISO depends on ability of the company to upgrade machines and equipment to standard requirements. As noted by a vice director of the MCM:

“...costs for procuring machines to meet requirements of QA system was relatively high, this was one of reasons why we relied on assistances from foreign projects and programs of the government [when adopting QA systems]” (MCM- p1).

4.2.2.2 Environment context

External Support

The company received support when it was chosen as part of a quality improvement initiative. HACCP has been adopted after a 1997 UNDP project invested in the company with fresh milk assembly line and provided training courses on producing good quality milk. Quality strategies had been considered by the company in a voluntary capacity but needed external support by a facilitator. Facilitation of quality campaigns were organised by the STAMEQ. Quality campaigns were also given attention by the governing bodies from 2000 with diffusions of quality systems within food processors in Vietnam. For example, the HACCP program has been supported by Ministry of Industry (MOI). In this ministry, a professional department (Department of Science and Technology) monitors progress on the HACCP program's diffusion in businesses in industry. Quality organisations, such as VDP and QUARCERT, through government programs, have supported domestic businesses in obtaining the ISO 9000 certifications by providing training courses (VPC, 2009). The MCM

got such support to assist it to introduce HACCP and ISO 9000. In short, factors that facilitated the MCM to adopt QA systems were assistance from an international body, the UNDP, and national organizations, the VPC and MOI, which ensures support for a part of setting up costs, and supplying information on QA systems for the MCM.

“Supports from foreign organizations, and associated authorities and agencies are vital for us to think better quality system applicable soon in practice. Decision to adopt quality system is as usual on cost benefit basis, if we have supports for quality activities, this adoption [of QA system] occurred easily and sooner” (MCM-p1).

Development of SMEs in general and MCM in particular was given attention by the government and other related organisations in the Reform process. Therefore, in combination with other factors, external support was a factor in assisting MCM to obtain QA systems.

Market pressures

It appears that any association between QA system adoption and buyers’ pressure and requirement, as well as competition from competitors of the company, was not strong. Most competitors of MCM are newly established and these competitors have traded dairy products in the Northern provinces since 2005. As a vice director commented:

“... [prior 2005] in the North, MCM was the first dairy company adopting QA system, and when the company adopted HACCP, there were few companies in dairy market. Under that situation, MCM seemed to have a monopoly in supplying fresh milk products to consumers. Furthermore, we did not have enough milk to sell because demand for Moc Chau milk was so high”. (MCM- p1)

As mentioned above, before 2005, competition within the dairy market was not fierce, especially in the Northern markets and for liquid milk. Therefore, it seems unlikely that this was a factor that affected the company’s decision to adopt QA systems in order to gain competitive advantage and a lead on competitors in the market. Another factor could have an association with the adoption of QA systems by the company is buyers’ pressure; that is consumers and retailers in down-stream requiring a dairy company to have quality certification. But this association was not present in this case. For MCM case, it was found

that the perception and understanding of consumers of quality labels on milk packs and milk bags, which show the company has applied QA systems, is limited. As reported by a wholesaler of MCM:

‘...consumer did not pay much notice to quality labels [with QA system symbols], and they seem not to know more of meanings of these labels...’ (MCM-w1).

This may be a reason why the company did not rely heavily on pressure from consumers when it decided to establish QA systems. Instead, its attitudes and strategies towards quality improvement and supplying high quality milk to consumers seems to be geared to protecting consumer as well as keeping its reputation intact.

Legal

The legal requirements for food safety and quality have been established by government, with the objective of protecting consumers and ensuring that foods are fit for human consumption. These requirements are contained in food laws and regulations. As mentioned in previous Chapter 1, in recent years, three important laws have been approved and issued by the Vietnamese National Assembly relating to food safety and hygiene. These are the Ordinance on Hygiene and Safety of Foods 2003, the Food Law 2008; and the Law on the Quality of Products and Goods 2008 (FCNA Food Committee of National Assembly, 2009). The Ordinance on the Hygiene and Safety of Foods 2003 focuses on the protection of consumers, and with this Act has come a particular understanding of the term ‘reasonable precautions’. Consequently, the contribution of formal QA systems to food safety management has been recognized legally. As with quality management, prevention has become the byword for food safety management.

In seeking to comply with the requirements of the Food Law, and to ensure ability to mount a competent defence in the event of prosecution under the Law, many food companies have implemented HACCP systems. A relevant of the Ordinance on the Hygiene and Safety of Foods 2003 stated that:

” This Ordinance regulates the ensuring of hygiene and safety of foodstuffs during the process of manufacture and trading and the prevention and remedying of poisonous foodstuffs and contagion via foodstuffs.” (Article 1, the Ordinance on the Hygiene and Safety of Foods 2003, p1, Vietnamese National Assembly, 2003).

“Trading in foodstuffs is a conditional business line. Organizations, family households and individuals manufacturing and trading foodstuffs shall be responsible for the hygiene and safety of the foodstuffs manufactured or traded.” (Article 4, the Ordinance on the Hygiene and Safety of Foods 2003, p1, Vietnamese National Assembly, 2003).

In the Law on the Quality of Products and Goods 2008, it is stated that:

“...Producers must comply with requirements of product quality in the production as follows: applying management systems is aiming at assuring product quality that they produce conforms with applied and announced standards, technical standards accordingly...” (Article 28, Law on the Quality of Products and Goods 2008, p.32, 2008)

However, at the time when the company made a decision on the choice of a QA system, it was influenced more by the Ordinance on the Hygiene and Safety of Foods 2003. In the food industry, MCM is one of the businesses processing and manufacturing dairy products. As such, legislation and national regulations is one of factors that require the MCM to obtain a QA certificate. As commented director of MCM:

“ We do business in dairy products. Safety of consumers is very important for us. Therefore, we frequently search for proper measures to improve product quality [...] and must have an obligation with the State laws and regulations related to foodstuff safety. An application of international quality systems is one of our choices. We think it is also the best option” (MCM-p1).

The government started its HACCP plan in 2002 and has since enforced it. This sets up the target of “aiming for eighty percent of foodstuff processors have HACCP certificate by the year 2010, and 100% food processors have HACCP certificate by the year 2020” (MOH,

2010, p.1). There seems to be a relationship between this plan and the quality strategies of food businesses, including dairy businesses; and HACCP is starting to be mandatory for food processors. For example, the Decision 37/2007 issued by Ministry of Public Health MOH, mandates HACCP for businesses doing business in 10 “high risk” foods groups², such as dairy, fish, meat, vegetable, fruit. This is likely to be one of factors that motivate domestic food businesses to begin to meet the necessary conditions to obtain HACCP. However, the MCM was not influenced strongly by this particular Decision because it adopted HACCP in 2001.

In contrast to the law relating to the HACCP system, the legislations and acts do not regulate the firms to become certified ISO 9000 system. As defined, ISO is quality assurance tool and is characterized by more voluntary application than the HACCP system. In this case, government often publicises ISO 9000 and seeks participation from the firms. This means that firms do not rely on any act for its adoption decision. That is one of reasons why firms often obtain HACCP system prior to ISO9000.

In addition to legal requirements, national and ministerial standards are considered as requirements for the food industry to assure products are fit for consumer consumption. Dairy products are classified as a high-risk food product in aspects of risks in consumption and harming consumers (Decision 11/2006/QD-BYT). In Vietnam, National Standards known as TCVN are established for product groups. For example, for dairy products, the standards TCVN 7028:2002, TCVN 7029: 2002, and TCVN 7030: 2002 are technical regulations for sterilized milk, sterilized homogenised milk, and yoghurt milk products, respectively (Vietnam SPS organisation, n.d). Dairy businesses have an obligation to meet these requirements as a prerequisite for its production and manufacture activities. Hence, the MCM is a dairy business that must comply with the requirements for producing fresh and sterilized milk products. These National Standards are mandatory for dairy businesses. A benefit of them is that they give them experience and so become basic prerequisites in accessing other international quality standards.

² High risk foods are foods with a high possibility of contamination by biological, chemical and/or physical agents and which may affect the health of consumers (The Ordinance on the Hygiene and Safety of Foods 2003, Article 3.11).

“...The company has followed national standards for dairy products since 1989 for its fresh milk products. These standards are frequently updated by related authority organizations. National standards are simple and contain fewer contents than those of international standards, but cover some requirements and have certain harmonization in terms of contents with some global standards. Therefore, it gives a basis for the company to approach and obtain these [international] standards” (MCM-p1).

National and ministerial standards relating to food safety assurance is a factor that influences the adoption of QA systems. The company chooses to comply with these requirements and standards and endorses the food safety intention of these laws. Commonly, national and ministerial standards have developed with compatible requirements to ISO 9000 that encourage the firms step from national standards to ISO 9000 become easier. Therefore, in extent aspect, a presence of national and ministerial standards and regulations is considered as a factor influencing the adoption decision of ISO 9000 system.

“In industrial production, national standards that are applied by firm cover some principles and contents of international standards, and we have experience in these national standards prior approaching ISO system” (MCM-p1).

In addition to this qualitative analysis, an assessment through opinions of interviewees (on a five point scale) also was conducted. An assessment of such results shows the degrees of influence of these factors on the adoption of QA systems. These are shown in Table 4-6.

Table 4-6 Perceived environmental factors influencing adoption of QAS’s-MCM case

Factors	HACCP	ISO 9000
i. Legal, national regulations	H	M
ii. External supports	H	H
iii. Market pressure	L	L

Note: H high influence, M moderate influence, L low influence

In conclusion, legal food laws and national standards are an environment factor that has strong effect on the company’s decision to adopt, since the company operates in a particular legal environment, which requires quality to be assured and trading requirements to be complied with. So, the application of QA systems brings benefits, in terms of quality

assurance, to the company, which follows indirectly from its necessity to comply with requirements of legal and food regulations that are set up by the government. Safety regulations have strong effect on the adoption of the HACCP system, while national standards have an impact on the ISO adoption decision.

4.2.2.3 Organisation context

This Section focuses on organization characteristics context (including firm size, firm structure, top management and product features) that may be major factors impacting on the adoption decisions, as well as on adoption issues that have arisen because of these characteristics.

Table 4-7 Perceived organisational factors influencing adoption of QAS's-MCM case

Factors	HACCP	ISO 9000
i. Firm size	L	L
ii. Governance structure	M	M
iii. Top management supports	M	M
iv. Firm's and product nature	H	H

Note: H high influence, M moderate influence, L low influence

Table 4-7 summarise the perception of management in respect to the impact of organisational factors on the decision to adopt QA systems. It shows that the nature of the product has a high impact, the governance structure and role of top management had a moderate impact and the firm size had low impact.

These results are now explained by further qualitative analysis.

Firm size

Firm size may be an important determinant of the adoption of QA systems. However, for MCM, a smaller company doing business in dairy products, the study finds that any association between firm size and adoption of QA systems is not clear. It has been shown that QA systems have been established within the company early, even earlier than other larger

dairy businesses in the country. As noted above, small and medium sized firms in Vietnam usually receive certain support from the government through development programs. Furthermore, low costs for setting up initial QA systems may be a favourable condition for these businesses in getting quality certification. As assessed by a plant manager:

“The company has two milk plants and a feed plant, and to put them on uniform quality system certification has been a concern of directors. The company is small size that is advantage for getting quality certifications, especially a small plant size bears lower a set up cost to get HACCP than large plants. Besides, support from the government in obtaining a quality system is applicable for small and medium firms. This is one factor for a quality system coming into practice in our company” (MCM-p2).

This indicates that small firms may have an advantage over larger firms in obtain QA systems because of lower set up costs for QA systems, such as registrar’s cost and auditing fees. The only problem for MCM is the high costs for upgrading its technology and facilities. However, the extent of such costs depends on the plants’ status and the necessity for maintenance of the QA systems in the long term.

Governance structure

With respect to complexity, the MCM has some complexity, since it performs different activities, including selling dairy products: fresh milk, sterilized milk, drinking yoghurt, and cake milk. Many diverse and hierarchical departments within the MCM organisation can affect the adoption of QA systems, as quality management is part of the process. The company has a QC division reporting issues relating to product quality to its administration department. Some quality issues have arisen because of the complexity of processes:

“Production process is complicated and includes many activities, quality control is difficult, furthermore, mixed up assigning tasks to staff [QC] occurs”(MCM-p1)

The calibre of personnel team has a vital role in determining whether QA systems are adopted efficiently within plants of the company for HACCP, and within the company and plants for ISO9000. The MCM has a long history in dairy production, so it has extensive

prior experience in quality management. This experience is one of the factors that makes the decision-making process easier.

“QC staff group with their experience is a thinking tank for quality and first wave of quality systems” (MCM-p1).

However, one limitation could be posed by the organization structure, as the QC division is responsible directly to the administration department. There is not a separate quality management section, and it is not directly ruled and led by the directorate board but by the administration department. Hence, decision making requires two stages of agreement among plant managers, administration department, and the director board.

“[...] MCM is still owned by the State with major share, so its organisational structure found like old planning management style” (MCM-p1).

Top management support

The top management factor deals with the role of top managers (directors and plant managers) and their influence on quality control and decision processes of QA system adoption. The managers who are the decision makers on quality management strategies and the application of this innovation (i.e. QA system) have an undergraduate education, though not in food technology or microbial biology, but they are concerned about producing quality products and give a lot of encouragement to employees and staff. They got commitments from employees before the discussion to adopt QA systems, which they considered vital. The influence of this factor appears to be strong with respect to promoting a QA system in place. The Directorate board of the MCM was appreciated highly by MARD when they applied QA systems for quality improvement.

“The company has directors who have high qualification in management and support strongly a quality campaign that company pursuits” (MCM-p2).

Firm's and product nature

As noted above, MCM is doing business in dairy products, which is the one of ten high-risk food groups classified by Vietnamese authorities. Because of characteristics of these products, the company puts strong emphasis on complying with standards requirements to avoid unnecessary penalties and fines, and uses this feature to support the sustainable growth in sales and profit. In this regard, the decision of dairy processor to adopt QA systems is different from that for other processors in the food sector, such as tea, maize or rice. These products often do not cause immediate harm to consumers in respect to food poisoning or acute food-borne illness.

“Product is also factor we think of improving quality, and following international standards, and easy to accept by consumers on the markets, especially dairy products that are sensitive and easy spoiled may affect people's health. We need to prove our products safe and good for consumers in domestic. ... Dairy products are required highly by consumers in terms of quality and safety for their health. The application of HACCP may allow us to satisfy that demands of consumer” (MCM-p1).

4.2.3 Perceived impacts of QA systems on organisational outcomes

One of the objectives of this study is to identify any associations between QA systems and organisation outcomes. There will be interactions and interrelationships among QA systems and between the various performance dimensions and so associations between them may be difficult to identify. Therefore, objective measures were supplemented by subjective perceptions of outcomes. A list of potential outcomes from QA systems were identified and shown to respondents, which they were then asked to rank. Firm's outcomes were measured through business and financial results, and production quality dimensions. Overall outcomes were evaluated by respondents' opinions, and data from the company's reports.

According to reports of the company, MCM's business results have changed dramatically in recent years. Its turnover has shown rapid growth, in line with an increase of profit, and salaries paid for employees. Furthermore, its market for dairy products has expanded to 35 out of 65 provinces in the country. These business results are detailed in Table 4-8.

Table 4-8 Realised business performance - MCM case

Year	Turnover (Million VND)	Profit before tax (Million VND)	Average monthly salary of employee (VND)	Number of provinces with MCM products distribution
2006	91,132	752	1,234,000	16
2007	230,649	869	1,500,316	22
2008	319,743	1,100	1,727,000	27
2009	372,497	1,246	2,100,321	35
2010est	386,000	1,500	3,200,432	42

Source: Moc Chau company, 2010

These improved financial results occurred after the company applied QA systems although the extent to which the QA systems contributed to these results is not clear. Other measures, such as return on assets (a ratio of a net income to total assets), and return on equity (a ratio of net income to total equity) were also reported to have improved after introduction of QA systems. As noted by a vice director:

“There is a big change [after applying QA systems], and that [adoption of QA system] creates an opportunity for all employee and managers involving in quality strategy in business. Revenue this year increases more than past year. The company financial results [net income, return on assets, and return on equity] are improved. Employees’ lives have been improved, salary of employees increase now 3-4,000,000 VND a month. [Turnover] 2006: 91 billion VND 2007: 230 billion VND 2008: 320 billion VND 2009: 370 billion VND (reduced less as a plan as affect by melamine scandal)” (MCM-p1).

This quote suggests that the adoption of QA systems within MCM is viewed within the company itself as contributing towards its improved performance. Even though these changes could have been influenced by other factors besides the certification process, they can be indicative of the effect of the adoption of QA systems on the firm’s performance, and this is supported by subjective perceptions. In Table 4-9, perceptions of the impact of QA systems on measures of business ness performance are shown. Subjective assessments support an association between QA systems and increases in sales with a high impact (H), return on sale with a moderate impact (M), market share with a high impact (H) and sale growth rate with a high impact (H) for the HACCP system. For ISO 9000, assessments were shown for increases of market share, profitability, return on sales, and sales growth rate with respect impact.

These showed a high impact on market share, and a moderate impact on profitability, return on sales and sales growth rate.

Table 4-9 Perceived impacts of QA systems on business performance – MCM case

QA systems	Respondents	Measures					
		Revenue	Sales	Market share	Profitability	Return on sales	Sales growth rate
HACCP	TM	4	4	4	4	3	4
	MM	3	5	4	2	3	5
	INF ^a	NE	H	H	NE	M	H
ISO 9000	TM	4	4	4	3	3	3
	MM	3	3	5	3	3	3
	INF ^a	NE	NE	H	M	M	M

Note: 1: no increase 2: less increase, 3: somewhat, 4: increase, 5: large increase.

Respondents: TM top management; MM middle manager.

^a INF influence: L low influence; M moderate; H high influence; NE no evidence.

Market share is perceived to have increased as a result of adopting both QA systems by the top manager. This could indicate that QA systems might be one of the marketing tools the company deployed to attract new customers and grasp their confidence. This observation was supported by the vice director, who commented:

“[after applying QA systems] our company’s market share changes and day by day occupies more, [...] and the company expands to markets in 35 provinces” (MCM-p1).

While the impact of QA systems on sales growth rate is assessed as high for the HACCP system, it was assessed as little lower for the ISO system. This was explained by HACCP contributing more directly to quality improvement in dairy products, which lead to improving competitive advantage of the company and sales ability.

Table 4-10 Perceived Impacts of QA systems on operational performance-MCM case

QA systems	Respondents	Measures					
		Unit production costs ^a	Fast deliveries ^a	Cycle time ^a	Design quality	Manufacturing quality	Customer satisfaction
HACCP	TM	2	NA	NA	4	4	3
	MM	1	NA	NA	3	4	3
	INF ^b	H	NA	NA	NE	H	M
ISO	TM	3	2	3	5	4	5
	MM	3	2	4	4	4	3
	INF ^b	M	H	NE	H	H	NE

Note: 1: no increase 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a 1 large decrease, 2 decrease, 3 somewhat, 4 less decrease, 5 no decrease

Respondents: TM top management; MM middle manager

^b INF influence: L low influence; M moderate; H high influence; NA not applicable; NE no evidence

As illustrated in Table 4-10, for HACCP, operational performance was perceived to have improved through manufacturing quality and customer satisfaction. It was explained that product quality has increased in processing with the application of HACCP procedures, and packaging processes have been given more concern by the company. Customer satisfaction with products was considered as an indirect result of the introduction of this system. It appears that the improvement in product quality and safety led to reduce claims from customers related to defect products.

For ISO9000, the effect on operational performance is more far reaching, including unit production costs, fast delivery, design quality, and customer satisfaction. It is clear that optimizing processes in production and transportation when the ISO system was adopted has occurred. After MCM passed the initial stage of ISO system implementation, the impact of the system in cutting down costs that are incurred for defect products became clear, along with impacts on labour productivity and efficiency. Customer satisfaction was perceived to have increased, which was explained by customers having more confidence to buy dairy products from the MCM. A vice director commented further on the ISO system:

“ISO 9000 is a tool for improving logistics process that may contribute in the company efficiency” (MCM-p1).

Table 4-11 Perceived impact of QA systems on quality performance – MCM case

QAS	Respondents	Measures										
		Defect rate ^a	Recall rate ^a	Guarantee costs ^a	Performance	Features	Reliability	Conformance	Durability	Serviceability	Aesthetics	Perceived quality
HACCP	TM	1	2	2	3	3	4	4	4	5	4	4
	MM	1	3	3	2	4	2	5	4	2	1	4
	INF ^b	H	NE	NE	NE	NE	NE	H	H	NE	NE	H
ISO	TM	1	1	4	1	4	5	3	1	4	2	2
	MM	2	1	1	2	4	5	2	2	1	2	3
	INF ^b	H	H	NE	L	H	H	NE	L	NE	L	NE

Note: 1: no increase 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a 1 large decrease, 2 decrease, 3 somewhat, 4 less decrease, 5 no decrease.

Respondents: TM top management; MM middle manager

^bINF influence: L low influence; M moderate; H high influence; NE no evidence

As illustrated in Table 4-11, the key effects of QA systems on product quality performance was perceived to be in decreases of defect rate, and increases of conformance, durability, and perceived quality after the company adopted HACCP, and increases of features and reliability resulting from the adoption of ISO9000. The system also contributed to product quality improvement. A vice director commented on effects of the two QA systems:

“ both [HACCP and ISO] systems bring direct and indirect benefits to the company in terms of improving product quality in general...” (MCM-p1).

4.2.4 Conclusions

The Section analysed reasons that motivate the MCM to adopt QA systems. Primary reasons for the adoption of the HACCP system are quality improvement and meeting international standards to maintain its customer base, but not competition with its competitors. Primary reasons for the adoption of the ISO 9000 system are customer satisfaction through efficient management regimes, which leads to cost reduction and quality improvement. Reasons such as uniformity between plants, retaining existing customers, improving efficient utilization and improving skills/attitudes of employee are also mentioned. Issues arising in implementation were explored, and it was concluded that set up costs were not high, but costs for upgrading equipment, machinery and technology were high.

The study also focused on factors that impact on adoption decisions. Factors were considered under two major categories, environment context and organisation characteristics context. For the MCM case, there was a moderate impact from external support factors on its adoption decision. This support was from an international organization (i.e. UNDP) through providing training courses and capital support, and national organizations such as STAMEQ, VPC, MOI, through initial support of partial setting up costs for QA systems registration. There did not appear to be any impact from market pressure factors on MCM's adoption decision in respect to buyer pressure and competitor pressure. This finding shows that legal food law and national standards are an environment factor that has a strong influence on the company's decision to adopt, since the company operates in a particular legal environment, which requires quality to be assured and trading requirements to be complied with. Safety regulations have a strong effect on HACCP system adoption, while national standards have

an impact on ISO adoption decision. These conclusions are summarised in Figure 4-3.

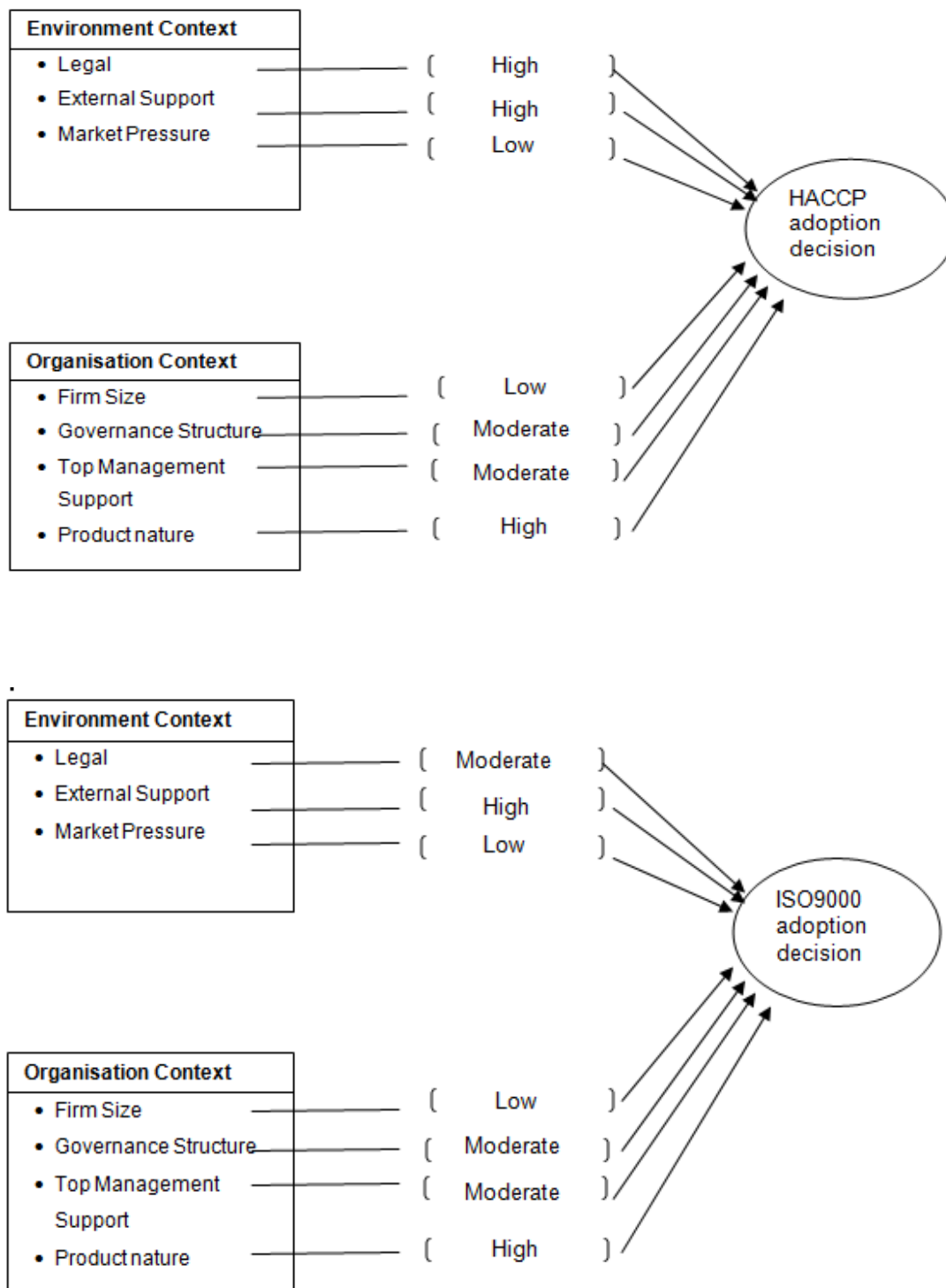


Figure 4-3 Perceived factors influencing the adoption of QAS's -MCM case

The study explored organization outcomes after implementing QA systems within the company through identifying perceived changes in three dimensions: business performance, operational performance and quality performance. The main findings are that there are substantial changes in sales, turnover, and market share. Other financial results were reported to have increased and improved after the company adopted the QA systems. There are different degrees of effects of HACCP and ISO system on organization outcomes. This indicates that difference between two QA systems in practice, although ultimate results brought by them to have quality dairy products. These findings are illustrated in Figure 4-4 and 4-5

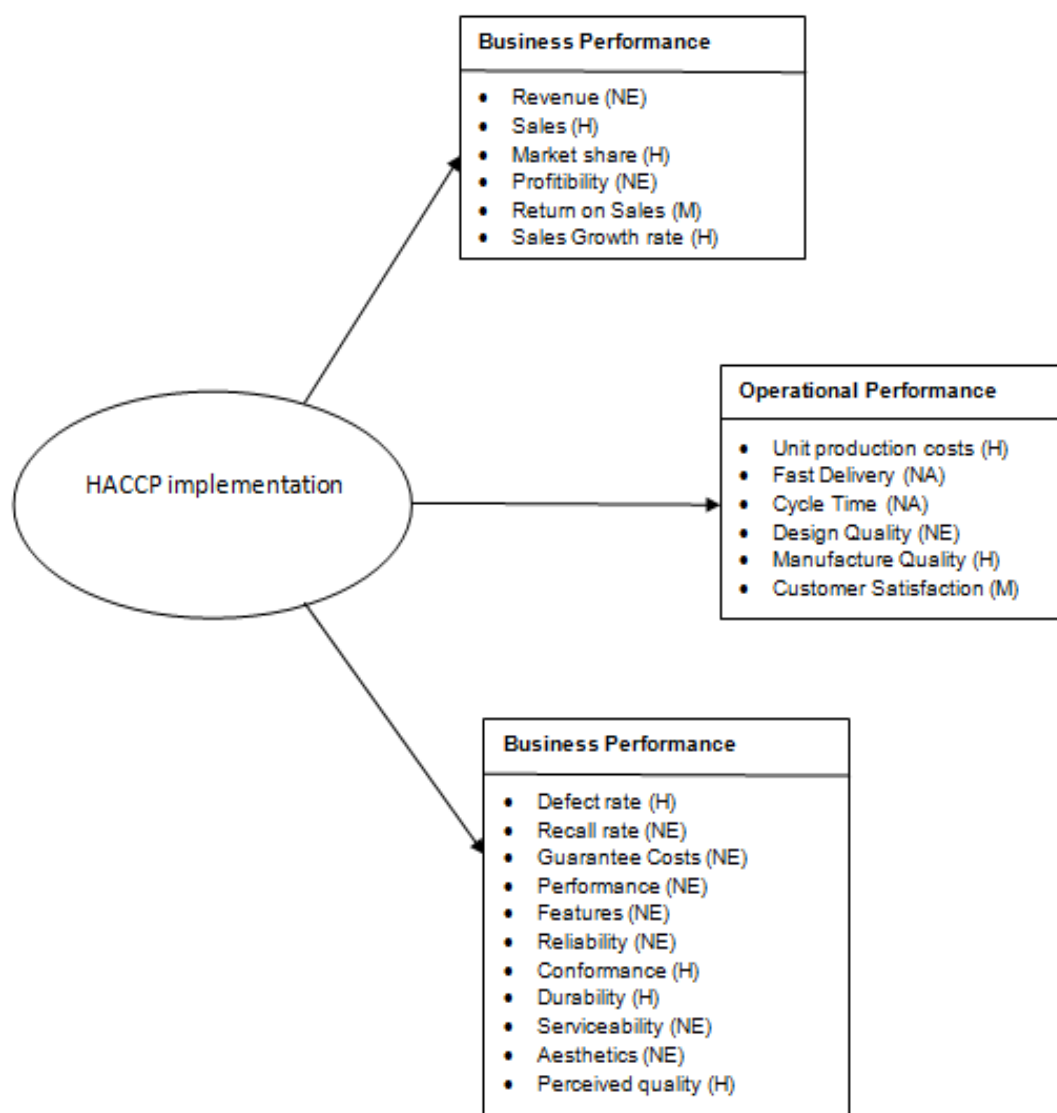


Figure 4-4 Perceived impacts of HACCP system on organization outcomes –MCM case

Note: H high impact; M moderate; L low; NA not applicable; NE no evidence

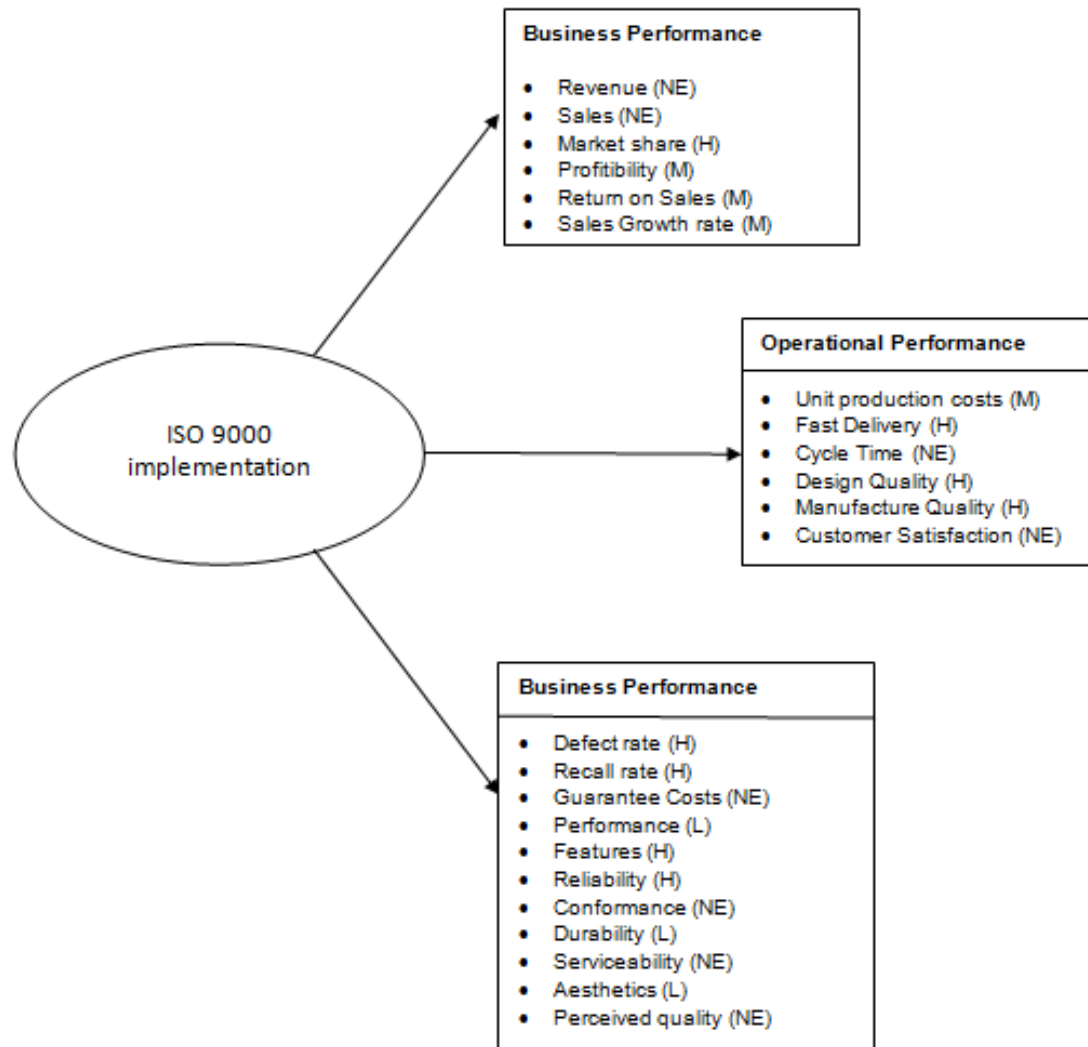


Figure 4-5 Perceived impacts of ISO 9000 system on organisation outcomes-MCM case

Note: H high impact; M moderate; L low; NA not applicable; NE no evidence

Chapter 5

Results 2- Large firms: Dutchlady Vietnam and Vinamilk cases – Description and Analysis

Chapter 5 contains a brief description of two cases, DutchLady Vietnam (DLM) and Vinamilk (VNM), which are large companies. Differences and similarities between these cases and Moc Chau Milk Company (MCM), which were described in detail in Chapter 4, are outlined with respect of the firm nature, governance structure and supply chain structure. A brief analysis of factors impacting on the adoption decision and organisational outcomes is also presented for each individual case.

5.1 Dutch Lady Vietnam (DLM)

5.1.1 Overview

The Dutch Lady Vietnam (DLM), renamed Friesland Campina Viet Nam in 2009, is one of the largest manufacturers of dairy and dairy-related products in Vietnam. DLM was originally a joint venture between Royal Friesland Foods (Friesland Coberco Dairy Foods) and Protrade based in Vietnam, with its main establishment in Binh Duong province and a network of regional sales offices in other parts of Vietnam. The parent company, the Royal Friesland Foods, is one of the largest dairy companies in the world with its headquarters in the Netherlands and business activities in many countries. Protrade was a local company established in the old planned economy. Such ventures are categorized into two types: central and local. All these enterprises have been run with State capital. Protrade was founded in 1982, and was one of the commercial business units of Binh Duong Province. It engages in garment export, has timber, food and beverage, construction interests, a golf resort, and rubber and paper businesses operated through its subsidiaries.

The name of the operating company was changed from Foremost to Dutch Lady Vietnam (DLM) in 2006, and then to FrieslandCampina Vietnam in 2009. The company has an impressive history of significant milestones beginning in 1924, when the first 150 cartons of Dutch Lady sweetened condensed milk were imported and sold in Vietnam. In 1993, the

representative office of DLM was established in Ho Chi Minh City and a factory built, a venture praised by the Binh Duong provincial government. In February 1996, the first commercial invoice was officially issued and many of DLM's products were subsequently launched onto the market. In 1997, DLM began to build up a distribution system throughout Vietnam. In 2000, a new name "Dutch Lady Vietnam" was introduced. In 2005, DLM invested in advanced technology for sealing bottles, and in 2006, DLM build a second factory in Ha Nam with an initial investment of US\$20m. Hence, DLM has experienced rapid growth, which has paralleled the growth of Vietnam (Dutch Lady Company, 2010).

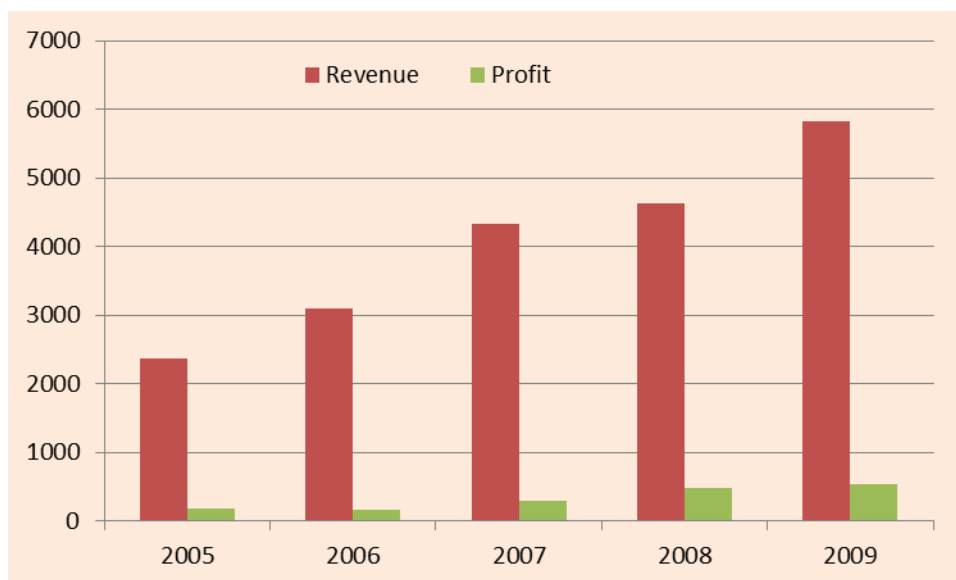


Figure 5-1 Trend in revenue and profit (2005-2010) – DLM Vietnam

Sources: Vietnam Credit, 2009; DutchLady Vietnam, 2010.

DLM has a large share by revenue (23%) of the domestic milk products market (Habubank Securities, 2010), and is ranked second in Vietnam after Vinamilk (VNM) in this market. However, it has a much larger share than VNM in the powder milk market. The company's success in dairy production, processing, and marketing dairy food products has encouraged other joint-ventured companies, such as Nestle (French), Milky US (US), F&N Company (USA), and Lothamilk (China) to enter the Vietnam dairy market. The company's total revenue is VND 5,833bn in 2009 (VietnamCredit, 2010), which has steadily grown over the last five years (Figure 5-1).

Regarding capital assets and facilities, DLM has an office headquarters and two milk processing plants. Its office headquarters is located in Thuan An district in Binh Duong province. One milk factory is also located in Thuan An district, Binh Duong province (in the South). It began operation in 1997 and has a capacity of 60 million litres. Another factory is located in Ha Nam province (in the North). It has an initial capacity of 45m litres per year, and this will increase up to 200 million liters per year in the future. The plant at Binh Duong produces various kinds of product, such as fresh milk and UHT milk under its brand of DutchLady, Yo-most, and drinking yoghurt products. The plant at Phu Ly in Ha Nam province mainly produces fresh milk and powdered milk, and has a designed capacity of 14 million boxes of condensed milk and 1 million barrels of milk powder a year, an output of approximately 200 million kg annually. Total assets are valued at US\$55m (Habubank Securities, 2010). The Ha Nam milk plant has implemented programs for the control and management of quality, as well as issues related to safety and hygiene for milk products. The plant is equipped with a fully automatic assembly line, and applies ISO 9001/2008, ISO 22000/2005, and ISO 14001/2004 QA systems.

5.1.2 Governance structure

The DLM organizational structure has functional departments under the management of directors that conduct its business activities in Vietnam (Figure 5-2). This organizational model relies heavily on the structure of the parent company, the Royal Friesland Foods in the Netherlands, and this organization structure has been used by the parent company in other countries, such as Malaysia and China.

Since DLM is a subsidiary company of Friesland Foods, Netherlands, its managing director is responsible for organising production and business in Vietnam, and is responsible to the general director of the parent company. His activities are overseen by a Supervisor Board and an Internal Auditing Board. The Supervisor Board has five members, and the Internal Auditing Board has six members.

Functional and professional departments, such as financial and administration, have a duty to undertake and report business activities monthly, quarterly, and yearly, and to organise office activities, prepare meetings, and undertake other activities assigned by the managing director. The Department of Marketing Consumer is responsible for business, sales activities,

resolving claims from consumers and other issues related to consumer responses, as well as managing sales distributors, agents, and its own DLM shops. The two milk plants are under the leadership of a director of operations, and have a mission to produce dairy products for high quality supply to consumers.

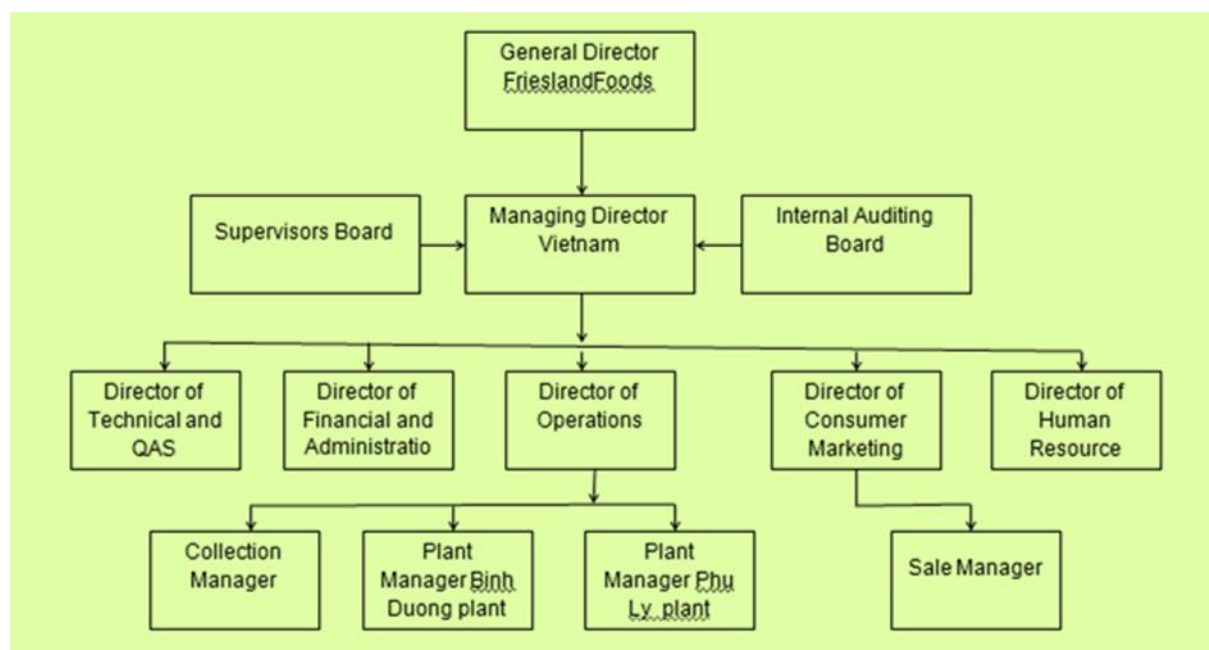


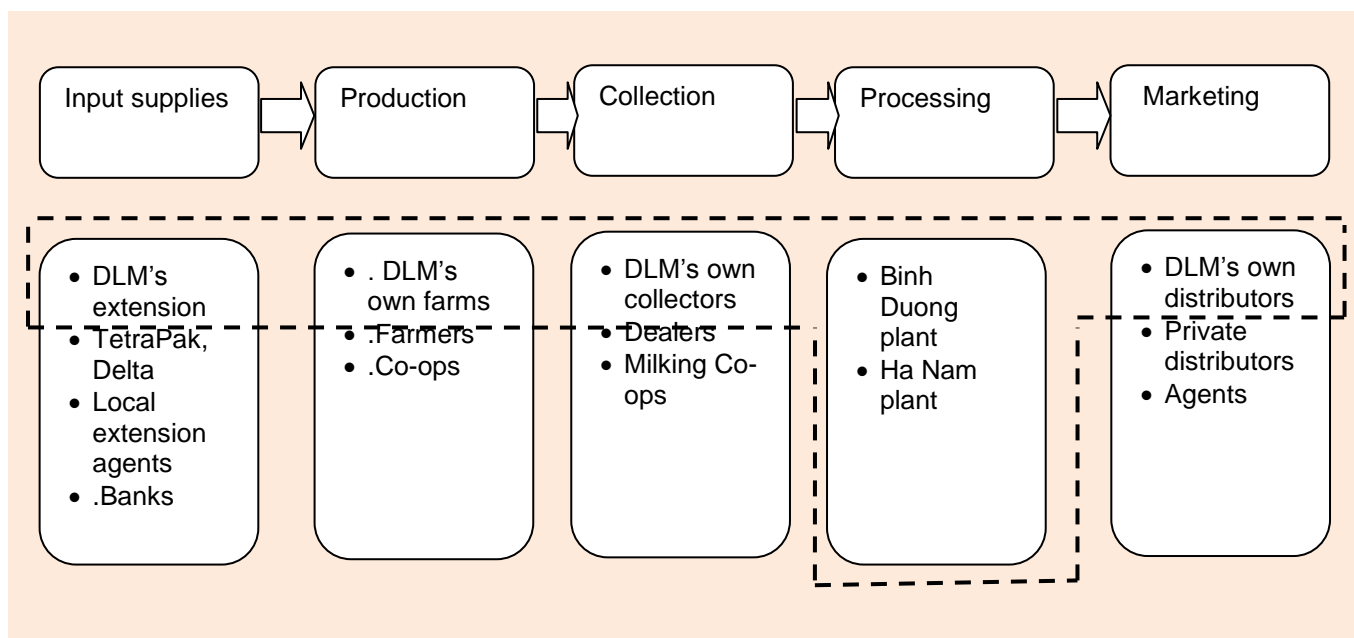
Figure 5-2 Governance Structure - DLM Vietnam

Source: Adapted from Dutchlady Viet Nam Company, 2010.

The Department of Technical and QA has a mission to organize activities such as supporting farmers technical services (veterinary services, training service, etc.), and practices of quality management, and managing laboratories to control and inspect quality of fresh milk and final dairy products. It also has responsibility to monitor and document the development of QA systems applied within the company/plants. The director of this department reports to the managing director.

5.1.3 Supply chain structure

Figure 5-3 gives a vertical representation of the supply chain. DLM has a network of external suppliers and distributors, and has also partially vertically integrated these and other activities into the company.



----- Boundary for vertical integration within DLM

Figure 5-3 Supply chain structure – DLM Vietnam

Source: Adapted from DutchLady, 2010

Suppliers are dairy farms that are from Binh Duong province, rural suburbs of Ho Chi Minh City, Long An province, and Lam Dong province. The number of suppliers is 2,500 farms and the number of cows supplying milk to the company is over 27,000. The volume of daily milk collected in a day is 170 tons (DutchLady Company, 2010). Farms have signed contracts to supply raw milk to the company. Because of this close relationship with suppliers, the company has a stable source of fresh milk for its plants.

The company has established 39 collecting points, where dairy farmers can sell milk directly to the company. These company collecting points are located in Binh Duong, Long An, Tay Ninh and Ho Chi Minh City. In addition, the company has built 3 chilling centres with an investment of US\$1.7m (VNexpress, 2010). Milk procured from farmers is chilled in these centres before transporting to plants for further processing.

Milk products are distributed through the company's system of agents and retailers. Over time, the number of distributors has increased. At present, the distribution system includes 7 head distributors, 145 wholesale outlets and 80,000 retailers in the whole country (Dutch Lady, 2010a). Annual turnover via retail shops is VND1,100b (equivalent US\$60m)

(Dutchlady, 2010b). The main products of the company are fresh milk, condensed milk, powdered milk and its key brands are Yo-most and Dutchlady.

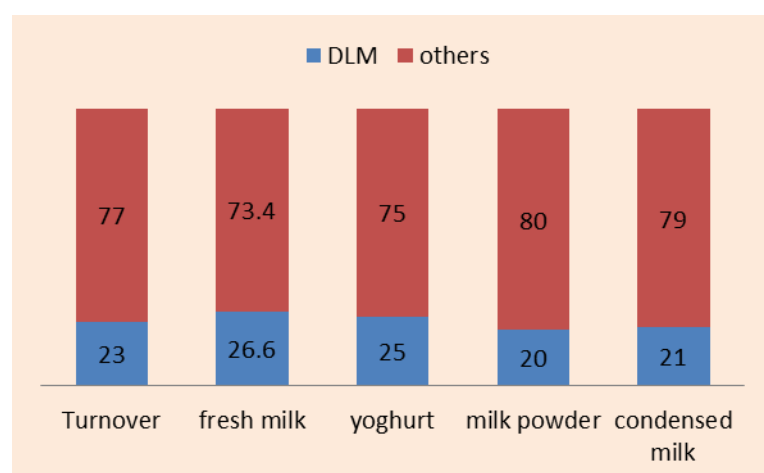


Figure 5-4 Market share (%) by products – DLM Vietnam

Sources: FSC, 2009; DutchLady, 2010

Market share is different for each dairy product marketed and distributed by the company (Figure 5-4). DLM enjoys a share of 23% by turnover. On a product basis, this is 26.6% for fresh milk (holding second position), 20% for milk powder (holding first position of companies for milk powder in Vietnam (of which, VNM 16%, and imported 64%)), 25% for yoghurt, and 21% for condensed milk with sugar in domestic market (FSC, 2009). This confirms that DLM is one of the largest dairy companies in the country.

There is a major difference in size of DLM compared to MCM. For example, DLM has over 2,500 farms supplying fresh milk, while MCM has only 700 farms doing so. Even though both have 2 milk processing plants, the capacity of two DLM's plants is larger much than MCM's plants. There are also differences in terms of ownership, governance structure, and supply chain structure. DLM is a foreign owned company and the experience, management expertise and the knowledge of the CEO and senior managers is thought to be better other companies. In addition, marketing and public relation strategies are very systematic and evaluated carefully (Huyen, 2011).

In this DLM case, it was found that chain structure characteristics show major differences compared to the MCM case, in respect to the nature of collectors, producers, and distributors. At each chain level, differences in ownership and management regimes are found. Suppliers

supplying fresh milk to the processing plants include private smallholder farms, DLM's own farms, and cooperatives with the dual purposes of purchasing and producing fresh milk. Like MCM, DLM maintains supplies from small private farms, owning less than 10 dairy cows. However, in MCM, farms are located in a more concentrated area around the company than farms are in DLM. That results in difference in procurement of fresh milk, as DLM is larger than MCM in respect to collection area, daily volume, and number of farms from which it purchases fresh milk.

Similarities between the two cases are found in that both have their own farm systems supplying fresh milk to processing plants, although DLM supplies 15% volume of milk from its own farms (43 tons per day), while for MCM, this ratio is over 50%. DLM's own farms have modern technology and facilities, and are of large size with 2000 dairy cows, which is larger than farms owned by MCM. For both cases, there is an average 8 cows per farm for private supplies, and both maintain relationships with these private smallholder farms. However, DLM works with 1,500 farms while MCM works with only 500 farms. Because they have their own farms, both can control and improve quality in active ways, such as investing in more advanced machinery and equipment, and hiring employees with higher qualifications for their establishments. Both cases show contractual relationships with small farmers. Written contracts between the company and suppliers exist in order to ensure that quality and quantity of fresh milk supplied to plants is good quality and stable.

5.1.4 Business strategy and QA systems

With respect to the company's vision, it has a commitment towards 'assuring top quality and bringing rich and safe nutrition sources to its consumers.' (DutchLady, 2010a, p1). To achieve this vision, the company launched the Dairy Farming Program in 1995. After 10 years' implementation, it was deemed successful, and the program will continue. Milk quality management implemented from farm to plant is a key to the success of the program. To achieve this, farmers have training courses and communication about procedures associated with hygienic milking and transporting. Staff of the company involved in the program are also trained to maintain quality in the whole collection systems. Infrastructure and organization of collection have been supported and consolidated through the ISO system. The effectiveness of this system is bringing benefits to farmers through producing milk of high

quality, which contributes to generating and raising incomes from dairy production, and furthermore benefits DLM through its collection of high quality milk (Dutchlady, 2009).

DLM has obtained international QA systems and is the earliest of the foreign-owned companies to do so in the dairy industry in Viet Nam. These systems are HACCP in 2002, ISO 9000 achieved by the company in 2000, upgraded to ISO 9000/2008 in 2008, ISO 22000/2005 in 2009 (Dutchlady, 2010a). In addition, DLM has also applied for ISO 14000-environmental standard and OHSAS 18000- International Health and Occupation Safety Specification System. With the implementation of these QA programs, the company has demonstrated its commitment to supplying consumers with high quality milk products.

5.1.5 Perceived factors influencing adoption of QAS's

5.1.5.1 Motivation

Stages in decision-making in the adoption of QA systems were explored in interviews. Like MCM, information was sought on the motivation for the adoption of QA systems. Reasons the company considered important were 'improving competitive advantages' in the domestic market over other competitors including larger companies, and related to this, expanding its market, and increasing the market share for its products. DLM's marketing manager stated:

"QA systems will help our company to have leading position in the dairy market. ISO 9000 system will improve procedures and processes that we are applying for production and collection of fresh milk in our assembly system". (DLMp1).

DLM's plant manager also stressed internal motivational factors, as well as external advantages. He stated:

"The HACCP system we chose is appropriate and will benefit company and consumers in respect of quality and safety" (DLMp2).

To explore further the motivations of management for the adoption of QA systems, the opinion of top manager was collected. (Table 5-1).

Different motivations for the adoption of individual QA system were found. It is clear that, prior to the adoption, management expected that these QA systems would bring benefits to the company. Table 5-1 shows that, for HACCP, the principal motivation is ‘satisfying food legislation and national regulations’, which ranked higher for this than it did for other systems. This indicated that management thought that HACCP related primarily to quality and safety of products. In contrast, for ISO 9000 and ISO 22000, management thought that these were efficient competitive tools that could be used against competitors in the market. So, the principal motivation for seeking these two ISO systems given was ‘improving competitive advantage over competitors’ in trading dairy products.

Table 5-1 Motivations for seeking QA systems – DLM case

Top five motivations	HACCP	ISO 9000	ISO 22000
1	Satisfying food legislation and national regulations (E)	Improving competitive advantages over competitors (E)	Improving competitive advantages over competitors (E)
2	Improving product quality (I)	Improving the company’s image (E)	Improving product quality (I)
3	Improving competitive advantages over competitors (E)	Satisfying legislation and national regulations (E)	Improving production processes (I)
4	Improving the company’s image (E)	Improving product quality (I)	Satisfying food legislation and national regulations (E)
5	Improving production processes (I)	Improving production processes (I)	Improving the company’s image (E)

Note: I: internal motivation, E: external motivation

5.1.5.2 Perceived factors Influencing adoption of QAS’s

Vietnam plans to make it mandatory for dairy firms to implement the HACCP system. DLM has experience in dairy marketing and distribution activities globally, and so are very aware of the importance of this system. A foreign owned company like DLM is very vigilant in obeying Vietnamese law in the field that it has business activities. Furthermore, DLM is a branch company of its parent company in The Netherlands, and so its quality control and management follows Dutch quality criteria and procedures. As a result, its standards are world class and at a high level. Therefore, the decision to adopt HACCP, and the ISO 22000 systems was influenced by this factor. The company considered factors that are legal (i.e. business environment, Vietnam legal and law related to investment, food safety, etc), and

quality regulations from its parent company (Friesland Foods, 2008) as primary factors influencing its decision to adopt all QA systems.

One environment context factor considered in the wider analysis is external support from government or external organisations. This factor was not relevant in this case because DLM itself did not receive any support from government, trading and industrial associations. It is not even a formal member of the Vietnam Dairy Association VDA that was founded in 2010 (VDA, 2010).

Market pressure was found to impact strongly on the QA system adoption decision, since competition with other companies, such as Vinamilk in the Southern market, requires the company to have QA systems that can provide tools for the company advertising images to demonstrate product quality and thus improve its competitive advantage. Within the food chain environment, relationships between supplier and buyer are supported by written contract, with quality norms included in these contracts. This supports DLM's QA systems, especially in relation to wholesalers and retailers outside the company.

Opinions of DLM's top manager of factors impacting on the adoption decision were further explored, and the results are shown in Table 5-2.

With respect to the environment context, food legal and national regulations affected the adoption of all individual QA systems. This factor was ranked highly for all QA systems, however, for the HACCP system, it was perceived by DLM's top manager to have an even stronger impact than for other QA systems decision, and also was a key factor influencing the adoption decision overall. This reflects mandatory enforcement of HACCP from Government and related food safety and quality authorities for food businesses, and DLM has been influenced by this mandate. This factor has also influenced the decision to adopt other QA systems but less so, because DLM has introduced QA systems, such as ISO 9000, ISO 22000, that are voluntary rather than mandatory. Market pressure is another factor that was explored. This factor was perceived to have a high influence on the decision of the company to adopt ISO systems in particular, because in the dairy market at present, there are three large dairy companies, VNM, HNM, and DLM, all of which compete strongly to gain market share. This reflects the resource base view (RBV) that any company has a stronger competitive

advantage once it applies new innovations (i.e. QA system) prior to other rivals in the market. Another market pressure, a requirement of buyers and/or down-stream stakeholders to adopt QA systems, was also considered. For DLM, this factor has less impact on the adoption of QA systems, because buyers in Vietnam have little awareness of quality and quality assurance systems, as well as have a relatively weak role in the supply chain. So, this factor was considered as having a low (L) impact on the DLM decision to adopt QA systems.

Table 5-2 Perceived factors influencing adoption of QAS's – DLM case

Factors \ QA systems	HACCP	ISO 9000	ISO22000
A.Environment context			
i) Food legal and national regulations	H	M	M
ii) External support	NA	NA	NA
iii) Market pressure	M	H	H
B.Organisation context			
i) Firm size	L	L	L
ii) Governance structure	M	M	M
iii) Top management support	M	M	H
iv) Firm's product nature	H	L	H

Note: Low impact (L); Moderate impact (M); High impact (H); not applicable (NA)

Firm size, according to feedback of respondents, is a factor that had low (L) impact on the adoption decision for all QA systems. In theory, adoption of QA systems will increase costs and investment, but DLM is supported by strong financial resources from its parent company. Governance structure was another factor considered and had moderate (M) impact on the adoption decision of all QA systems. This is because there is a need to harmonize standards with Dutch HACCP and world class food safety requirements set up by the parent company. Top management and their experience in the dairy industry is a factor that influenced DLM to adopt QA systems. As well as their role in business and trade organization, and strategy formulation, they have a strong and important role in quality decision processes. This is considered as having a moderate (M) impact for HACCP and ISO 9000, and high (H) impact

for the ISO22000 adoption decision. This conclusion was reached because they are integrating their quality strategy into the business strategy of the company, as well as organizing quality activities within the company, and empowering quality staff to raise employees' awareness of quality philosophies and activities. Product nature is another factor that management considered when QA systems were adopted. Manufacturing more kinds of product makes it more complicated to implement HACCP, and imposes more work gathering quality information, and internal auditing, etc for the ISO series systems. This factor was assessed to have a high (H) influence on the adoption of HACCP, and a moderate impact (M) for ISO adoption decision.

5.1.6 Perceived impacts of QA systems on organisational outcomes

According to DLM's top management, QA systems benefited the company both in respect of business results and of changing employees' behaviours towards quality. A DLM marketing manager commented:

“Quality programs are one of factors benefiting the company in term of improving business state, through financial indicators improved and grown up, beside of raising skills and senses of employees and staff in quality, quality culture becomes expanded within our company” (DLM-p1).

Opinions from respondents were collected from questionnaires and are summarised in Table 5.3 – 5.5. Changes in organisation outcomes resulted by QA systems were perceived to have difference across individual QA systems.

As seen in Table 5-3, according to respondents, ISO 22000 did not have much impact on business performance, which was assessed as having a low (L) impact for all but one measure. HACCP and ISO 9000 were assessed to have a moderate (M) and high (H) impact on business performance since implementation of these systems. That is consistent with the length of implementation of these QA systems within the company. Both HACCP and ISO 9000 systems were attempted first within the company, while ISO 22000 has just been done recently. This means that the experienced duration of HACCP is 10 years, and for ISO 9000 is 8 years, while for ISO22000, it is only one year. Differences in assessment of business performance between ISO 9000 and HACCP arise because each was adopted for different purposes. For example, market share increase was perceived as having a moderate (M) impact after implementing HACCP, while ISO 9000 was perceived as having a high (H)

impact, which is explained by the fact that HACCP was for product quality improvement while ISO 9000 was introduced as a marketing tool.

Table 5-3 Perceived impacts of QA systems on business performance – DLM case.

QA systems	Respondents	Measures					
		Revenue	Sales	Market shares	Profitability	Return on sales	Sale growth rate
HACCP	TM	3	5	3	4	3	4
	MM1	3	4	3	4	5	1
	MM2	3	5	3	2	4	5
	EM1	4	3	5	4	4	4
	EM2	1	4	4	4	5	5
	INF	M	H	M	H	H	H
ISO 9000	TM	4	4	5	4	1	2
	MM1	4	3	4	2	1	4
	MM2	3	4	3	5	1	5
	EM1	5	4	4	1	5	1
	EM2	5	3	4	1	5	5
	INF ^a	H	H	H	L	L	H
ISO 22000	TM	2	2	1	2	3	4
	MM1	1	1	2	2	4	4
	MM2	3	1	4	3	3	1
	EM1	4	1	2	5	3	2
	EM2	1	1	2	2	4	1
	INF ^a	L	L	L	L	M	L

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

Respondents: TM top management; MM middle manager; EM employees

^aINF influence: L low influence; M moderate; H high influence.

Table 5-4 Perceived impact of QA systems on operational performance – DLM case

QA systems	Respondents	Measures					
		Unit production costs ^a	Fast deliveries ^a	Cycle time ^a	Design quality	Manufacturing quality	Customer satisfaction
HACCP	TM	1	NA	NA	3	4	1
	MM1	4	NA	NA	3	3	5
	MM2	1	NA	NA	4	3	2
	EM1	3	NA	NA	4	2	4
	EM2	2	NA	NA	3	3	4
	INF ^b	H	NA	NA	M	M	H
ISO 9000	TM	3	5	1	5	2	4
	MM1	3	1	2	3	1	3
	MM2	3	2	5	5	1	3
	EM1	5	5	3	1	5	4
	EM2	4	4	2	5	5	4
	INF ^b	M	H	L	H	L	H
ISO 22000	TM	5	1	2	2	3	2
	MM1	3	1	3	1	1	5
	MM2	5	5	5	1	3	4
	EM1	3	1	4	1	3	4
	EM2	1	2	4	3	4	2
	INF ^b	L	L	H	L	M	H

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a1: large decrease, 2 decrease, 3: somewhat, 4: less decrease, 5: no decrease.

Respondents: TM top management; MM middle manager; EM employees

^bINF influence: L low influence; M moderate; H high influence; NA not applicable.

Table 5-4 shows the perceived impact of QA systems on operational performance. This illustrate the different purposes of introducing individual QA systems. For example, production costs were perceived to have increased less for ISO 9000 (and so assessed as a moderate (M) impact), whereas after implementing HACCP, these costs increased more (and were assessed as a high (H) impact). Some measures are not applied for HACCP, and are only assessed for ISO 9000 or ISO 22000, such as “fast deliveries” ‘cycle time’ and ‘quality design’.

Table 5-5 Perceived impact of QA systems on quality performance- DLM case

Measures	HACCP						ISO900						ISO22000					
	TP	MM1	MM2	EM1	EM2	INF ^b	TP	MM1	MM2	EM1	EM2	INF ^b	TP	MM1	MM2	EM1	EM2	INF ^b
a. Defect rate ^a	1	3	1	1	2	H	2	2	4	2	3	H	3	2	4	3	3	M
b. Recall rate ^a	2	1	1	1	1	H	1	4	4	5	3	H	2	4	1	2	2	H
c. Guarantee costs ^a	1	2	2	3	2	H	3	3	3	4	2	M	2	3	1	1	2	L
d. Performance	3	3	3	2	3	M	2	1	1	2	1	L	3	5	3	3	2	M
e. Features	5	5	2	5	2	H	3	3	3	5	5	M	4	5	2	3	4	H
f. Reliability	2	2	1	4	1	L	3	3	4	4	5	H	3	4	3	1	3	M
g. Conformance	2	2	4	4	5	H	4	2	4	1	3	NE	4	4	1	5	4	H
h. Durability	2	5	4	1	3	NE	4	2	4	1	2	L	2	5	4	1	5	H
i. Serviceability	2	3	2	2	2	L	5	5	1	4	3	H	3	3	5	3	2	M
j. Aesthetics	5	4	5	2	2	H	3	1	1	3	2	L	1	5	1	1	1	L
k. Perceived quality	2	5	5	5	2	H	2	5	4	4	3	H	2	2	4	1	2	L

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a1: large decrease, 2 decrease, 3: somewhat, 4: less decrease, 5: no decrease.

Respondents: TM top management; MM middle manager; EM employees

^bINF influence: L low influence; M moderate; H high influence; NE no evidence; NA not applicable.

As seen in Table 5-5, measures of quality performance, including ‘guarantee costs’, ‘recall rate’, ‘defect rate’, were perceived to have strongly decreased, when HACCP and ISO 9000 were implemented. Hence, these measures are assessed as being strongly impacted by the QA systems.

It can be seen that individual QA systems have different perceived impacts on organisation outcomes, according to the perception of respondents. However, results indicate a trend of influence of QA systems. HACCP and ISO 9000 were thought to have a strong influence on outcomes, while for ISO22000, respondents perceived that there was moderate influence. This may arise from the fact that it is just newly introduced, and so it requires more work and coordination in the supply chain in the initial stage, especially given DLM’s partial vertical integration. Perceived quality performance was assessed to have been impacted less by this system, which indicates that the duration of application may not yet be meaningful. Furthermore, fresh milk with quality controlled under ISO22000 supplied by DLM’s own farm, is minor compared to other sources supplied by mainly private small farms, which may also have an impact.

5.1.7 Conclusions

This Section described DLM, as a foreign owned dairy company, which is one of the largest dairy companies in Vietnam. Quality activities from production to marketing are engaged in by the company. It has implemented three QA systems, HACCP, ISO 9000, and ISO 22000. DLM coordinated and organized its supply chain with quality controls, and contractual relationships with farmers as suppliers for quality inputs to its milk processing plants.

Factors perceived as affecting the adoption decision were analysed. Within the environment context, legal factors had a strong impact on adoption decision, especially for HACCP adoption. This is similar to the previous case, MCM, in this respect. With respect to organisation context, factors such as firm size, was assessed to have a low influence on the decision adoption for all QA systems, with the reason given was that the company gets support from the parent company. The role of governance structure and top management support also had an influence on the adoption decision. This results from the direction and functions of the CEO, and the desire to harmonize parent company and world class safety

standards with the food legal environment in Vietnam. The complex nature of dairy products had a strong impact on HACCP adoption in particular and also ISO 22000, but not ISO 9000.

With respect to perceived outcomes after implementing individual QA systems, business performance was perceived to have been impacted strongly with increase in measures such as sales, profitability, return on sales, and growth of sales. There were assessed to have a high impact (H) for the HACCP system; with perceived increases in measures relating to revenue, sales, market share, and growth of sales rate, for the ISO 9000 system. Opinions for ISO 22000 were that it had not yet benefited the company in respect of improving measures of business performance. This difference in perceived business performance seems to result from the earlier adoption of HACCP and ISO 9000, compared to later adoption of ISO 22000:2005.

5.2 Vinamilk (VNM)

5.2.1 Overview

VNM is a State run corporation producing and marketing dairy products, and supplying services in the dairy industry. Apart from dairy production and manufacture, the company has other business activities, such as trading in processed foods, spare parts, materials, chemicals, and raw materials, trading in real estate, including real estate brokerage and leasing, trading in warehouses and wharves, automobile goods transportation, loading and unloading goods, manufacturing and trading in alcohol, beer, beverages, processed foods, and tea, coffee (Vinamilk, 2006). The company has been established since 1976, and was at first owned by the State after a nationalisation process. In 2003, it was equitised and changed into joint stock ownership with State shareholding of 43%. It has a head office in Ho Chi Minh City, branches in big cities, including Da Nang, Bien Hoa, Ha Noi, Can Tho, and processing plants located in provinces throughout the country.

The company employs the largest number of employees and has the highest turnover of all dairy companies in Vietnam. It has 4,000 employee, and turnover was VND20 thousand billion VND (1 billion USD) in 2010 with growth rate of 15% in the past five years. It is in top 200 dairy companies worldwide (Vinamilk, 2010; VietStock, 2010).

Total processing design capacity of Vinamilk is 504 thousand tons per year. The milk processing plants of Vinamilk are equipped with the most modern assembly lines and sterilized systems in the ASEAN region and produce 14 million product units in all kinds daily. Most of the plants are large scale, of which the largest plants are Mega milk plant, Dielac2, and Da Nang. Mega plant in Binh Duong province has the largest capacity in the South Asia region, equipped automatic technology, produces 400 million litre milk per year, with total investment of VND2,527 billion. Dielac Milk plant 2, having four times the capacity of Dielac plant 1, produces 54,000 tons of milk powder per year, with total investment of VND1,724 billion. Da Nang milk plant has a capacity of 64.4 million litres of milk and 240 million yoghurt boxes per year, with investment of VND481 billion (Vinamilk, 2009). In 2008, the company completed and opened the Tien Son milk processing plant in Bac Ninh province. The plant produces dairy products, such as sterilized milk, drinking yoghurt, eating yoghurt, and juice, mainly to serve the Northern market. The company also operates milk assembly line to produce yoghurt with Probi at 3.5 million litres per year (Vinamilk 2010).

Turnover of the company has been increased remarkably over the last 5 years (See Figure 5-5). This contributes to VNM holding first position in domestic market. VNM occupied 37% share by value on domestic dairy market in 2010 and was the domestic company having the highest export value in Viet Nam.

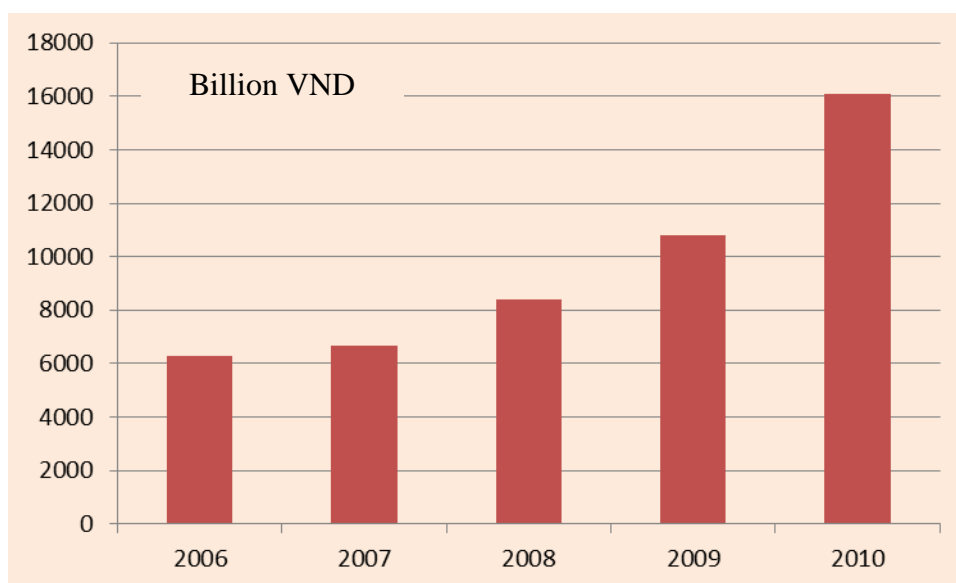


Figure 5-5 Growth of turnover and profit (2005-2010) -VNM case

Source: Adapted from Vinamilk Company, 2010

Although global economy continued to decline as a result of the financial crisis, VNM has continued to expand in the market and has exported dairy products to 15 countries, of which, USA, Australia, the Federal of Russia, Turkey, Iraq, Sri Lanka, Philippines, and Korea are its stable exportation markets. Its turnover was 22,279 billion VND (over 1 billion USD) in 2011, increasing 37% in comparison with the same period last year (VNS, 2011). Export earnings of VNM in 2011 exceeded planned company exports, at 140 million USD, increasing 72% compared to 2010. Major export products were Dielac brand milk powder, and Ridielac brand nutritious powder for children, condensed milk with sugar, yoghurt, fresh milk, soymilk, and Vfresh branded drink juice. In 2011, VNM was one of top 5 largest companies in Vietnam (VNR, 2011).

VNM's products are diversified with 200 brands from dairy products and dairy-extracted products, such as condensed milk, powder milk, nutrition powder, fresh milk, ice cream, yoghurt, cheese, other products, such as soybean drinks, juice drinks, beverages, cake, instant coffee, bottled drinking water, tea, and drinking chocolate. Through its abundant array of products, VNM has met demands of consumers and diversified its risks (Figure 5-6).



Figure 5-6 Major products – VNM case
Source: Vinamilk, 2010

To gain competitive advantages over rivals on the market, strategies used by the company are to focus on producing and manufacturing products that are being consumed widely, and ultimately raising product quality. Its major products is solid milk, accounting for 34% in

turnover with a growth rate 26% per year in a 5 years period from 2005 – 2009. This product occupies 78% market share domestically. Fresh milk contributes 26% to turnover with a growth rate of 17-18%, (Vinamilk, 2010), occupying a 35% market share after DLM. DLM is said to have better marketing strategies than VNM (Huyen, 2009).

5.2.2 Governance structure

VNM is a joint stock company with the major State share. An annual general meeting of shareholders is held, and in the meeting, shareholders are advised of and adopt the business strategies of the company. The Board of Management, who is elected in the shareholders' meeting, has leadership and organization roles in the business activities of the company, under which is the chairwoman of the management board, who is also CEO, responsible for production and trading businesses on behalf of shareholders (Figure 5-7).



Figure 5-7 Management board structure- VNM case

Source: Vinamilk, 2009

Responsibility for quality systems (QS) comes under the leadership of the Executive Director of Production and R&D, who is responsible for quality control in production. The division of QS in the company is responsible for setting up technical requirements of raw materials and end products, announcing quality of products according to Law, and managing and monitoring quality. The Division of QA in plants implements the control of input materials,

technical specifications of processing, analyzing end products, and allowing products to markets if goods achieved acceptable criteria.

5.2.3 Supply chain structure

The supply chain of Vinamilk includes major input suppliers, independent dairy farmers, its own farms, and imported milk powder. TetraPak (Sweden), Moboloc (Germany) are companies supplying packaging, containers, machines, and equipment. Dairy farmers, own farms in provinces such as Can Tho, Ho Chi Minh, Lam Dong, and Nghe An, supply fresh milk as raw material for dairy processing plants (see Figure 5-8). In the supply chain, VNM has the leading role in procurement and distribution of milk products. It collects milk produced on private farms and its own farms. VNM is also the company occupying the largest share in the procurement and collection of fresh milk on domestic market (48% of the share in 2008 (VNSC, 2009), which was larger than DLM and MCM).

VNM's supply chain is a partially integrated vertical structure and is similar to other cases, such as DLM and MCM. The chain is organised with own farms satisfying the partial demand of milk to plants, and with most small farmers supplying to plants through collection systems of VNM, dealers, and cooperatives.

In dairy production, VNM owns dairy farms in Can Tho, Lam Dong, Nghe An, Tuyen Quang, and Ho Chi Minh provinces, and each farm has over 2,000 cows, with an average milk yield of 25 – 30 litre per cow a day. These farms are equipped with industrial facilities, sheds, shelter, parlours, automatic milking machines, and modern sanitized systems. These farms supply fresh milk to processing plants. Beyond this source, contracted farms supply milk to plants. Establishing its own farms to supply milk to processing plants in VNM is similar to that of other companies, MCM and DLM; however, it has a difference from MCM in that are farms are located in a more focused area within 20 -30 km diameter.

In distribution, the company maintains both traditional and modern marketing channels. For the traditional channel, VNM has branches, 220 head distributors, 14,000 retail shops, 14 show rooms in Ha Noi, Da Nang, Ho Chi Minh City, and Can Tho. Besides this, VNM supplies to grocery stores and supermarkets, and metros, as modern distribution to consumers, with 1,400 level 1 agents. 5,000 level 2 agents. It maintains 170,000 retail outlets, and groceries located in 64 provinces and cities in the country (Vinamilk, 2010; Luong,

2010). This is larger than the number of retail outlets of DLM, around 150,000 in 2009 (Dutchlady, 2009; Phan, 2009). Grocery is one of retailing types that are popular in Vietnam. In grocery, a shop keeper, apart from selling other products, sells dairy products supplied by various dairy companies, such as DLM, HNM, and BaVi Milk Company. VNM has strong competition with rivals, such as DLM, in occupying domestic market share. Its market share was 37% by value (Vinamilk, 2010) compared to 35% devoted to DLM (Dacco, 2010).

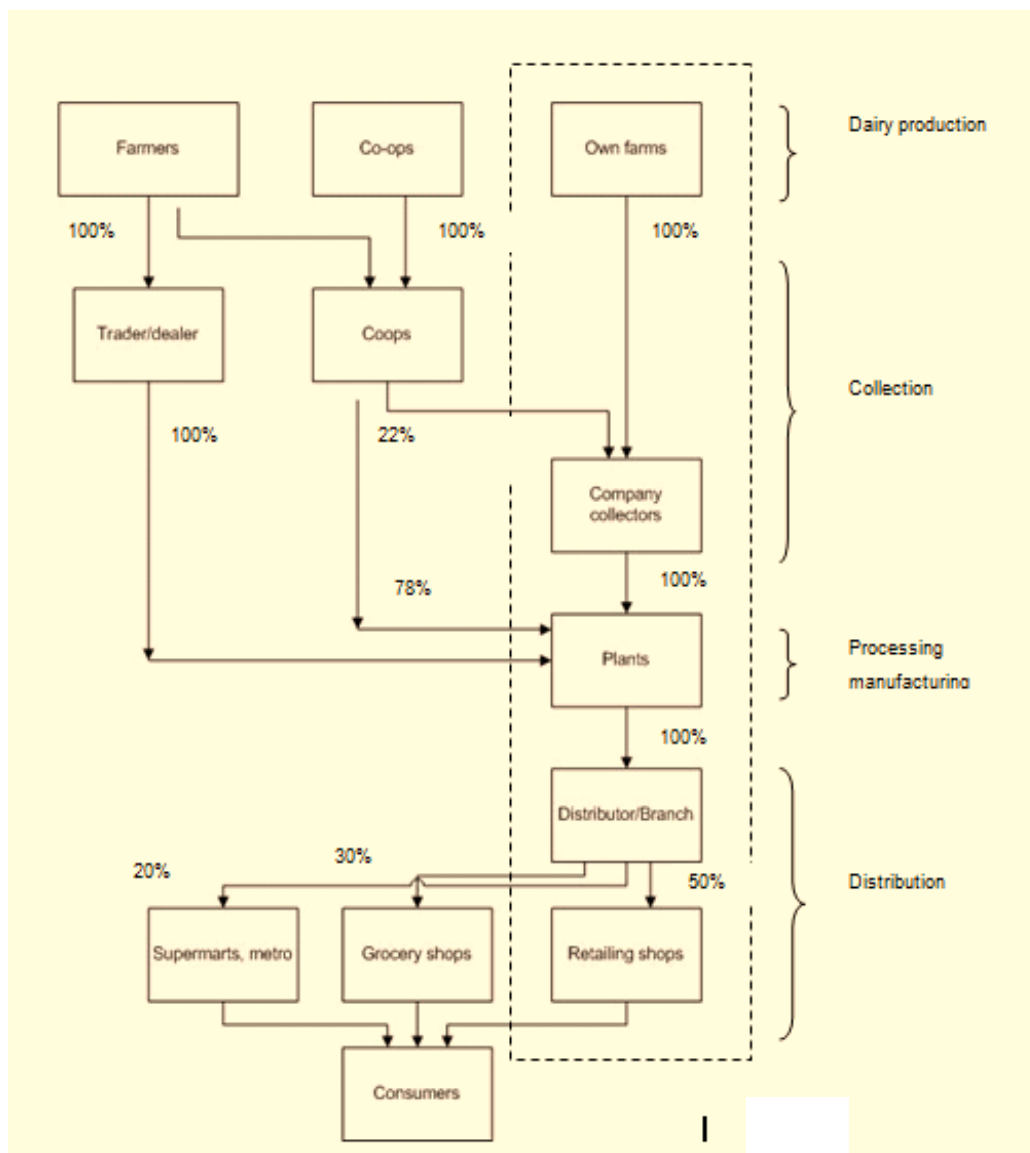


Figure 5-8 Dairy supply chain – VNM case

Source: Adapted from Vinamilk, 2009

To distribute and market dairy products fast and efficiently, the company has an agent network spread out in the provinces. In each province, VNM's marketing executives receive a part of their salary awarded according to sales, which encourages them enlist retail agents.

This agent network is an advantage of VNM over its rivals. However, efficient management of agents, especially in isolated remote areas, is a challenge to the VNM because of limitations in transportation. According to transport recommendations, maximum loading is only 8 boxes, but in practice, up to 15 boxes are transported, which leads to unloading damage of containers. VNM also faces difficulties in storage and in monitoring. For example, in remote areas, there are no cooling facilities for fresh milk. The market for VNM's product is very large, covering the country, so monitoring is very difficult, especially access to small shops in remote and isolated areas. In addition, transporting products with cooling vehicles is only accessible to agents, and head distributors, and after that, transporting dairy products is by other means, such as motorbikes and trucks, where quality assurance is ignored (Luong, 2010).

5.2.4 Business strategy and QA systems

The company has quality policy that is oriented toward customers. "Leverage our customer's belief through continuous innovation and development in quality, safety, competitive price and customer-oriented services committed to satisfy all customer demands" (Vinamilk, 2006, p2) is a part of long- term development strategy of the company. With its goal to become one of the largest dairy businesses in the world with the turnover of USD3 billion by 2017, VNM invests in depth in technology and processing machines. Plants have been newly-built to produce high quality products, such as the milk powder plant equipped with the modern and advanced assembly line in joint venture establishment with Miraka company (New Zealand) with total investment of NZD90m. (Vinamilk, 2010), Mega milk processing plant in Binh Duong province, and Tien Son milk processing plant in Bac Ninh province.

Milk supplies are concern of the company, because, at present, they are heavily reliant on imports with high prices and passive supplies. Therefore, the company intends to reduce dependence on this source and maintain domestic supply with high quality. Strategies for quality that have been adopted and are successful are strictly controlling fresh milk, signing contracts with farmers with compulsory terms, such as 'absolutely not purchasing fresh milk from hired milking workers'. To support improving farming skills and hygienic practices for dairy producers in dairy production, the company has signed an agreement with the Friesland Campina company (DLM) to build together a dairy farming technical and training center in Lam Dong province. The company has invested in building its own dairy farms equipped with modern industrial and large scale technology. Such dairy farms have been built in Nghe

An, Vinh Phuc, Lam Dong, Binh Dinh, Binh Duong, and Soc Trang provinces, each farm having 2,000 cows to supply an average of 30 million litres of milk a year. As a result, VNM has basically assured fresh milk sources for its production and operation.

VNM is in collaboration with three European corporations, DSM (Swiss), Lonza (Swiss), and Chris Hansen (Denmark) to research and apply nutritious science in dairy production and manufacture. These are world-leading corporations in nutrition, especially in biological and microbiological technology. With this international collaboration and application of advanced equipment and the most modern laboratories, VNM employed domestic and foreign specialists have manufactured specific milk formulas with international quality (VNS 2011).

To satisfy the increasing demand of high quality dairy products of consumers, VNM has achieved two QA certifications. These are international HACCP certification in 2004 and ISO 9000/2000 certification in 2000 (Vinamilk, 2010).

5.2.5 Perceived factors influencing adoption of QAS's

5.2.5.1 Motivation

VNM is large company, exports dairy products, and has long history in production and marketing. Regarding HACCP adoption, one of reasons given by the management was the application of HACCP aims to satisfy a requirement of buyers in export markets. In such circumstance, the company gets entry into countries where certification is required as quality assurance, which means VNM must adapt to the food laws and Acts issued by these countries' related authorities. An Executive Director of Marketing commented:

“our buyers require the company to have this [HACCP] as proof of quality assurance” (VNM- p1).

The company gave another reason to pursue HACCP certification, which was gaining competitive advantages over rivals in domestic and foreign markets. It is appear that companies like to achieve the HACCP system as a tool for expanding into new markets. He continued:

“our company plans to export to potential markets where strong fiercely competition existed among the companies having achieved HACCP certification, if we have not achieved this system, jumping in new market becomes impossible...” (VNMP1).

Regarding the ISO 9000 system, the company expected that it would improve plant processes standardization, save materials and reduce costs in production and manufacture. The reason is considered as ‘internal motivation’. Another reason for VNM seeking this system was improving the image of the company, and contributing to its commitment of supplying good and safe dairy foods to its consumers. An Executive Director of Production noted that:

“Quality management needs being improved and perfect by involvement of employee, staff toward quality and applying international standards in production and processing. Quality management system [ISO 9000] is useful and efficient for this activity. This system can contribute to improving production processes in our plants.” (VNM-p2).

For further within-case analysis, the reasons for seeking QA certifications were gained through questionnaires, which were summarised as follows:

Table 5-6 Motivations for seeking QAS’s – VNM case

Top five motivations	HACCP	ISO 9000
1	Satisfying requirements of buyers (E)	Utilizing efficiency production processes, reduction defects (I)
2	Increasing market share in domestic market (E)	Improving competitive advantage over other competitors (E)
3	Utilizing an efficient production, reduction defects (I)	Increase market share in domestic market (E)
4	Meeting food legislations and national regulations (E)	Satisfying requirements of buyers (E)
5	Improving employee, staff behaviours toward quality (I)	Improving employee, staff behaviour toward quality (I)

Note: I internal motivation; E external motivation

As show in Table 5-6, it can be seen that there were differences in motivations for individual QA systems. Management cited “satisfying requirements of buyers” as the main reason to seek HACCP certification, while “utilizing efficiency production processes” was the main reason for seeking ISO 9000. The lowest ranking reason “improving employee, staff behaviours toward quality” was considered the same by top management for both systems, which may indicate that expectations for changing resistance of employee involvement and participation in quality program was assessed to be difficult and/or not important.

5.2.5.2 Perceived factors influencing adoption of QAS's

Making a choice of QA system that is suitable and adaptable to company conditions is difficult for managers, especially when considering in aspects of registration and implementation costs and long-term benefits that QA systems bring. Being a State owned corporation in the dairy industry, VNM both must show corporate responsibility and be involved in community activities, and also be a mirror for other State businesses in terms of efficient production and conducts of business activities. The company must follow State practices in business and this is a stronger influence on this company than on other private companies.

Fulfilling legal obligations related to food safety, hygienic sanitation and industrial standards, and outcompeting rivals- such as DLM in fresh, liquid, powder milk segment, and Abbot and S&N in the powder product segment- are prerequisites for firm survival. External support where support comes from State and local authorities for registration of QA system has a certain impact. For instance, for support programs for small and medium enterprises in HCM city, subsidiary companies owned by the parent company (Vinamilk) benefited from supports. Ho Chi Minh City's authority has supported VND25 million for each enterprise that registers QA certification. However, such support may be inconsequential in larger companies, like as VNM. An Executive Director of Production commented:

“ Leadership lights of government for business is a part of strategy of the company. An application of innovations, such as quality systems, will be influenced by external factors, especially business environment where law is existed, in which, having law related to food safety. Dairy product is essential and high risk for consumers, if they are not produced and manufactured, stored in appropriate ways” (VNM-p2).

One competition aspect that was referred to by the company was a factor affecting the decision strongly. VNM launches and exports its products to international markets where the requirement of quality, is high from distributors and customers; for example, every supplier is required to have HACCP certification as quality signaling, and where competition between dairy large companies becomes fierce, any company that has a stronger advantage will be a winner in the race to gain market share. For VNM, these pressures make the company search for tools for improving its competitive advantages, of which achieving an international quality standard is a target. He further noted that:

“ market factors are a decisive prerequisite for us to pursue these systems in terms of getting long term and ultimate profitability in global competition that becomes more and more fierce.” (VNM-p2).

These main factors were assessed by top management through questionnaires, and are summarized in Table 5-7:

Table 5-7 Perceived factors influencing adoption of QAS's- VNM case

Factors	HACCP	ISO 9000
A.Environment context		
i) Food legal and national regulations	H	H
ii) External support	L	L
iii) Market pressure	M	H
B.Organisation context		
i) Firm size	L	L
ii) Governance structure	M	L
iii) Top management support	M	M
iv) Firm's product nature	M	M

Note: H high influence; M moderate influence; L low influence

As can be seen in Table 5-12, factors had different impact across individual QA systems. Law and national regulations factor was assessed to have a strong impact on the adoption decision for both systems.

Market pressure was assessed as moderate or high, while external support was not considered important in either system. With respect to organization context, top management support and the nature of product were thought to have a moderate influence, as was the governance structure for HACCP. Firm size was not seen as an important factor.

5.2.6 Perceived impact of QA systems on organisational outcomes

After having implemented QA systems, including HACCP and ISO 9000 for over 10 years, VNM has seen remarkable growth in its production and marketing. Both QA systems are thought to have contributed to improving annual sales and market share. As noted before, VNM is the largest dairy company and dominates the domestic market in distribution of dairy products and collection of fresh milk. An Executive Director of Marketing noted that:

“It is clear that changes in revenues of the company over years are real after implementing quality schemes, and market share we gained over other dairy companies is not small”.
(VNM-p1).

Effects of QA systems on organization outcomes in terms of operational performance, such as reducing defect products, waste, saving production costs in production processes, and delivery time in distribution of end products, was noted. Differences were perceived before and after implementing QA systems. He continued:

“ ... ratio of defects, waste in production processes is reduced more than before when the company does not apply food safety program [HACCP]. There are traces of satisfaction on our products from customers, such as claims from customers reduced even though reduce is not much if we compare at two times of prior and after the company has achieved ISO certification” (VNM-p1).

These qualitative findings indicated that QA systems bring real benefits. To analyze results after the company implemented QA systems, opinions of top management, plant manager, and employee were collected from questionnaires and summarized in the Table 5-8.

Table 5-8 Perceived impacts of QA system on business performance- VNM case

QAS	Respondents	Measures					
		Revenue	Sales	Market shares	Profitability	Return on sales	Sales growth rate
HACCP	TM1	5	1	2	1	4	5
	TM2	4	4	3	3	4	3
	MM1	4	3	5	2	2	3
	MM2	2	5	4	5	3	3
	EM1	3	2	1	4	4	4
	INF ^a	H	H	M	H	H	M
ISO 9000	TM1	5	2	3	3	4	2
	TM2	5	5	1	5	3	4
	MM1	3	4	3	2	3	4
	MM2	4	4	1	4	2	5
	EM1	3	1	3	5	3	3
	INF ^a	H	H	M	H	M	H

Note: 1 no increase, 2 less increase, 3 somewhat, 4 increase, 5 large increase

Respondents: TM top management; MM middle manager; EM employee,

^aINF influence; H high; M moderate; L low.

As can be seen in this table, many similarities and some minor differences were found between the two QA systems in organization outcomes. Both QA systems were perceived to have a high impact on revenue, sales, and profitability, a moderate influence on market share, and a moderate to high influence on return on sales and sales growth rate.

Table 5-9 Perceived impact of QA systems on operational performance – VNM case

QA systems	Respondent	Measures					
		Unit production costs ^a	Fast deliveries ^a	Cycle time ^a	Design quality	Manufacturing quality	Customer satisfaction
HACCP	TM1	4	NA	NA	1	2	3
	TM2	2	NA	NA	2	5	2
	MM1	3	NA	NA	2	3	4
	MM2	5	NA	NA	4	2	5
	EM1	3	NA	NA	1	2	4
	INF ^b	NE	NA	NA	L	L	H
ISO 9000	TM1	3	5	5	1	2	3
	TM2	5	2	2	1	2	4
	MM1	3	3	4	2	5	3
	MM2	1	2	3	1	4	3
	EM1	1	4	2	1	2	5
	INF ^b	NE	NE	NE	L	L	M

Note: 1 no increase, 2 less increase, 3 somewhat, 4 increase, 5 large increase
^a1 large decrease, 2 decrease, 3 somewhat, 4 less decrease, 5 no decrease.
 Respondents: TM top management; MM middle manager; EM employee,
^bINF influence; H high; M moderate; L low; NA not applicable; NE no evidence

As seen on table 5-9, there was similarity of benefits between two QA systems, in terms of two measures of operational outcomes, design quality and manufacturing quality, which were both perceived to have a low impact. These were a difference in the measure of ‘customer satisfaction’.

Table 5-10 shows the perceived impact of the QA systems on quality performance. This shows that there were similar perceptions of a decreasing defect rate, guarantee costs after the company implemented HACCP and ISO 9000, as assessment to be a high influence (H), and the same impact to be perceived as moderate (M) for recall rate. Other measures of product performance were perceived to have a high impact (H) of HACCP, such as reliability, aesthetics, while has a high impact (H) on measures of performance, conformance, aesthetics by the ISO 9000 system.

Table 5-10 Perceived impact of QA systems on quality performance – VNM case

Measures	HACCP					INF ^b	ISO 9000					
	TM1	TM2	MM1	MM2	EM1		TM1	TM2	MM1	MM2	EM1	INF ^b
a. Defect rate ^a	2	2	5	1	1	H	1	2	2	3	4	H
b. Recall rate ^a	5	3	4	3	3	M	4	3	3	1	3	M
c. Guarantee costs ^a	1	5	1	1	1	H	4	2	2	2	1	H
d. Performance	1	2	5	1	3	L	4	4	4	5	5	H
e. Features	1	4	2	3	3	NE	3	1	2	2	5	L
f. Reliability	5	4	5	1	1	H	2	1	1	5	1	L
g. Conformance	5	1	4	2	1	L	4	5	4	3	4	H
h. Durability	1	1	5	2	3	L	3	4	2	4	3	NE
i. Serviceability	2	5	1	5	2	L	2	1	2	3	4	L
j. Aesthetics	4	5	2	5	3	H	5	4	5	4	1	H
k. Perceived quality	3	1	5	3	3	M	2	2	5	1	5	L

Note:

1 no increase, 2 less increase, 3 somewhat, 4 increase, 5 large increase

^a1 large decrease, 2 decrease, 3 somewhat, 4 less decrease, 5 no decrease.

Respondents: TM top management; MM middle manager; EM employee,

^bINF influence; H high; M moderate; L low; NE no evidence

5.2.7 Conclusion

In summary, VNM is the largest dairy company in Vietnam, involved in several activities ranging from production to manufacturing and services in areas other than dairy production. Having adopted QA systems, the company supplies its consumers high quality products. The study explored motivations the company adopted individual QA system, which revealed that the main motivation for HACCP adoption was satisfying requirements of buyer, (importers, foreign distributors), which differed from ISO 9000, where the main motivation was perceived to be improving product quality. Perceived factors impacting on adoption, such as legal and national regulations factor were perceived to strongly impact on the decision to adopt both QA systems. Regarding impact of QA systems on organization outcomes, there were different perceptions. For business performance improvement, both QA systems were perceived to have a high impact on revenue, sales, and profitability, a moderate influence on market share, and a moderate to high influence on return on sales and sales growth rate. And there were similar impacts of both systems for decreasing defect rate and guarantee costs in quality performance.

5.3 Chapter Conclusion

This Chapter contained summary descriptions and results for two large dairy companies selected for this study, as a basis for comparison with the in-depth MCM case. These large dairy cases had specific characteristics that were described briefly in terms of their historical

development and processes, production capacity, types of products, supply chain, and governance structure. The strategies and quality assurance systems the companies are applying within the company and its plants were identified. These two companies occupy a total market share of 80% between them in the domestic market.

The two companies differ from each other in terms of their establishment and development, size and capacity, capital capability, and ownership. However, they are similar in respect to their degree of coordination (partial vertically integrated coordination by processor). The differences may impact on the decision to adopt QA systems. These similarities and differences will be explored further in Chapter 7, where the cross-case analysis is presented.

Chapter 6

Result 3- Small Firms: Hanoimilk and IDP cases-Description and Analysis

In this Chapter, the remaining two cases are presented. These are both small companies, Hanoimilk Company and the International Dairy Products Joint Stock Company (IDP). As with Chapter 5, any new differences and similarities between these cases and the Moc Chau Milk Company (MCM) are outlined with respect to the firm nature, governance structure and supply chain structure. A brief analysis of factors impacting on adoption and organisational outcomes is also presented for each individual case.

6.1 Hanoimilk Company (HNM)

6.1.1 Overview

HNM is a food company in northern Vietnam, with its main activities including processing and marketing milk, soymilk, dairy foods, processing agricultural product, foodstuffs, drinks, juice and other business activities (Hanoimilk, 2009). It was established in 2001 and began operation formally in 2003. It has its headquarters office and milk processing plant in Vinh Phuc province. The company has three branches in Hanoi, Binh Duong and Ho Chi Minh City.

The number of employees and staff working in the company is 250 and the average salary per worker was VND4,090,000 (\approx USD210) monthly in 2010 (Hanoimilk, 2010). From 2005 to 2008, its turnover and profit were relatively static (Figure 6-1).

The company has gone through stages in the course of its development. On March 8, 2002, HNM began to build its milk processing plant in Ha Noi. It has an annual capacity of 150 million litre, which is a large scale plant for Vietnam with an investment of VND100 billion (\approx US\$60 million). On April 4, 2002, VNM signed a contract to purchase modern milk processing equipment and machines from Tetra Pak, Sweden. After one year of building and trials, the milk processing plant began to formally operate. By October 2004, 100 million product units of milk were processed in total. On 5 May, 2006, VNM moved its office and

processing plant to Vinh Phuc province. In the same year, the company registered on the Ha Noi stock exchange market with its share named HNM.

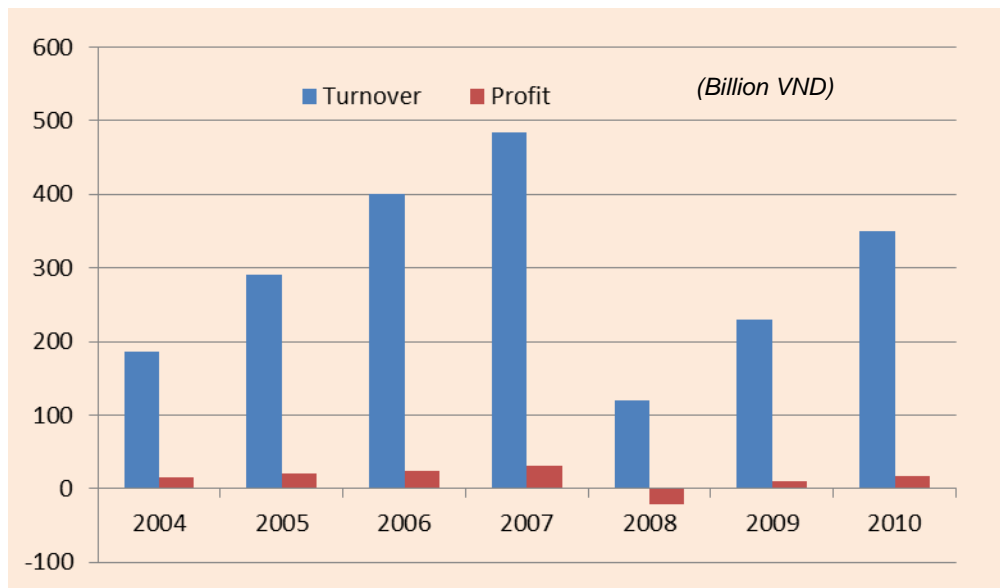


Figure 6-1 Trend in turnover, and profit in 2005-2010 – HNM case

Source: Hanoimilk company, 2010

HNM has matured to become one of the top businesses in the dairy industry. The company has gained consumer loyalty with dairy products branded as IZZI, Yotuti, and Hanoimilk 100% fresh milk (Figure 6-2). Of these, the IZZI Dinomilk 110ml pack was released in 2010 and focuses on nutrition, combining Prebiotics and vitamin A and C ingredients.

Having the milk processing plant equipped with modern and advanced technology assembly lines, and a human resource base of highly qualified staff and employees, allows HNM to continuously raise its quality control in procuring and producing milk in order to supply consumer safe dairy products. After 7 years' business, the company has a number of new dairy products and formulas, and has a higher growth rate than average for those firms in the dairy industry. This has ensured that Hanoimilk is a strong brand in dairy industry.



Figure 6-2 Major products – HNM case

Source: Adapted from Hanoimilk Company, 2009

Unfortunately, at the end of 2008, the Chinese “melamine storm” spread to Vietnam and HNM was affected strongly by this “dirty milk storm”, resulting in a loss of consumer belief in the Hanoimilk brand. Turnover was reduced, product recalls happened and the company faced many difficulties. The company lost share in the domestic market, and dropped from third position to fifth position in the dairy business rankings (based on market share by value) after VNM, DLM, MCM, and IDP. Faced with this difficult situation, a new chairperson of the Supervisor Board was elected in the annual general meeting of shareholders held on 12 April 2009, and an enterprise re-structure program was adopted. Since then, HNM has been in a reform process. HNM is at present on the road to becoming a professional dairy company obtaining international standards and is ambitious to return to its third position held in the past.

6.1.2 Governance structure

HNM is a joint stock company with capital contributions from strategic partners (other companies, corporations) and private shareholders.

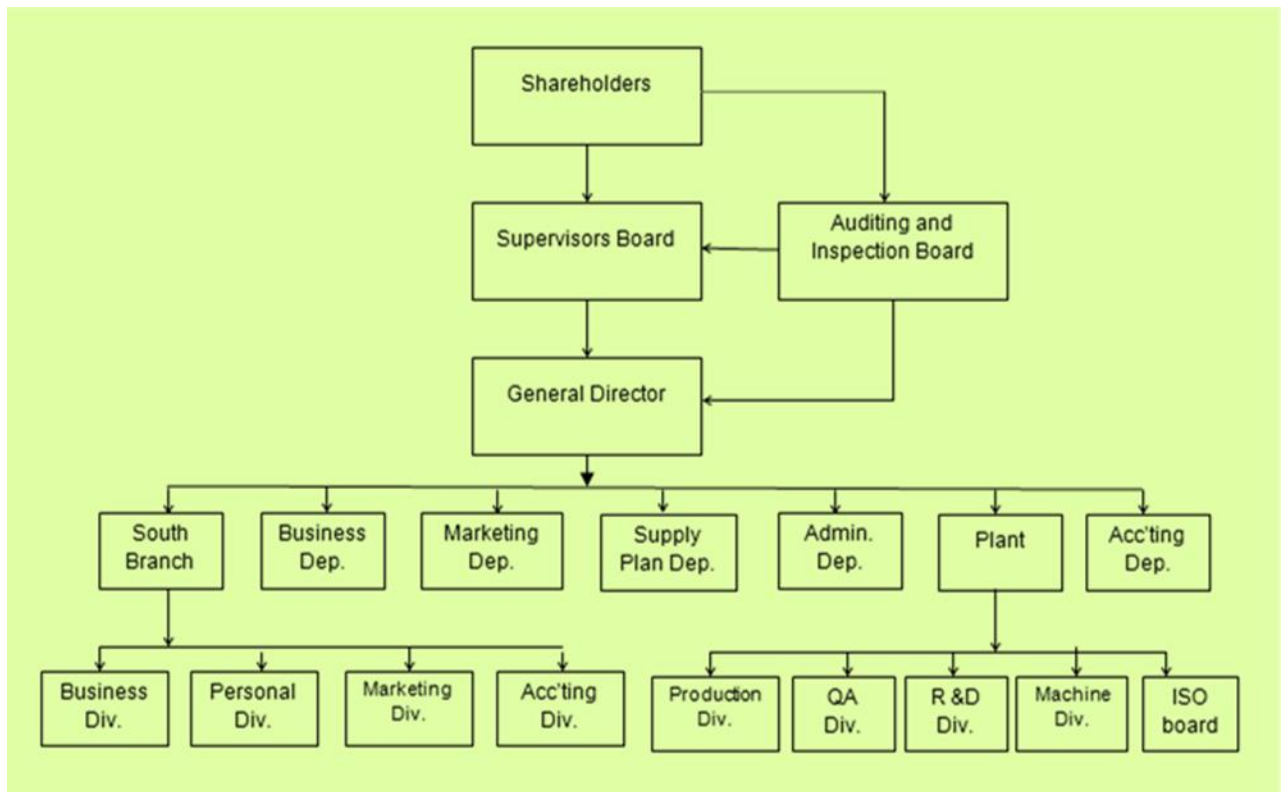


Figure 6-3 Governance structure – HNM case

Source: Adapted from Hanoimilk Company, 2010

HNM's organization is designed with the highest level being shareholders, under which, there is the Board of Supervisors, Board of Directors, and Board of Auditing and Inspection. A general director is responsible for the vision and strategy adopted by shareholders in annual meetings, and for managing the company's activities. The organization is vertical in structure with the leading boards at the top position. Professional and functional departments are at level 2. These are branches, the 'business', marketing, planning supply, administrative and accounting departments, as well as the plant department (see Figure 6-3). There are minor differences in the governance structure between HNM and previous cases. Unlike MCM, the company has joint stock ownership and does not have the State shareholder as a majority. Other shareholders are strategic partners and private investors outside the company. These domestic investors are investing in the company based on capital contributions. This is similar to DLM in this respect although DLM has foreign investors rather than domestic investors. In the HNM capital structure, major shareholders are strategic partners that hold a 60% share, and other shareholders are private investors, workers, members of the director's and the supervisor's boards.

6.1.3 Supply chain structure

HNM has some vertical coordination in the procurement and processing of dairy products (Figure 6-4). The company has procurement staff who go to milk supplying areas to collect raw milk from the farmers. Unlike previous cases, such as MCM and DLM, the company conducts on-the-spot transactions in procurement of raw material, and the distribution of end products, both of which are based on market prices. The company used to sign contracts with farmers and other suppliers to ensure a stable source for its milk processing plant's operation, but it was not successful because most suppliers sold to several companies in the area, such as VNM, IDP, and Ba Vi milk company, so a relationship was difficult to establish. Another difference from the MCM and DLM cases is that the company does not have its own farms to supply fresh milk to its plant, but relies heavily on purchasing fresh milk from private farms in Ha Nam, Bac Ninh, Vinh Yen, Vinh Phuc, Ba Vi and Phu Dong. These suppliers also sell fresh milk to other companies, or are involved in other supply chains.

This structure causes difficulties in quality control and the efficient application of a QA system, such as ISO 22000, along the whole chain. Instead, product and quality assurance has been implemented through the application of QA systems and the inspection of the basic requirements of those systems by individual firms. This indicates that HNM is only able to control the quality of the fresh milk reception at its plant gate, and at the other end of the chain, through storage and distribution at its branch. Regarding supplier structure, unlike MCM, in HNM's chain, 10 cooperatives are involved in supplying fresh milk to the processing plant, of which, Phu Dong and Vinh Tuong cooperatives are the largest. Dealers are also permitted to be involved in the chain. This is similar to DLM having cooperatives supplying fresh milk to its plants. HNM's milk processing plant has a capacity of 16,500 litre per hour, and is one of the most modern plants with an adequate TetraPak assembly line. Total HNM's processing capacity is 80 million litres.

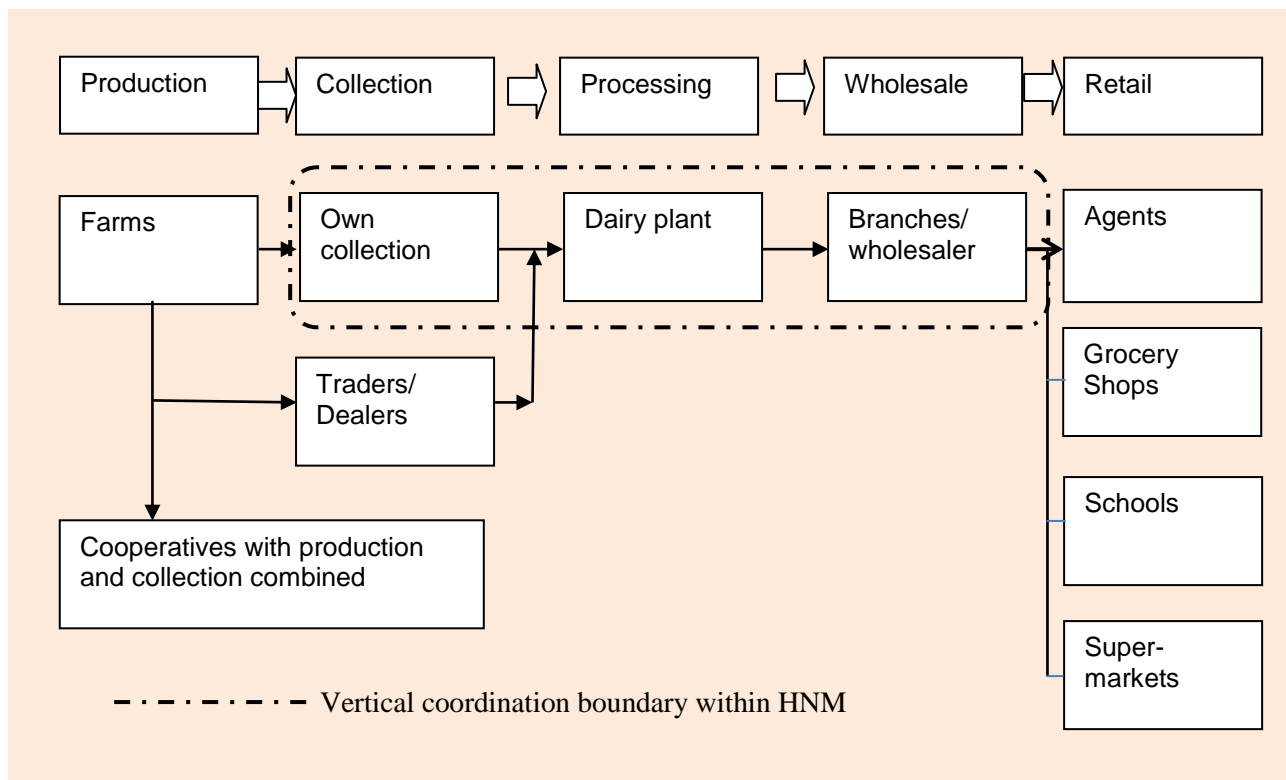


Figure 6-4 Supply Chain Structure – HNM case

Source: Adapted from Hanoimilk company, 2010

HNM maintains diversified distribution channels, and has increased the number of head distributors, so that it now covers 64 provinces and 90 cities, and the number of retailers increased from 30,000 to 40,000 in 2009 (Hanoi Milk Company, 2010). The company has three branches in Ha Noi, Binh Duong, and Ho Chi Minh.

6.1.4 Business strategy and QA systems

For their business strategy, the company follows the 3A's principle – Affordability, Availability, and Acceptability, and for marketing develops strategies for distribution, product, pricing, and promotion with a focus on developing human resources, procedures and engineering infrastructures. The long term strategic vision set up by the company is shown in Figure 6-5.

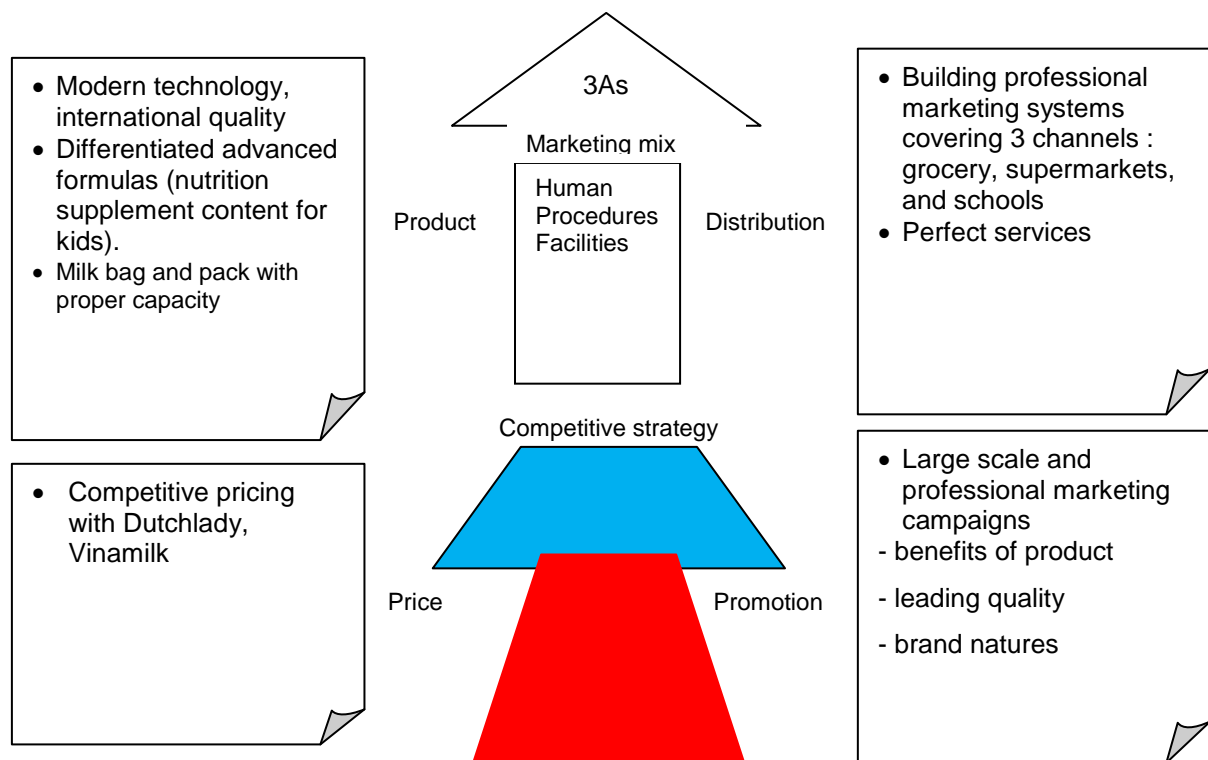


Figure 6-5 Business strategy of HNM

Source: Adapted from the Hanoimilk, 2009.

Note : 3As= Availability, Affordability, Acceptability

To ensure high quality, the company conducts quality control of fresh milk and imported milk powder. This includes the fresh milk from dairy farms in areas of Ha Noi, Ha Nam, Bac Ninh, Vinh Yen, Vinh Phuc, Ba Vi and Phu Dong. Milk powder, extra ingredients, and flavour extracts are imported mainly from countries internationally well-known for producing high quality milk. A marketing manager stated that:

“...milk powder and auxiliary contents with international quality standards are imported from New Zealand and Denmark. Furthermore, by strict application of ISO and HACCP standards to control quality from material procurement to production process and to sale services, we ensure that the product quality of Hanoimilk is assured and is correctly matched to the quality required by the Ministry of Public Health” (HNM-p1).

With respect to the organization of quality management activities, the company has re-organised its Research and Development Division and has changed the name of the Quality Control Division to the ‘Quality Assurance QA’ division. The company continues to invest in upgrading lines and equipment in line with the QA systems ISO and HACCP which have

been introduced within the company. The quality processes from procuring milk, processing, storage, and to the sale services have been improved greatly. HNM appreciates the necessity to produce dairy products to international standards (Ha, 2010). HNM has formally achieved the three international QA systems HACCP, ISO 9000 in 2004, and ISO 22000. HNM is also the first domestic dairy company to obtain the ISO 22000 certificate.

6.1.5 Perceived factors influencing adoption of QAS's

6.1.5.1 Motivation

The motivation for adopting individual QA systems by HNM were found to differ according to QA system. For HACCP , product quality improvement was the main factor, while ISO 9000 and ISO 22000 adoption were expected to give the company a better competitive advantage in the domestic market; for example, against DLM and HNM for yoghurt products. All key motivations for the adoption of QA system are shown in Table 6-1:

Table 6-1 Motivations for seeking QA systems – HNM case

Top five motivations	HACCP	ISO 9000	ISO22000
1	Improving product quality (I)	Raising competitive advantages over competitors (E)	Raising competitive advantages over competitors (E)
2	Complying with legal and national regulations (E)	Enhancing company's image (E)	Enhancing company's image (E)
3	Enhancing company's image (E)	Improve quality in production process	Expanding domestic market and/or potential foreign market (E)
4	Expanding market (E)	Expanding domestic market and/or potential foreign market (E)	Improve product quality and toward the highest quality (I)
5	Raising competitive advantages over competitors (E)	Complying with legal and national regulations (E)	Differentiating themselves from competitors (E)

Note: I internal motivation; E external motivation

As seen in Table 6-1, for HACCP the key motivation is 'improving quality in production process', while 'raising competitive advantages over competitors' is the key trigger for the two remaining QA systems, ISO 9000 and ISO 22000. This shows the HACCP role of improving quality, while the ISO series places more emphasis on human resources and ensuring proper relations in the production process.

6.1.5.2 Perceived factors influencing adoption of QAS's

In this particular within-case analysis, legal factors, including food safety legislation issued by related authorities and ministries, was perceived to be critically important to the adoption decision for the HACCP system. This factor was perceived to have a stronger influence on this system than on other QA systems. This was due to the enforcement and mandatory nature of HACCP within food businesses carried out by the government in recent years. It is likely to also have been influenced by the experience HNM had with the melamine scandal. Another factor, market pressure, was perceived to have a high influence on the adoption decision for HACCP and ISO 22000. It was explained by the officials that they liked to differentiate their products by the adoption of QA systems particularly when they started to compete with larger companies, such as DLM and VNM in northern markets in recent years (See Table 6-2). This different influence of this factor between the three QA system adoptions was perceived to have a moderate influence on the adoption of ISO 9000. It may be concluded that the company has competed with other companies by using QA systems for quality improvement rather than a marketing tool per se.

According to one respondent, external support had a role in the diffusion of QA systems. Such support, such as certifying bodies offering training courses related to QA systems, were more for ISO 9000 than HACCP. So, this factor was not perceived as having strongly affected HACCP's adoption decision.

“ we received some guidance through butterfly leaf and documentation that talked about HACCP from certifying companies. This documentation is only an introduction and suggests the company register, and shows necessary conditions that the company needs to have. For ISO 9000 system, we learned that we would benefit from training courses for quality staff and employees. This is a favour for the company if it involves obtaining international standards” (HNM-p1).

The governance structure was another factor affecting the QA adoption decision in respect to the organisation and qualifications of the top managers'. The Board of Directors members in HNM have high qualifications and education, which may impact on promoting QA systems within the company. Most members of the supervisory and directorial boards have doctoral degrees and have 20 years' experience in business and management. This factor promotes the introduction of new QA systems within the company as well as quality campaigns. Unlike

MCM and DLM, the company has a separate QA division, which contributes to a faster introduction of QA systems within the company; for example, in addition to ISO9000, another QA system - ISO 22000 - has been adopted. However, this factor was perceived to have a moderate influence for the adoption decisions for all QA systems. Assessment of the top management support factor in the adoption decision showed that this factor has the same perceived influence, a moderate influence (M), in the adoption decision for HACCP and ISO 9000, while it was perceived to have a high influence (H) on the adoption decision of ISO 22000. This may be explained by the fact that ISO 22000 is new and a complicated system that needs more participation of top management in organization and leading quality activities, as well as coordinating departments and divisions within the company to implement this system efficiently.

Table 6-2 Perceived factors influencing the adoption of QAS's -HNM case

Factors \ QA systems	HACCP	ISO 9000	ISO22000
A. Environment context			
i) Legal, national regulations	H	L	L
ii) External supports	L	H	L
iii) Market pressure	H	M	H
B. Organisation context			
i) Firm size	L	L	L
ii) Governance structure	M	M	M
iii) Top management support	M	M	H
iv) Firm's product nature	L	L	H

Note: H high influence; M moderate influence; L low influence

6.1.6 Perceived impacts of QA systems on organisational outcomes

As for the other cases, organisation outcomes were considered as three components: business performance, operational performance and quality performance. There are different perceived benefits after the implementation of an individual QA system. One reason for this might be the later adoption of ISO22000. A marketing manager commented that:

“ company has really benefited from quality programs adopted in terms of increasing turnover in the past three years, improving the position of the company on the market, and improving the behaviour of employees toward quality and safety; however, such achievements obtained over the years resulted more from HACCP and ISO 9000. The new system ISO 22000: 2005, in practice, has just been adopted for one year, which does not allow assessing the results achieved” (HNM-p1).

It was also noted that the QA systems were not necessarily totally responsible for better organizational outcomes. One respondent suggested:

“Our perception of benefits from quality systems is different between each person, ... According to our data, turnover that has been increasing after the scandal does not imply quality programs contributed to all the improvement even if the ‘accident’ shock, like the melamine scandal, recently wiped off the total achievements that we obtained before” (HNM-p2).

However, other comments indicated that the company’s performance has improved when it adopted QA systems, and has improved more over the last 5-6 years, which is an appropriate period for an assessment of the changes in measurements of performance. A marketing manager stated that:

“It is clear that business performance has improved after we adopted quality programs that help in product and market aspects” (HNM-p1).

“... plant’s activities and the involvement of employees in quality control and commitments has improved and this result is considered in part due to the success of quality programs in practice” (HNM-p2).

The company has options to adopt, reject, abort, and resume quality programs. According to these systems’ guides and requirements, QA certifications are valid for 3 years, and after three years, a company may continue or abort participating in the QA system. Currently, HNM still adopts and maintains these QA systems within its plant. This is also evidence of the benefit brought by these systems, and explains why the company pursues them.

To gain an insight into the perceived impacts of QA systems, opinions were synthesized from the questionnaires. Results are shown in Table 6-3. There was perceived to be a higher influence by the HACCP system than other systems on business performance measures.

Respondents cited increased sales and market share as showing “high influence” when it adopted the HACCP system, with ‘low influence’ for ISO 9000 and ‘no evidence’ for ISO 22000. For HACCP, an high influence was also noted for the return on sales and the sales growth rate. ISO 9000 was perceived to have a high influence on profitability, return on sales, and sales growth rate, with less impact on these factors perceived for ISO 22000.

Table 6-3 Perceived impact of QA systems on business performance – HNM case

QA system	Respondent	Revenue	Sales	Market shares	Profitability	Return on sales	Sales growth rate
HACCP	TM	3	4	2	3	4	2
	MM	3	3	4	2	5	4
	EM	5	4	5	4	5	5
	INF ^a	M	H	H	NE	H	H
ISO9000	TM	2	2	2	5	4	4
	MM	5	1	5	3	1	4
	EM	2	1	2	5	5	1
	INF ^a	L	L	L	H	H	H
ISO22000	TM	5	5	3	1	3	2
	MM	2	3	1	3	2	3
	EM	2	2	5	3	1	3
	INF ^a	L	NE	NE	M	L	M

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

Respondents: TM top management; MM middle manager; EM employees

^a INF influence: L low influence; M moderate; H high influence; NE no evidence.

For the impacts from the implementation of QA systems on operational outcomes, the research results indicated there were different impacts for different measures across the individual QA systems. For example, HACCP was perceived to have increased ‘customer satisfaction’, which may be a reflection that quality improved after implementation of this system. This outcome is the same for ISO 9000 in this respect. For ISO9000, other measures were perceived to have improved, such as ‘fast deliveries’ and ‘manufacturing quality’. Despite having been the last system adopted, ISO 22000 was perceived to have made a contribution to manufacturing quality and, in addition, other measures were improved, such as fast deliveries and cycle time. In contrast, customer satisfaction was perceived to have a moderate impact that can possibly be explained by the length of implementation. It was noted that it was hard to implement this system in the initial stage, and at the time it was implemented within the plant, it had been implemented by other firms in the chain.

Table 6-4 Perceived impact of QA systems on operational performance – HNM case

QA systems	Respondents	Unit production costs ^a	Fast deliveries ^a	Cycle time ^a	Design quality	Manufacturing quality	Customer satisfaction
HACCP	TM	2	NA	NA	5	3	4
	MM	1	NA	NA	3	1	3
	EM	2	NA	NA	2	4	4
	INF ^b	H	NA	NA	NE	NE	H
ISO9000	TM	2	1	4	5	4	4
	MM	3	1	1	3	4	5
	EM	5	2	3	2	3	4
	INF ^b	NE	H	NE	NE	H	H
ISO22200	TM	1	2	1	2	5	1
	MM	3	4	1	4	2	2
	EM	3	1	5	1	5	4
	INF ^b	M	H	H	M	H	M

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a 1: large decrease, 2: decrease, 3: somewhat, 4: less decrease, 5: no decrease.

TM top management; MM middle manager; EM employees

^b INF influence: L low influence; M moderate; H high influence.

Assessment of respondents for impacts of QA systems on quality performance found there was benefit relating to outcomes such as perceived defect rate, recall rate, and guarantee costs, all of which decreased strongly. These were assessed to have a high influence after implementing the three QA systems, and this result was the same for all three systems. The remaining measures for quality performance, such as product ‘performance’ showed a high influence for HACCP, with a moderate influence for ISO 22000. It was strange that there was no difference between HACCP and ISO 9000 in measures for quality performance, overall, where it is assessed to be low influence (in other words, less impact resulted from implementation of these systems), while there was ‘moderate influence’ (with a range from ‘increase to strongly increase’) for ISO 22000.

Table 6-5 Perceived impact of QA systems on quality performance – HNM case

Measures	HACCP				ISO9000				ISO22200			
	TM	MM	EM	INF ^b	TM	MM	EM	INF ^b	TM	MM	EM	INF ^b
a. Defect rate ^a	2	4	1	H	2	2	1	H	2	1	2	H
b. Recall rate ^a	1	2	3	H	1	1	1	H	3	1	1	H
c. Guarantee costs ^a	1	2	1	H	2	2	1	H	1	1	4	H
d. Performance	2	4	5	H	4	1	3	NE	5	3	3	M
e. Features	2	1	1	L	4	1	2	L	3	3	2	M
f. Reliability	2	5	4	H	1	3	5	NE	2	2	5	M
g. Conformance	5	1	2	L	2	3	2	L	1	1	5	M
h. Durability	3	2	5	NE	1	3	2	L	1	4	1	M
i. Serviceability	2	4	1	L	4	5	5	H	5	3	2	M
j. Aesthetics	3	1	5	NE	3	2	2	L	5	3	2	M
k. Perceived quality	2	4	3	NE	1	5	2	L	4	3	2	M

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a 1: large decrease, 2: decrease, 3: somewhat, 4: less decrease, 5: no decrease.

TM top management; MM middle manager; EM employees

^b INF influence: L low influence; M moderate; H high influence.

6.1.7 Conclusion

HNM is a dairy company that holds third position for dairy companies in Vietnam based on market share (value). In spite of being a new company that entered the market after 2000, HNM has had a dramatic growth in sales, and has made progress in developing new milk formulas and products. To satisfy the increasing demand for high quality dairy products, the company has sought international standards, and currently has achieved HACCP, ISO 9000, and ISO 22000.

During the adoption of QA systems, top management decisions were affected by internal and external factors which were explored in this research. Differences between the motivation for individual systems were identified. The first motivation for seeking HACCP was satisfying food legislation and national regulations, while ‘improving competitive advantages over competitors’ was the key motivation for the two remaining QA systems. Other motivations were also found to differ between each QA system.

Factors impacting on the adoption decision were found to have no difference between these systems, which emphasized that legal factors were important considerations by the top

manager. Other external factors, such as government support, flexible training courses and external auditing consultation offers from certifying bodies, were considered to have a moderate impact on the decision.

Perceived benefits the company obtained after implementing QA systems were explored. It was concluded that there were different perceived benefits from different QA systems. The HACCP system was perceived to contribute to increases in business performance, such as sales and market share; and ISO 9000 was perceived to have a high impact (increase and strongly increase) for measures of profitability, return on sales, and the sales growth rate. This differed from ISO 22000, which was perceived to have a low impact on these measures. For impacts of QA systems on operational outcomes, the research results indicated that HACCP was perceived to have increased 'customer satisfaction', a reflection of quality improvement after implementation of this system. This outcome was the same for ISO 9000. For ISO9000, other measures were perceived to have improved, such as 'fast deliveries' and 'manufacturing quality'. For impacts of QA systems on quality performance, it was found that there were benefits to outcomes such as the perceived defect rate, recall rate, and guarantee costs, all of which were perceived to have decreased strongly after implementing three QA systems. The result was the same for the three systems. The remaining measures for quality performance, such as product 'performance' showed a high impact from HACCP, but with a moderate influence for ISO 22000.

6.2 International Dairy Products Joint Stock Company (IDP)

6.2.1 Overview

The International Dairy Products Joint Stock Company (IDP) is a domestic dairy company that has its headquarters in Ha Noi. It has two milk plants located in areas of large raw milk access in Northern Vietnam; Truong Yen milk plant in Chuong My district and Ba Vi milk plant in Ba Vi district in Ha Noi city. The company employs 134 full-time staff and employees. The company's turnover was VND85 billion in 2009 (IDP, 2009).

IDP was established in 2004 and is one of the new companies to enter the dairy market. It is a late company participating in the dairy market, so it may have learned some lessons from other companies in the application of new technology and innovations. In its early days, the

company installed a modern production line with advanced technology to process the milk. Its packaging and sealing lines were the most modern in Asia when erected.

The company has gone through growth stages with changes to its organisation structure and name, and new products have been launched into the market. On September 4, 2004, the Ha Tay Foods and Milk Processing Co. Ltd was established. On May 12, 2005, the company was renamed to IDP Co. Ltd. On October 26, 2005, the company was again renamed to IDP Joint Stock Company. In September 2010, the company celebrated the opening of its second milk processing plant in the Ba Vi district. In its product history, the company produced and introduced sterilized milk with the Purina brand in 2004, introduced UHT milk, yoghurt with the z'Dozzi brand in 2005, introduced UHT yoghurt milk with its Disney brand, and in June 2008, it produced sterilized milk, UHT milk, and stir yoghurt milk with the 'Ba Vi' brand (IDP, 2009).

Owing to modern equipment and assembly lines, the product of the company was awarded prestigious prizes, such as the 'Europe golden cup and certification for quality' by the Trade Leader Club in Madrid in Spain (IDP, n.d.). They also produce a vegetable oil product with the brand of Vinaoil. Their products are well-known by consumers in urban areas.

The company can be classified into the group of small businesses in the dairy industry. Its major competitors in milk collection and product markets in the North are Moc Chau Dairy Company (MCM), Elovi Dairy Company, HanoiMilk Company, and BaVi Dairy Company. These companies procure milk in the same area, BaVi district, where the number of cows was 16,000 and number of farms was 5,000 in 2010. However, IDP is procuring over 80% of the volume of milk in this area (approx. 9,600 tons per year) (IDP, 2009). To date, the capital assets of the company are valued at approximately 13 million USD, which includes its main processing assembly line, and collection centres, as well as transport. Equipment and machines in its milk plants include cream separators, UHT, sterilized machines, sealing and filling lines.

6.2.2 Governance structure

The IDP organisation is similar to other joint stock companies that are operating in Vietnam, with ultimate authority vested in a general annual meeting of shareholders.

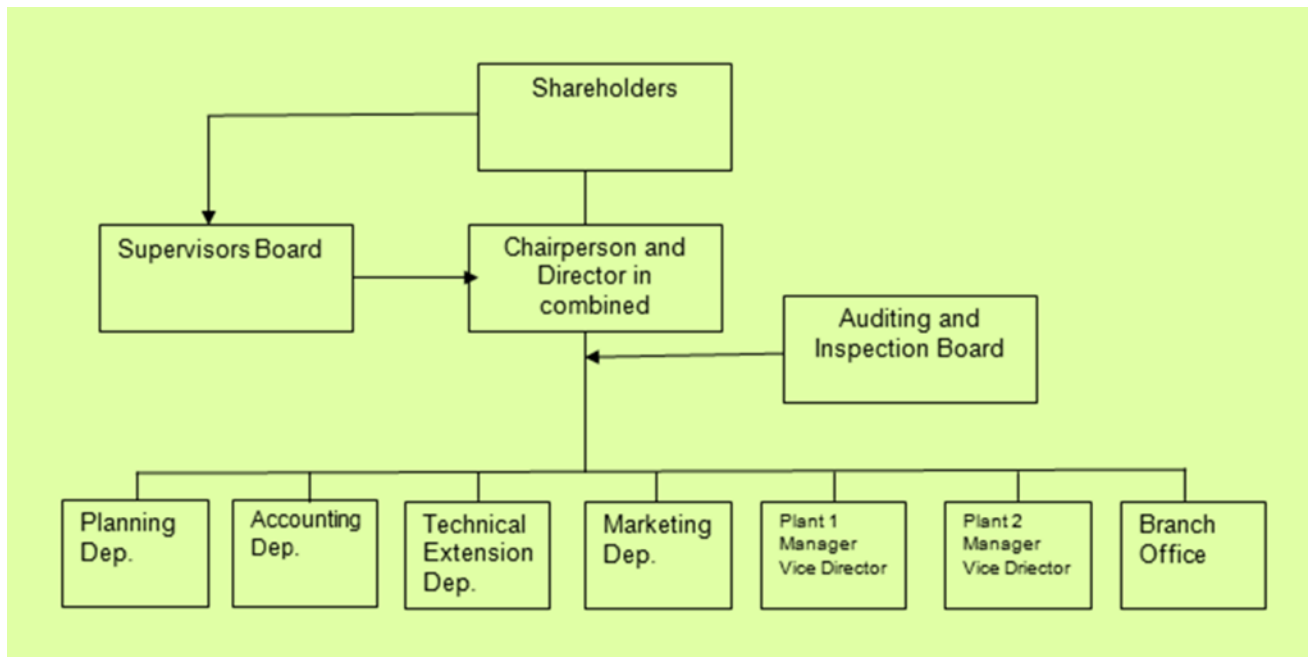


Figure 6-5 Governance structure of IDP

Source: Adapted from IDP company, 2009

The Chairperson of the Supervision Board and Director of the company (a combined position) has the responsibility to organise production and business activities and to implement long term business strategy together with the employees and staff in the company. The Director is also involved in formulating the quality strategy and integrates this with the business strategy of the company. However, detailed quality control and management activities are organised by a quality team managed by a Quality Manager in the Q&A unit, which is under the Planning Division. Activities of this unit include managing quality records in the production processes, formulating technical standards and criteria for material costs, quality of final products, training employees and informing the company on new quality standards. Quality teams in plants are under the Q&A unit, and are responsible for quality control in plants, such as record information, documentation and reporting to the Quality Manager. In IDP's organisation structure, the Q&A unit is in the Division of Planning, which is similar to the MCM case.

6.2.3 Supply chain structure

The IDP supply chain is shown in Figure 6-6. It is basically similar to that of HNM. Raw milk delivered to the company is sourced mainly from the Ba Vi area in Ha Noi, and provinces around its milk plants, such as Hoa Binh, Hung Yen, and Vinh Phuc. Similar to

HNM, the company purchases milk from small farmers with or without signed contracts, but most transactions are ‘spot market’. For contracted farmer suppliers, the IDP procures all the milk they produce, and has subsidization policies to benefit these supplies. The company supports farmers through supplying credit without interest, and farmers pay back by deduction from their milk supplies. This loan helps farms to purchase a milking machine and a bulk tank. This support that IDP supplies is the same in the other companies, such as DLM and VNM, who also supply credit at a low or free interest rate and agree to purchase all milk the farms produce. The company also collaborates with the Ba Vi Grassland Centre to provide training courses on dairy cow farming skills to farmers. This contributes to improving the quality of the milk produced on the farms. Recently, the company has established a training centre with the dual purpose of demonstration and training (Ba Vi dairy farm model). This centre plans to train 16,000 farmers from 8,000 farms on farming skills, and milk hygiene. Through such training, farmers can utilise their land to provide feed for their cows (Baomoi.com, 2012). This centre is a large demonstration dairy farming the country’s North, covering 25 hectares and costing an initial VND40 billion. This Ba Vi dairy farm model includes breeding, feeding and milking sections using hi-tech equipment imported from Sweden’s DeLaval. The aim of the dairy farm is to help farmers establish their own farms in an efficient way. This is similar to VNM and DLM who also have training centres.

Suppliers in the IDP case are similar to suppliers in the HNM case, but there are no cooperatives for suppliers. There are larger numbers of small farm supplying to IDP than to HNM and MCM. Farms raising 4-5 milk cows account for 83% of dairy farms in this area (Tuyen, 2007; Suzuki, 2005).

IDP has other input suppliers for materials such as packs, sugar, machines and equipment for its production. They are TetraPak, DeLaval, and APV. This is similar to other cases. These input suppliers are largely foreign companies who have more sophisticated technology and experience in supplying inputs to the dairy industry in Vietnam.

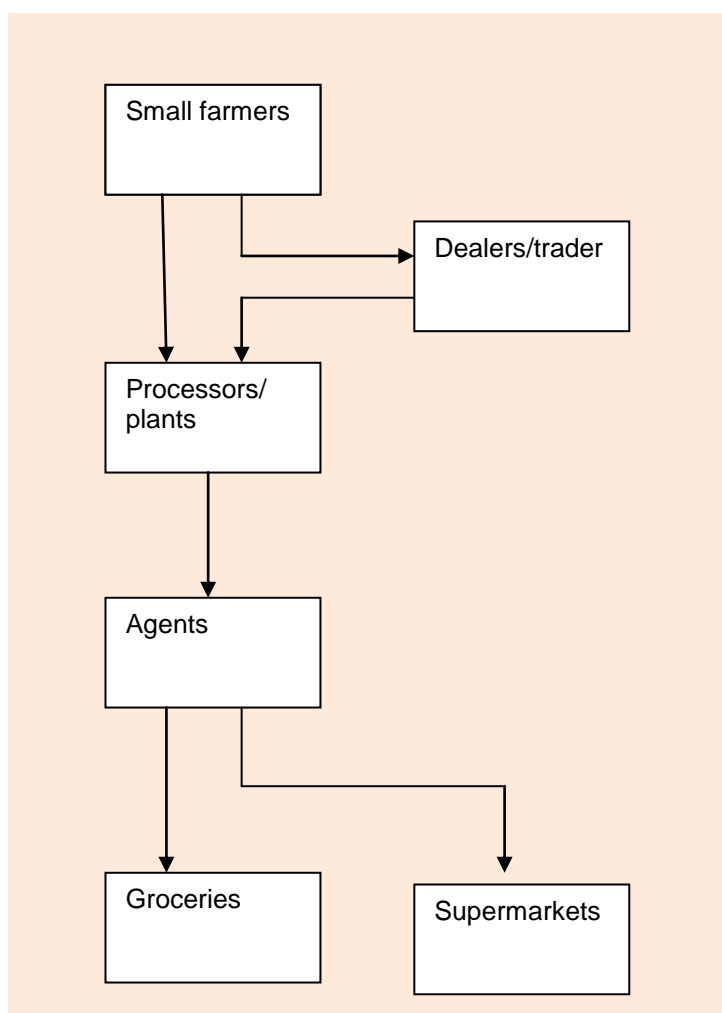


Figure 6-6 Supply Chain of HNM

Source: Adapted from IDP company, 2010.

IDP has two milk processing plants, the Chuong My plant with a capacity of 60 tons per day, and its Ba Vi plant with a capacity of 80 tons per day. The company procures 80% of its raw milk from farmers in the Ba Vi area (or 9,600 tons per year). The plant sizes are larger than those of MCM but smaller than the capacity of VNM, DLM, and HNM plants.

There are differences in this supply chain compared to other company supply chains. Unlike MCM and DLM, there are no collection systems owned by the company. Most farmers and traders sell milk directly to the plants. If a farm, or farms in a collective, produce a volume of at least 300 kg/day, the company sends a truck to transport the milk to the plants. As mentioned above, most farmers have not signed a contract with the company to supply raw milk, and these transactions are based on a trust relationship that is overseen by a third party,

the District People's Committee, which is the government administration authority. This is the same system used by HNM in the procurement of milk from small farmers.

The company has distribution system for dairy products in domestic markets, mainly in the urban areas of the Northern provinces. The company has signed contracts to supply end products to 140 agents in urban Hanoi. This market coverage is smaller than for other cases, such as HNM, MCM, and VNM. Grocery stores and supermarkets are the final retailers in the IDP's dairy chain and supply of dairy products to end consumers. This IDP retail network is also smaller than those in other cases such as HNM, VNM, and DLM.

6.2.4 Business strategy and QA systems

The company's long term strategy is to supply high quality and safe products to consumers with its Ba Vi brand. To carry out this strategy, the company has invested in technology, processing, and also has established good relationships with its farmer suppliers. A vice-manager of a milk plant noted that:

“ The company supplied credit to farmers to buy a cow, milking machines, filter cloth, and utensils at zero interest rate, and assured the farmers they would purchase all their milk” (IDP-p2) .

In addition, it is one of the later companies to enter the market, so it may have gained from the experience of other companies. Recognising the important role of quality in the competitive market, and in order to attract new customers, the IDP Company obtained ISO 22000/2005 certification for the Chuong My milk plant in 2006. However, due to its small company size and its limited resources, the company has been not been able to afford to implement more than one QA system at this stage. A plant manager-cum-vice-Director commented:

“We had difficulty in making a decision to adopt quality programs. Applying more than one quality program would extend our limited financial resources. We are not able to afford this at this stage because our business is very small. An additional QA may be used to ensure one quality standard when another plant is planned” (IDP-p2).

6.2.5 Perceived factors influencing the adoption of QAS's

6.2.5.1 Motivation

Opinions from top management and middle managers about the motivation of the company to adopt QA systems were gained through semi-structured interviews. The reasons given for adopting ISO22000 were enhancing the company's image, quality improvement, and competitive advantage. As commented by a Director of the company:

“we need to achieve quality systems because we create differentiation in the products and the company's image on the market, where our rivals day by day become strongly competitive in the market segment of our products. This system [ISO 22000] is newly introduced into the firm at present, so it can bring us better product quality and provide a leading competitive advantage over rivals...” (IDP-p1).

Other different reasons for seeking ISO 22000 were to meet food legislation, improve production processes, reduce waste and defects, gain the confidence of consumers, and to reduce recall rates. A Plant Manager stated that:

“A Quality system is important for the existence of our company. Food law and Decrees become strict and force us to improve quality through upgrading using new technology and seeking quality systems. This system [ISO 22000] will contribute to cost and defect reduction in the production process, and attract customers and make them confident in buying our dairy products” (IDP-p2).

Further perceptions of top managers gained from questionnaires are summarised as follows:

Table 6-6 Motivations for seeking QA system -IDP case

Top five motivations	ISO 22000
1	Satisfying food law and national regulations (E)
2	Improving competitive advantages over competitors (E)
3	Improving product quality (I)
4	Improving plant efficiency (I)
5	Enhancing the company's image on the market (E)

Note: I internal; E external

The main reason for IDP to adopt ISO 22000 was satisfying and meeting laws and national standards related to food safety and hygiene sanitation. It is clear that in trading food products, safety is of importance to consumers and society, and it is also a strategy to pursue the long term profitability of the company. The Law and Decrees that were conformed to by the company are complex, requiring involvement of all employees and top management. The lowest ranking reason was improving the company's image on the market, which reflected the fact that the company does not use ISO 22000 as a marketing or public relations tool, and in practice, consumers in Vietnam have a limited knowledge of these general quality systems.

6.2.5.2 Perceived factors influencing the adoption of QAS's

As noted before, the impact of the government through issues such as legislation and support systems affects the company adoption decision. Government assistance includes support for consultancies and certification body fees, and the cost of training courses. External support from the national standards body, consultants and the certification body also influenced the adoption decision. Feedback from the top management indicated the company received support from the national standards organization, STAMEQ, such as providing information when the company searched for information about the quality standards. A Director of IDP commented:

“...To pursue quality and better meet the demand for dairy products by consumers, our company seeks international standards that are not popular in Vietnam, in which ISO 22000/2005, perhaps, is the best these days. In this search, we received the valued support from the Department of Scientific and Technology, and the registrar body, QUARCERT.”
(IDP-p1).

Market pressures from competitors, and the requirements of buyers are also factors that can affect the adoption decision; however, this factor was perceived to have a low impact. It was explained that IDP has a small market share, like MCM, so it focuses on specific products where it has a strong advantage, such as fresh milk and stir yoghurt. In addition, the company exploits its “Ba Vi” brand that is well known by consumers. As mentioned above, consumers in Vietnam have limited understanding of quality assurance, but they know the history and reputation of a brand when making a choice of dairy products. A Director of IDP continued:

“Consumers still believe and trust in purchasing dairy products [Ba Vi brand] from us, and our mission is supplying the best and safest dairy products to consumers using all measures

possible, in which [we] are applying quality standards in a voluntary way and paying for this system, although agents and consumers do not require us to achieve do this” (IDP-p1).

A summary of factors affecting the adoption decision was collected from questionnaires, and is shown in Table 6-7:

Table 6-7 Perceived factors influencing adoption of ISO 22000 – IDP case

Factors	ISO 22000
A. Environment context	
i) Legislation and national regulations	H
ii) External support	H
iii) Market pressures	M
B. Organisation Context	
i) Firm size	L
ii) Governance structure	M
iii) Top management support	H
iv) Product natures	H

Note: H high influence; M moderate influence; L low influence

Firm size was cited by respondents as having a low influence on the adoption decision. It was explained that the company’s assessment happened when it achieved ISO 22000 certification for its first plant. The governance structure was a factor perceived to have a moderate influence on the adoption decision, while other factors such as top management support and product nature were perceived to have a high influence on the adoption decision. This reflected the fact that ISO 22000 was new to the company; therefore, involvement of directors and plant managers in providing direction and leadership was important. Product nature was also important because diversification of products is one of the aims in the company strategy. This is related to verification and setting up procedures for each product produced when the company adopts the ISO 22000 system.

Because the company adopted only one system, ISO 22000, comparison between this system and other systems is not applicable for this case. However, further cross-case comparisons related to these factors will be presented in Chapter 7.

6.2.6 Perceived impact of QA systems on organisational outcomes

With respect to business performance, according to the opinions of top management and a middle manager, revenue increased after the company adopted ISO 22000 in 2007. However, market share did not improve greatly and remains small. The Chairperson of the Supervision Board stated that:

“from establishing the company, we have chosen a quality system such as ISO 22000 that integrates both systems, HACCP and ISO 9000. The system benefits our company. Business and production has been improved, and revenue in later years increased more than past years. In 2006: revenue was VND124,435 million, 2007: VND146,342 million, 2008: VND175,162 million, 2009: VND204,765 million; however, our market portion was 2.7 percent in 2009” (IDP-p1).

An important thing identified was that the QA system contributed to improving production processes through mobilizing employees to participate in the quality philosophy with respect to production and saving time and materials. Finally this system helps the company produce high quality and safe dairy products that meet the increasing demand of consumers for quality. He continued to note that:

“we committed to supply good and safe products to consumers, and at present, we have achieved this. Quality program help us with this achievement”(IDP-p1).

Further analysis was undertaken through rating measures gained from the questionnaire, and results are summarized in Table 6-8, Table 6-9, and Table 6-10. With respect to business performance, the QA system the company adopted was perceived to have a low impact on revenue, and have a moderate impact on sales. In other words, revenue was perceived to have decreased and sales were perceived to be unchanged, which may be explained by the fact that ISO 22000 that has only been adopted for four years and more positive effects have yet to emerge. However, a high perceived impact on measures of profitability and sales growth rate were noted which may indicate that ISO22000 was newly introduced and played a role in image advertisement, rather than improving product quality and reducing production costs (Table 6-8).

Table 6-8 Perceived impact of QA systems on business performance

Respondent	Revenue	Sales	Market shares	Profitability	Return on sales	Sale growth rate
TM	2	3	4	1	5	2
MM1	4	4	3	4	3	5
MM2	3	3	5	4	5	2
EM1	2	3	5	1	3	3
EM2	2	3	1	4	2	3
INF ^a	L	M	H	H	NE	NE

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

TM top management; MM middle manager; EM employees

^a INF influence: L low influence; M moderate; H high influence; NE no evidence.

With respect to operational performance, Table 6-9 showed that perceived production costs increased. This was a reflection of the fact that the company has only just recently adopted this system. This increase is consistent with the observation that costs often increase in the initial years when a company adopts a QA system. However, measures of design quality and customer satisfaction were perceived to be improved, so perhaps the principles and procedures of this system that have HACCP features have led to an improvement of packaging and design, which can attract customers.

Table 6-9 Perceived impact of QA system on operational performance

Respondent	Unit production costs ^a	Fast deliveries ^a	Cycle time ^a	Design quality	Manufacturing quality	Customer satisfaction
TM	1	2	2	4	2	1
MM1	5	2	3	4	2	5
MM2	1	1	1	5	2	4
EM1	1	1	2	1	2	5
EM2	3	3	1	3	1	3
INF ^b	H	H	H	H	L	H

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a 1: large decrease, 2: decrease, 3: somewhat, 4: less decrease, 5: no decrease.

TM top management; MM middle manager; EM employees

^b INF influence: L low influence; M moderate; H high influence.

As seen in Table 6-10, it was perceived that there were some changes in product performance. In particular, the defect rate was perceived to decrease after implementing ISO 22000, and overall, it was perceived to have a high impact. Other measures, such as features, serviceability, and perceived quality, were perceived to have a positive impact on product performance since QA certification.

Table 6-10 Perceived impact of QA system on product performance

Measures	TM	MM1	MM2	EM1	EM2	INF ^b
a. Defect rate ^a	1	2	1	2	2	H
b. Recall rate ^a	4	3	3	1	3	M
c. Guarantee costs ^a	1	2	3	4	4	NE
d. Performance	5	2	2	3	5	NE
e. Features	5	5	5	4	4	H
f. Reliability	3	3	4	4	3	M
g. Conformance	2	3	1	2	2	L
h. Durability	3	3	1	1	5	NE
i. Serviceability	5	5	5	1	4	H
j. Aesthetics	5	4	1	3	2	NE
k. Perceived quality	4	5	2	1	5	H

Note: 1: no increase, 2: less increase, 3: somewhat, 4: increase, 5: large increase.

^a 1: large decrease, 2: decrease, 3: somewhat, 4: less decrease, 5: no decrease.

TM top management; MM middle manager; EM employees

^b INF influence: L low influence; M moderate; H high influence; NE no evidence.

Once again, within-case comparison between this system and other systems was not applicable as the company adopted only one system, ISO 22000. However, further comparisons of the benefits across cases will be presented in Chapter 7.

6.3 Chapter Conclusion

This Chapter contains summary descriptions and results for two small dairy companies selected for this study as a basis for comparison with the in-depth MCM case. These small dairy cases were described briefly in terms of their historical development and processes, production capacity, types of product, supply chain, and governance structure. Strategies and quality assurance systems the companies apply were also identified. Similarities and differences between these companies will be explored in Chapter 7, the cross-case analysis chapter.

Chapter 7

Cross-case Analysis, Discussion and Conclusions

Chapter 4, 5 and 6 contain descriptions of individual cases with associated within-case analysis. In contrast, this Chapter compares the findings of the five cases, highlights differences and similarities, and puts forward arguments explaining these. This study produced a number of findings related to the research questions. These are discussed in Section 7.1. However, some findings appear to be related to more than one research question and generated higher level insights. These insights are presented in Section 7.2. Finally, a discussion of the significance and contribution of the research to existing knowledge and practice is presented. The Chapter concludes with a summary, a discussion of the limitations of the study and recommendations for further research.

7.1 Discussion on the Main Findings

7.1.1 Characteristics of supply chains, processes and QA systems

7.1.1.1 Characteristics of supply chains

The selected supply chains differed in the degree of vertical integration of the chain and role of the processors in this vertical coordination (Table 7-1). Three of case study chains showed a moderate degree of vertical integration, while one chain exhibited a low degree of vertical integration by the processors, while the remaining chain did not integrate any functions beyond processing.

Those processors with a moderate degree of vertical integration had their own farms (large or small), their own collectors, did their own processing, and had their own wholesalers and retail agents. However, they also procured milk from private farmers, and sold end products to private wholesalers and retailers. For the remaining processing firms, all milk is purchased from private farmers, then is processed and manufactured in milk plants (small scale). These firms also have agents for distribution of their products, but that is small scale. Two cases have overlapping supply areas with farmers involved in more than one supply chains.

Table 7-1 Characteristics of supply chains

Case	Chain structure	Participants
MCM	Vertical integration by processor	Private farmer suppliers, Own farm (small), collectors, processors, wholesalers, and retail agents
DLM	Partial vertical integration by processor	Private farmer suppliers, Own farms (large), collectors, processors, wholesalers, and retail agents
HNM	Spot market transaction	Private farmer suppliers, traders and own collectors, processors, wholesalers, and retail agents
VNM	Partial vertical integration by processor	Private farmer suppliers, Own farms (large), collectors, processors, wholesalers, and retail agents.
IDP	Spot market transaction	Private farmer suppliers, traders, collectors, processors, wholesalers, and retail agents

When milk was procured from private suppliers, all processors used a combination of contract arrangement and spot purchases. For larger farmers and cooperatives, written contracts were used to secure supply for MCM, DLM and VNM. For small farmers, transaction costs of doing this are too high, and so, spot transactions are used instead. However, unstable milk sourcing could happen in these cases because companies were dependent on collection staff and their relationships with farmers, and purchasing price arrangements.

7.1.1.2 Chain processes

Table 7-2 shows the chain processes for the five cases. In all cases, milk was produced on farms that varied from small to large, and with different forms of ownership. After milking, farmers in four cases delivered milk to collection centres by their own transport means, or the company arranged to transport milk for large farms and groups of farms. Milk that was procured from farmers and intermediaries was stored at collection points. There were differences in collection points in the degree of quality equipment and cooling systems, as well as the participants involved in this stage. In some cases, the company did the milk collection themselves, while other cases, intermediaries were used. Companies purchasing milk from intermediaries found this a convenient arrangement to transport and reduce their transaction costs, but it is more difficult to control milk quality. After being stored in collection points, milk is then transported to plants for further processing. Milk collected from farmers' deliveries is weighed and quality checked. Price is formulated according to quality levels of milk delivered by farmers. However, the gap between the prices for normal and high quality milk was not big, so would not necessarily encourage farmers to produce high quality milk.

Raw milk was processed in plants. Three case firms own large plants and the remaining case firms own small plants. There was not much difference in the processes at this stage. All plants applied advanced technologies and produced the same main products, with the only real difference being plant capacity. In distribution, there were differences in scale of wholesalers in the number and warehouse capacity. There is similarity in the arrangements for cooling when transporting milk from processors to wholesalers.

Three of the five companies gave support in various ways to upstream and downstream participants, and the remaining companies did not give any support, instead applying competitive purchasing regimes. However, support was mainly devoted to large farms, not small farms. In distribution, all the companies supported contracted wholesalers and retailers but with different flexible arrangements.

Table 7-2 Supply chain processes and processor activities

Stages	MCM	DLM	HNM	VNM	IDP
Production	<ul style="list-style-type: none"> .Own farms (small), private farms, . Company support inputs, vet service; a loan for cooling tanks; gives training courses. . farmers deliver milk to collection stations or company sends tank trucks to transport (large farms or group of small farms) 	<ul style="list-style-type: none"> . Own farms (large), private farms (small, large) . Company contracted and supported large farms, i.e. credit, provide vet services, give training courses . farmers deliver milk to collection points and/or plants 	<ul style="list-style-type: none"> . Private farms (small) . Applies flexible and competitive prices when buying milk . Farmers deliver milk to collection points and/or plants 	<ul style="list-style-type: none"> .own farms (large), private farms (small, large) . Company offers training courses, assist farmers to access credit and loans . farmers deliver milk to collection points and or plants 	<ul style="list-style-type: none"> .Private farms (small), contracted to cooperatives . applies competitive purchasing prices when buy milk . farmers deliver milk to collection points and or plants
Collection	<ul style="list-style-type: none"> . Own collectors with collection centres . poor facilities and quality testing equipment . received milk from farmers. weigh, quality test and inspect, . pay in different forms; bonus for milk that exceeds normal requirements . own company trucks; transport milk to plants 	<ul style="list-style-type: none"> . own collectors, traders, and cooperatives . modern facilities, good quality test equipment . receive milk from farmers . weigh, quality test and inspect . pay in different forms . bonus for milk that exceeds normal requirements . own company truck; transport milk to plants 	<ul style="list-style-type: none"> . own collectors without collection centres . weigh and quality check . pay cash . transport arrangement to plants 	<ul style="list-style-type: none"> . own collectors with collection stations, private traders, cooperatives . modern facilities, good quality test equipment . weigh, visually inspect, and lab tests . pay in different forms . own company trucks; transport to plants 	<ul style="list-style-type: none"> . own collectors, traders, cooperatives . weigh, quality inspected visually . pay in cash . transport arrangement to plants
Processing	<ul style="list-style-type: none"> . milk made into dairy products: UHT, fresh, yoghurt, milk cake, candy in plants (small) . product finished and stored in warehouse 	<ul style="list-style-type: none"> . Milk made into dairy products: UHT, fresh, yoghurt, milk powder in plants (large) . product finished and store in warehouses 	<ul style="list-style-type: none"> . processing UHT, fresh milk, yoghurt in plants (large) . product finished and stored in warehouse 	<ul style="list-style-type: none"> . processing dairy products: UHT, fresh, yoghurt, powder, condensed milk in plants (large) . product finished and stored in warehouses 	<ul style="list-style-type: none"> . processing fresh milk, UHT, yoghurt in plants (small) . product finished and stored in warehouses
Distribution	<ul style="list-style-type: none"> . wholesale centre (small), simple, one tier 	<ul style="list-style-type: none"> . 7 first tier distributors (large) . large, complicated with 2-3 tiers 	<ul style="list-style-type: none"> . wholesalers (small, private) . simple, one tier 	<ul style="list-style-type: none"> . head distributors (large, own, private) . Show rooms (own) . tier 2 distributors (own, private) . Large, complicated 2-3 tiers 	<ul style="list-style-type: none"> . wholesalers (small, private) . simple, one tier
Retail	<ul style="list-style-type: none"> . support freezer for agents . support delivery to agent by cooling trucks 	<ul style="list-style-type: none"> . support banner, market umbrella, chairs 	<ul style="list-style-type: none"> . not supported 	<ul style="list-style-type: none"> . support freezers, fridges, banners, posters 	<ul style="list-style-type: none"> . not supported

7.1.1.3 Quality processes

Table 7-3 shows a comparison of quality processes in the case study supply chains. In five cases, milking was done in the open in pasture, or in milking barns. Milking shed systems were used on large farms, and hand milking and micro-milking machines were used on small farms. There was a difference in time that milk was stored and cooled on the farms, depending on their milk cooling capability. In four of five cases, milk was cooled at collection points or plants, and in one case, milk was cooled on the farm. Differences in hygiene practices that farmers followed were not found. In addition, quality checking with test equipment by farmers on the farms did not exist. Three of five case study processors had their own collection points that differed in facilities and equipment. One had poor facilities and testing equipment, and two had more modern facilities. One of two cases had additional chilling systems located beside collection points, where milk may be stored for a longer time before it was transported to plants. Other processors did not have this capability. Quality criteria applied in grading and purchasing milk from farmers and others by companies were found to be different.

There was not much difference between case study firms in processing. Milk was unloaded, quality checked in reception, stored in silos, then moving to production lines to make into dairy products and packaging, stored in temperature controlled warehouses for distribution, where employees conduct hygienic practices and comply with QA system requirements. However, the degree of compliance was different from case to case. Moreover, there were also differences in equipment used in storage, warehouse, processing machines, and practices for cleaning or disinfecting machines.

In distribution, there were simple practices to assure dairy product safety and hygiene. To preserve dairy products, sellers used temperature regulated systems, but conducted hygienic practices infrequently. There were differences in transporting dairy products from wholesalers to retailers and agents. In three of the five cases, cool trucks were used, and for the remaining cases, other transport means, such as trucks and motorbikes, were used.

Table 7-3 Quality processes

Stages	MCM	DLM	HNM	VNM	IDP
Production	<ul style="list-style-type: none"> • Hand and/or mechanical milking - farmer • Cleaning utensils, machines-farmer • Hygienic practices-farmer • Cool milk (large farm)-farmer • Transport to collection points or plants (small farms)-farmer; company send truck (large farms)-company staff 	<ul style="list-style-type: none"> • Hand and/or mechanical milking - farmer • Cleaning utensils, machines-farmer • Hygienic practices –farmer • Cool milk: no • Transport to collection points or plants - farmer 	<ul style="list-style-type: none"> • Hand milking - farmer • Cleaning utensils, machines-farmer • Hygienic practices –farmer • Cool milk: no • Traders come to collect • Transport to collection points or plants – farmer or trader, 	<ul style="list-style-type: none"> • Hand and/or mechanical milking - farmer • Cleaning utensils, machines-farmer • Hygienic practices –farmer • Cool milk: no • Transport to collection points or plants - farmer 	<ul style="list-style-type: none"> • Hand milking - farmer • Cleaning utensils, machines-farmer • Hygienic practices –farmer • Cool milk: no • Traders come to collect • Transport to collection points or plants – farmer, cooperative truck
Collection	<ul style="list-style-type: none"> • Weigh-staff • Visual check and test with main quality criteria-staff • No grade • Milk stored: short time-staff • Tank truck transport to plants-staff 	<ul style="list-style-type: none"> • Weigh, visual check-traders • Weigh, visual check and test with main quality criteria-staff • Grade: yes • Stored longer time, in chilling stations -staff • Tank truck transport to plants-staff 	<ul style="list-style-type: none"> • Weigh, visual check-traders • Weigh, visual check and test with main quality criteria-staff • No grade • Tank truck transport to plants-staff, traders 	<ul style="list-style-type: none"> • Weigh, visual check-traders • Weigh visual check and test with main quality criteria-staff • Grade: yes • Store short time –staff • Transport to plants-staff 	<ul style="list-style-type: none"> • Weigh, visual check-traders • Weigh, visual check and test with quality criteria-staff • No grade • Tank truck transport to plants-staff, traders
Processing	<ul style="list-style-type: none"> • Milk made into dairy products • Hygienic practices followed by employees • Met requirements of QA systems:minimum- employees • Test finished products • Product stored in warehouses for distribution • Machinery : dated • Capacity: small 	<ul style="list-style-type: none"> • Milk made into dairy products • Hygienic practices followed by employees • Met requirements of QA systems: Exceed- employees • Test finished products • Product stored in warehouses for distribution • Machinery : modern • Capacity: large 	<ul style="list-style-type: none"> • Milk made into dairy products • Hygienic practices followed by employees • Met requirements of QA systems: Exceed- employees • Test finished products • Product stored in warehouses for distribution • Machinery : modern • Capacity: small 	<ul style="list-style-type: none"> • Milk made into dairy products • Hygienic practices followed by employees • Met requirements of QA systems:minimum- employees • Test finished products • Product stored in warehouses for distribution • Machinery : dated • Capacity: small 	<ul style="list-style-type: none"> • Milk made into dairy products • Hygienic practices followed by employees • Met requirements of QA systems:minimum- employees • Test finished products • Product stored in warehouses for distribution • Machinery : modern • Capacity: small
Distribution	<ul style="list-style-type: none"> • Cooling trucks transport to wholesalers-own drivers • Product stored in warehouse-staff • Warehouse temperature regulated 	<ul style="list-style-type: none"> • Cooling trucks transport to wholesalers-own drivers • Product stored in warehouse-staff • Warehouse open 	<ul style="list-style-type: none"> • Cooling trucks transport to wholesalers-own drivers • Product stored in warehouse-staff • Warehouse open 	<ul style="list-style-type: none"> • Cooling trucks transport to wholesalers-own drivers • Product stored in warehouse-staff • Warehouse open 	<ul style="list-style-type: none"> • Cooling trucks transport to wholesalers-own drivers • Product stored in warehouse-staff • Warehouse open
Retail	<ul style="list-style-type: none"> • Cool truck transport to agents • Products stored in freezers, fridges • Use of hygienic practices not frequent 	<ul style="list-style-type: none"> • Trucks transport to retailers • Products stored in freezers, fridges • Use of hygienic practices: not frequent 	<ul style="list-style-type: none"> • Trucks and motorbike transport to retailers • Products stored in freezers, fridges • Use of hygienic practices: not frequent 	<ul style="list-style-type: none"> • Trucks and motorbike transport to retailers • Products stored in freezers, fridges • Use of hygienic practices: not frequent 	<ul style="list-style-type: none"> • Truck and motorbike transport to retailers • Products stored in freezers, fridges • Use of hygienic practices: not frequent

7.1.1.4 QA systems

Table 7-4 shows quality systems in place for all cases. There are quality systems used in all stages of the supply chain for all cases. However, there are some differences in standards and QA systems adopted by actors in particular supply chains. In four cases, farmers followed hygienic practices to produce safe milk, and in one case, farmers also complied with GAHP requirements, although they were not certified. Private farms followed national and sector/industry standards on either a mandatory or volunteer basis. However, inspection for compliance of these standards by related organisations and local authorities was not frequent. In three of five cases, farms owned by processing companies also followed their companies' standards. Milk quality is related to milking practice, and relies on the equipment, storage time, cooling systems, and transport, thereby including all hygienic practices used by farmers.

At the collection stage, three of the five cases had their own collection points that followed national and ministerial standards for hygienic requirements, such as cleaning, and disinfecting tank containers, and cooling milk at proper temperatures. These collection points also conform with the requirements of the processing company. The collectors sent by the companies to supply areas to collect milk followed organisation standards. Private collectors, or traders, collecting milk from farms appeared not to follow any standard. In their procurement processes, milk was stored for a longer time in tank trucks, because of the purchasing arrangements, which affected milk quality. Variation of quality milk will also depend on the storage equipment, and hygienic practices that staff conduct at this stage.

There were differences in the adoption of QA systems at the processing stage. All cases complied with national and ministerial standards, but differed in adoption of international standards they had in place (HACCP, ISO 9000, and ISO 22000). This feature is discussed further in the following section.

At the distribution stage, for all selected cases, wholesaler and retailers gained national food hygiene certifications. These standards are mandatory for traders in food trading. However, inspection by related organisations and local authorities was limited.

Table 7-4 Quality systems and standards adopted by actors in supply chains

Actors	SC –MCM	SC-DLM	SC-HNM	SC- VNM	SC- IDP
Farmer Supplier	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • GAHP/GMP • Organisation standards-own farms 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • Organisation standards –own farms 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • Organisation standards-own farms 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards
Collector	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • Organisation standards-own collectors 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • Organisation standards-own collectors 	<ul style="list-style-type: none"> • Organisation standards-own collectors • No standards-traders 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • Organisation standards-own collectors 	<ul style="list-style-type: none"> • Organisation standards-own collectors • No standards-traders
Processor	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • HACCP, ISO9000 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • HACCP, ISO9000, ISO22000 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • HACCP, ISO9000, ISO22000 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • HACCP, ISO9000 	<ul style="list-style-type: none"> • Industrial and Sector standards • National standards • ISO22000
Wholesaler	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications
Retailer	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications 	<ul style="list-style-type: none"> • National food safety certifications

7.1.1.5 Discussion

With respect to vertical integration and relationship characteristics, the firms vary their ability to control quality along the chain through their own quality processes. In particular, they have limited control over on-farm quality processes when they buy from private farmers. Potential quality issues could arise with supply from small farmers and with milk from independent collectors. However, it seems that quality is better controlled on large farms, which are supported by the companies. Differences in facilities and quality practices used by farmers result in quality variation of milk supplied to processors. However, limited high quality milk is delivered to the collection points, because the pricing does little to encourage quality. Thus, milk production is a weak link in the chain. This phenomenon was also noted by several other researchers (Umm et al., 2011; Loc, 2006), who showed processors found it difficult to manage quality on the farms, especially on small farms that are typical in developing

countries, and because of fragmentation of the producers. It is reported that the processing companies had a strategy to reduce transaction costs through purchasing milk from independent collectors and intermediaries, and that their concerns focused on quantity rather than quality (Umm et al., 2011). Consistent with this research, prior research has found processors helped large and medium farms in preference to small farms (Swinnen et al., 2004; van Berkum, 2004).

The processing stage was well controlled by processors, although differences in technology and hygienic standards also cause variations in product quality between cases. Quality issues might also arise at the distribution stage, where product preservation and transport issues are more of a focus than quality and hygienic practices. Control over the product in the distribution stage is often under-emphasised because of specific features of the dairy products that are regulated. For example, the shelf-life of processed products varies depending on the kind of product; i.e. UHT and fresh milk. In this study, it was found that there were issues with cooling in transport and refrigerator equipment used, and evidence of poor hygienic practices in the distribution phase along with poor product preservation strategies. This is caused by the small scale and fragmented nature of the distribution system, which limits investment in improving quality and product preservation. As well, inspection by related organisations and local authorities is infrequent, which can potentially mean quality issues are not identified. This phenomena has also been referred to in prior research by Farina et al. (2005); Loc (2005), along with limited enforcement of compliance with safety standards (Umm et al., 2011).

Responsibility for monitoring was a shared function, and local authorities' compliance inspection was inconsistent and inefficient. National and ministerial standards were implemented by companies but there was limited, and so ineffective, monitoring of milk safety. Requirements of these standards are lower than those of international standards. These findings are consistent with those observed in other studies in developing countries, such as in the dairy sector in Pakistan (Umm et al., 2011).

7.1.2 Processing firms and QA systems

The five processing firms represent a very heterogeneous group in terms of size, QA systems, and the number of years they have been certified. Firm size, when measured by number of employees, ranges from small (1-200 employees for cases MCM, HNM, and IDP) through to

large (over 3,000 employees) for cases DLM and VNM. The range is also large when viewed by turnover. The smallest firm had a turnover of VND400bn (=\$US20m), and the largest firm had a turnover of VND 20,000bn (=\$US1bn).

Four of the five firms have applied both plant based HACCP and ISO 9000, and three of the five firms are certified for ISO 22000. The length of time that firms were certified for QA systems ranges from one to 10 years.

Adoption of the QA systems was found to differ in respect of the time of implementation, time required to implement the system, and external certifying bodies used by the companies. This is shown in Table 7-5. Time required to implement depends on the type of system and the potential adaptation of that system within the company. The implementation of QA systems is reliant on internal factors, including investment, human resources, the technology the firm deploys, and upgrading possibilities to satisfy requirements. It is known from secondary sources that the required time to implement ISO 9000 was, on average, 18 months and that costs ranged from US\$1,000 - 1,500 per employee (Boiral, 2003). There is also US\$5,000 for the registration fee and external consultation for each QA system in Vietnam (VPC, 2010). When upgrading technology and machines to meet requirements of the HACCP system, small firms can face challenges in financial and human resources. For example, they need to invest more into plants where equipment and machines are out-dated, and in the case of MCM, the investment for this work was up to 4 billion VND (US\$2.0 million) (Moc Chau Company, 2009). Such investment may be big burden for small firms if they adopt more than one QA system for a single site or get quality certification for multi sites.

Table 7-5 The adoption of QA systems by dairy firms

Case	QA systems (years)	Required time (months)	Certifying bodies
MCM	HACCP (9 years), ISO 9000 (7 years)	HACCP: 12 months, ISO 9000: 18 months	Domestic /QUARCERT
DLM	HACCP (8 years), ISO 9000 (10 years), ISO 22000 (1 year)	HACCP: 12 months, ISO 9000: 12 months, ISO22000: 12 months	Foreign/TUV
HNM	HACCP(6 years), ISO 9000 (6 years), ISO 22000 (2 years)	HACCP: 12 months, ISO 9000: 8 months, ISO22000: 12 months	Foreign (BVQI) and domestic/QUARCERT
VNM	HACCP (6 years), ISO 9000 (6 years)	15 months (both HACCP and ISO 9000)	Domestic (QUARCERT)
IDP	ISO22000 (4 years)	ISO 22000: 12 months	Domestic and foreign (QUARCERT/BVQI)

Note: * in this study, the term ISO 9000 is interchangeable for 9001,9002, and 9004 versions (1994, 2000, and 2008); the term ISO 22000 is interchangeable for ISO 22000/2005 and ISO 22000/2008.

To place the adoption of QA systems into a wider context, it is acknowledged that high quality products are the essence of a company's survival and competitiveness in the marketplace (Garvin, 1987). To help achieve these goals, companies adopt QA systems. Safety assurance systems are required to ensure the safety of food and to show compliance with regulatory and customer requirements at each step in the food chain (Trienekens & Zuurbier, 2007). Therefore, the implementation of QA systems in the global market strengthens companies' position and improves their competitiveness (Karipidis et al., 2009). As a result, food companies are implementing QA systems, such as HACCP and ISO 9000 in order to adopt quality practices (Ziggers & Trienekens, 1999). The HACCP system focuses mainly on assurance of technical requirements while ISO 9000 focuses more on management aspects (Luning et al., 2006; Loc, 2006). ISO 22000 standards is aimed at managing safety in the food chain (Manning & Baines, 2004). Therefore, ISO 22000 provides the basis for demonstrating a company's compliance to quality system by establishing the documentation and procedural standards that must be met.

A trend of adopting or integrating more than one QA system within an establishment is becoming popular, which indicates the role of quality systems in improving business comparative advantage (Karipidis et al., 2009) and the value of certification achieved from third party certifying bodies. Such certifications are publicly recognized as signal for food safety. Recent studies show that the number of firms adopting multiple systems in place is increasing, especially in food sector (Herath et al., 2004).

Which QA system is adopted by firms depends on requirement of buyers, and also on available human and financial resources of businesses. Choosing certifying bodies for certification is related to the value of certifying bodies in firm publicly, and costs incurred for registration. In respect to certifying bodies, good recognition usually attracts customers (Jin, et al., 2008). Small firms face more limited options compared to larger firms. Limited resources in small firms lowers the number of adopters of QA systems for single or multiple site-based certifications (Holleran et al., 1999; Herath et al., 2007). Small firms have a further disadvantage in adoption compared to larger firms. Implementing ISO 9000, for example, forces small firms to allocate a greater proportion of their resources to implementation than larger firms (Holleran et al., 1999), and large firms are more likely to adopt QA systems than small firms (Pieniadz & Hockmann, 2007). These observations from the literature are explored further in the context of this study in Section 7.1.3 and 7.1.4.

7.1.3 Key motivations for adopting different QA systems

7.1.3.1 HACCP

Table 7-6 shows a comparison of the main reasons the case study firms gave for adoption. These reasons differ between firms. For example, VNM, a large company exporting fresh and powder milk products, had a key motivation of satisfying the requirement of buyers for adopting the HACCP system. With the adoption of this system, this company expected to gain competitive advantage over other competitors in the dairy market in countries where regulators and distributors require their suppliers to have HACCP to signal quality. But for case MCM, a company supplying internal demand, the motivation of “improving quality” was for a survival reason. Three of the four cases referenced the motivation of changing behaviours of employee, staff towards quality as the least important motivation, which suggests that this motivation is not important and not highly expected by firms when adopting HACCP. It appears that small dairy firms were motivated first by internal motivation rather than external motivation, which was more important for larger dairy firms.

Table 7-6 Motivations for adopting HACCP

Top five motivations	MCM (HACCP 2001)	DLM (HACCP 2002)	HNH (HACCP 2004)	VNM (HACCP 2004)	IDP (no HACCP)
1	Improving product quality (I)	Meeting food legislation and national regulations (E)	Improve quality in production process (I)	Satisfying the requirements of the buyers (E)	NA
2	Improving company's image (E)	Improving product quality (I)	Raising competitive advantage over competitors (E)	Increasing market share in domestic market (E)	NA
3	Expanding markets (E)	Raising competitive advantage over competitors (E)	Improving company's image (E)	Utilizing efficient production, reduction in defects (I)	NA
4	Raising competitive advantage over competitors (E)	Improving the company's image (E)	Expanding market (E)	Meeting food legislations and national regulations (E)	NA
5	Changing behaviours of employee, staff toward quality (I)	Improving production processes (I)	Changing behaviour of employees and staff toward quality (I)	Changing behaviour of employees and staff toward quality (I)	NA

Note: E external, I internal motivation, NA not applicable

7.1.3.2 ISO 9000

Table 7-7 shows a comparison of motivations given by firms for adopting ISO 9000. Even though the firms pursue ISO 9000 for a number of different reasons, they seem to place

greater emphasis on its use as a tool to expand their market and raise their competitive advantage rather than for other purposes. The first motivation given and highly rated by MCM and VNM were “raising competitive advantage” and “expand domestic market”, respectively. One explanation for the similarity in highly rating external motivations is that this system is adopted by firms on a voluntary basis and so is influenced by market pressure. Three of the four cases highly ranked adoption of this system to improve the company’s image. As with HACCP, improving product quality was a lower ranked reason for the adoption of the system, and motivation of improving behaviours and attitude of employees toward quality as a reason for adoption of ISO 9000 was lowest ranked three of the four cases.

Table 7-7 Motivations for adopting ISO 9000

Top five motivations	MCM (ISO 9000 in 2003)	DLM (ISO 9000 in 2000)	HNM (ISO 9000 in 2004)	VNM (ISO 9000 in 2004)	IDP (no ISO9000)
1	Expanding market (E)	Raising competitive advantage over competitors (E)	Raising competitive advantage over competitors (E)	Utilizing efficiency in production processes, reduction of defects (I)	NA
2	Improving company’s image (E)	Improving the company’s image (E)	Improving company’s image through QA systems	Raising competitive advantage over other competitors (E)	NA
3	Improve quality (I)	Satisfying legislation and national regulations (E)	Improve quality in production process (I)	Increase market share in domestic market (E)	NA
4	Raising competitive advantages over competitors	Improving product quality (I)	Expanding market (E)	Satisfying the requirement of the buyers (E)	NA
5	Improving behaviours of employee, staff toward quality (I)	Improving production processes (I)	Improving behaviours of employee, staff toward quality (I)	Improving behaviours of employee, staff toward quality (I)	NA

Note: E external; I internal motivation; NA not applicable.

7.1.3.3 ISO 22000

Table 7-8 shows a comparison of motivations rated by firms for adopting ISO 22000. Two of the three firms ranked ISO 22000 most highly as a tool to raise competitive advantage, while the remaining firm perceived internal production improvement to be the top motivation. This could reflect the fact that these two firms have a larger market share and sales volume and so use this system as a marketing tool for differentiating their products. The small firm (IDP) has not adopted ISO 9000, so this might explain why this internal motivation, rather than external motivation, is ranked most highly.

Table 7-8 Motivations for adopting ISO 22000

Top five motivations	MCM (no ISO 22000)	DLM (ISO 22000 in 2009)	HNM (ISO 22000, in 2008)	VNM (no ISO22000)	IDP (ISO 22000, in 2006)
1	NA	Raising competitive advantage over competitors (E)	Raising competitive advantage over competitors (E)	NA	Utilizing efficiency production processes, reduction of defects (I)
2	NA	Improving product quality (I)	Improving company's image (E)	NA	Raising competitive advantage over other competitors (E)
3	NA	Improving production processes (I)	Expanding market (E)	NA	Increase market share in domestic market (E)
4	NA	Satisfying food legislation and national regulations (E)	Improve quality in production process (I)	NA	Satisfying requirements of buyers (E)
5	NA	Improving the company's image (E)	Improving the company's image (E)	NA	Improving behaviour of employee, staff toward quality (I)

Note: E external; I internal motivation; NA not applicable

7.1.3.4 Discussion

The top motivation for adopting HACCP was an internal motivation for small firms, and an external motivation for larger firms. Three of the four cases cited improving skills and behaviour of employees toward quality as the lowest ranking motivation. This finding is consistent with prior research. Hobbs et al. (2002) found that maintaining access to US and other foreign markets was a key motivation for Canadian meat processors to adopt HACCP. Likewise, in countries where buyers as consumers and authorities as regulators have become a strong force, businesses exporting food products are required to have the HACCP system and even comply with other standards (Bilalis et al., 2009; Henson et al., 1999; Zaibet, 2000). This reflects that the fact that governments in developed economies have policies to better control food quality and protect consumers than those of developing countries. However, this external motivation was not found to be a key motivation for small firms in this study, perhaps because small firms aim to satisfy internal markets where the buyers do not require their suppliers to have HACCP. That indicates that there may be problems with limited knowledge and awareness of domestic consumers, and may show weak enforcement in Vietnam. Prior studies have shown that food producers adopt HACCP in order to satisfy downstream customers (Mazzocco, 1996; Henson et al., 1999); however, this study did not find this motivation.

The first reason for adopting ISO 9000 given by firms was external. That indicates that market pressure is a key force in encouraging the firms to adopt this system, in order to

improve competitive advantage and also contribute to positioning better in domestic markets. This finding supports (Curcovic, 1999), who indicated that ISO 9000 was adopted as one tool in a larger strategy of achieving competitive advantage through quality management and communicating quality results. Such a finding is in contrast, to some degree, with research that found that customer requirements was a key factor in securing ISO9000 certification in global firms or institutions (e.g. Withers & Ebrahimpour, 2000; Terziovski, 2003). However, satisfying customer requirements is an element of improving competitive advantage and ISO 9000 is adopted on a voluntary basis. So firms will consider actual benefits and costs when adopting the system; that is, firms will pursue maximum profitability as their ultimate aim (Anderson et al., 1999). While the motivation of improving employees' behaviour toward quality was cited as the lowest reason in most cases, it is noteworthy that one of the unexpected benefits of ISO 9000 was an improvement in encouragement and support of employees towards a quality philosophy within their plants. Thus, it seems that improved employee behaviour toward quality is a by-product of, rather than a reason for, registration. While it might have been expected that competitive pressures would be a highly rated reason, it appears that companies regard registration primarily as a vehicle for expanding their market rather than as a response or reaction to their competitors' actions. It also appears that companies do not expect registration to have much of an impact on their company image. This view can possibly be explained by the lack of widespread knowledge of consumers about what ISO 9000 registration signifies.

The findings on motivations for adopting ISO 22000 shows similarity between two of the three cases, who focused on external motivation as a key reason, while only one case focused on internal motivation. This may indicate that, because this system is new, it has more potential as a strategy that can be used by management to differentiate product, and so is a contributor to competitive advantage for any company that is an early adopter. This finding contrast with results of prior research on adopting ISO 22000, where more emphasis is placed on internal factors as a reason (Mamalis et al., 2009; Bilalis et al., 2009). One study on ISO 22000 found the key reason for adopting this system is improving hygiene and safety in production processes; that is, company protection is a key, with the company meeting a buyer or legal demand (Mamalis et al., 2009).

An interesting finding relates to the number of QA systems adopted by the case study firms. One of the selected five cases did not adopt ISO 9000 and HACCP, and two of selected five

cases did not adopt ISO 22000. Qualitative results indicate some reasons for the non-adoption of systems. In particular, for case VNM, a non-adopter of the ISO 22000 system, the reason for non-adoption of this system given was that “...not suitable for us this time, [this QA system] is complicated to certify for plants in an organization. Our plants have just been built” (VNM-p1). Since it requires time for preparation for establishing the quality systems within plants, and case VNM had only just built new plants, adoption of ISO 22000 had not yet been considered. For case IDP, a non-adopter of both the HACCP and ISO 9000 systems, reasons for this non-adoption are shown in statements of top management; that is “*limited financial resources for adoption of more than one plant based QA system*”, and “...think ISO 22000 follows HACCP principles applied” (IDP-p1), which in their view, made HACCP unnecessary. This shows that this small firm faced constraints with financial resources, and this is likely to be particularly relevant since government financial support is focused on firms registering to achieve the ISO system.

7.1.4 Key factors influencing the adoption decision

7.1.4.1 HACCP

Table 7-9 shows a comparison of factors influencing the decision for adopting HACCP.

Table 7-9 Perceived factors influencing adoption of HACCP

Factors	MCM	DLM	HNM	VNM	IDP
A. Environment context					
i) Food legal and national regulations	H	H	H	H	NA
ii) External support	H	NA	L	L	NA
iii) Market pressure	L	M	H	M	NA
B. Organisation context					
i) Firm size	L	L	L	L	NA
ii) Governance structure	M	M	M	M	NA
iii) Top management support	M	M	M	M	NA
iv) Firm's product nature	H	H	L	M	NA

Note: H high, M moderate, L low influence, NA not applicable.

For all cases, according to respondents, the legal factor was perceived to have a high influence on the decision to adopt this system. In addition, the decision of companies was

influenced by market pressure in varying degree, and this factor was perceived to have an influence ranging from low to high across individual cases. External support varied and was rated from low to high in terms of having an extent impact on the decision to adopt this system. Likewise, market pressure ranged from low to high influence in the decision to adopt the system. With respect to organisation context, firm size was rated low across all cases, while governance structure and top management was assessed as having a medium impact on the decision to adopt HACCP in all cases. Finally, the impact of the firm's product nature on the adoption decision was rated from low to high influence across cases.

7.1.4.2 ISO 9000

Table 7-10 shows a comparison of factors influencing the decision to adopt ISO 9000. According to respondents, the legal factor was perceived as having differing influences between cases, ranging from low to high influence, on the decision to adopt this system. Similarly, external support and market pressure was rated differently across cases. Firm size was rated lowest among organisational factors, while governance structure and top management were assessed as having medium impact on the decision to adopt HACCP in all cases. Finally, the firm's product nature was rated as ranging from low to high influence across cases.

Table 7-10 Perceived factors influencing adoption of ISO 9000

Factors	MCM	DLM	HNM	VNM	IDP
A. Environment context					
i) Food legal and national regulations	M	M	L	H	NA
ii) External support	H	NA	H	L	NA
iii) Market pressure	L	H	M	H	NA
B. Organisation context					
i) Firm size	L	L	L	L	NA
ii) Governance structure	M	M	M	L	NA
iii) Top management support	M	M	M	M	NA
iv) Firm's product nature	H	L	L	M	NA

Note: H high, M moderate, L low influence, NA not applicable.

External support was perceived to have high influence by two small firms, but low influence for larger firms. It indicates that small firms may need more support for certification, because the system incurs high initial costs.

7.1.4.3 ISO 22000

Table 7-11 shows a comparison of factors influencing the decision to adopt ISO22000. In all cases, according to respondents, the influence of the legal factor was perceived to be variable, ranging from low to high. The decision of companies to adopt was also influenced strongly by market pressure for cases DLM and HNM. With respect to organisational factors, firm size was perceived as having a low influence on the adoption decision in all cases where it was adopted. Governance structure had a moderate impact on the decision of companies. Top management support and the firm's product nature emerged as the most important organisational factors, both having a high influence for all cases adopting ISO 22000.

Table 7-11 Perceived factors influencing adoption of ISO 22000

Factors	MCM	DLM	HNM	VNM	IDP
A. Environment context					
i) Food legal and national regulations	NA	M	L	NA	H
ii) External support	NA	NA	L	NA	H
iii) Market pressure	NA	H	H	NA	M
B. Organisation context					
i) Firm size	NA	L	L	NA	L
ii) Governance structure	NA	M	M	NA	M
iii) Top management support	NA	H	H	NA	H
iv) Firm's product nature	NA	H	H	NA	H

Note: H high, M moderate, L low influence, NA not applicable.

One reflection on this is that the system is complicated and documentation is complex, as is practical implementation, so it will be necessary to rely on human resource competence, especially the leadership group in businesses adopting this system. The high influence of the firm's product nature may be explained by the diversified array of dairy products, which

leads to detailed identification of CCPs for each product. This will take time for organisation and establishment of these procedures.

7.1.4.4 Discussion

Some issues were discussed partially in the above section, and now other factors will be considered in more depth. These are external factors, such as legal, market pressure, and external support. In addition, internal factors, such as firm size, governance structure, and top management support will also be discussed.

Legal

It was found that the legal factor strongly influenced the decision of companies to adopt HACCP. It appears that companies are increasingly mindful of the safety regulations that govern their operations, and that their inability to adhere to these regulatory pressures may result in serious penalties, including legal sanction, costly court proceedings, fines and penalties. Hence, fear of legal sanction is considered a primary reason why companies adopt QA systems in general and HACCP in particular. Legal sanctions can encourage companies to publicly disclose safety handling activities because doing so can reduce external suspicions about their quality assurance activities.

It needs to be recognised that Vietnam runs an economy with a State orientation, where the State has a powerful role in legal enforcement, typically characterised by a top down approach and command to businesses, particularly businesses in food production and the manufacturing sector. In principle, the government forces its requirements through decrees sanctioned by legislation and law, such as Ordinances and Directives on food safety³, to protect consumers and reduce the cost to society caused by poisonous substances and illness borne by unsafe foods. These decrees establish a legal framework to regulate firms and force them to produce, manufacture, and distribute safe foods to consumers. It also rules the business environment where firms operate, and constrains their strategic behaviours, particularly for a heavily regulated sector, such as a dairy sector. In particular, it appears that *the Decree on Safety and Hygiene of Foods 1997* has an important impact on the decision to adopt HACCP, as it forces firms producing and trading in dairy products to do so in a safe

³ Main legislation and regulation related to food safety are the Food Law, the Law on Safe Goods Trading, the Decree on Safety and Hygienic of Foodstuff 1997, the Ordinance on Food Hygienic and Safety 2007, National HACCP plan by the year 2010 formulated in 2003, and national and industry standards.

way to assure benefits to consumers. Furthermore, dairy businesses that were established after 2003 might have been influenced by *the HACCP National Plan 2003*, which mandates food establishments to have HACCP, although it has some exemptions⁴. Regulatory pressure is shown also by indirect actions by government on the decisions of companies.

Within the State-owned companies, the government has also direct intervention and a direct impact on these companies' business strategies through its legal representatives on the Supervisor Board. However, this intervention has become weaker in recent years, as the State has conducted an 'equitisation' process, and reduced its stake in the registered capital of these companies; for example, in cases MCM and VNM, it has changed from 100% State capital to 50% and 42%, respectively (Moc Chau Company, 2009; Vinamilk company, 2010).

The influence of legal factors on the decision to adopt was also shown strongly for foreign companies. This reflects the fact that foreign companies, with a view to protect new markets, pursue their obligation to follow rules and laws in these markets, and safety in their business activities. This finding supports prior research by Henson & Heasman (1999), and Caswell & Johnson (1991), who also found that a legal factor strongly affected the adoption of HACCP. Jin et al. (2008) found that external factors may affect the decision as whether or not to adopt the HACCP system in Chinese businesses, and also indicated that compliance with the law and the recommendation of industry associations was one of the most important factors. However, firms also expected to gain economic benefits (i.e. market share or profitability) when it responded to compliance requirements. Hooker et al. (2002) researched meat processing firms complying with regulations of the USDA and found that Canadian firms followed these regulations to export product to USA, and Henson & Heasman (1999) emphasised the role of enforcement in regulatory process for assuring safety of food.

Legal factors had less influence on the adoption decision for the two remaining systems, ISO 9000 and ISO 22000, which reflects the voluntary nature of these systems. There are not many law articles or decrees ruling these systems. Government also uses encouragement rather than mandating or forcing firms to adopt such systems. This effect of the legal factor may be explained as guiding how to make these systems compatible with national standards; for example, both TCVN⁵ and ISO 9000. These findings support Anderson et al. (1999), who

⁴ Case IDP, HACCP principles embedded in ISO 22000: 2005, was accepted as HACCP approved but not certified.

⁵ Vietnam Standards established or harmonized with other international standards by STAMEQ, national standardization organization.

showed that, to an extent, economic and political forces influenced managers to adopt ISO 9000. For ISO 22000, the legal factor is not so significant. An explanation for this is that this system is relatively new, and the government seems not to have policies for regulating this system, or plans to encourage its adoption.

Market Pressures

This research finds that market pressure encourages companies to adopt QA systems in general, but this factor is a higher force for large firms than for small firms. Market pressure shows up as competition pressure rather than other forces, perhaps because upstream stakeholders in the supply chain do not require processors to achieve QA systems. This may be explained by the observation that domestic consumers are thought to have limited knowledge and awareness of product quality and QA systems; therefore, they are a weak force in negotiation with suppliers on price, quantity and quality of products. In an emerging economy context like Vietnam, they are not able to request their suppliers to have QA systems. This weakness can also be observed with intermediate businesses, such as wholesalers and agents. Supply contracts are signed between agents/ purchasers and supplier/sellers, but processors have more power in contract negotiation in the quality and quantity norms they set up, while purchasers have weaker power in requesting their suppliers to obtain QA systems as a quality signal. This finding supports (Wang et al., 2006) indicated that customer requirement alone was not enough to pressure organisations to obtain ISO 9000 certification. However, it contrasts with results of others (Ziggers, 1999; Walgenbach, 2007; Terziovski et al., 2003), who found partners were able to request their suppliers to have QA system, as ‘pressure from customers’. However, these stakeholders, as noted in the chains in their research, are more powerful than those in supply chains in this research. This reflects features of an emerging economy, such as Vietnam.

As a result, competition between dairy firms is one of the key factors affecting the adoption of QA systems. To survive in the market economy, firms compete to gain market share, and gain a stronger position over rivals. For the dairy products market in Vietnam, it was found that competition was not so strong between companies with small market share, because these firms addressed this by focusing on a market niche for particular dairy food products. These appear to be stronger competition between larger companies that have large market share. It is possible that the competition factor forces larger companies to apply new technology and innovations, including QA systems, thus incorporating quality improvement

into their long term strategy. Such a finding is consistent with that of Ebrahimpour (2003), who indicated that ISO9000 a competitive tool to win the lead over competitors.

External Support

This research finds that external support impacted on the adoption decision. There are different influences on adoption decisions because support that benefited companies differs in types and level, and also by supporting organisations. External support is of importance for small firms, but not for larger firms. This is consistent with the observation that small firms in Vietnam are lacking financial resources, whereas the cost for setting up systems, such as ISO 9000 is initially often high, including registration fee, training, etc. The support went to businesses to achieve the ISO 9000 system rather than other QA systems, because the HACCP system is mandated by government within the food industry in general, and in the dairy sector in particular. On the other hand, ISO 22000 is new system just introduced into businesses in recent years. In general, businesses expect to have support once they register for QA certification. This result is similar to those of other previous studies in developing countries, where a tendency to offer support to SMEs in QA system registration is noted, as these can be considered as tools for improving national competitive advantage; for example, ISO 9000 in Greece (Aggelogiannopoulos et al., 2007), and HACCP in India (Deodhar, 2003).

Firm Size

It was found that the adoption decision was influenced by organisational context to different degrees in different firms. These are summarised in Table 7-12. Firm size was perceived to be of lesser importance to the decision, especially for small firms. In this study, it was shown that they received external support. Such support facilitates and encourages firms to move towards quality and efficiency. For larger firms, this factor was perceived to have a low influence on their decision, as these companies have fair financial resources sourced from government investment and capital or from their parent corporation's capital. This observation is in contrast to previous studies that indicated firm size did affect the adoption of HACCP (Henson & Holt, 2000; Shavell, 1987; MacDonald & Crutchfield, 1996) and of ISO 9000 (Ghodbadian & Galleary, 1996; Adams, 1999; Garr et al., 1997). As noted above, the dairy firms in this study received an external support to set up QA systems, which explains this contrasting finding.

Governance structure

Governance structure plays a vital role in efficiently implementing a business strategy of companies. In addition, where quality management practices and its activities is embedded, this is affected by organisation structure. The study revealed that governance structure had a moderate impact on the adoption decision, shown by moderate influence rated by respondents. Organization structure is based on ownership type, which has a key role in the diffusion of QA systems. When ownership lies partly with the State, the company is an early beneficiary of interventions and information from government when the State launches new policies and strategic programs, such as the HACCP national program. One of the aspects in organization structure observed was complexity in organization characteristics, such as the company having a QA division, and roles and function of top management (i.e. CEO/director and chairperson of Supervisors Board combined, or independent).

Governance is also affected by company structure. This can influence where the QA system is embedded, and whether it is implemented with a quality division/department organization. If information sharing from plant teams is isolated from the company headquarters' QA divisions, this may have some effect on adoption decision. The governance structure may also determine whether a QA division is separated under director management or a planning department. Key factors are availability of human resources for the quality team, and linkages of plant quality teams with the company, in the case of scattered plants (case DLM, case VNM, case IDP), where the quality team was under regional office or branches.

Table 7-12 Organisation context factors in analysed cases

Cases	Firm size *	Market share by turnover	Governance structure	Business Strategies	Product natures
MCM	Small	Less than 3%	. Ownership: Joint stock, State majority share; . Chairperson of Supervision Board and Director combined; over 20 years experienced in dairy industry . QA team available prior to adoption	. maximize profitability, supply quality product	.Dairy products, fresh, pasteurised, UHT milk, butter, cheese, milk cake . supplying cow breed
DLM	Large	26.6%	. Joint venture, foreign owned majority . Vietnam representative Director . QA team	. maximize profitability, supply quality product . export target for milk powder	Dairy products: fresh, UHT, pasteurised milk, milk powder, stir and drinking yoghurt
HNM	Small	Less than 3%	. Joint stock . Available QA division prior to adoption;	. maximize profitability, supply quality product, 3A's principle**	Dairy products, fresh, UHT, pasteurised milk, milk powder, stir and drinking yoghurt +services
VNM	Large	37%	. Joint stock, State majority share; . Chairperson of Supervision Board and Director combined; over 20 years experienced in dairy industry . QA department in company, QA team in plants	. maximize profitability, supply quality product . foreign market expansion	Dairy products, other products, fresh, UHT, pasteurised milk, milk powder, stir and drinking yoghurt +services
IDP	Small	Less than 3%	. Joint stock, chair and director combined; . QA team	. maximize profitability, supply quality product	Dairy products fresh, UHT, pasteurised milk, milk powder, stir and drinking yoghurt

Note: * Firm size measured by number of employees, and/or turnover

** 3 A's : Availability Affordability Acceptability

Top management support

It was found that top management support had a high impact on the decision to adopt. This reflects the fact that top management's attributes, such as education and experience is of importance when integrating business and quality strategies, and ensuring adoption occurs as expected. For example, in state owned dairy companies, top management had over 20 years' experience specialising in dairy production and trade, and such managers encouraged the adoption of QA system easier and faster than other companies. This finding supports prior study that indicated that characteristics of top management affected the decision to adopt QA systems. These included education level of top management, skill and awareness, and ability to manage risks after a decision is made (Papadakis & Barwise, 2002).

In addition, the structure of top management in dairy firms impacted on the adoption decision. In this regard, it was found that when the positions of CEO and chairperson of the supervision board were independent; that is, two positions held by two persons, then decisive decision making by the top management was observed. However, for case VNM, this structure was not observed, and it appears that the decision to adopt by top management was slower than other cases. Hence, the adoption decision may be affected by organisation structure⁶. In this study, case DLM and VNM's organization was observed to be a mechanistic structure, focused on organizing and controlling activities and making employee behaviour predictable, an approach often used when the environment surrounding an organization stable. In such a structure, authority is centralized at the top of the managerial hierarchy, roles and tasks are clearly specified, employees are closely supervised, and emphasis is on strict discipline and order. However, for other cases such as HNM and IDP, organisation structure was more organic, with authority decentralised and devolved to middle managers to encourage them to take responsibility and to respond effectively to the unexpected, therefore reacting quickly to a changing environment.

These observations support previous studies on management structure and the adoption of innovations. Thompson (1965) finds a negative relationship between centralisation and innovation, and that a participatory work environment facilitates innovation by increasing organisation member's awareness, commitment and involvement. Daft & Becker (1978) argue that low professionalism, high formalisation, and high centralisation facilitate

⁶ There are two types of organization structure, mechanistic and organic (Spencer, 1994)

administrative innovations, while the inverse conditions facilitate technical innovations. Etlie et al. (1984) argue that structure complexity and decentralisation should lead to more incremental innovations. Similarly, Dewar & Dutton (1986) and Khan & Manopichetwanna (1989) argue that top managers are irrelevant or even have a negative impact on implementation of process innovations.

7.1.5 Impacts of QA systems on organisational outcomes

7.1.5.1 HACCP

Table 7-13 shows a summary comparison of the perceived impacts of HACCP on organisation outcomes across the four cases that adopted HACCP. Organisational outcomes are categorised according to business, operational, and quality performance.

It was found that HACCP had a perceived impact on business performance, though the impact of this system on business performance was mixed, ranging from moderate to high for different measures. However, it had high perceived impact on 'sales' measure after adoption. This may be explained by the fact that most companies adopting this system perceived that HACCP has had effect on safety, and the reduction of defects and waste, which is interpreted as better product quality, a feature grasped by customers, who then contributed into increasing sales of the companies. However, it was perceived to have had a mixed impact on other measures, such as market share. Two of the four cases stated there appears to be an increase of market share, while other remaining cases did not. This difference may be explained by the observation that two cases are small firms that experienced fast growth of their market share, while the two larger firms found the growth of their market share slower. It is also worthy to note that larger firms have switched their strategy to focus on overseas market expansion, while small firms have attempted to introduce a range of new products that contributed to increase their share on the domestic market.

It was found that HACCP had a perceived impact on operational performance. This was shown through a perceived increase in 'customer satisfaction'. Three of the four cases perceived that HACCP had a strong impact on this dimension, while one case did not. The difference indicated that the challenge of implementation of HACCP within plants is high, and it is difficult for companies to create value from this system through the reduction of claims on products from customers.

Table 7-13 Perceived impacts of HACCP on organisational outcomes

Dimensions	MCM	DLM	HNM	VNM	IDP
A. Business performance					
• Revenue	NE	M	M	H	NA
• Sales	H	H	H	H	NA
• Market shares	H	M	H	M	NA
• Profitability	NE	H	NE	H	NA
• Return on sales	M	H	H	H	NA
• Sales growth rate	H	H	H	M	NA
B. Operational Performance					
• <i>Unit production costs</i>	H	H	H	NE	NA
• <i>Fast deliveries</i>	NA	NA	NA	NA	NA
• <i>Cycle time</i>	NA	NA	NA	NA	NA
• Design quality	NE	NA	NE	L	NA
• Manufacturing quality	H	M	NE	L	NA
• Customer satisfaction	M	H	H	H	NA
C. Quality performance					
• <i>Defect rate</i>	H	H	NE	L	NA
• <i>Recall rate</i>	NE	H	L	L	NA
• <i>Guarantee costs</i>	NE	H	L	L	NA
• Performance	NE	M	H	L	NA
• Features	NE	H	L	NE	NA
• Reliability	NE	L	H	H	NA
• Conformance	H	H	L	L	NA
• Durability	H	NE	NE	L	NA
• Serviceability	NE	L	L	L	NA
• Aesthetics	NE	H	NE	H	NA
• Perceived quality	H	H	NE	M	NA

Note: H high impact (large increase); M medium impact (some increase); L low impact (no increase); Dimensions in Italic H high impact (large decrease), M medium impact (some decrease); L low impact (no decrease). NE no evidence; NA not applicable.

HACCP was perceived to have an impact on quality performance, and these impacts ranged from low to high for different dimensions, such as costs, defect and recall rates. The difference may be explained by the observation that, HNM and VNM were developing and introducing an array of new products, and were in trial operation of machines that had been installed and upgraded. For DLM, it was noted that the firm had substantive internal training for raising knowledge and the skill set of employees with respect to meeting requirements set by the HACCP system. An assessment of the perceived impact of HACCP on quality performance through Garvin's 8 dimensions gave mixed impacts varying from low to high.

For example, for the ‘conformance’ measure, two of the four cases perceived that HACCP had a high impact, while two the remaining cases did not. This difference appears to be influenced more by complicated procedures and organisation and implementation of this system within the plant.

These results support prior research that found that HACCP contributed to improving business performance. These studies found a range of improvements, such as enhanced access to markets, cost effectiveness, time savings, production efficiency, employee development, improved information and communication, enhanced compliance with regulation organisational development, improved product quality and safety (Taylor, 2001; Romano et al., 2004; Trienkens & Zuurbier, 2008), and changes in sales and market share (Khatri & Collin, 2007). One study showed market share improved over a number of years after fish companies in Oman adopted HACCP for exported products to the EU (Zaibet, 2000). Australian firms gained a reduction in rejects/rework/out of specification products, reduction in customer complaints, improved product hygiene, improved morale and an increase in overseas markets after adopting HACCP (Khatri & Colin, 2007). Nganje (1999), who studied HACCP implementation in the US meat industry and found that firms with HACCP were shown to be more efficient after adoption than before HACCP adoption. A second relevant set of studies (e.g., Maldonado et al., 2005; Henson et al., 1999) pointed out that the relevance and realization of certain benefits from adopting HACCP systems differ by context.

7.1.5.2 ISO 9000

Table 7-14 shows a comparison of the perceived impacts of ISO 9000 on organisational outcomes across the four cases. Firms had mixed benefits after implementing ISO 9000, ranging from low to high. In particular, the rating from HNM was low, which showed there was not a perceived impact of ISO 9000 on revenue, sales, and market share. This reflects the fact that the company has just emerged from the melamine scandal. For DLM, respondents perceived that ISO 9000 had a high impact on business performance. This was shown by a perceived increase in revenue, sales, and market share, and sales growth rate, though unchanged profitability and return on sales. This is explained by the observation that the company was paying the increased costs incurred for raising the capacity of its Phu Ly plant and expanding its distribution network to the North of Vietnam. For VNM, dimensions of

revenue, sales, profitability, and sales growth rate were perceived to increase, but market share and return on sales were less so. It appears that share in the domestic market of the company remained stable, and the company promoted expansion into foreign markets and so costs for promotion and marketing increased. This leads to a decreased 'return on sales' when compared previous years.

Regarding the impact of ISO 9000 on operational performance, three cases perceived that ISO 9000 had a high impact on 'delivery'. It appears that logistics, organization of storage and warehouse inventory, and safety checks of products in and out conformed to standards, and 'design quality', (for MCM and DLM), was perceived to improve. It seems that the companies applied new technology in packaging and diversified the design of containers.

In respect to the relationship between ISO 9000 and quality performance, four cases perceived the system to have had an impact on defect rate, recall rate, and guarantee costs. In particular, three of the four cases perceived a large decrease in defect rate, while one case showed no change in this dimension. The assessment is explained by the observation that in the period when companies develop and introduce new products onto the market, the impact of ISO 9000 may not reflect through these dimensions at this early stage. MCM perceived that it had an increase in feature and reliability dimensions, and a low impact on performance, durability, and aesthetic dimensions. DLM was perceived to have an increase of reliability, serviceability and perceived quality dimensions while HNM was perceived to have not had a change in Garvin's quality dimensions. VNM was perceived to have an increase of performance and aesthetic. With respect to 'performance', two of the four cases reported a low perceived impact on 'performance' dimension as a result of their ISO 9000 registration (MCM and DLM). One firm, HNM, reported a moderate perceived impact on this dimension as a result of its registration efforts, while another firm (VNM) perceived that the ISO 9000 had highly impacted on this dimension after introducing the system. The difference between the perceived impacts of ISO 9000 on quality may indicate that it is difficult to measure how quality performance changed.

Table 7-14 Perceived impacts of the ISO 9000 on organisational outcomes

Dimension	MCM	DLM	HNM	VNM	IDP
A. Business performance					
• Revenue	NE	H	L	H	NA
• Sales	NE	H	L	H	NA
• Market shares	H	H	L	M	NA
• Profitability	M	L	H	H	NA
• Return on sales	M	L	H	M	NA
• Sales growth rate	M	H	H	H	NA
B. Operational performance					
• <i>Unit production costs</i>	M	M	NE	NE	NA
• <i>Fast deliveries</i>	H	H	H	NE	NA
• <i>Cycle time</i>	NE	L	NE	NE	NA
• Design quality	H	H	NE	L	NA
• Manufacturing quality	H	L	H	L	NA
• Customer satisfaction	NE	H	H	M	NA
C. Quality performance					
• <i>Defect rate</i>	H	H	H	L	NA
• <i>Recall rate</i>	H	L	H	NE	NA
• <i>Guarantee costs</i>	NE	M	H	H	NA
• Performance	L	L	M	H	NA
• Features	H	M	M	L	NA
• Reliability	H	H	M	L	NA
• Conformance	NE	NE	M	H	NA
• Durability	L	L	M	NE	NA
• Serviceability	NE	H	M	L	NA
• Aesthetics	L	L	M	H	NA
• Perceived quality	NE	H	M	L	NA

Note: H high impact (large increase); M medium impact (some increase); L low impact (no increase); Dimensions in *Italic* H high impact (large decrease), M medium impact (some decrease); L low impact (no decrease). NE no evidence; NA not applicable.

Overall, it was found that there appears to be a mixed benefit gained by companies after adoption. It is worth noting that business performance is perceived to be improved, as shown by responses on measures of business performance. Quality performance was perceived to have changed with this change seeming to stem from ISO 9000 registration. In this study, perceived firm benefits might stem from good leadership and good organisation of ISO 9000 implementation. This is consistent with the idea that quality may arise from the people not the programs (Akers, 1991). The finding is consistent with prior studies that found that ISO 9000

adoption improved an organisation's financial performance (Corbett et al., 2005; Naveh & Marcus, 2005; Heras et al., 2002; Simmons, 1999). Prior research highlighted two possible sources of performance improvements from ISO 9000. First, performance is expected to improve through operational efficiency that translates directly into cost reductions. These efficiency improvements stem, in part, from the initial efforts to document and rationalise processes, resulting in less wasted effort and duplication. Researchers of ISO 9000 found that additional efficiency improvement arises as organisations consistently conform to the resulting documented, standardized procedures, and these control processes further improve yield of defect free products, translating into reduced waste and costs (Anderson et al., 1999; Corbett et al., 2005; Terziovski et al., 2003). Withers and Ebrahimpour (2000) found that the dimensions that appear to benefit the most from improvements in ISO 9000 are reliability, conformance, serviceability, and perceived quality.

7.1.5.3 ISO 22000

Table 7-15 shows a comparison of the perceived impact of the ISO 22000 on organisational outcome across the three cases. Organisation outcomes are clustered into business, operational and quality performance. Perceived impacts on organisational outcomes ranged from low to high for different dimensions.

In particular, the system appears not to have an effect on changes of 'revenue' in the three cases. This result may be explained by the fact that the system is newly introduced and not enough time has elapsed to have an effect on outcomes. However, there was a difference in the 'profitability' dimension. ISO 22000 was perceived to have contributed to large increase in probability for IDP. IDP adopted the system earlier than DLM, and IDP's supply chain was simpler than those of DLM, which may explain this result. Regarding the impact of ISO 22000 on operational performance after adopting this system, DLM was perceived to have unchanged production costs and deliveries dimensions, but a decrease of cycle time. HNM was perceived to have some increase in production costs, fast deliveries, and cycle time. This is explained by the observation that the company has just introduced this system, and high administration costs raise production costs. Practical implementation is also complex. IDP was perceived to have a decrease of production costs, and cycle time, and an increase of perceived quality dimension. One reflection on this is that the company adopted this system earlier than two prior cases.

Table 7-15 Perceived impacts of the ISO 22000 on organisational outcomes

Dimensions	MCM	DLM	HNM	VNM	IDP
A. Business Performance					
• Revenue	NA	L	L	NA	L
• Sales	NA	L	NE	NA	M
• Market shares	NA	L	NE	NA	H
• Profitability	NA	L	M	NA	H
• Return on sales	NA	M	L	NA	NE
• Sales growth rate	NA	L	M	NA	NE
B. Operational Performance					
• <i>Unit production costs</i>	NA	L	M	NA	H
• <i>Fast deliveries</i>	NA	L	H	NA	NE
• <i>Cycle time</i>	NA	H	H	NA	H
• Design quality	NA	L	M	NA	H
• Manufacturing quality	NA	M	H	NA	L
• Customer satisfaction	NA	H	M	NA	H
C. Product Performance					
• <i>Defect rate</i>	NA	M	L	NA	L
• <i>Recall rate</i>	NA	H	L	NA	M
• <i>Guarantee costs</i>	NA	L	L	NA	NE
• Performance	NA	M	M	NA	NE
• Features	NA	H	M	NA	H
• Reliability	NA	M	M	NA	M
• Conformance	NA	H	M	NA	L
• Durability	NA	H	M	NA	NE
• Serviceability	NA	M	M	NA	H
• Aesthetics	NA	L	M	NA	NE
• Perceived quality	NA	L	M	NA	H

Note: H high impact (large increase); M medium impact (some increase); L low impact (no increase); Dimensions in *Italic* H high impact (large decrease), M medium impact (some decrease); L low impact (no decrease). NE no evidence; NA not applicable.

It was found that ISO 22000 seems not to impact strongly on organisational outcomes at this time. However, this is a new system introduced into firms. Additionally, it indicates that

complicated characteristics of the system in organisation and its procedures. Even though the system focuses on ensuring safety in the supply chain, rather than just in the plant, in this study, it was observed that there was no trace of diffusion of the system along the supply chain at the moment, no indication of an association between company and certified suppliers. This finding contrasts with prior research that indicated that ISO 22000 contributed to an increase in sales in firms in the service sector (Bilalis et al., 2009). However, maybe this system has a higher effect in the service sector than food sector. One piece of research showed that ISO 22000 led to an increase of safety and quality rather than other measures (Mamalis et al., 2009).

7.1.5.4 Comparisons of impact of particular QA systems

Qualitative results indicate that changes of organisational outcomes resulted from QA systems. According to feedback from top management, it was noted that ISO 9000 and HACCP “...creates an opportunities for all employees and managers to have quality strategy in business. Revenue this year increases more than past year...” (MCM-p1). This indicates that QA systems may have benefited firms with respect to behaviours and culture, in terms of quality philosophy and understanding of this. In addition, firms achieved business improvements over time. This is shown in comments on DLM and HNM “... improving business state, ...raising skills and senses of employee staff in quality and quality culture ...” (DLM-p1), “...increasing turnover in past three years, improving position of the company on the market, improving behaviours of employee toward quality and safety...” (HNM-p1). Also, a QA system helps firms to improve in production processes and save costs when defect rates fall “...changes in revenues of the company over years are real...”; “...ratio of defects, waste in production process is reduced more than before...[HACCP]...improving satisfaction on our products from customers ...[ISO9000]” (VNM-p1); “...situation of business and production has been improved, revenue in later year increased more than past years...” (IDP-p1). It may be concluded that companies benefitted from QA systems, especially from improvement in business performance and change of behaviour and attitude of employees and staff in their understanding of quality.

There were differences perceived organisational outcomes between cases after implementing QA systems. However, there appears a trend showing positive an impact of QAS's on organisational outcomes. For example, it was found that HACCP had a perceived impact on

business performance, which was shown through a perceived increase in sales of the firms after adoption. On the other hand, the perceived impact of ISO 9000 and ISO 22000 was not uniform across cases. HACCP and ISO 9000 had clearer impacts on business performance than did ISO 22000.

With respect to the perceived impact of QA systems on business performance, regardless a size of firm, HACCP benefited firms in respect to improving business performance. Variation of perceived benefits that firms obtained after adoption of this system may be explained by different organisational and management efforts to implement this system in plants.

Perceived benefits from the introduction of ISO 9000 were similar to HACCP in some respects. In particular, business performance was perceived to improve. However, there were differences, which may stem from ISO 9000 having a focus on good leadership within companies. In comparison with ISO 22000, HACCP and ISO 9000 were adopted by firms, so their impacts on organisational outcomes appeared to be clearer and significant, while ISO 22000 seems not to have impacted strongly on organisational outcomes at the moment because it is a new system introduced into dairy firms with some complicated characteristics.

7.2 Key Insights

The cross-case analysis gave insight into quality assurance and adoption of QAS's by dairy processing firms in Vietnam. This section focuses on interrelationships of quality assurance, and adoption of QAS's, motivations, influenced factors and organisational outcomes, and the insights that emerge from these.

7.2.1 Emerging economies and food quality management

Much research on issues related to quality management has been conducted on developed country issues; however, such research is scarce in emerging countries, where food quality is only now beginning to be recognised as important issue, and paid attention to by consumers and functional agencies. This study on the adoption of QAS's in the dairy processing sector in Vietnam gives some insight into quality management in high growth, emerging countries and so helps to fill this gap.

Vietnam is an emerging country and has rapidly growing income, population, and so has an increasing demand for food and higher quality food, including dairy products. Not surprisingly, the introduction of QAS's into businesses is linked to establishing a competitive position in this growing market. However, in a more static market place, a focus on maintaining market position and reducing costs might be associated with the introduction of QAS's. As this emerging market grows, embedding a quality strategy within the business strategy of companies is important as companies cope with stronger competitions in the powdered milk segment, and more products are imported and distributed by foreign distributors in domestic markets.

However, an additional feature of Vietnam as an emerging economy is that the country is characterised as a market economy but with a planning orientation. This means intervention of the State in both direct and indirect ways, in businesses and their environment. This includes dairy companies, where some companies have a major State share, such as Vinamilk and Moc Chau. This State involvement affects the company strategies, and also supports these companies in seeking competitive advantage over other rivals in dairy markets.

7.2.1 The lead role of processing companies in quality assurance

In developed countries, quality can be assured along the entire supply chains to supply safe and quality food to consumers. It can involve all actors in these chains because of the large scale in production and manufacture at each stage of the chain. Such whole chain quality assurance can create barriers to entry. In addition, processors also have a powerful role in such chains, which contributes to mobilising other actors and maintaining the supply and distribution relationships for suppliers certified with QAS's.

In contrast, in Vietnam, quality assurance is observed and emphasised in processing plants, but less so in other parts of the supply chain. These are several reasons for this, but the principal reason is very fragmented management along the chain, without a whole chain focus. The processing companies are only just adopting QAS's, either compulsorily or voluntarily within their plants. Thus quality seems to be only better controlled and addressed in this processing and manufacturing stages, and these companies are in a position to play a lead role in diffusing quality up and down the chain.

In this respect, some companies have integrated their operations both forward and backward, which will allow them greater control over the chain, including quality control. In addition, government is playing a key role in quality assurance since it sets national standards, supports processors (e.g. small and medium scale companies) and farmers in the processors' chains. Therefore, a key challenge for emerging economies is how to support and manage the process of assuring quality along the entire chain, recognising the key role of processors in this task.

7.2.2 Assurance of quality and perceived organisational outcomes

Lack of quality assurance along the chain can be linked to claims of unsafe dairy products. The weakest parts of the supply chain are distribution of end products and the supply (collection) of raw milk. In addition, quality within processing firms is assured only to minimum levels. Despite this apparently low level of quality assurance, within firms, perception of perceived organisational outcomes seems to be more optimistic, especially with respect to business performance. This is consistent with operating in a rapidly growing, emerging economy, where quality concerns start to increase as consumers have increasing income and more understanding of quality than before. As noted previously, QAS's can then become marketing tools and quality labels that attract buyers. Other perceived outcomes, such as operational and quality performance, were more mixed. This reflects the newness of QA in Vietnam, the external rather than internal focus of QAS's and the minimum level of application of QA systems within firms.

In an emerging economy, it might be concluded that firms are moving towards quality assurance. This contrasts to the situation in more developed economies where the focus will be more on refinement of QAS's. This indicates that challenges in quality assurance are quite different in these different contexts.

7.3 Conclusions

7.3.1 Research contribution

7.3.1.1 Contributions to the literature

The contribution of this research to the literature arises from the development and use of a multi-perspective model that links motivation, factors influencing the adoption of QAS's, and perceived outcomes for processing firms within the broader supply chain. The application of this model was to an emerging economy context.

As noted in the prior discussion sections in this Chapter, the results confirmed much prior research on motivations and factors influencing adoption of QAS's, but the research also found differences for some features (see Table 7-16). In particular, it did not confirm the finding that the main reasons for businesses adopting ISO 22000 are internal (Mamalis et al., 2009; Bilalis et al., 2009). Some interesting differences were also observed with respect to factors influencing the adoption of QAS's. In contrast to findings by Ziggers & Trienkens (1999), Walgenbach, (2007) and Terziovski et al. (2003), market pressure shown by partners and pressure from customers did not force businesses to adopt QAS's. As well firm size did not influence the decision to adopt HACCP, (in contrast to the findings of Henson (2000), Shavell (1987) and Crutchfield (1996)) or ISO 9000 (in contrast to the findings of Ghodbadian & Gallear (1996), Adams (1999) and Garr et al. (1997)).

With respect to outcomes, this research did not support earlier research by Bilalis et al. (2009) that ISO 22000 improves business performance or research by Mamalis et al. (2009) that it improves quality performance. However, as noted in Chapter 2, the literature on outcomes from the adoption of QAS's is scant, possibly because this is a difficult area to research. While it was only possible to get some perceptions of outcomes in this study, doing so allowed relationships between motivations, factors influencing adoption and perceived outcomes to be better explored, which helps to come up with insights into role of quality management in an emerging economy.

Table 7-16 Comparison of results of current study with some previous research

Topics	Findings	Authors	Did current study confirm findings
Motivation to adopt QAS's	Main reason for businesses adopting HACCP is that is requirement of buyers in export markets	Bilalis et al., 2009; Henson et al. 1998 ; Hobb et al., 2002; Zaibet, 2000	Yes
	Main reason for businesses adopting ISO 9000 is that is improving competitive advantage	Curcovic, 1999; Withers & Ebrahimpour, 2000; Terziovski, 2003	Yes
	Main reasons for businesses adopting ISO 22000 are internal.	Mamalis et al., 2009 ; Bilalis et al. 2009	No
Factors influencing adoption of QAS's	Legal factor strongly influences adoption of HACCP, but has less influence to other QAS's	Henson, 2010, Caswell, 2003; Jin et al. 2008; Hooker et al., 2002 ;Henson & Heasman, 1999.	Yes
	Market pressure shown by partners and pressure by customers forces businesses to adopt QAS's	Ziggers & Trienkens, 1999 ; Walgenbach, 2007; Terziovski et al., 2003.	No
	External support considered important to SME to adopt QAS's	Aggelogiannopoulos et al., 2007	Yes
	Firm size influences decision to adopt HACCP	Henson, 2000 ; Shavell, 1987 ; Crutchfield, 1996 ;	No
	Firm size influences decision to adopt ISO 9000	Ghodbadian & Gallea, 1996 ; Adams, 1999 ; Garr et al., 1997	No
	Governance structure influencing in adoption of QAS's	Moch & Morse, 1977; Zmud, 1982	Yes
	Top management support influencing adoption of QAS's	Thompson, 1965; Daft & Becker, 1978;	Yes
Impact of QAS's on organisational outcomes	HACCP improves business performance,	Khatri & Collin, 2007; Taylor, 2001; Romano et al., 2004	Yes
	HACCP improves operational performance	Khatri & Collin, 2007;	Yes
	HACCP improves quality performance	Trienkens & Zuubier, 2008;	Yes
	ISO9000 improves business performance	Anderson et al., 1999; Corbett et al., 2005 ; Terziovski et al., 2003.	Yes
	ISO 9000 improves operational performance	Withers & Ebrahimpour, 2000; Curkovic, 1999.	Yes
	ISO 9000 improves quality performance	Withers & Ebrahimpour, 2000;	Yes
	ISO 22000 improves business performance	Bilalis et al., 2009	No
	ISO 22000 improves operational performance	No prior research observed.	-
	ISO 22000 improves quality performance.	Mamalis et al., 2009.	No

A key contribution to the literature of this research was the influence of external factors in the establishment and improvement of QAS's in an emerging economy. That is, quality management is occurring within the context of a rapidly growing economy, where population incomes are growing. QAS's are being put in place as a market positioning device and with the sanction and support of government. As a result, the key perceived outcomes will relate to business performance.

7.3.1.2 Operational and policy implications

This research on quality assurance and adoption has some concrete policy implications. Results obtained from the research revealed that QAS adoption along the chain is fragmented with different systems and standards seen at different points in the chain. It was also seen that the processors are playing a key lead role and other parts of the chain have weak quality assurance, such as collectors and distributors/retailers.

Government and its functional organisations have a key role to play to strengthen quality management in dairy supply chains, in order to reduce the loss to society that may result from unsafe dairy products. It can do this in a number of ways.

Government can strengthen inspection and auditing of QAS's to ensure compliance through frequent inspection. At present, adherence to standards is minimal, and government can lift the adherence to standards to approach best practice internationally, and accept the challenge of eliminating any constraints associated with the implementation of QAS's at all stages of the chain. It can also assist with training staff in the certification bodies. It should pay attention to statutory and regulatory requirements, administrative procedures and other requirements that could negatively impact on QAS's adoption.

As processing firms are key firms in the chain, government should work with them to diffuse quality up and down the chain, in order to ensure that dairy products satisfy the increasing and higher quality demand of its consumers. Likewise, it should continue to work with other parts of the chain on quality management. For example, extending its efforts to small farmers as well as continuing to work with larger farmers. It also needs to look at collection and the distribution/retail level and how it can get cost effective quality management in the chain.

Government also has a role in harmonising standards along the chain, especially harmonising Vietnamese standards (TCVN) with international standards. This will require input by its functional departments and related Ministries, including the Ministry of Science and Technology, which could be considered the host and focal point of this effort. In collaboration with the Department of Science and Technology, and the Department of Quality Assurance for Agricultural Products of the Ministry of Agriculture and Rural

Development, they could research and issue standards and introduce these to dairy firms and their supply chains.

The government could also contribute to raising consumers' awareness of the importance of quality products, and so strengthen their position in these supply chains. It has a role in providing public media campaigns. It can also raise the profile of Vietnam's emerging quality status in overseas markets. This could include researching solutions to any trade-related issues and conflicts relating to quality of dairy products, and ensuring that Vietnam's quality standards for dairy products are aligned with international standards.

7.3.2 Limitations of the research

Although this research contributes to the literature on quality assurance and QAS's adoption, and associated factors, it has some limitations. The first limitation is the selection of the cases. The empirical research focused on five case studies. Although the research has yielded interesting theoretical insights, the results cannot be extrapolated to the Vietnamese dairy sector as a whole in any quantitative sense. However, it is worth highlighting that some of the chains studied conduct a reasonable volume of business within the sector they belong to. This increases the chances that the issues identified and studied here are important issues for the Vietnamese dairy sectors.

A second limitation relates to the fact that the study has only investigated perceived outcomes, rather than actual outcomes. However, these perceptions were compared to other data and information from secondary sources, particularly historical data on the state of businesses after adopting these QAS's. A related limitation may be the interviewees may not be aware of actual outcomes and other aspects of QA systems. In addition, quality issues relating to dairy products is sensitive information that could impact on public and consumer perception, and so the reputation of the company. This places limitations on the depth possible with results. This reliance on the perceptions of respondents is an unavoidable bias although the author used multiple data sources and triangulation where possible. Despite this limitation, key theoretical findings were able to be made.

The research has been conducted in the context of an emerging economy. However, Vietnam may not be representative of other emerging economies because of its planned system, which means that government can play a strong focused role. Despite this difference, there are other features, such as rapid growth, that are consistent with other emerging economies.

7.3.3 Suggestions for future research

The limitations of the research give rise to a number of suggestions for further research. Further quantitative research covering a larger representative sample of dairy processing companies, farmers, collectors, and retailers/distributors could explore regression relationships between factors that were constructed in the theoretical model in this research. Also, based on the development of the current research, empirical research looking on whether perceived outcomes matches realised outcomes for multitude QAS's would be interesting in the operational and quality management area. In addition, extending the research linking motivations, factors influencing adoption and outcomes to other emerging economies would be meaningful.

7.3.4 Implications of the research

In Vietnam, government directly and indirectly supports domestic businesses, including dairy businesses. It was shown in this study that Government has a vital role in promoting QA in dairy companies that are producing and manufacturing safe dairy products to serve domestic markets. The State-owned companies received both indirect support, as well as direct support through State investment, while privately owned businesses received indirect support, mainly through programs to enhance quality, such as adopting QAS's in plants. This finding illustrates the role that government can play in encouraging businesses to adopt QAS's. The adoption of QAS's can then begin the process of raising the competitive advantage of domestic enterprises relative to foreign companies in Vietnam, and increasing their ability to integrate into the global economy.

Foreign-owned companies entering the Vietnam market can play a role in upgrading quality. Not only do they bring advanced technology and management skills, but also transmit ideas on quality to domestic firms. For example, DLM is a foreign-owned company, which had or gained registered international quality certifications – HACCP, ISO 9000 and ISO 22000 – when it entered the country. It continues to update these certifications. This places pressure on its competitors, which are then forced to imitate it, in order to compete.

With respect to ownership structure, most of the surveyed companies were organised as joint stock companies, so ultimate power resides with shareholders, who express this at their annual meeting, where they give their opinions about development strategy, and quality

strategy, as well as moderating activities of top management. The results of the research did not give a lot of guidance on whether some ownership structures might enhance quality better than others. However, with respect to management structure, the Directors Board played a larger role in some companies than others. For example, some positions were held by one person, such as Chairperson of the Supervisors Board in combination with general Director. In such a situation, his/her leadership style may be very conducive to introducing and maintaining QA programs. The research found that the activities of management boards; for example, in re-structuring the QA department (HNM), strengthening internal training and reducing intermediaries in milk procurement (DLM), changing management structure and supporting downstream actors (VNM), have all contributed to improved QA for dairy products.

The dairy companies investigated have differences in their historical development. In particular, some companies, such as MCM and VNM, have a long history, and have experienced more stages in their development than other companies. Prior to the 1990s, most companies operated in a highly planned economy, and at that time, quality perhaps was not so important. However, today, in a market economy, quality seems to be a decisive competitive factor for businesses in order to gain market share. In this context, VNM is State-owned, and occupies the greatest market share in both milk distribution and procurement. This means that companies that enter the market later have to formulate specific business strategies, so that they can survive and prosper in the market. For example, one product strategy is operating in a 'niche market'. Thus, a situation is observed where VNM exploits its strengths by focussing on dairy powder and fresh milk with flavours, while HNM sees its competitive advantage in stirred yoghurt. MCM is recognised for 100% fresh milk, and have implemented a quality strategy, where they rapidly gained QA certification, and organised a vertically integrated supply chain appropriate for this, thus reducing any reliance on other actors outside their own firm, since they cannot control quality for these actors.

LIST OF REFERENCES

- Achterbosch, T., & Tongeren, van F. (2002). *Food safety measures and developing countries: Literature overview*. The Hague, the Netherlands: LEI Agricultural Economics Research Institute. Retrieved March 12, 2010, from <http://www.lei.dlo.nl/wever/UK/Research%20Areas/FoodSafetyDCs.pdf>
- Adams, M. (1999). Determinants of ISO accreditation in the New Zealand manufacturing sector. *Omega*, 27, 285-292.
- Aggelogiannopoulos, D., Drosinos, E. H., & Athanasopoulos, P. (2007). Implementation of a quality management system (QMS) according to the ISO 9000 family in a Greek small sized winery: a case study. *Food Control*, 18 (2007), 18,1077-1085.
- Agroviet. (2009). Dairy cattle production and development plan for 2002 -2010. Retrieved April 10, 2009, from [http:// www.agroviet.gov.vn/dairysector](http://www.agroviet.gov.vn/dairysector)
- Akey. (2004). Dairy Newsletter. Retrieved January, 2009, from http://www.akey.com/ruminant/dairy/pdf%20dairy%20newsletters/2004_04_augsept_dairy_newsletter.
- Ambdk. (2009). Food safety and hygiene control. Retrieved November 3, 2009, from <http://www.ambhanoi.um.dk/en/menu/CommercialServices/MarketOpportunities/Sector+Analysis/Food+safety+and+hygiene+control/>
- Anderson, M., & Sohal, A. S. (1999). A study of the relationship between quality management practices and performance in small businesses. *International Journal of Quality and Reliability Management*, 16 (9), 859-877.
- Anderson, S. W., Daly, J. D., & Johnson, M. F. (1999). Why firms seek ISO 9000 certification: Regulatory compliance or competitive advantage? *Production and Operations Management*, 8(1), 28-43.
- Antle, J. M. (1996). Efficiency food safety regulation in the food manufacturing sector. *American Journal of Agricultural Economics*, 78, 1242-1247.
- Antle, J. M. (1999). Benefits and costs of food safety regulation. *Food Policy*, 24(6), 605 – 623.
- Askey, J. M., & Dale, B. G. (1994). From ISO 9000 series registration to total quality management: an examination. *Quality Management Journal*, 1(4), 67-76.
- ASQ (American Society of Quality). (2002). Quality glossary. *Quality Progress*, 35 (7), 43-44.

- Badri, M. A., & Davis, D. (2000). Operations strategy, environment uncertainty and performance: a path analytic model of industries in developing countries. *Omega*, 28(2), 155-173.
- Baines, R., & Manley, W. (1999). *Implications of food assurance on UK primary producers*. RICS research conference ROOTS' 99. Royal Institution of Chartered Surveyors.
- Bao Viet Securities Company. (2009). *Vinamilk. Analysis report*. HCMC: Bao Viet Securities Company.
- Baomoi.com. (2012). IDP open Ba Vi grass demonstration field. Retrieved December 12, 2012, from <http://www.baomoi.com/Khanh-thanh-trai-bo-sua-va-dong-co-mau-Ba-Vi/45/8008568.epi>
- Baron, B., & Baron, P. B. (1980). A regulatory compliance model. *Journal of Contemporary Business*, 9(2), 139-150.
- Barwise, P. (2002). How much do CEOs and top managers matter in strategic decision-making?. *British Journal of Management*, 13(1), 83-95.
- Beekhuis-Gibbon, L., Whyte, P., O'Grady, L., More, S. J., & Doherty, M. L. (2011). A HACCP-based approach to mastitis control in dairy herds. *Irish Veterinary Journal*, 6, 1-2.
- Beulens, A. J. M., Broens, D. F., Folstar, P., & Hofstede, G. J. (2003). Food safety and transparency in food chains and networks, relationships and challenges. *Food Control*, 16(6), 481-486.
- Bilalis, D., Stathis, I., Konstantas, A., & Pasiali, S. (2009). Comparison between HACCP and ISO 22000 in Greek organic food sector. *Journal of Food, Agriculture and Environment*, 7 (2), 237-242.
- Billones, R. G. (1999). *Consumer and Farmer Perceptions of the New Zealand Dairy Industry's Image*. Unpublished master's thesis, Massey University, Palmerston North, New Zealand.
- Bocker, A., Bredahl, M. E., & Northern, J. (2003). ISO 9000 certification in British agribusiness: motivations and performance impacts. *Proceedings of the 82nd International European Seminar on Quality Assurance, Risk Management and Environment Control in Agriculture of Food Supply Network* (pp.51-60). Bonn, Germany: International Seminar of the European Association of Agricultural Economists.
- Boiral, O. (2003). ISO 9000: outside the iron cage. *Organisation Science*, 14 (6), 720-737.
- Briz, J., Nuria, A., Marian, G., Teresa, B., & Isabel, de F. (2006). *Quality management and improvement in the Spanish SME food industry: the adoption of ISO 9000*. Paper presented in the XI Congress of the EAAE, Copenhagen, Denmark, pp.1-14.

- Buttle, F. (1996). An investigation of the willingness of UK certified firms to recommend ISO 9000. *International Journal of Quality Science*, 1 (2), 40-50.
- Canavari, M., Regazzi, D., & Spadoni, R. (1998). *Evaluation of quality assurance systems in the agri-food sector*. Paper presented in the Sixth Joint Conference on Food, Agriculture and the Environment, Minneapolis, Minnesota, USA, pp.1-17.
- Cao, K. Q. T. T. (2007). *An Economic Analysis of Hazard Analysis of Critical Control Point –Based Risk Management Programme in the New Zealand Meat Industry*. Unpublished doctoral thesis, University of Waikato, Waikato, New Zealand.
- Capmany, C., Hooker, N. H., Ozuna, T. Jr., & van Tilburg, A. A. D. (2000). ISO 9000 – a marketing tool for US agribusiness. *International Food and Agribusiness Management Review*, 3(1), 41-53.
- Casadesus, M., Heras, I., & Ochoa, C. (2000). *The benefits of the implementation of the ISO 9000 normative: empirical research in the Spanish companies*. Paper presented in the Fifth World Conference on Production and Operations Management, Seville, Spain, pp.1-10.
- Caswell, J. A., & Henson, S. J. (1997). Interaction of private and public food quality control systems in global markets. In R.L. Loader, S.J. Henson & W.B. Trail (Eds.), *Globalisation of the food industry: policy implications* (pp. 217-236). Reading, UK: Department of Agricultural and Food Economics, the University of Reading.
- Caswell, J. A., & Hooker, N. H. (1996). HACCP as International trade standard. *American Journal of Agricultural Economics*, 78(3), 775-779.
- Caswell, J. A., & Johnson, G. V. (1991). Firm strategic response to food safety and nutrition regulatory. In J.A. Caswell (Ed.), *Economics of food safety* (pp. 273-297). New York: Elsevier.
- Caswell, J. A., Bredahl, M. E., & Hooker, N. H. (1998). How quality meta-systems are affecting the food industry. *Review of Agricultural Economics*, 20(2), 547-557.
- Celaya, C., Zabala, S.M., Perez, P., Medina, G., Manas, J., Fouz, J., Alonso, R., Anton, A., & Agundo, N. (2007). The HACCP system implementation in small business of Madrid's community 2007. *Food Control*, 18(10), 1314-1321.
- Chakravarthy, B. S. (1986). Measuring strategic performance. *Strategic Management Journal* 7(September –October), 437-458.
- Chau, P. Y. K., & Tam, K. Y. (1997). Factors affecting the adoption of open systems: an exploratory study. *MIS Quarterly*, 21(1), 1-24.
- Choi, B. (2002). *Knowledge Management Enablers, Processes, and Organizational Performance: an Integration and Empirical Examination*. Unpublished doctoral thesis, Korea Advanced Institute of Science and Technology, Korea.

- Cole, R. J., & Somers, M. (1980). Business and government regulation: a theory of compliance decisions. *Journal of Contemporary Business*, 10(1), 143-53.
- Cole, R.E. (1985). The macro politics of organizational change: a competitive analysis of the spread of small group activities. *Administrative Science Quarterly*, 30, 560 - 585.
- Commodity Product Quality Law(2008). Vietnam National Assembly, pp.1- 362.
- Corbett, C. J., Montes-Sancho, M. S., & Kirsch, D. A. (2005). The financial impact of ISO 9000 certification in the United States: An empirical analysis. *Management Science*, 51(7), 1046-1059.
- Creswell, J. W. (1994). *Research design: qualitative and quantitative approaches*. Thousand Oaks, CA: SAGE Publications.
- Creswell, J. W., & Tashakkori, A. (2007). Developing publishable mixed methods manuscripts Editorial. *Journal of Mixed Methods Research*, 1 (2), 107-111.
- Crosby, P. B. (1980). *Quality is free*. New York: McGraw-Hill.
- Curkovic, S., & Pagell, M. (1999). A critical examination of the ability of ISO 9000 certification to lead to a competitive advantage. *Journal of Quality Management*, 4(1), 1-17.
- Daft, R., & Becker, S. (1978). *Innovation in organization: innovation adoption in school organisations*. New York: Elsevier.
- Dairyvietnam. (2009). Development of dairy sector in Viet Nam. Retrieved October 19, 2009, from <http://www.dairyvietnam.org.vn>.
- Damanpour, F. (1987). The adoption of technological, administrative, and ancillary innovations: impact of organizational factors . *Journal of Management*, 13(4), 675-688.
- Damanpour, F. (1991). Organizational innovation; a meta analysis of effects of determinants and moderators. *Academy of Management Journal*, 34 (3), 555-590.
- Dang, T.H. (2009). *Milk price of Vietnam is the highest in the world*. Retrieved June 19, 2009, from <http://nhandan.org.vn/tinbai>.
- De Ruyter, K., & Scholl, S. (1998). Positioning qualitative marketing approach: reflections from theory and practice. *Qualitative Market Research*, 1(1), 7-14.
- Decision 11/(2006)/QD-BYT. Ten high risk food groups. Ministry of Public Health, Hanoi, Vietnam.
- Deloitte & Touche. (1994). US firms see striking paybacks from ISO 9000 registration. *Quality Progress*, (January), 26-27.
- Deming, E. (1986). *Out of crisis*. Boston: MIT Press.

- Deohar, S. Y. (2003). *Motivation for and cost of HACCP in Indian food processing industry*. Ahmadabad, India: Indian Institute Management.
- Dewar, R. D., & Dutton, J. E. (1986). The adoption of radical and incremental innovations: an empirical analysis. *Management Science*, 36(2), 123-139.
- Dinh, V. C. (2008). Dairy market and problems related to development of dairy production in Vietnam. Retrieved September 15, 2008, from <http://www.dairyvietnam.org.vn/vi/publications.php?mnu=5&nid=120&type=1>
- DLH (Department of Livestock Husbandry). (2010). *Development planning on livestock sector by the year 2020 and vision 2030*. Unpublished , Hanoi, Vietnam.
- Dries, L., & Swinnen, J. F. M. (2004). Foreign direct investment, vertical integration and local suppliers: Evidence from the Polish dairy sector. *World Development*, 32(9), 1525-1544.
- Dumicic, K., Lazibat, T., & Matic, B. (2005). Quality system implementation and market structure. *Ekonomski Pregled*, 56(9), 615-633.
- Dutchlady (2010a). *Annual report on production and business*. Unpublished, Binh Duong, Vietnam.
- Dutchlady (2010b). *Report of director board*. Unpublished, Binh Duong, Vietnam.
- Dutchlady company (2010). Overview of Dutch Lady Vietnam company. Retrieved April 7, 2011, from <http://suanuoc.dutchlady.com.vn/gioi-thieu>
- Ebrahimpour, M., Withers, B., & Hikmet, N. (1997). Experiences of US and foreign-owned firms: a new perspective on ISO 9000 implementation. *International Journal of Production Research*, 37 (2), 567-576.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14 (4), 532-550.
- Eklof, J. A., Hack, L. P., & Westlund, A. (1999). On measuring interactions between customer satisfaction and financial results. *Total Quality Management*, 10 (12), 1233-1246.
- Etlie, J. E., Bridges, W. P., & O'Keefe, R. D. (1984). Organisational strategy and structure differences for radical versus incremental innovation. *Management Science*, 30(6), 682-695.
- Faergemand, J., & Jespersen, FD. (2004). ISO 22000 to ensure integrity of food supply chain, . *ISO Management Systems ISO Insider Review*, 4(September –October), 21-24.
- FAO (Food and Agriculture Organisation). (1998). *Food Quality and Safety Systems - A Training Manual on Food Hygiene and the Hazard Analysis and Critical Control Point (HACCP) System*. Rome, Italy: FAO.

- FAO (Food and Agriculture Organisation). (2009). *Smallholder dairy development: Lessons learned in Asia*. Bangkok, Thailand: FAO regional office for Asia and Pacific.
- FAO/WHO. (2003). *Assuring food safety and quality: guidelines for strengthening national food control systems*. Joint FAO/WHO Publication. FAO Food and Nutrition Paper 76. Rome, Italy: FAO/WHO.
- Faye, B., & Loiseau, G. (20022000). Sources of contamination in dairy supply chains and approaches to quality control (pp.1-5). In E. Hanak, E. Boutrip, P. Fabre & M. Pinairo (Eds.), *Proceedings of the International Workshop on Food Safety Management in Developing Countries CIRAD-FAO*. Montpellier, France: International Workshop on Food Safety Management in Developing Countries.
- Fayouzi, H., Caswell, J. A., & Hooker, N. H. (2006). Motivations of fresh cut produce firms to implement quality management systems. *Review of Agricultural Economics*, 28(1), 132-146.
- Fearne, A., Hornibrook, S., & Dedman, S. (2001). The management of perceived risk in the food supply chain: a comparative study of retailer- led beef quality assurance schemes in Germany and Italy. *International Food and Agribusiness Management Review*, 4 (1), 19-36.
- Ferguson, W. (1996). Impact of the ISO 9000 series standard on industry marketing. *Industrial Marketing Management*, 25(4), 305-310.
- Foodstuff Safety and Hygiene Ordinance 2003. Vietnam National Assembly, Hanoi, Vietnam.
- Forker, L.B., Vickery, S.K., & Drooge, S.L. (1996). The contribution of quality to business performance. *International Journal of Operations and Production Management*, 16(8), 44-62.
- Friesland Foods. (2006). *Sustainability report 2006*. Friesland foods N.V., the Netherland. Retrieved 18 July, 2010, from www.frieslandcampina.com/.../80B508C3934B439DBF747647D407ED...
- FSC (First Securities Company). (2009). *Analytic report on dairy industry*. Unpublished, Ho Chi Minh City, Vietnam.
- Fueller, F. H., Huang, J., Ma, H., & Rozelle, S. (2006). Got Milk? The rapid rise of China's dairy sector and its future prospects. *Food Policy*, 31 (6), 201-215.
- Garr, S., Mak, Y. T., & Needam, J. (1997). Differences in strategy, quality management practices and performance reporting systems between ISO accredited and non-ISO accredited companies. *Management and Accounting Research*, 8(4), 383-403.
- Garvin, D. (1984). What does 'product quality' really mean? *Sloan Management Review*, Fall, 25-28.

- Garvin, D. (1987). Competing on the eight dimensions of quality. *Harvard Business Review*, 65(6), 101-109.
- Geraedts, H. P. A., Montenarie, R., & van Jijk, P. P. (2001). The benefits of total quality management. *Computerized Medical Imaging and Graphics*, 25(2), 217-220.
- Ghodbadian, A., & Gallear, D. N. (1996). Total quality management in SMEs. *Omega*, 24(1), 83-106.
- Glancey, K. (1998). Determinants of growth and profitability in small entrepreneurial firms. *International of Entrepreneurial Behaviour and Research*, 4(1), 18-27.
- Globalgap.org. (2012). Guides for global GAP. Retrieved November 13, 2012, from <http://globalgap.org>.
- GOV (Government of Vietnam). (2006). Decision No 43 adoption of national programme for assuring food safety and hygiene by the year 2010. Retrieved November 2, 2009, from <http://www.chinhphu.vn/vanbanpq/lawdocs/QD43TTG.rtf?id=15671>.
- GSO (General Statistical Office). (2009). *Statistics Yearbook*. Hanoi, Vietnam: Statistical Publishing House.
- GSO (General Statistical Office). (2010). *Statistics Yearbook*. Hanoi, Vietnam: Statistical Publishing House.
- Guilhon, A., Martin, J. & Weill, M. (1998). Quality approaches in small or medium sized enterprises: methodology and survey results. *Total Quality Management*, 9(8), 689-701.
- Gummesson, E. (2005). Qualitative research in marketing. *European Journal of Marketing*, 39 (3-4), 304-329.
- Habubank Securities. (2009). *Dairy industry report*. Unpublished, Hanoi, Vietnam.
- Hall, R. H. (2002). *Organizations: Structure, Processes, and Outcomes* (8th ed.). Upper Saddle River, New Jersey: Prentice Hall.
- Hanoimilk. (2009). *Annual report of business and production*. Unpublished, Vinh Phuc, Vietnam.
- Hashem, G., & Tann, J. (2007). The adoption of ISO 9001 standards within the Egyptian context: A diffusion of innovation approach. *Total Quality Management and Business Excellence*, 18 (6), 631-652.
- Hassan, Z. A., Green, R., & Herath, D. (2009). An empirical analysis of the adoption of food safety and quality practices in the Canadian food processing industry. Essay in honour of Stanley R. Johnson. Retrieved October 1, 2009, from <http://www.bepress.com/sjohnson/art18>.

- Hatten, K. J., & Hatten, M. L. (1985). Some empirical insights for strategic marketers: the case of beer. In H. Thomas & D. M. Gardner (Eds.), *Strategic marketing and management* (pp. 275-292). Chichester: John and Sons Ltd.
- Havnes, P. A., & Senneseth, K. (2001). Do networks work, panel study of firm growth among SME network. *Small Business Economics*, 16(4), 293-302.
- Henriques, I., & Sadorsky, P. (1996). The determinants of an environmentally responsive firm: an empirical approach. *Journal of Environmental Economics and Management*, 30(3), 381-395.
- Henson, S., & Heasman, M. (1999). Food safety regulation and the firm: Understanding the process of compliance. *Food Policy*, 23(1), 9-23.
- Henson, S., & Holt, G. (2000). Exploring incentives for adoption of food safety controls: HACCP implementation in UK dairy sector. *Review of Agricultural Economics*, 22(12), 407-420.
- Henson, S., & Northen, J. (1997). Public and private regulation of food safety: the case of the UK fresh meat sector. In G. Schiefer & R. Helbig (Eds.), *Quality management and process improvement for competitive advantage in agriculture and food*. Bonn: University of Bonn.
- Henson, S., Holt, G., & Northern, J. (1999). Costs and benefits of implementing HACCP in the UK dairy processing sector. *Food Control*, 10(2), 99-106.
- Heras, I., Casadesus, M., & Dick, M. P. G. (2002). ISO 9000 certification and the bottom line: a comparative study of the profitability of Basque region companies. *Managerial Auditing Journal*, 17 (1), 72-78.
- Heras, I., Dick, M. P. G., & Casadesus, M. (2002). ISO 9000 registration impact on sales and profitability: a longitudinal analysis of performance before and after accreditation. *International Journal of Quality and Reliability Management*, 19(6), 774-791.
- Herath, D., Hassan, Z., & Henson, S. (2007). Adoption of food safety and quality controls. Do firm characteristics matter? Evidence from the Canadian food processing sector. *Canadian Journal of Agricultural Economics*, 55(3), 299-314.
- Herriot, R., & Firestone, W. (1983). Multisite qualitative policy research: optimizing description and generalizability. *Journal of Education Research*, 12(2), 14-19.
- Hobbs, J. E., Fearn, A., & Spriggs, J. (2002). Incentive structures for food safety and quality assurance: an international comparison, *Food Control*, 13(2), 77-81.
- Holber, N. B., & Speece, M. W. (1993). *Practical marketing research— an integrated global perspective*. Singapore: Prentice Hall.
- Holleran, E., & Bredahl, M. E. (1997). Food safety, transaction costs and institutional innovation in the British food sector. In G. Schiefer & R. Hillbig (Eds.), *Quality*

management and process improvement for competitive advantage in agriculture and food. Bonn: University of Bonn.

- Holleran, E., Bredahl, M. E. & Zaibet, L. (1999). Private incentives for adopting food safety and quality assurance. *Food Policy*, 24(6), 669-683.
- Holsapple, C. W., & Joshi, K. D. (2001). Organizational knowledge resources. *Decision Support Systems*, 31(1), 39-54.
- Hooker, N. H., Nayga, Jr. R. M., & Siebert, J. W. (2002). The impact of HACCP on cost and product exit. *Journal of Agricultural and Applied Economics*, 34(1), 165-174.
- Huyen, H. (2011). *Marketing strategy of Dutch Lady Company*. Report, Hanoi, Vietnam.
- ICMSF. (1988). *Microorganism in food 4, application of the Hazard Analysis Critical Control Point (HACCP) system to ensure microbiological safety and quality*. Oxford: Blackwell Scientific Publications.
- IDP (International Dairy Products company) (2009). *Overview of IDP company*. Retrieved March 12, 2010, from <http://www.IDP.com.vn>
- IDP (International Dairy Products company). (2008). *Annual report on production and business*. Unpublished, Hanoi, Vietnam.
- IDP (International Dairy Products company). (2009). *Annual report on production and business*. Unpublished, Hanoi, Vietnam.
- Ishikawa, K. (1986). *Guide to quality control*. New York: Kraus International Publications.
- ISO (International Standardisation Organisation). (2008). *Implementation guidance for ISO 9001: 2008*. Geneva, Swiss: Secretariat of ISO/TC176/SC2.
- Jaffee, S., & Masakure, O. (2005). Strategic use of private standards to enhance international competitiveness: Vegetable exports from Kenya and elsewhere. *Food Policy*, 30(3), 316-333.
- Jayasinghe - Mudalige, U., & Henson, S. (2004). Quantifying the impact of economic incentives on firms' food safety responsiveness: the case of red meat and poultry sector in Canada. A selected paper presented at the Annual American Agricultural Economics Association Meeting, Denver, Colorado, August 1-4, 2004 (pp.1-28).
- Jin, S., Zhou, J., & Ye, J. (2008). Adoption of HACCP system in the Chinese food industry: a comparative analysis. *Food Control*, 19(8), 823-828.
- John, A., Khan, H. T. A., Raeside, R., & White, D. (2007). *Research methods for graduate business and social science students*. London: SAGE publications.
- Johnson, G., & Scholes, K. (1997). *Exploring corporate strategy* (3rd ed.). New York: Prentice Hall.

- Jouve, J. L. (1994). HACCP as applied in the EEC. *Food Control*, 5(3), 181-186.
- Juran, J. M., & Gryna F. M. (1970). *Quality planning and analysis*. New York: McGraw-Hill
- Juran, J.M. (1982). *Upper management and quality*. New York: Juran Institute.
- Juran, J.M. (1995). *A history of managing for quality: the evolution, trends and future directions of managing for quality*. Milwaukee, WI: ASQ Quality Press.
- Kannan, V. R., Tan, K., & Handfield, R. B. (1998). Managing competition, quality customer relations, and the supply base, and its impact on firm. In *Proceedings of the Decision Science Institute* (pp. 1259-1261). Las Vegas, Nevada, USA.
- Karaman, A. D., Cobanoglu, F., Tunalioglu, R., & Ova, G. (2012). Barriers and benefits of the implementation of food safety management systems among the Turkish dairy industry. *Food Control*, 25 (2), 732-739.
- Kauer, D., Prinzessin zu Waldeck, T. C., & Schäffer, U. (2007). Effects of top management team characteristics on strategic decision making: shifting attention to team member personalities and mediating processes. *Management Decision*, 45(6), 942-967.
- Kaynak, H. (2003). The relationship between Total Quality Management practices and their effects on firm performance. *Journal of Operations Management*, 21 (4), 405-435.
- Khan, A. M., & Manopichetwanna, V. (1989). Innovative and non-innovative small firms: type and characteristics. *Management Science*, 35(5), 597-606.
- Khatri, Y., & Collins, R. (2007). Impact and status of HACCP in the Australian meat industry. *British Food Journal*, 109 (5), 343-354.
- Knaflewska, J., & Pospiech, E. (2007). Quality assurance systems in food industry and health security of food. *Acta Sci. Pol., Technol. Aliment*, 6(2), 75-85.
- Kramer, A., & Twigg, B. A. (1962). *Fundamentals of quality control for food industry*. Westport: AVI Publishing Company Inc.
- Krause, D. R., Pagell, M., & Curkovic, S. (1998). Purchasing strategy: an empirical analysis. In *Proceedings of the Decision Science Institute* (pp. 1259-1261). Atlanta, USA: Decision Science Institute.
- Krause, D. R., Scannell, T. V., & Calantone, R. J. (2000). A structure analysis if the effectiveness of buying firms' strategy to improve supplier performance. *Decision Sciences*, 31 (1), 33-55.
- Krieger, S., Schiefer, G., & de Silva, A. C. (2007). *Costs and benefits in food quality systems: concept and a multi criteria evaluation approach*. Agricultural management, Marketing and Finance working document, 22. Rome, Italy: FAO.
- Kuei, C., & Madu, C. N. (2001). Identifying critical factors for supply chain quality management. *Asia Pacific Management Review*, 6(4), 409-423.

- Kuei, C., Madu, C. N., Lin, C., & Chow, W. S. (2002). Developing supply chain strategies based on the survey of supply chain quality and technology management. *The International Journal of Quality and Reliability Management*, 19(7), 889-901.
- Le, T. N. (2005). Country paper of Vietnam. In M. Satin (Ed.), *Quality enhancement in food processing through HACCP* (pp.172-176). Tokyo, Japan: Asian Productivity Organisation.
- Lieberson, S., & O'Connor, J. F. (1972). Leadership and organizational performance: study of large corporation. *American Sociology Review*, 37(2), 117-130.
- Lima, M. A. M., Resende, M., & Hansenclever, L. (2000). Quality certification and performance of Brazilian firms: an empirical study. *International Journal of Production Economics*, 66(2), 143-147.
- Lin, C., Chow, W. S., Madu, C. N., Kuei, C. H., & Yu, P. P. (2005). A structural equation model of supply chain quality management and organizational performance. *International Journal of Production Economics*, 96, 355-365.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage Publications, Inc.
- Lloyds Register Quality Assurance (1995). *ISO 9000: setting standards for better business*. New Jersey: Hoboken.
- Loc, V. T. T. (2006). Seafood supply chain quality management: The Shrimp supply chain quality management perspective of seafood companies in Mekong Delta Vietnam. *Paper presented at the 7th International Conference in Agrifood chains and Networks*, Ede, Netherlands (pp.1-15).
- Locke, L. F. (1987). *Proposals that work: a guide for planning dissertation and great proposals*. Newbury Park, London: SAGE.
- Luning, P. A., & Marcelis, W. J. (2007). A conceptual model of food quality management function based on a techno managerial approach. *Trends in Food Science and Technology*, 18(3), 159-166.
- Luning, P. A., & Marcelis, W. J. (2006). A techno managerial approach in food quality management research. *Trend in Food Science & Technology*, 17(7), 378-385.
- Luning, P. A., Bango, L., Kussaga, J., Jovira, J., & Marcelis, W. J. (2008). Comprehensive analysis and differentiated assessment of food safety control systems: a diagnosis instrument. *Trends in Food Science and Technology*, 19(10), 522-534.
- Luong, B. V. (2010). Vinamilk marketing strategy research. Unpublished undergraduate thesis. University of Ho Chi Minh, Vietnam.
- MacDonald, J. M., & Crutchfield, S. (1996). Modelling the costs of food safety regulations. *American Journal of Agricultural Economics*, 78, 1285-1290.

- Maldonado, E., Henson, S., Caswell, J., Leos, L., Maninez, P., Aranda, G., & Cadena, J. (2005). Cost-benefit analysis of HACCP implement in the Mexican meat industry. *Food Control*, 16(4), 375-381.
- Maldonado-Siman, E., Ruiz-Flores, A., Nunez-Dominguez, R., Gonzalez-Alcorta, M., & Hernandez-Rodriguez, B. A. (2009). Level of adoption of quality management systems in Mexican pork industry. In D. Li & Z. Chunjiang (Eds.), *Computer and Computing Technologies in Agriculture II*, Vol 3 (pp. 1747-1756). Boston: Springer.
- Mamalis, S., Kafetzopoulos, D. P., & Aggelopoulos, S. (2009). *The new food safety standard ISO 22000. Assessment, comparison and correlation with HACCP and ISO 9000:2000. The practical implementation in victual business*. Paper prepared for presentation at the 113th EAAE seminar “A resilient European food industry and food chain in a challenging world”, Chania, Crete, Greece. Retrieved December 13, 2012, from <http://ageconsearch.umn.edu/bitstream/58088/2/Mamalis.pdf>
- Manchester Business School. (1995). *ISO 9000: does it work?* Surrey: SGS Yarsley.
- Marcus, A. E. (1984). *The adversary economy*. London, England: Quorum books.
- MARD (Ministry of Agricultural and Rural Development). (2007). Vietnamese dairy sector overview. Retrieved September 14, 2008, from <http://www.agroviet.gov.vn>
- MARD (Ministry of Agricultural and Rural Development). (2008). *Manual for implementing Good Animal Husbandry Practices VietGAHP*. Unpublished, Hanoi, Vietnam.
- MARD (Ministry of Agricultural and Rural Development). (2009). Dairy cattle production and development plan 2002 – 2010. Retrieved June 24, 2009 from <http://www.agroviet.gov.vn>.
- Martin, S. A., & Anderson, D. W. (2000). HACCP adoption in US food industry. In L. D. Unnevehr (Ed.), *The economics of HACCP: costs and benefits*, (pp. 15-28). St Pault Minnesota: Eagan Press.
- Martinez-Costa, M., Martinez-Lorente, A. R., & Choi, T. Y. (2008). Simultaneous consideration of TQM and ISO 9000 on performance and motivation: an empirical study of Spanish companies. *International Journal of Production Economics*, 113 (1), 23-29.
- Mayes, T. (1998). Risk analysis in HACCP: burden or benefit?. *Food Control*, 9 (2-3), 171-176.
- Maza, M. T., & Ramirez, V. (2003). Reasons for the implementation of ISO 9000 standards and main achievements and modifications obtained in companies. Application in Spanish agribusiness. In G. Schiefer & U. Rickert (Eds.), *Proceedings of the 82nd European Seminar on Quality Assurance, Risk Management, and Environmental Control in Agriculture of Food Supply Network* (pp. 61-70). Bonn, Germany: European Seminar on Quality Assurance, Risk Management, and Environmental Control in Agriculture of Food Supply Network.

- Mazzoco, M. A. (1996). HACCP as a business management tool. *American Journal of Agricultural Economics*, 78(3), 770-774.
- Meagal, S. T., & Taylor, W. A. (1997). Factors influencing a successful transition from ISO 9000 to TQM. *International Journal of Quality and Reliability Management*, 14 (2), 100-117.
- Mehta, S., & Wilcock, A. (1996). Quality system standards in the Canadian food beverage industry. *Quality Management Journal*, 4(1), 72-96.
- Mekong Securities. (2009). *Dairy industry Analytic report*. Unpublished. Ho Chi Minh City, Vietnam.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, California: Sage Publications.
- Moc Chau Company. (2008). *Annual report of production and business in 2008*. Unpublished. Moc Chau, Vietnam.
- Moc Chau Company. (2009). *Annual report of production and business in 2009*. Unpublished. Moc Chau, Vietnam.
- Moc Chau Company. (2009). Overview of Moc Chau company. Retrieved October 12, 2009, from <http://www.mocchaumilk.com>
- Moc Chau Company. (2010). Overview of Moc Chau company. Retrieved August 10, 2010, from <http://www.mocchaumilk.com>.
- Moc Chau Company. (2011). Overview of Moc Chau company. Retrieved March 12, 2011, from <http://www.mocchaumilk.com>.
- MOI (Ministry of Industry and Commerce). (2008). Situation of implementing quality management systems in business firms in Vietnam. Retrieved December 14, 2008, from <http://www.moi.gov.vn/News/detail.asp?Sub=10&id=18491>
- MOI (Ministry of Industry and Commerce). (2009). *Development plan of dairy industry Vietnam by the year 2020 and vision 2025*. (in Vietnamese). Hanoi, Vietnam, pp.1-154.
- MOI (Ministry of Industry and Commerce). (2010). *Master plan of dairy industry development in Vietnam towards year 2020*. Report. (in Vietnamese). Hanoi, Vietnam, pp.1-247.
- Morgan, R. E., & Strong, C. A. (2003). Business performance and dimensions of strategic orientation. *Journal of Business research*, 56 (3), 163- 176.
- Morse, J. M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research*, 40(2), 120-123.

- Motarjemi, Y., & Keferstain, F. (1999). Food safety Hazard analysis and critical control points and the increase in foodborne disease: a Paradox? *Food Control*, 10 (4-5), 325 - 333.
- Motarjemi, Y., & Mortimore, S. (2005). Industry need and expectations to meet food safety. *Food Control*, 16 (6), 523-529.
- Myers, M. D. (2009). *Qualitative research in business and management*. London: SAGE Publications.
- NACMCF. (1992). Hazard analysis and critical control point system. *International Journal of Food Microbiology*, 16, 1-23.
- Nancy, B. L, Luca, F., Patric, G., Trung, P. Q., & Dominic, S. (2006). *Review, analysis,, and dissemination of experienced in dairy production in Vietnam*. Rome: FAO.
- Naser, K. Y., Karbhari, M., & Mokhtar, Z. (2004). Impact of ISO 9000 Registration on company performance evidence from Malaysia. *Managerial Auditing Journal*, 19 (4), 509 - 516.
- Naveh, E., & Marcus, A. (2005). Achieving competitive advantage through implementing and replicable management standard: Installing and using ISO 9000. *Journal of Operations Management*, 24(1), 1-26.
- Nganje, W. (1999). *Assessing the Impact of Regulated HACCP on the Efficiency and Profitability of Meat Processing and Packing Sectors*. Unpublished dissertation, University of Illinois, USA.
- Nguyen, T., Wilcock, A., & Aung, M. (2003). Food safety and quality systems in Canada: An exploratory study. *International Journal of Quality reliability Management*, 21(6), 655-671.
- Nguyen, A. P. (2007). *Lessons learned studies: Case of Vietnam. Improved market access and small holder dairy farmer participation for sustainable dairy development (CFC/FIGMDP/16FT)*. Report FAO/CFC (pp.1-18). Retrieved June 16, 2009, from: http://dairyasia.org/file/Information/Improved%20Market%20Access%20and%20Small%20Dairy%20Farmers_Vietnam.pdf
- Nguyen, A. P. (2009). *Vietnam: the emergence of a rapidly growing industry in small holder development: Lessons learned in Asia*. Bangkok, Thailand: FAO.
- NIAPP (National Institute of Agricultural Planning and Projection). (2010). *Development strategy for developing livestock by the year 2010 and 2020*. Unpublished, Hanoi, Vietnam, pp. 1-178.
- NIAPP (National Institute of Agricultural Planning and Projection). (2007). *Development plan for dairy cow herd in Vietnam*. Hanoi, Vietnam, pp. 1-252.
- Papadakis, V. M., & Barwise, P. (2002). How much do CEOs and top managers matter in strategic decision making? *British Journal Management*, 13(1), 83-95.

- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, California: SAGE Publications.
- Phan, T. G. T. (2007). Vietnam. In W. Vorley, A. Fearn & D. Ray (Eds.). *Re-governing markets: a place for small-scale producers in modern agri food chains?* (pp. 125-130). Hampshire: Gower Publishing Limited.
- Pieniadz, A., & Hockmann, H. (2007). Incentive compatible pricing and quality adoption: the case of the Polish dairy sector. *Paper presented at the 104 th (joint) EAAE-IAAE Seminar Agricultural Economics and Transition "What was Expected What We Observed the Lessons Learned"* (pp.1-14). Budapest, Hungary: Corvinus University of Budapest.
- Pierson, M. D., & Corlett, D. A. Jr. (1992). *HACCP: Principles and applications* (2nd ed.). New York: Van Nostrand Reinhold.
- Pillay, V., & Muliyl, V. (2005). *ISO 22000 Food safety management systems, the one universal food safety management system standard that works across all other*. London, UK: SGS systems & certifications services. Retrieved from March 14, 2010, from http://uk.sgs.com/white_paper_ISO_22000_2.pdf.
- Porter, M., & Keteis, C. (2003). *UK competitiveness : moving to the next stage*. Economic Papers ESRC. Retrieved March 4, 2011, from <http://www.bis.gov.uk/files/file14771.pdf>
- Potter, N. N., & Hotchkiss, J. H. (1995). *Food science* (5th ed.). New York: Chapman and Hall.
- Premkumar, G., & Ramaurthy, K. (1999). The role of interorganizational and organizational factors on the decision mode for adoption of interorganizational systems. *Decision Sciences*, 26(3), 303-306.
- Premkumar, G., & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *Omega*, 27(4), 467-484.
- Quazi, H. A., & Padibjo, S. R. (1997). ISO certification –a Singapore experience. *The TQM Magazine*, 9 (5), 364-371.
- Rao, S. S., Ragu-Nathan, T. S., & Solis, L. E. (1997). Does ISO 9000 have an effect on quality management practices? An international study. *Total Quality Management*, 8 (6), 335-346.
- Rayner, P., & Porter, L.J. (1991). BS 5750/ISO 9000: The experience of small and medium-sized firms. *International Journal of Quality & Reliability Management*, 8(6), 16-28.
- Redmond, E. C., & Griffith, C. J. (2003). Consumer food handling in the home: a review of food safety studies. *Journal of Food Protection*, 66(1), 130 - 161.
- Rocourt, J., Moy, G., Vierk, K., & Schlundt, J. (2003). *The present state of foodborne disease in OECD countries*. Geneva: World Health Organisation, Food Safety Department.

- Rogers, E. M. (1995). *Diffusion of Innovations* (4th ed.). New York: Free Press.
- Romano, D., Cavicchi, A., Rocchi, B., & Stephani, G. (2004). Costs and benefits of compliance for HACCP in Italian meat and dairy sectors. Retrieved 12 January, 2010, from <http://ageconsearch.umn.edu/bitstream/24983/1/sp04ro02.pdf>
- Romano, P. (2000). ISO 9000: What is its impact on performance? *Quality Management Journal*, 7(3), 38-56.
- Rugman, A. M., & Verbeke, A. (1998). Corporate strategies environmental regulations. *Strategic Management Journal*, 19 (4), 363-375.
- Rungtusanatham, M. J., Choi, T. Y., Hollingworth, D. G., Wu, Z., & Forza, C. (2003). Survey research in operations management: historical analysis. *Journal of Operations Management*, 21(4), 475-488.
- Salaheldin, S. I. (2007). The impact of organizational characteristics on AMT adoption: A study of Egyptian manufacturers. *Journal of Manufacturing Technology Management*, 18 (4), 443-460.
- Saraph, J. V., Benson, P. G., & Schoroeder, R. G. (1989). An instrument for measuring the critical factors of quality management. *Decision Science*, 20 (4), 810-829.
- Seddon, J., David, R., Loughran, M., & Murrell, R. (1993). *BS 5750 Implementation and value added: a survey of registered companies*. Buckingham, UK: Vanguard Consulting Ltd.
- Shavell, S. (1987). *Economic analysis of accident law*. Cambridge, M.A: Havard University Press.
- Sikora, T., & Strade, T. (2006). *Safety and quality assurance, and management systems and management in food industry*. Retrieved June 13, 2010, from http://www.ip.aua.gr/Studies/Sikora-Strada_final.pdf
- Silverman, D. (2001). *Interpreting qualitative data: Method for analyzing talk, text and interaction* (2nd ed.). London: Sage.
- Simmons, B.L. (1999). The relationship between ISO 9000 and business performance: Does registration really matter? *Journal of Management Issues*, 11 (3), 330-343.
- Sissell, K. (1996). Survey rates ISO 9000 success. *Chemical Week*, 158, 33.
- Skrabec, R., Quentin, Jr., Ragu-Nathan, T. S., Rao, S. S., & Bhatt, B. T. (1997). ISO 9000: Do the benefits outweigh the costs?. *Industrial Management*, 39(6), 26-33.
- Somers, R., Hoang, K. G., Smis, T., & Verle, P. (2008). *Re-empower paused dairy development in Vietnam*. Hanoi, Vietnam: Vietnam Belgium Dairy Project.
- Spencer, B. (1994). Models of organization and total quality management: a comparison and critical evaluation. *Academy of Management Review*, 19(3), 446-471.

- Sperber, W. H. (1998). Future developments in food safety and HACCP. *Food Control*, 92 (2-3), 129-130.
- Spiegel, M. van der. (2002). *Measuring Effectiveness of Food Quality Management*. Doctoral dissertation, University of Wageningen, the Netherland.
- Spriggs, J., Hobbs, J., & Fearne, A. (2000). Beef producers attitudes to coordination and quality assurance in Canada and the UK. *International Food Agribusiness Review*, 3, 95-109.
- STAMEQ (Directorate for Standards, Metrology and Quality). (2008). *Present state of quality registration in Vietnam*. Retrieved November 21, 2008, from <http://www.stameq.gov.vn>
- Staw, B. M., & Epstein, L. D. (2000). What bandwagons bring: effect of popular management techniques on corporate performance, reputation, and CEO pay. *Administrative Science Quaterly*, 45(3), 523-556.
- Stigler, G. (1971). The theory of economic regulation. *Bell Journal Economics and Management Science*, 2(1), 3-21.
- Strandskov, J. (1999). *Sources of competitive advantage and business performance in European meat processing industry*. MAPP working paper No. 63, Aarhus:Aarhus School of Business.
- Sultan, F., & Chan, L. (2000). The adoption of new technology: the case of object-oriented computing in software companies. *IEEE transactions on Engineering Management* 47(1), 106-126.
- Sumner, J. (1995). *A guide to food quality assurance*. Deviot, Australia: M& S Food Consultants Pty Ltd.
- Sun, H. (1999). Diffusion and contribution of total quality management: an empirical study in Norway. *Total Quality Management*, 10(6), 901-914.
- Surak, J. G., & Simpson, K. E. (1994). Using ISO 9000 standards as a quality framework. *Food Technology*, 48(9), 63-64.
- Suzuki, K. (2005). Investigation into the constraints to Dairy Cattle Health and Production in Northern Vietnam. Doctoral Thesis, The Royal Veterinary College University of London, UK.
- Talbot, V. (2007). ISO 22000 standard: A food safety standards in the food industry, developments and challenges. *International Journal of Production Economics*, 113 (1), 107-122.
- Taylor, E. (2001). HACCP in small companies: benefits or burden? *Food Control*, 12, 217-222.

- Taylor, E., & Kane, K. (2005). Reducing the burden of HACCP on SMEs. *Food Control*, 16(10), 833-839.
- Teo, T. S. H., & Raganathan, C. (1998). An empirical study of adopter and non adopter of the internet in Singapore. *Information and Management*, 34(6), 339-345.
- Terlaak, A., & King, A. (2006). The effect of certification with the ISO 9000 quality management standard: a signaling approach. *Journal of Economic Behaviour and Organization*, 60 (4), 579-602.
- Terziovski, M., Samson, D., & Dow, D. (1995). The impact of ISO 9000 certification on customer satisfaction. *Asia Pacific Journal of Quality Management* 4, 66-68.
- Terziovski, M., Samson, D., & Dow, D. (1997). The business value of quality management systems certification. Evidence from Australia and New Zealand. *Journal of Operations Management*, 15(1), 1-18.
- The Asia Business News (2009, November 14). Asia dairy production, p1. Hanoi, Vietnam.
- The Decision 11/2006 QD-BYT. (2006). On the 10 high risk foods groups regulation. Ministry of Public Health. Hanoi, Vietnam.
- The Law on the Quality of Products and Goods (2008). Vietnamese National Assembly, Hanoi, Vietnam.
- The Ordinance on the Hygiene and Safety of Foods (2003). Vietnamese National Assembly, Hanoi, Vietnam.
- Thompson, V. A. (1965). Bureaucracy and innovation. *Administrative Science Quarterly*, 10 (June), 1-20.
- Tornatzky, L. G., & Fleischer, M. (1990). *The process of technological innovation*. Lexington, MA: Lexington books.
- Trienekens, J. (2006). Impact of quality standards on food chains: comparison of three regions. IAMA symposium 2006. Retrieved October 11, 2010, from http://www.webalice.it/andrea.marescotti/.../3-1-Standards/2006_Trienekens.pdf
- Trienekens, J., & P. Zuurbier. (2008). Quality and safety standards in food industry, developments and challenges. *International Journal of Production Economics*, 113(1), 107 - 122.
- Tsekouras, K., Dimara, E., & Skuras, D. (2002). Adoption of a quality assurance scheme and its effect on firm performance: A study of Greek firms implementing ISO 9000. *Total Quality Management*, 13(6), 827-841.
- Turner, C. R., Ortmann, G., & Lyne, M. (2000). Adoption of ISO 9000 Quality assurance standards by South African agribusiness firms. *Agribusiness*, 16 (3), 295-307.

- Tuyen, D. K. (2007). Dairy herd development in Vietnam. *Animal Husbandry Review*, 12, 11-154.
- Tuyen, D. K. (2009). *Present status of dairy production 2001- 2009 and forecast 2010 -2020*. Unpublished manuscript. Hanoi, Vietnam.
- Umm, E., Zia, T., Mahmood, & Ali, M. R. (2011). *Dairy Development development in Pakistan*. Rome, Italy: FAO (Food and Agriculture Organisation).
- Unnevehr, L. J., & Jensen, H. H. (1998). *The economic implications of using HACCP as a food safety regulatory standard*. Working paper 99-WP 228. Center for Agricultural and rural Development Iowa State University, Ames, Iowa.
- Unnevehr, L. J., & Jensen, H. H. (1999). The economic implications of using HACCP as a food safety regulatory standard. *Food Policy*, 24(6), 625-635.
- USDA (United States Department of Agriculture, Foreign Agriculture Service (FAS). (2006). *Vietnam livestock and Products Annual 2006*. Global Agriculture Information Network GAIN report VM 6054. American Embassy, Hanoi, Vietnam.
- Uyar, A. (2008). An empirical investigation of the relationship between quality initiatives and financial performance. *Eurasian Journal of Business and Economics*, 1(1): 25-36.
- van Berkum, S. (2004). *Vertical coordination in ECA supply chains: Evidence from the dairy sector in Romania*. Report. Agricultural Economics Institute- LEI, Wageningen University.
- Vasconcellos, J. A. (2004). *Quality assurance for food industry: a practical approach*. New York: CRC Press.
- VDA (Vietnam Dairy Association). (2010). List of members and formal agencies in VDA. Ho Chi Minh City, Vietnam.
- Vietnam Credit. (2010). Ranking on Vietnamese business report. Unpublished, Hanoi, Vietnam.
- Vietnam SPS organization. (2007). Standards for foods - milk and dairy products. Retrieved April 21, 2011, from <http://spsvietnam.gov.vn/pages/thucpham-suavasanphamsua.aspx>
- Vietnamnet. (2009, July 12). Overview of Vinamilk. Retrieved August 11, 2010, from <http://www.vinamilk.com.vn>
- Vietstock. (2010). *Financial Analysis Report*. Unpublished, Ho Chi Minh City, Vietnam.
- Vinamilk (2006). *Annual report 2006*. Unpublished, Ho Chi Minh City, Vietnam.
- Vinamilk. (2007). *Annual report 2007*. Unpublished, Ho Chi Minh City, Vietnam..
- Vinamilk. (2008). *Annual report 2008*. Unpublished., Ho Chi Minh City, Vietnam.

- Vinamilk. (2009). *Annual report 2009*. Unpublished., Ho Chi Minh City, Vietnam.
- Vinamilk. (2010). *Annual report 2010*. Unpublished, Ho Chi Minh City, Vietnam.
- Vinasme. (2009, August 24). Decree 56/ ND-CP supporting SME in Vietnam issued by the Government of Vietnam. Retrieved October 11, 2009, from <http://www.vinasme.com.vn/nd5/detail/co-so-du-lieu/van-ban-phap-luat/nghi-dinh-cua-chinh-phu-ve-viec-tro-giup-phat-trien-doanh-nghiep-nho-va-vua/51292.007019.html>
- Vnexpress. (2010). Dutch Lady company produces milk followed the Dutch standards. Retrieved 10 June 2010, from <http://vnexpress.net/gl/doi-song/mua-sam/2010/03/3ba19981/>
- Vohies, D. W., & Morgan, N. A. (2005). Benchmarking marketing capability for sustainable competitive advantage. *Journal of Marketing*, 69 (1), 80 - 94.
- VPC (Vietnam Productivity Center). (2009). *Report on present status of quality certification registrar*. Unpublished, Hanoi, Vietnam.
- VPC (Vietnam Productivity Center). (2010). *List of registered businesses with quality certifications*. Unpublished, Hanoi, Vietnam.
- VSQC (Vietnam Quality Standard Center). (2008). Quality manament systems GMP and HACCP. Retrieved December 14, 2008 from <http://www.vsqc.org.vn/news000102.aspx>
- VTCnews. (2009, April 11). Dutch Lady will recall about 1.5 million of fresh milk packs. Retrieved April 19, 2011, from <http://www.vtc.vn/.../co-gai-ha-lan-se-thu-hoi-gan...>
- Walgenbach, P. (2007). Faeçcade and means of control: the use of ISO 9001 standard. In L. Theuvsen, M. Spiller, M. Peupert, & G. Jahn (Eds.), *Quality management in food chains* (pp. 29-42). Wageningen, the Netherlands.
- Wang, M. Y. (2008). Determinants affecting the adoption time of ISO 9000 standards across countries. *Journal of the Chinese Institute of Industrial Engineers*, 25 (6), 497-509.
- Ward, P. T., Duray, R., Leong. G. K., & Sum, C. H. (1995). Business performance, operations strategy, and performance: an empirical study of Singapore manufactures. *Journal of Operations Management*, 13(2), 99-115.
- Wayhan, B. V., Kirche, T. E., & Khumawana, M. B. (2002). ISO 9000 certification: the financial performance implications. *Total Quality Management*, 13(2), 217-231.
- WFP (World Food Program). (2008). Definitions of quality standards. Retrieved December 15, 2009, from <http://foodquality.wfp.org/FoodSafetyandHygiene/FoodQualitySystems/>.

- William, P. J. (1997). *Rapport Building Processes Used by an Expert Farm Management Consultant*. Unpublished master's thesis, Massey University, Palmerston North, New Zealand.
- Williams, F. P., D'Souza, D. E., Rosenfeld, M. E., & Kassaei, M. (1995). Manufacturing strategy, business strategy and firm performance in a mature industry. *Journal of Operations Management*, 13(1), 19-33.
- Wither, B., & Ebrahimpour, M. (2000). Does ISO 9000 affect the dimensions of quality used for competitive advantage? *European Management Journal*, 18(4), 431-443.
- Withers, B.E., & Ebrahimpour, M. (2001). Impact of ISO 9000 registration on European firms: A case analysis. *Integrated Manufacturing Systems*, 12(2), 139-151.
- Wolf, C. (1979). A theory on non-market failure: framework for implementation analysis. *Journal of Law and Economics*, 21(1), 107-139.
- Wolf, C. (1986). Markets or governments: choosing between imperfect alternatives. Prepared for the Alfred S Sloan Foundation. Santa Monica, California, USA: Rand Publisher.
- Wong, A., Tjosvold, D., Wong, W. Y. L., & Liu, C. K. (1999). Relationships for quality management in the Hong Kong China supply chain. *International Journal of Quality and Reliability Management*, 16(1), 24-41.
- World wide Learning limited Limited. (2007). *Business environment extra management*. London, UK: Worldwide Learning Limited publisher.
- Worthington, I., & Britton, C. (2006). *Business environment* (5th ed.). New York: Prentice-Hall publisher.
- Yin, R. K. (1994). *Case study research* (2nd ed.). Thousand Oaks, California: Sage Publications.
- Yin, R. K. (2003). *Case study research* (3rd ed.). Thousand Oaks, California: Sage Publications.
- Yin, R. K. (2009). *Case study research –Design and methods* (4th ed.). Los Angeles, California: Sage Publications.
- Zaibet, L. (2000). Compliance to HACCP and competitiveness of Oman fish industry. *International Food Agribusiness Review*, 3(3), 311-321.
- Zaibet, L., & Bredahl, M. (1997). Gains from ISO certification in the UK meat sector. *Agribusiness*, 13(4), 375-384.
- Zhang, H. (2008). *Water down the truth*. Retrieved Jan 22, 2009, from <http://www.guardian.co.uk/commentisfree/2008/sep/18/china?gusrc=rss&feed=commentisfree>

- Zhu, S., & Scheuermann, L. (1999). A comparison of quality programmes: Total quality management and ISO 9000. *Total Quality Management*, 10(2), 291-297.
- Ziggers, G. W., & Trienkens, J. (1999). Quality assurance in food and agribusiness supply chains: developing successful partnerships. *International Journal of Production Economics*, 60-61, 272-279.
- Zmud, R. W. (1984). An examination of “Push Pull” theory applied process innovation knowledge works. *Management Sciences*, 30(6), 727-738.

Appendix A Protocol questions for interview

A.1 Appendix A.1 Protocol Questions for interviewing small farm producers

Section 1: Production situation of farm

Q1: How many cows do you milk on your farms?

Q2: How many days do you milk a year?

Q3: Does number of days milking varied across years?

Q4: What is average volume of milk a cow per day?

Q5: Which kind of cow breed does your farm own?

Q6: How many workers are working for your farm?

Q7: Are workers family member or hired labour?

Q8: What capital and equipment do you have for dairy farming?

Q9: Who supplies these capital and equipment?

Q10: What is history of your cow diseases in recent years?

Q11: How do you treat when dairy cows suffered diseases?

Q12: If so, milking is ceased or not?

Q13: Milk sample is tested quality with acceptable contents of antibiotics, etc or given away?

Q14: Do you cope with any last rejects of buying milk from company?

Q15: Why did company reject buying the milk from farms that time?

Q16: What is any problem with milk on the farm?

Section 2: Process of producing milk on the farm

Q17: Describe how you milk your cow?

Q18: How often do you milk? (daily/twice daily?)

Q19: How much volume per each milking time do you have a day?

Q20: Describe what happens after the cows are milked and before the milk goes to collectors?

Q21: How long is it stored before being collected?

Q22: If whether bring milk to collecting centers as soon as possible that can improve quality of milk?

Q23: Is raw milk transported by you or collected by collectors to collecting centers?

Q24: Describe how the milk is transported?

Q25: How often is fresh milk collected by collectors or brought by you to collecting centers?

Section 3: Technical requirements and price formulation for milk

Q1: Who do you sell to (collectors or companies)

Q2: Describe how the prices are set up by collectors or company?

Q3: What requirements related to quality do company demand?

Q4: Do you have any guides about requirements demanded by factory?

Q5: What are disadvantages in improving quality of raw milk in farm?

Q6: What are advantages in improving quality of raw milk in farm?

Section 4: Perceptions about milk quality, quality systems

Q1: What do you think is meant by good quality raw milk?

Q2: Do you know about quality programs? If so, which ones you heard of ?

Q3: Do you know what the requirements of these programs are?

Q4: How about results after application of this program?

Q5: Why are these systems not applied at current time in your farms?

Q6: What about any innovations being applied on your farm?

Section 5: Economic efficiency in milk production

Q1: What about costs such as feed, labour, etc for dairy cow?

Q2: Is there any difference when you follow GMP program?

Section 6: Institutional issues

Q1: a.Do you have any training on skills to improve dairy quality on farm?

b.Who provided the trainings?

Q2: Do you involve in any projects or programs to improve dairy productivity and quality?

Q3: How often training courses organized a year?

Q4: Do you have any written contract with company?

Q5: What are details of the contract?

Q6: What is your plan and strategy in the future?

A.2 Appendix A.2. protocol questions for interviewing collectors

Section 1: Process of collecting milk from farms

- Q1:** How many collecting center does your company own?
- Q2:** How number of employees is working for collecting center?
- Q3:** What are capital and equipment in collecting center?
- Q4:** How is hygienic condition of tanks, storages in collecting center?
- Q5:** How is average distance from these collecting centers to dairy farms that you procure milk from?
- Q6:** How many farms does each collecting center procure from?
- Q7:** What are capital and equipment for testing quality in collecting centers?
- Q8:** Does the collecting centers or do the farmers bring milk to the collecting centers?
- Q9:** If the company collects milk from farms, describe the process from the time the milk is picked up until it reaching the collecting centers?
- Q10:** Describe the process from the time the milk reaches the collecting center until the time it leaves?
- Q11:** How long is the milk stored and chilled in collecting centers?
- Q12:** How often is raw milk transported to factory?
- Q13:** What is any problem with dairy quality in collecting center?

Section 2: Technical requirements and prices of milk

- Q1:** What are common technical requirements for dairy quality when procuring raw milk from dairy farms?
- Q2:** Is collecting center belong factory or private?
- Q3:** If private, who buys the milk?
- Q4:** What are advantages in improving dairy quality in collecting centers?

Q5: What are disadvantages in improving quality in collecting centers?

Section 3: Perceptions about quality systems

Q1: Do you know any about quality programs? If so, what program have you heard of?

Q2: Are any of the programs in place?

Q3: Why are these programs not applied current time in collecting centers?

Q4: What do you understand 'good quality to mean at a collecting center?

*

A.3 Appendix A.3. protocol questions for interviewing processors/plants

Part A: Factory status and Process

Q1: What year was factory in operational?

Q2: How many employees are working in dairy factory?

Q3: What is designed and actual capacity of factory in processing and manufacturing dairy products?

Q4: Does your factory cope with shortage of raw milk in seasonality?

Q5: Describe how milk is processed in factory?

Q6: What are kinds of dairy products processed and manufactured by dairy factory?

Q7: How much volume is each kind of products processed and manufactured by factory?

Q8: How often does milk sample be tested? Which are technical criteria for testing milk in factory?

Q9: Describe the QAS processes in place?

Q10: How do factory treat raw milk not being passed test of quality?

Q11: What is any problem with dairy quality in factory?

Part B. Quality assurance systems and its operation in factory

Section 1: Motivations/expectations

Q1:What do you understand by good quality?

Q2: Is there any quality program applied in factory?

Q3: What are your expectations/objectives when adopting QAS in factory?

Section 2: Business Environment

Q1: Does your company have any supports for registration of quality programs?

Q2: If possible, what type of supports do you describe?

Q3: How do trade and industrial associations have a role to support your company to have registration of quality program?

Q4: What kind of support do you describe?

Q5: Have market pressures from customers and competitors influenced you to adopt a QAS?

Q6: If so, how has pressure of customer influenced your decision?

Section 3: Firm characteristics

Q1: How much do you have expense for setting up quality program?

Q2: How much do you have investment for upgrading technology and equipment, employee, maintaining QAS?

Q3: Could you describe each component of these costs?

Q4: How are roles of manager board for adopting QAS?

Q5: How do you think about type of products processed and manufactured by firm have any effect to adoption decisions?

Q6: How do you think power leadership factors in management have influenced adoption decisions?

Section 4: Institutional

Q1: What kinds of document do you prepare to get quality QAS certification?

Q2: What certifying company do you usually register to?

Q3: Does the factory have quality staff?

Q4: What activity does quality staff do?

Q5: How is information and data related to quality control been stored and shared?

Section 5: Advantages and disadvantages QAS applied in factory

Q1: What is your opinion of advantages in application of QAS in your factory?

Q2: What is your opinion of disadvantages in application of QAS in your factory?

Section 6: Outcomes/results after adoption of QAS's

Q1: What changes are there when adopting QAS in your factory?

Q2: What do you describe more details about changes in business results after adopting QAS? May describe detail for each particular QA system that the company is adopting.

- a. Revenue
- b. Sales
- c. Market shares
- d. Profitability
- e. Return on sales
- f. Sale growth rate

Q2: What do you describe details about changes in operational outcomes after adopting QAS? May describe in detail for each particular QAS's?

- a. Unit production costs
- b. Fast deliveries
- c. Cycle time
- d. Design quality
- e. Manufacturing quality
- f. Customer satisfaction

Q3: What do you describe details about changes in product quality outcomes after adopting QAS? May describe in detail for each particular QAS's?

- a. Defect rate
- b. Recall rate
- c. Guarantee costs
- d. Performance
- e. Features
- f. Reliability
- g. Conformance
- h. Durability
- i. Serviceability
- j. Aesthetics
- k. Perceived quality

Q4: What is your plan and business strategy in the future?

A.4 Appendix A.4. protocol Questions for Interviewing distributors

Section 1: Process

Q1: What kind of dairy products do you sell?

Q2: How do you know if dairy products that you buy are good quality?

Q3: What companies do you buy dairy products from?

Q4: How do you store dairy products to assure quality?

Q5: Describe how do you get dairy products from factory to sell?

Q6: Describe how the products are sold?

Q7: What are advantages in selling dairy products?

Q8: What are disadvantages in selling dairy products?

Section 2: Governance issues

Q1: Do you have any supply contract with dairy company?

Q2: Are these contracts long term with supplying companies?

Q3: How quality terms are shown in contracts between you and dairy company?

Section 3: Perceptions of quality

Q1: What do you understand is meant by dairy quality?

Q2: What is your opinion about relationship of dairy quality and sale prices?

Q3: How is dairy product with quality program label sold?

Q4: Do you know any about quality programs?

Q5: If so, what program have you heard of?

Q6: Are any of the programs in place?

Q7: Why are these programs not applied current time in distributors’?

Q8: What do you understand ‘good quality’ to mean at a distributors’?

Q9: What is your plan and business strategy in the future?

A.5 Appendix A.5. Protocol questions for interviewing retailers

Section 1: Process

Q1: What kind of dairy products do you sell?

Q2: How do you know if dairy products that you buy are good quality?

Q3: What companies do you buy dairy products from?

Q4: How do you store dairy products to assure quality?

Q5: Describe how do you get dairy products from factory to sell?

Q6: Describe how the products are sold?

Q7: What are advantages in selling dairy products?

Q8: What are disadvantages in selling dairy products?

Section 2: Economic efficiency

Q1. How about income from sale milk?

Section 3: Governance

Q1: Do you have any supply contract with dairy company?

Q2: are these contracts long term with supplying companies?

Q3: How quality terms are shown in contracts between you and dairy company?

Section 4: Perceptions

Q1: What do you understand is meant by dairy quality?

Q2: What is your opinion about relationship of dairy quality and sale prices?

Q3: How is dairy product with quality program label sold?

Q4: Do you know any about quality programs?

Q5: If so, what program have you heard of?

Q6: Are any of the programs in place?

Q7: Why are these programs not applied current time in distributors’?

Q8: Do you have quality registration issued by MOH?

Q9: What requirements are shown in registration?

Q10: What do you understand ‘good quality’ to mean at a distributors’?

Q11: What is your plan and business strategy in the future?

Appendix B Questionnaire form for post surveying

BỘ CÂU HỎI QUESTIONNAIRE FORM

Phần 1: Thông tin chung của người được hỏi/Section 1: General information of respondent

1.1.Họ và tên/full name:

1.2.Chức vụ/Position:

1.3.Công ty, nhà máy đang áp dụng hệ thống quản lý chất lượng nào?/Which QAS's have company/plants certified?

☐HACCP ☐ISO 9000 ☐ISO 22000 ☐Các hệ thống khác/others_____

Phần 2: Lý do áp dụng hệ thống quản lý chất lượng /Section 2: Motivations to seek QAS's

2.1.Theo Anh(chị) thì các lý do được liệt kê dưới đây, lý do nào được cho là quan trọng trong theo đuổi hệ thống quản lý chất lượng (đánh giá bởi thang 5 điểm)? Anh (chị) chỉ chọn 1 cho từng lý do.

Below is a list of issues which may motivate the decision to adopt a particular QAS. Please indicate the importance of each issue by ranking them on a 5 point scale from 1: very unimportant to 5: very important. Please circle only one response against each reason.

Hệ thống HACCP/HACCP system

	Unimportant → Very important				
	Không quan trọng-----→ rất quan trọng				
a.Đáp ứng các yêu cầu về luật pháp, qui chuẩn Satisfying food legislation and national regulations	1	2	3	4	5
b.Đáp ứng yêu cầu của khách hàng Satisfying requirement of customers	1	2	3	4	5
c.Nâng cao năng lực cạnh tranh Raising competitive advantage over competitors	1	2	3	4	5
d.Cải thiện chất lượng sản phẩm Improving product quality	1	2	3	4	5

<u>Hệ thống HACCP/HACCP system (tiếp tục)</u>	1	2	3	4	5
Improving production processes					
f.Làm mới hình ảnh của doanh nghiệp	1	2	3	4	5
Improving company's image					
g.Làm giảm phản hồi của khách hàng	1	2	3	4	5
Reduce customer complaints					
h.Cải thiện hiệu quả của nhà máy	1	2	3	4	5
Improving efficiency of plant					
i.Theo khuyến cáo của Bộ công thương, hiệp hội Sữa	1	2	3	4	5
As recommended by MOI, dairy association					
k.Giảm bớt sản phẩm hỏng	1	2	3	4	5
Reducing product wastes					
l.Được coi là công cụ tốt	1	2	3	4	5
Regards as good practice					
m.Tiếp cận thị trường nước ngoài	1	2	3	4	5
Accessing new overseas market					
 <u>Hệ thống ISO 9000/ISO 9000 system</u>					
a.Đáp ứng các yêu cầu về luật pháp, qui chuẩn	1	2	3	4	5
Satisfying food legislation and national regulations					
b.Đáp ứng yêu cầu của khách hàng	1	2	3	4	5
Satisfying requirement of customers					
c.Nâng cao năng lực cạnh tranh	1	2	3	4	5
Raising competitive advantage over competitors					
d.Cải thiện chất lượng sản phẩm	1	2	3	4	5
Improving product quality					
e.Cải thiện quá trình sản xuất	1	2	3	4	5
Improving production processes					
f.Làm mới hình ảnh của doanh nghiệp	1	2	3	4	5
Improving company's image					
g.Làm giảm phản hồi của khách hàng	1	2	3	4	5

<u>Hệ thống ISO9000/ ISO9000 system (tiếp tục)</u>
--

h.Cải thiện hiệu quả của nhà máy	1	2	3	4	5
Improving efficiency of plant					
i.Theo khuyến cáo của Bộ công thương, hiệp hội Sữa	1	2	3	4	5
As recommended by MOI, dairy association					
k.Giảm bớt sản phẩm hỏng	1	2	3	4	5
Reducing product wastes					
l.Được coi là công cụ tốt	1	2	3	4	5
Regards as good practice					
m.Tiếp cận thị trường nước ngoài	1	2	3	4	5
Accessing new overseas market					

Hệ thống ISO 22000 (nếu có)

a.Đáp ứng các yêu cầu về luật pháp, qui chuẩn	1	2	3	4	5
Satisfying food legislation and national regulations					
b.Đáp ứng yêu cầu của khách hàng	1	2	3	4	5
Satisfying requirement of customers					
c.Nâng cao năng lực cạnh tranh	1	2	3	4	5
Raising competitive advantage over competitors					
d.Cải thiện chất lượng sản phẩm	1	2	3	4	5
Improving product quality					
e.Cải thiện quá trình sản xuất	1	2	3	4	5
Improving production processes					
f.Làm mới hình ảnh của doanh nghiệp	1	2	3	4	5
Improving company's image					
g.Làm giảm phản hồi của khách hàng	1	2	3	4	5
Reduce customer complaints					
h.Cải thiện hiệu quả của nhà máy	1	2	3	4	5
Improving efficiency of plant					
i.Theo khuyến cáo của Bộ công thương, hiệp hội Sữa	1	2	3	4	5
As recommended by MOI, dairy association					
k.Giảm bớt sản phẩm hỏng	1	2	3	4	5
Reducing product wastes					
l.Được coi là công cụ tốt	1	2	3	4	5
Regards as good practice					
m.Tiếp cận thị trường nước ngoài	1	2	3	4	5

Phần 3: Các yếu tố ảnh hưởng đến áp dụng hệ thống quản lý chất lượng/Section 3: Factors influencing adoption decision

3.1. Anh (chị) có thể cho biết các yếu tố được liệt kê dưới đây, yếu tố nào ảnh hưởng đến quyết định áp dụng hệ thống quản lý chất lượng (Đánh giá theo thang điểm 1-5 theo từng hệ thống quản lý chất lượng)?/ Below is list of factors influencing adoption, please indicate influence level of the factor according to five point scale. Please circle one response against each factor.

Hệ thống HACCP /HACCP system

	Ít ảnh hưởng → rất ảnh hưởng No effect → very strongly effect				
a.Luật pháp, qui chuẩn quốc gia/Food legal, national regulations	1	2	3	4	5
b.Trợ giúp từ bên ngoài doanh nghiệp/external support	1	2	3	4	5
c.Sức ép của thị trường/Market pressure	1	2	3	4	5
d. Qui mô của doanh nghiệp/Firm size	1	2	3	4	5
e.Cơ cấu của doanh nghiệp/Governance structure	1	2	3	4	5
f.Sự trợ giúp, khuyến khích của lãnh đạo/Top management support	1	2	3	4	5
g.Đặc điểm của công ty và sản phẩm/Nature of product and firm	1	2	3	4	5

Hệ thống ISO 9000/ ISO 9000 system

	Ít ảnh hưởng → rất ảnh hưởng No effect → very strongly effect				
a.Luật pháp, qui chuẩn quốc gia/Food legal, national regulations	1	2	3	4	5
b.Trợ giúp từ bên ngoài doanh nghiệp/external support	1	2	3	4	5
c.Sức ép của thị trường/Market pressure	1	2	3	4	5
d. Qui mô của doanh nghiệp/Firm size	1	2	3	4	5
e.Cơ cấu của doanh nghiệp/Governance structure	1	2	3	4	5
f.Sự trợ giúp, khuyến khích của lãnh đạo/Top management support	1	2	3	4	5
g.Đặc điểm của công ty và sản phẩm/Nature of product and firm	1	2	3	4	5

Hệ thống ISO 222000 (nếu có)/ISO 22000 (if possible)

	Ít ảnh hưởng → rất ảnh hưởng No effect → very strongly effect				
a. Luật pháp, qui chuẩn quốc gia/Food legal, national regulations	1	2	3	4	5
b. Trợ giúp từ bên ngoài doanh nghiệp/external support	1	2	3	4	5
c. Sức ép của thị trường/Market pressure	1	2	3	4	5
d. Qui mô của doanh nghiệp/Firm size	1	2	3	4	5
e. Cơ cấu của doanh nghiệp/Governance structure	1	2	3	4	5
f. Sự trợ giúp, khuyến khích của lãnh đạo/Top management support	1	2	3	4	5
g. Đặc điểm của công ty và sản phẩm/Nature of product and firm	1	2	3	4	5

Phần 4: Tác động của hệ thống quản lý chất lượng lên kết quả của doanh nghiệp/Section 4: Impact of QAS's on organisational outcomes

4.1. Theo anh (chị), sau khi áp dụng hệ thống quản lý chất lượng các tiêu chí của doanh nghiệp được liệt kê dưới đây như thế nào (*Đánh giá theo thang điểm 1-5 theo từng hệ thống quản lý chất lượng*). Chỉ chọn 1 đánh giá và đánh dấu điểm cho mỗi tiêu chí.

Below is list of benefits that QAS's may create, please circle one against one issue according to 5 point scale.

Hệ thống HACCP

	Ít ảnh hưởng → rất ảnh hưởng No increase → large increase				
a. Doanh thu/Revenue	1	2	3	4	5
b. Doanh số bán/Sales	1	2	3	4	5
c. Thị phần/Market share	1	2	3	4	5
d. Lợi nhuận/Profit	1	2	3	4	5
e. Doanh thu trên doanh số bán/Return on sales	1	2	3	4	5
f. Tốc độ tăng trưởng doanh số bán/Sales growth rate	1	2	3	4	5
g. Chất lượng thiết kế/Design quality	1	2	3	4	5
h. Chất lượng chế biến/Manufacturing quality	1	2	3	4	5
i. Thỏa mãn khách hàng/Customer satisfaction	1	2	3	4	5
j. Hình thể/Performance	1	2	3	4	5
k. Đặc tính/Feature	1	2	3	4	5

l. Độ tin cậy/Reliability	1	2	3	4	5
m. Sự tương thích với các tiêu chuẩn/Conformance	1	2	3	4	5
n. Đảm bảo lâu hỏng/Durability	1	2	3	4	5
o. Đáp ứng dịch vụ/Serviceability	1	2	3	4	5
p. Uy tín thương hiệu sản phẩm/Aesthetics	1	2	3	4	5
q. Chất lượng cảm nhận/Perceived quality	1	2	3	4	5

	Giảm rất nhiều → không giảm Large decrease → no decrease				
a. Chi phí sản xuất đơn vị sản phẩm/Unit production costs	1	2	3	4	5
b. Chu trình thời gian/Cycle time	1	2	3	4	5
c. Thời gian giao nhận/Fast deliveries	1	2	3	4	5
d. Tỷ lệ sản phẩm hỏng/Defect rate	1	2	3	4	5
e. Tỷ lệ sản phẩm thu hồi/Recall rate	1	2	3	4	5
f. Chi phí bồi thường/Guarantee costs	1	2	3	4	5

Hệ thống ISO 9000

a. Doanh thu/Revenue	1	2	3	4	5
b. Doanh số bán/Sales	1	2	3	4	5
c. Thị phần/Market share	1	2	3	4	5
d. Lợi nhuận/Profit	1	2	3	4	5
e. Doanh thu trên doanh số bán/Return over sales	1	2	3	4	5
f. Tốc độ tăng trưởng doanh số bán/sales growth rate	1	2	3	4	5
g. Chất lượng thiết kế/Design quality	1	2	3	4	5
h. Chất lượng chế biến/Manufacturing quality	1	2	3	4	5
i. Thỏa mãn khách hàng/Customer satisfaction	1	2	3	4	5
j. Hình thể/Performance	1	2	3	4	5
k. Đặc tính/Feature	1	2	3	4	5
l. Độ tin cậy/Reliability	1	2	3	4	5
m. Sự tương thích với các tiêu chuẩn/Conformance	1	2	3	4	5
n. Đảm bảo lâu hỏng/Durability	1	2	3	4	5
o. Đáp ứng dịch vụ/Serviceability	1	2	3	4	5
p. Uy tín thương hiệu sản phẩm/Aesthetics	1	2	3	4	5

q. Chất lượng cảm nhận/Perceived quality	1	2	3	4	5
--	---	---	---	---	---

	Giảm rất nhiều	←		không giảm	
a. Chi phí sản xuất đơn vị sản phẩm/Unit production costs	1	2	3	4	5
b. Chu trình thời gian/Cycle time	1	2	3	4	5
c. Thời gian giao nhận/Fast deliveries	1	2	3	4	5
d. Tỷ lệ sản phẩm hỏng/Defect rate	1	2	3	4	5
e. Tỷ lệ sản phẩm thu hồi/Recall rate	1	2	3	4	5
f. Chi phí bồi thường/Guarantee costs	1	2	3	4	5

Hệ thống ISO 22000

a. Doanh thu/Revenue	1	2	3	4	5
b. Doanh số bán/Sales	1	2	3	4	5
c. Thị phần/Market share	1	2	3	4	5
d. Lợi nhuận/Profit	1	2	3	4	5
e. Doanh thu trên doanh số bán/Return on sales	1	2	3	4	5
f. Tốc độ tăng trưởng doanh số bán/sales growth rate	1	2	3	4	5
g. Chất lượng thiết kế/Design quality	1	2	3	4	5
h. Chất lượng chế biến/Manufacturing quality	1	2	3	4	5
i. Thỏa mãn khách hàng/Customer satisfaction	1	2	3	4	5
j. Hình thể/Performance	1	2	3	4	5
k. Đặc tính/Feature	1	2	3	4	5
l. Độ tin cậy/Reliability	1	2	3	4	5
m. Sự tương thích với các tiêu chuẩn/Conformance	1	2	3	4	5
n. Đảm bảo lâu hỏng/Durability	1	2	3	4	5
o. Đáp ứng dịch vụ/Serviceability	1	2	3	4	5
p. Uy tín thương hiệu sản phẩm/Aesthetics	1	2	3	4	5
q. Chất lượng cảm nhận/Perceived quality	1	2	3	4	5

Giảm rất nhiều ← không giảm

Large decrease ← no decrease

a. Chi phí sản xuất đơn vị sản phẩm/Unit production costs	1	2	3	4	5
b. Chu trình thời gian/Cycle time	1	2	3	4	5
c. Thời gian giao nhận/Fast deliveries	1	2	3	4	5
d. Tỷ lệ sản phẩm hỏng/Defect rate	1	2	3	4	5
e. Tỷ lệ sản phẩm thu hồi/Recall rate	1	2	3	4	5
r. Chi phí bồi thường/Guarantee costs	1	2	3	4	5

Xin chân thành cảm ơn Anh (chị) đã tham gia !/Thank you for your cooperation

Appendix C Major dairy companies in Vietnam

Company	Type of ownership	Plants	Plant size			QAS certified
			S	M	L	
1. VINAMILK	State owned	1. Saigon dairy factory	x			. GMP
	Major share	2. Hanoi dairy factory	x			. HACCP
		3. Cantho dairy factory		X		. ISO 9001: 9004, HACCP
		4. Binh dinh dairy factory	x			. ISO 9001: 2000
		5. Nghe An dairy factory	x			HACCP
		6. Dielac dairy factory	x			ISO, HACCP
		7. Truongtho dairy factory	x			ISO
		8. Thongnhat dairy factory	x			ISO, HACCP
		9. Hoakhanh dairy factory			x	HACCP
		10. TienSon dairy factory			x	HACCP
2. Hanoi dairy joint stock company Hanoimilk	joint stock	11. Melinh dairy plant			x	ISO 9000, HACCP, ISO 22000
3. Truyen Tam production and process company	Private	12. Dairy production unit Truyentam	x			HACCP
4. Tanvietxuan (Vixumilk) dairy company	private	13. Vietxuan dairy plant		X		ISO 9000, ISO22000, HACCP,
5. Cat and Sun joint stock dairy company	private	14. Dairy plant	x			HACCP
6. New world food Co Ltd	private	15. Dairy plant	x			HACCP, ISO 22000
7. Hoang Khang Processing and trade Company	private	16. Hoang Khang Dairy plant	x			HACCP
8. Van Tho An Company	private	17. dairy plant	x			HACCP
9. Saigon joint stock dairy company	joint stock	18. Saigon dairy plant		X		HACCP, ISO 9000

Company	Type of ownership	Plants	Plant size			QAS certified
			S	M	L	
10. Suc song joint stock dairy company	joint stock	19.Dairy plant Sucsong Thuong tin Hanoi	X			HACCP, ISO 22000
11. Nestle dairy Co Ltd	joint ventured	20.Nestle dairy factory Dongnai		X		. ISO 9001: 2000
12. Anco company	private	21. Bavi dairy plant		X		. GMP
13. Nutifood company	joint stock	22. Nutifood dairy factory BinhDuong	x			ISO, HACCP
14. FrieslandCampina dairy JV company (dutchlady)	joint ventured	23. Binh duong factory		X		ISO 9000, HACCP, ISO 22000
		24. HaNam factory			x	HACCP
15. Ta Anh food company	private	25. dairy plant	x			HACCP
16. Nam Viet food company	private	26.dairy plant	x			HACCP
17. LamDong dairy JSC	joint stock	27. Dalat dairy factory	x			HACCP
18. Long thanh joint ventured dairy company (Lothamilk)	joint ventured	28. Longthanh dairy factory		X		HACCP, ISO 9000, ISO 22000
19. International joint stock dairy products company IDP	joint stock	29.ChuongMy dairy plant			x	ISO 22000
20. HANCO Milk and Beverage Company	private	30.CuChi dairy plant			x	HACCP, ISO 9000
21. MocChau dairy and cow breeder joint stock company-SonLa	joint stock	31. MocChau dairy factory	x			HACCP, ISO 9001:2000
22. Lamson dairy js company	joint stock	32. Lamson dairy plant	x			HACCP, ISO 9000
23. Saigon Milk Company	private	33. Saigon dairy factory	x			HACCP, ISO 9000
24. Elovi company	private	34. Elovi dairy factory Thainguyen			x	HACCP, ISO 9000
25. Tuan cuong phat company	private	35. dairy plant	x			HACCP
26. Tuyen Quang js company	joint stock	36. Tuyenquang dairy plant			x	HACCP, ISO 9000
27. Cong ty co phan sua Lam Dong	private	Dala milk plant	x			HACCP
28. Cong ty S& N	private	Milk plant	x			HACCP
29. Cong ty T &H	private	ThanhHoa Milk plant	x			HACCP

Note: S<20 mil. litre per annual, M 20-40 mil liter per annual, and L > 40 mil. litre per annual

Appendix D Schedule time

Time	Activities	Informant	Collection methods
1-8 July 2010	Prepare letter of introduction, working with policy, agencies,	Academicians, policy maker, senior researchers	Secondary data, and collect reports
8 -15 July	Working with Moc Chau and visit plant	Directors, plant manager, planning officer; farmer, collector, retailers	Interview, and collect reports
20 July	Post survey sent first time		
18-22 July	Working with Hanoimilk and interview	Directors, plant manager, marketing manager;	Interview, and collect reports
11-16August	Working with IDP and interview	Directors, plant managers, farmers, collectors, distributors	Interview, and collect reports
18 August	Working with Phu dong plant	Plant manager	Interview, observation
20 August	Post survey re-sent		
18 September	Go to visit Phu Ly plant	Plant manager	Interview, observation
20 - 25September	Working with Vinamilk, Dutch Lady Vietnam company office Go visit plants	Directors, Marketing manager, plant manager, farmers, collectors, distributors/retailers	Interview, collect reports, observation

Appendix E Dairy processing in Moc Chau milk plant

