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THE LEARNING PREFERENCES OF WOMEN WORKING IN NEW ZEALAND DAIRYING: AN APPLICATION OF VARK STRATEGIES

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CONTENTS

EXECUTIVE SUMMARY

Agricultural sustainability depends on having systems that maintain or enhance the economic viability and the natural resource base of agriculture, and the ability of people involved in the industry, or in servicing the industry, to provide for their social and cultural well-being.

Today's dairy women have professional skills in other disciplines than farming which they then can translate to their dairy farming businesses. However it is important for New Zealand and the industry for dairy women to continue to learn as they can fulfil the roles of gatekeepers, handling accounts, paper work, professional services and be operative in the development of and implementation of strategy; they are an important channel for farm related information.

The scope of this study was to consider if there was a clear indication of a specific preferred learning style within the population of women in the New Zealand dairy industry.

It is important for the industry to understand more about the different audiences within the dairy industry, by this it is meant farm owners, sharemilkers, contract milkers and workers. Each of these segments 'acts' differently, by this it is meant that each person within these segments plays a different role. Women within the farm owner segment will be heavily involved in the 'strategic' farming business, where as the contract milkers will be more 'hands on'. It is often discovered that within like populations there is more variation with than between different populations.

A number of methods have been utlised in anaylyising this research problem. To gain the best understanding of the research problem a literature review on learning styles was conducted which included the review of past studies. First identified were the factors which are involved in learning styles. The previous findings around Dunn and Dunn's learning style model – VARK were studied. The methodology details the way in which the VARK survey was conducted through a focus group and an online survey. The findings of the survey were then outlined and discussed, including the learning preferences of the dairy women group.

The concept of learning styles has been explored and debated for several decades, resulting in a wide range of differing scales and inventories have been developed across the world. A person's learning style can have more influence than we may think, as it will change the way in which experiences are represented, the way information is recalled and implemented and even the words used.

Coffield's team found that none of the most popular learning style theories had been adequately validated through independent research, leading to the conclusion that the idea of a learning cycle, the consistency of visual, auditory and kinesthetic preferences and the value of matching teaching and learning styles were all "highly questionable."

One of the most widely-known theories assessed by Coffield's team was the learning styles model of Dunn and Dunn (1978), a VARK model. Honey and Mumford (2000), identified four key stages/styles, which they state are directly mutually corresponding

and overlaid, as distinct from the Kolb model in which the learning styles are a product of combinations of the learning cycle stages

There is much debate and research about learning styles, it is however recognised that each person prefers different learning styles and techniques. This may mean that they utlise a mix of learning styles, or have a dominant style or use different styles in different circumstances. There is no right mix.

Fleming (1995) describes the VARK learning styles as the category of instructional preferences as it deals with perceptual modes; which mean that it is focused on the different ways that people take in and give out information. VARK found that people have a preferred learning style and one part of that learning style is the profile of preferences. VARK provides a profile of instructional preferences. The acronym VARK stands for Visual, Aural, Read/Write and Kinesthetic, all being sensory modalities that are used for learning information.

VARK deals with only one dimension of the complex amalgam of preferences that make up a learning style. It is important to say what VARK is not, so that other components are not perceived as being a part of it. VARK has little to say about personality, motivation, social preferences, physical environments, or intraversion-extraversion.

Generational learning is not new and it is something that challenges training organisations and businesses with regularity. The generation a learner was born into can have a direct effect on their learning preferences and ability to use and adapt to technology in the learning environment.

Typically, generations are made up of diverse groups of people who share a place in history shaped by parenting patterns, defining events, and shared experiences that unite them across other demographic boundaries Veterans/ Traditionalist (Born 1920 - 1947), Baby boomers (1947-1965), Gen X (1966-1977) Gen Y (1978-1995), and Echo Boomers (1996- 2007) all have different channels of learning due to the time when they were born and theory of learning at that time.

Baird and Fisher (2007) state that all those involved with education of some form need to understand the symbiotic relationship between technology, knowledge transfer, social interaction and learning King (2009) states that all too often within training environments a 'one size fits all' approach is adopted, which unfortunately does not cater to the majority of a company's workforce. Understanding the majority and the way it works can assist in design training for a business and its workforce.

From the 100 surveys completed 51.1% of the dairy women recorded a Multimodal learning preference, which means that they have multiple learning preferences or V, A, R, K. The second preference was Read/Write with 26.7% of the survey population recording this. The third highest learning preference was the Kinesthetic with 13.3% of the population recording this learning preference. The Visual 5.6% and Aural 3.3% were recorded the lowest for the surveyed group.

The Zero for Modality result shows that only 11% of the survey population had zero scores within a particular learning preference. The highest being Aural, which

correlates with this learning preference being the less selected style from the surveyed group. The Multimodal preferences it shows that 30% of the total 51% has the full selection of Multimodal learning preferences; which means they use all four learning styles of V, A,R, K. The balance of the group of 21 % of the 51% has a varied learning style combination.

The dairy women surveyed showed that they had preference for the read/write learning style with a total of 26.7% demonstrating this. The dairy women surveyed showed that the third highest learning preference was Kinesthetic, with a total of 13% selecting this style. The dairy women surveyed showed that the visual learning style was not high with only 5.6% of them selecting this type of learning preference.

The Aural learning style was the least preferred style of learning for the dairy women surveyed, with only 3.3% of the population selecting this type.

These results could be due to the VARK result coming from the education sector. The author had suspected that Visual learning preference would be a higher result from the dairy audience survey and it is compared to the VARK results however not as high as was originally thought it might be. The reason for a higher result in this survey compared to VARK is that many activities within a dairy operation utlise this style, including some industry training.

Comparing the data from this research against the VARK data showed that the Aural learning preference of 3.3% for dairy women and 8% from VARK shows that dairy women don't learn their best from discussion, oral presentations and feedback, along with tutorials and talking with others. The learning preference style should not be confused with women's need to network.

Combining the multimodal, Read/Write and Kinesthetic learning styles covers over 91.1% of the dairy women surveyed. However the research showed that the industry that a person works in has an impact on the way they learn.

ACKNOWLEDGEMENTS

I wish to thank my supervisor Professor Clive Smallman for his guidance and assistance throughout the research. I am grateful and have enjoyed the opportunity to be able to work under his guidance. Clive, thank you for the time and energy you have provided in working with me to achieve this result.

Thanks also to Neil Fleming, who provided support and guidance, and if it was not for the VARK strategy work already achieved this research would have been more challenging than it was.

I am grateful to the support and assistance from Linda Clark and Michelle Wilson of the Dairy Women's Network. I also appreciate the support from all of the dairy women that completed the survey allowing me to collect the research data.

Thanks must also go to my family and friends for understanding when I needed to study.

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1. INTRODUCTION

1.1. Background

Dairy women over the past few decades have seen their role change within the business unit on farm. Some of the changes are results of global influences, others are due to the economic transformation of the rural sector, and still others are the result of broad social and demographic trends which has important implications for the agricultural industry. *(MAF Policy Technical Paper 97/11)*

There are both push and pull factors involved with the changes in dairy women's lives. Since it has become acceptable for women to participate in the paid workforce, or establish and run a business, many have done so. Where couples are farming, women are generally involved in the physical aspects of farm work. In the sheep and beef sector approximately 73% of the operations are based around 'families', with 79% in the dairy sector. Increasingly non-physical work is being recognised as of fundamental importance to the farm business. *(MAF survey, 2000)*

While there is certainly more diversity in rural living in terms of land use, gender roles, employment patterns and the demographics of rural populations, dairy women have also had to become more focused. It is well known that women on farms are now filling up to five roles, rather than the three of earlier years. Physical farm work and farm management are being added in addition to the already demanding schedule of domestic work, community work and family work. Most non-farm rural women are also experiencing increased demands on their time and energy.

Given the voice women increasingly have in the decision making processes on farms, the increased likelihood that women themselves are running and managing the farm, and have individual wealth and knowledge, this is a particularly outdated approach.

Another message from a past study (*MAF Policy Technical Paper 97/11)* is that women can have a difficult time entering the public arena. Where informal selection processes are used it is often difficult for women to secure positions. The situation is exacerbated in that when women are not seen in leadership roles, they may be regarded as not having leadership ability or potential. Women who achieve such positions are seen as exceptional. Instead of becoming role models, their very visibility sets them apart from other women and creates expectations of performance that most women would find difficult to emulate.

Agricultural sustainability depends on having systems that maintain or enhance the economic viability and the natural resource base of agriculture, and the ability of people involved in the industry, or in servicing the industry, to provide for their social and cultural well-being.

This requires an understanding of the inter-relationships between the agriculture sector, the wider rural community, and farmers and their families. It also requires an understanding of the factors which contribute to the social well-being of farm and rural communities. The well-being of rural women is important not only to enhance economic growth, but also to maintain the social fabric of rural communities.

While rural people are themselves making adjustments to enable them to cope with the changed status and roles of women and the matching adaptations of the status and roles of men, these adjustments can be assisted by the right kind of community and institutional support.

Economic efficiencies and environmental considerations are two key drivers of sustainable agriculture - but the third, social dimension, has been consistently underrated. When the contribution made by rural women to the social and economic growth of household, farm and community is appropriately recognised there will be greater understanding of the need for new kinds of infrastructural and cultural supports to assist men and women adapt to their modified and extended roles in the home, business and community. Sustainable agriculture needs rural communities with a high level of social well-being. *(MAF Policy Technical Paper 97/11).*

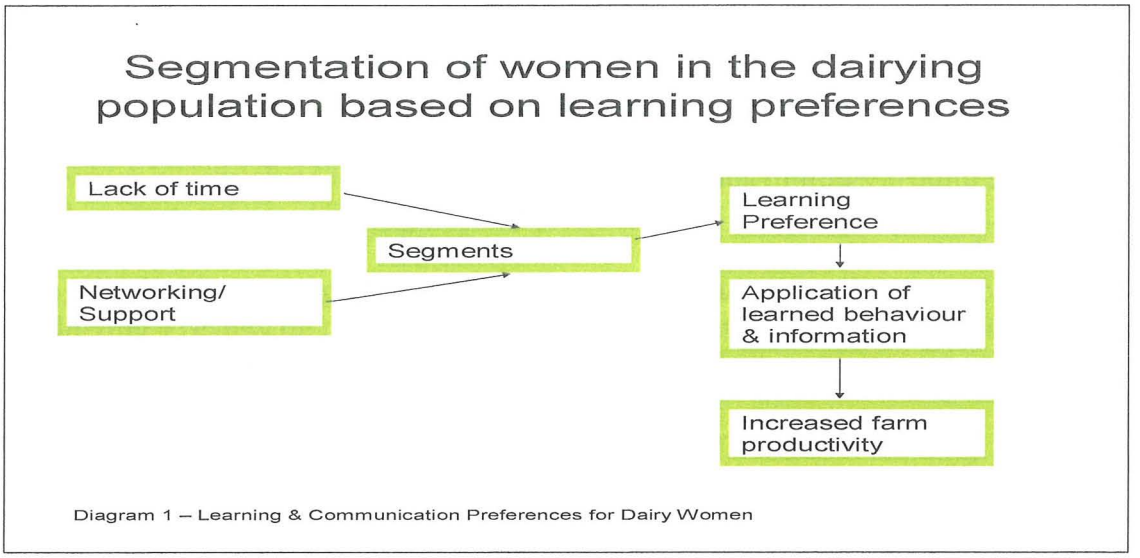
1.2. Scope of the Study

The scope of this study was to consider if there was a clear indication of the preferred learning styles within the population of women in the New Zealand dairy industry. The NZ Dairy Industry is a large contributor to the wealth of the country. Traditionally dairy farmers have learnt through a number of different mediums including but not limited to on farm extension type activities provided by dairy companies or industry organisations, consulting officers and media. The dairy industry is working hard to deliver training to farmers; however this study does not cover whether the industry delivers the same course and content, through a number of different styles to suit different learners.

Today's dairy women have professional skills in other disciplines than farming which they then can translate to their dairy farming businesses. However it is important for New Zealand and the industry for dairy women to continue to learn as they can be viewed as the gatekeepers, handling accounts, paper work, professional services and high involvement in strategy; they are an important channel for farm related information. *(Dairy Women's Network Colmar Brunton Survey 2005)*

However it is important for the industry to understand more about the different audiences within the dairy industry, by this it is meant farm owners, sharemilkers, contract milkers and workers. Each of these segments 'acts' differently, by this it is meant that each person within these segments plays a different role. Women within the farm owner segment will be heavily involved in the 'strategic' farming business, where as the contract milkers will be more 'hands on'. It if often discovered that within populations there is more variation with than between different populations.

Figure 1: Initial research model



The initial research model (Bristol, 2007) designed describes the problem that is faced when seeking continual learning for dairy women. Dairy women face a number of challenges when learning including:

- The lack time available to commit to learning
- The way in which women learn including the need for support and interaction.

This study does not include the segmentation and the measure of the application of new information, as this will take a longer time and will need further scope and understanding as it goes beyond the research question that is asked here.

The aim of this research is to be able to identity if there is a preferred learning style or styles for dairying women so that they are able to continue to play a significant role in the NZ Dairy Industry. Therefore only women were asked to complete the questionnaires.

The research problem that this proposal will consider is:
"What are the preferred learning styles of women in NZ dairying?"

1.3. Aims & Objectives

The Dairy Women's Network conducted a survey of dairy women and identified that dairy women have a high involvement in terms of decision making within their business. The survey also identified the need for "face to face" learning and networking opportunities whilst confirming that for the majority of women 'lack of time" is the single most important issue for dairy women.

Dairy women are very involved in decision making on farm and in the farm business and with the need for the industry to continually improve its productivity, the women are an important key to assist in making this happen. Therefore to better understand their learning preferences would enable the transfer of information required.

1.4. Structure of the Dissertation

A number of methods have been utlised in anaylyising this research problem. To gain the best understanding of the research problem a literature review on learning styles was conducted which included the review of past studies. First identified were the factors which are involved in learning styles. The previous findings around Dunn and Dunn's learning style model – VARK were studied.

Defining the VARK learning styles and previous work and research was completed prior to conducting a review on generational learning preferences, as this has a direct impact on being able to understand the results within the study,

The methodology details the way in which the VARK survey was conducted through a focus group and an online survey. The findings of the survey are then outlined and discussed including the learning preferences of the dairy women group.

The discussion was then completed enabling the research question to be examined against the findings.

2. LEARNING STYLE THEORY

2.1 Chapter summary

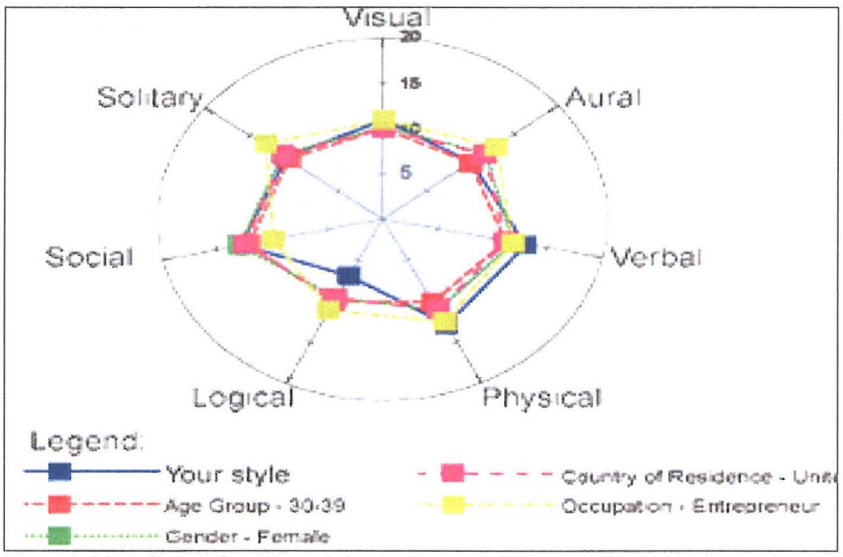
Understanding what makes up a learning style is a key to understanding a persons leaning style. Covered in this chapter is a review of the theory of learning styles and inventories which have been identified. Dunn and Dunn's VARK model and its definition of learning styles are discussed as well as generational learning styles.

2.2 Learning styles

The concept of learning styles has been explored and debated for several decades, resulting in a wide range of differing scales and inventories that have been developed across the world.

The figure below shows some of the considerations which may make up learning styles

Figure 2: Factors in learning styles



Source: http://www.learning-styles-online.com/overview/

A person's learning style can have more influence than we may think, as it will change the way in which experiences are represented, the way information is recalled and even the words used.

A non-peer-reviewed literature review by authors from the University of Newcastle upon Tyne identified 71 different theories of learning style (Coffield 2004). This report, published in 2004, criticized most of the main instruments used to identify an individual's learning style. In conducting the review, Coffield and his colleagues selected 13 of the most influential models for closer study. They examined the theoretical origins and terms of each model and the instrument that was purported to assess types of learning style defined by the model. They analyzed the claims made by the author(s), external studies of these claims, and independent empirical evidence of the relationship between the 'learning style' identified by the instrument and students' actual learning.

Coffield's team found that none of the most popular learning style theories had been adequately validated through independent research, leading to the conclusion that the idea of a learning cycle, the consistency of visual, auditory and kinesthetic preferences and the value of matching teaching and learning styles were all "highly questionable."

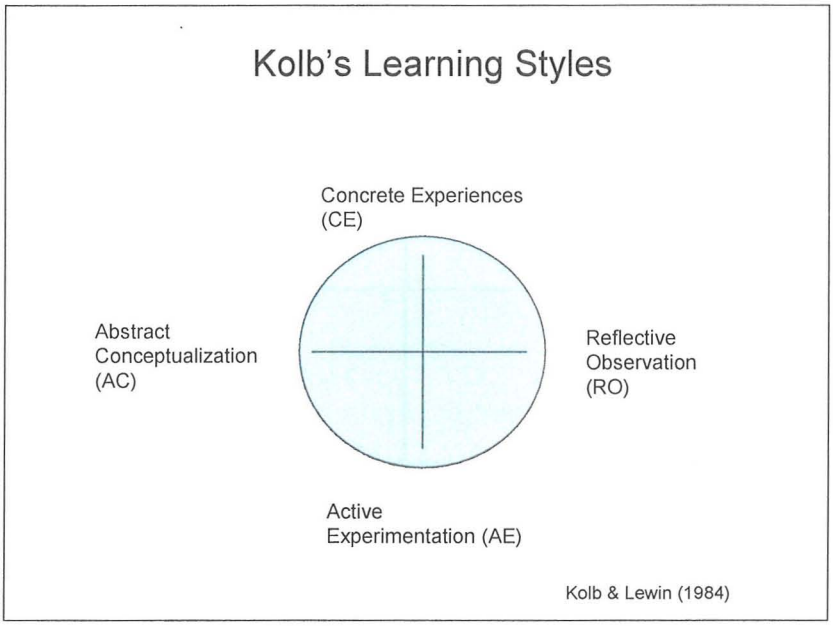
One of the most widely-known theories assessed by Coffield's team was the learning styles model of Dunn and Dunn (1978), a VARK model. This model is widely used in schools in the United States, and 177 articles have been published in peer-reviewed journals referring to this model.

In Sweden, Marton & Saljo (1976) explored the concepts of deep and surface learning and concluded that many divergent factors influence the adoption of learning style. Marton and Saljo also suggested that whilst students may have a preferred style, this can be altered or affected by extraneous factors such as assessment pressure.

Vella (1994) states that for adult learner's dialogue education principles and practice works. The approach to adult learning based on dialogue or 'the word between us" holds that adults have enough life experience to be in dialogue with any teacher about any subject and will best learn new knowledge, attitudes, or skills in relation to that life experience. Knowles (1970) Zohar (1997) believes that the principles and practices must begin, maintain and nurture the dialogue. Vella (1995) states that for adult learner's dialogue education principles and practice works. Warner (2005) supports Vella in that he states that it is necessary for a shift to occur between growers and extensionists so that they can actively participate in networks of social learning.

Kolb (1984) model proposes learning styles that specifically deal with characteristic styles of learning (see figure 2). Coffield's team found that none of the most popular learning style theories had been adequately validated through independent research, leading to the conclusion that the idea of a learning cycle, the consistency of visual, auditory and kinesthetic preferences and the value of matching teaching and learning styles were all "highly questionable."

Figure 3: Kolb's learning styles



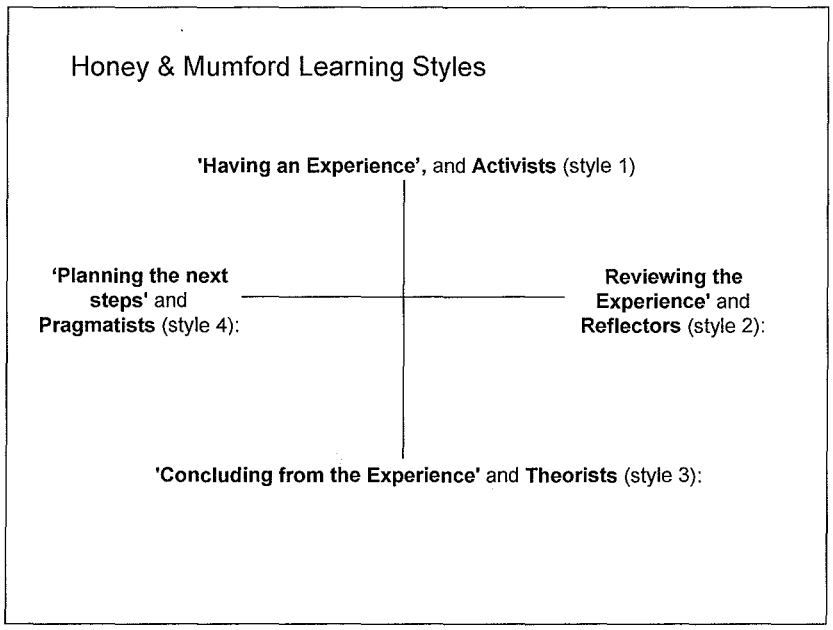
The CE/AC and AE/RO dimensions are polar opposites as far as learning styles are concerned and Kolb postulates four types of learners; divergers, assimilators, convergers, and accommodators depending on their position on these two dimensions. The Kolb model learning styles are linked to a learning cycle of experience, observation and reflection, formation and then testing of concepts. The Kolb learning styles were developed from the Lewin model in which the idea that students have a dominant phase of the cycle during which they prefer to learn and therefore will have a preferred mode of learning. The Kolb Inventory identifies students' preference for the four modes corresponding to the stages in the learning cycle.

Peter Honey and Alan Mumford (1993) developed their learning styles system as a variation on the Kolb model. Honey and Mumford say of their system:

"Our description of the stages in the learning cycle originated from the work of David Kolb. Kolb uses different words to describe the stages of the learning cycle and four learning styles..." And, "...The similarities between his model and ours are greater than the differences." (Honey & Mumford 1993)

Honey and Mumford (2000) identified four key stages/styles, which they state are directly mutually corresponding and overlaid, as distinct from the Kolb model in which the learning styles are a product of combinations of the learning cycle stages (see figure 3). The typical presentation of the Honey & Mumford styles and stages respectively are at north, east, south and west on a circle or four-stage cyclical flow diagram.

Figure 4: Honey and Mumford learning styles



More specifically:

Stage 1 **'Having an Experience',** and **Activists** (style 1): 'here and now', gregarious, seek challenge and immediate experience, open-minded, bored with implementation.

Stage 2 **'Reviewing the Experience'** and **Reflectors** (style 2): 'stand back', gather data, ponder and analyse, delay reaching conclusions, listen before speaking, thoughtful.

Stage 3 **'Concluding from the Experience'** and **Theorists** (style 3): think things through in logical steps, assimilate disparate facts into coherent theories, rationally objective, reject subjectivity and flippancy.

Stage 4 **'Planning the next steps'** and **Pragmatists** (style 4): seek and try out new ideas, practical, down-to-earth, enjoy problem solving and decision-making quickly, bored with long discussions.

There is a strong similarity between the Honey and Mumford styles/stages and the corresponding Kolb learning styles:

- Activist = Accommodating
- Reflector = Diverging
- Theorist = Assimilating
- Pragmatist = Converging

Duff & Duffy (2001) stated that there was limited evidence existing concerning the psychometric properties of Honey & Mumford's Learning Styles Questionnaire as proposed as an alternative for Kolb's Learning Style Inventory and the later refined version (LSI 1985). The Duff & Duffy study found that it failed to support the existence of the two bipolar dimensions as proposed by Kolb, and four learning styles hypothesised by Honey & Mumford.

There is much debate and research about learning styles, it is however recognised that each person prefers different learning styles and techniques. This may mean that they utlise a mix of learning styles, or have a dominant style or use different styles in different circumstances. There is no right mix.

2.3 VARK's Definition of Learning Styles

VARK was initially developed in 1987 by Neil Fleming at Lincoln University for teachers and students. It was the first to systematically present a series of questions with help sheets for teachers, students, employers, employees and others to use in their own way.

Fleming (1994) describes the VARK learning styles as the category of instructional preferences as it deals with perceptual modes; which mean that it is focused on the different ways that people take in and give out information. VARK found that people have a preferred learning style and one part of that learning style is the profile of preferences. VARK provides a profile of instructional preferences. The acronym Vark stands for Visual, Aural, Read/Write and Kinesthetic, all being sensory modalities that are used for learning information.

Fleming and Mills (1992) and Fleming (1994) would argue that the VARK Inventory enables both learner and teacher alike to consider differences and to explore ways of maximising learning for each individual. Fleming and Mills (1992) argue that the VARK is not just another inventory but rather it is a catalyst for reflection. Fleming and Mills also note that individuals' preferences for the way they receive the information will change over time according to factors such as age, experience and passage of time.

Fleming and Baume (2006) state that VARK is not technically a learning style, as it provides feedback only on one's preferred modes of communicating. They state that the "modal preferences for learning" are only a small part of what most theorists would include in a complete package deserving to be called a 'learning style".

However it does seem that there is much confusion about "learning styles" within the literature as it now is used loosely to describe almost any attribute or characteristic of learning.

Fleming and Mills (1992) developed a four sensory inventory, which highlights input and processing of information into Visual, Auditory, Reading/Writing and Kinaesthetic categories. Barsch (1996) uses similar categories but substitutes Tactile for the Fleming and Mill's Reading/Writing category. Both Fleming and Mills (1992) and Barsch suggest that the inventories can help identify preferences of both learner and teacher, and they go on to offer ideas for presentation and study methods.

Technically the term refers to all the components that might affect a person's ability to learn. Some inventories report on a number of components in a style (motivation, surface-deep approaches to learning, social, physical and environmental elements) and some personality inventories have learning characteristics as a part of their wider descriptions.

VARK deals with only one dimension of the complex amalgam of preferences that make up a learning style. The VARK questions and their results focus on the ways in which people like information to come to them and the ways in which they like to deliver their communication. The questions are based on situations where there are choices and decisions about how that communication might take place.

It is important to say what VARK is not, so that other components are not perceived as being a part of it. VARK has little to say about personality, motivation, social preferences, physical environments, or intraversion-extraversion. The choice to limit VARK to modal preferences was made because that is where Neil Fleming had most success in assisting students with their learning. Of course, changing the other dimensions affected learning, but it was the modal preferences that had the most direct application for more effective learning.

However Fleming & Baume (2006) go on to state that preferences can be matched with learning strategies, and that the learning strategies then can be aligned with the modes. Fleming and Baume acknowledge that the critics of learning styles say things like "knowing ones learning style does not improve learning". They also state that learning preferences should not be confused with learning ability or learning strengths.

The use of learning inventions and questionnaires is not without its critics. Fox (1984) Reynolds (1997) and Stellwagen (2001) all suggest that learning style questionnaires and inventories are of little value, partly because of uncertainty about their validity and reliability, and in the cases of Reynolds and Stellwagen both argue against what they view as labeling and stereotyping of individuals. Reynolds (1997) suggest that in his opinion there is a strong case for the abandonment of such measures and suggests that more effort should be put into ways of dealing with different learners.

Svinicki (2006) states that they found VARK is hard to validate statistically, including with several modifications tried as well as several statistical strategies such as multidimensional scaling, they struggled to get a good fit with the data.

However Svinicki (2006) commented that it does not mean that the instrument itself is not valid or desirable, but it shouldn't be used in research, as that is not its strength. Svinicki believes that VARK's strength lies in its educational value for helping people think about their learning in multiple ways and giving them options they might not have considered. The statistical properties Svinicki believes are not stable enough for research, but does admit that one of their findings is that no one has been able to design an instrument along these lines that does. Therefore VARK is in good company.

Svinicki also suggests that all who use the VARK loves it, so it is striking a chord, however it is important to recognize that the constructs of learning style are too varied to pin down accurately and every instrument tested suffers from this same issue.

2.4 Generational learning styles

Generational learning is not new and it is something that challenges training organisations and businesses with regularity. The problem is finding a course structure

that meets the expectations of the four different generations within the workforce today (King 2009).

The generation a learner was born into can have a direct effect on their learning preferences and ability to use and adapt to technology in the learning environment.

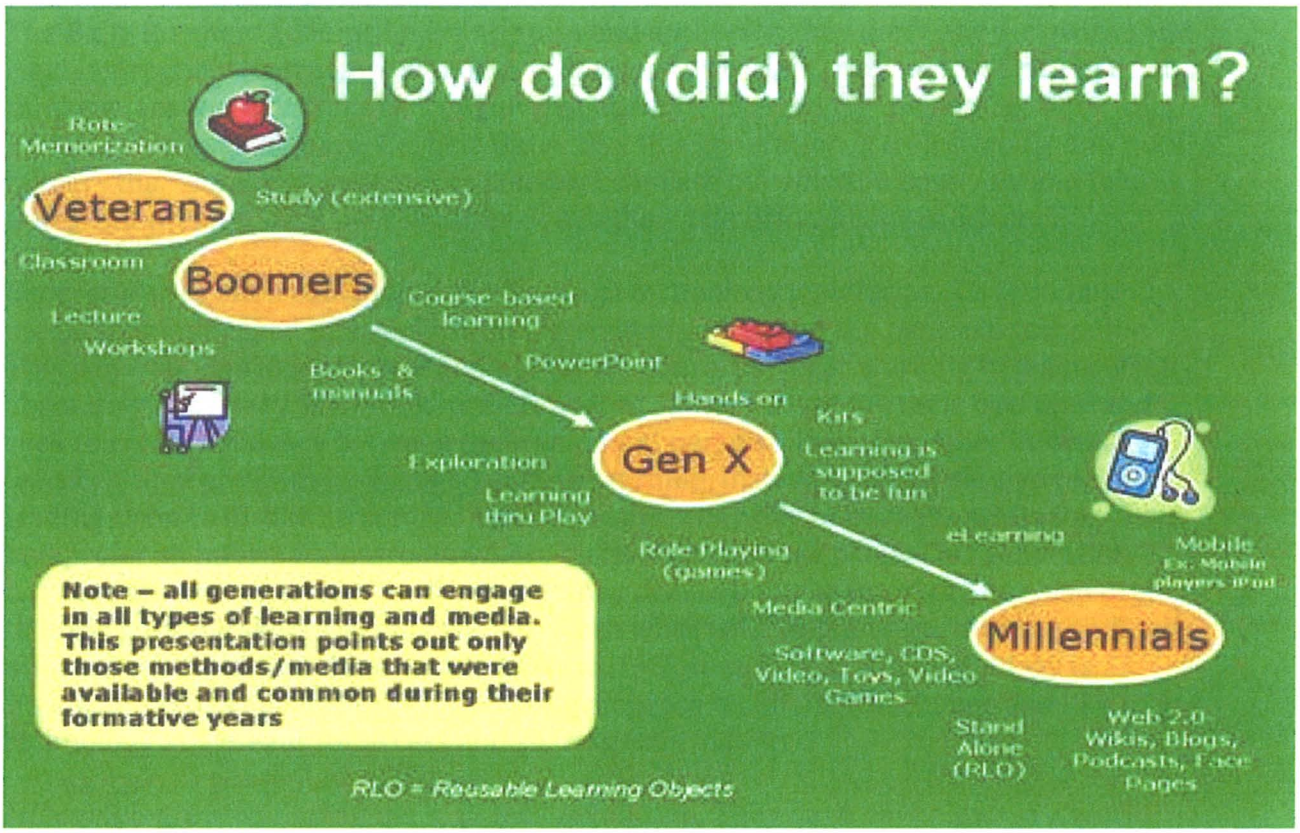
A "generation" tends to be about 20 years in length representing roughly the time from the birth of the group of people to the time they come of age and start having their own children. Typically, generations are made up of diverse groups of people who share a place in history shaped by parenting patterns, defining events, and shared experiences that unite them across other demographic boundaries. Adult audiences often include one or more of the following four generations:

- Veterans/ Traditionalists. They are also called the Silent Generation, the War Baby Generation, or the WWII Veteran Generation.
- Baby Boomers. They are also called the "Me" Generation because their Traditionalist parents wanted to give them a good life.
- Generation X. This generation is the children of both Traditionalists and Baby Boomers.
- Millennials. They are also called Generation Y, Generation ME, Generation WE, or Nexters.

Veterans/ Traditionalist (Born 1920 - 1947), Baby boomers (1947-1965), Gen X (1966-1977) Gen Y (1978-1995), and Echo Boomers (1996- 2007) all have different channels of learning due to the time when they were born and theory of learning at that time (see figure 5). The literature reviewed when comparing the parameters of the years included in each group varied by 1-2 years. For example Veterans/ Traditionalists (born 1920 - 1945), Baby boomers (1946-1964), Gen X (1965-1980) Millennials/Gen Y (1981- 2000)

Baird and Fisher (2007) state that all those involved with education of some form need to understand the symbiotic relationship between technology, knowledge transfer, social interaction and learning. King (2009) states that all too often within training environments a 'one size fits all' approach is adopted, which unfortunately does not cater to the majority of a company's workforce. Understanding the majority and the way it works can assist in designing training for a business and its workforce.

Figure 5: Generational learning sources



Source: *Implications on training design http://trainingpd.suite101.com)*

Corbett (2008) profiled each of the generations outlining their primary source of media and how in general they learn.

Corbett stated that the *Veterans / Traditionalists* generation was influenced primarily by film. He profiled this group as private being reluctant to participate in a learning community because they don't want to share too much information about themselves. Corbett stated that by giving them time and encouragement to share their thoughts by letting them know their experience is respected and valuable to be heard. Veterans/ Traditionalists are structured and focused as they adhere to rules, preferring structure, order, formal hierarchies, and a formal communication style. Prefer passive learning where they can take notes and watch someone lecture and they like to refer to their notes when applying knowledge. The Veterans/ Traditional generation prefer to absorb content slowly and incrementally with minimal risk of failure as they like to learn and write down things in a logical sequence. "Waste not, want not" mentality - Their time is precious to them and they become irritated when they perceive others are wasting their time. Corbett stated that this generational group is tech-averse, typically disliking technology as they don't absorb information well from simulations because the recorded environment prevents them from going through the information and taking notes.

For *Baby Boomers* Corbett stated that the primary media influence was television. They are Team Oriented which enables them to embrace a team based approach to everything. The Baby Boomer generation is the personal goal oriented generation, who learn more easily when content relates to their personal life experiences. The incorporation of personal anecdotes and interactivity is important to them. This

generation value peer competition and don't settle for second best. They are best motivated when training involves activities that allow them to compete in some way. The Baby Boomers generation is anti rules and authority; they don't like dictatorial and rigid instruction. Instructors should present options to demonstrate flexibility in their thinking, answer questions thoroughly, expect to be pressed for the details, and avoid using controlling language. Corbett states that this generation is tech-friendly and note takers - the "show me" generation. Like to assimilate information passively and take notes, but prefer videos over lectures due to their television-heavy childhood.

Generation X is often considered the first high technology generation. The primary media that influenced this generation were video games and the personal computer. This generation is independent and not team joiners, however working in teams when absolutely necessary, but would prefer to work alone. They value their free time and seek to create a balance between their work and personal lives. Gen X are informal learners, they prefer to be engaged in their learning, instead of being passive recipients; leading them to dislike structured environments. They like to have fun while they learn and prefer an informal classroom where discussion can take place. This generation needs continuous, periodic feedback, but they dislike being mentored. They also prefer to build portable skills and only want to learn what will benefit them, thriving on a self-directed schedule. Gen X are tech-friendly assimilators. The use of technology is important to this generation. They eagerly embrace technological change and like to use technology as a means for access and sharing information.

Millennials grew up during the high tech revolution. They have never known a world without the Internet, video games, cell phones, laptops, and e-mail. Millennials possess a particularly strong inclination toward influencers (parents, mentors, friends, etc.). If they develop a meaningful connection with the instructor, they will react with zeal in learning. This generation expects and is motivated from almost instant feedback on tests and other learning. They prefer to engage in a fun, interactive activity that forces them to learn by doing. They are achievement driven, however they lack passion for the content itself but are more interested in how it will help them achieve their goals and are often found to possess a strong sense of self entitlement. Millennials are socially driven and the most socially connected generation, being actively into blogging, social networking, and online communities. This generation are team players with a capital "T.", possessing strong team instincts and thrive on the sense of connection they feel when they are part of a group project. This generation is structure driven preferring structure in the classroom and is accustomed to following rules, which increases their comfort level and helps them excel. This generation is the most techno-savvy multi-taskers of all the four generations profiled by Corbett. They expect courses to use the most modern tools in an efficient and effective way. Also being multi-taskers, they can be seen with a TV playing in the background while simultaneously reading a book, listening to an iPod, and engaging in multiple online chats with friends. They are the Internet-generation learners who favor online learning because it allows them to access information whenever they need it. Simply reading web pages is not enough; it needs to be interactive.

With many different learning styles identified it becomes important for this research to isolate the best models to work with in this research. The model of Dunn and Dunn, a VARK model enhanced by the work completed by Fleming and combining this with the generational learning styles should enable the research method to be established.

3 METHODOLOGY

The methodology used for this research included a Focus Group Survey and a VARK Online Survey.

The VARK questionnaire designed by Fleming has only 16 questions, as experience suggests that if there are too many questions (25+) some people take the questionnaire less seriously and some may become bored with it or provide spurious answers because of questionnaire fatigue.

The survey was run in two parts, the first as a focus group and the second online with a total of 100 surveys being collected.

A small focus group of nine women from Southland was asked to participate in completing a paper copy of the survey while attending a Dairy Women's Network Dairy Day Training Course. Unfortunately only a small group was able to complete the written survey due to the timing of this study.

As the dairy industry is more tech savvy than other farming segments mainly due to better internet access, it was decided to use an online survey. The VARK-learn.com website enabled a dedicated survey for this group to be established where 100 women completed the survey.

The online survey was marketed via the Dairy Women's Network Email Digest and through the author's direct contacts.

Survey respondents were instructed to choose the answer which best explained the preference. The respondents were instructed that they were able to select more than one answer, if they utlised more than one preference. Survey participants could also leave blank any question that did not apply. Therefore scoring is not as simple as counting, when respondents chose more than one answer for each question.

Each respondent who completed the questionaire online received a score across the four VARK styles. Each score will have been individual as there is nothing normal about preferences for communication just as there is nothing normal about humans.

The online analysis was conducted through the VARK-learn.com website where the programme allowed for the information for this research to be collected within a contained area. The paper questionnaires were then processed within the online system to allow easy complying of the results.

For the purpose of this research the following VARK definitions of the sensory modalities are defined as in table 1.

Table 1: VARK Definitions

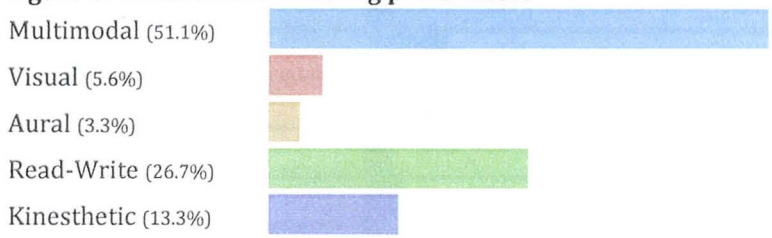
Sensory Modality	**Preference**	**Comments**
Visual	Depiction of information in charts, graphs, flow charts, layout white space, headings, patterns, designs and colour.	Are more aware of their environment & their place in space. Does not include pictures, movies, videos, animated websites as these belong to Kinesthetic preference.
Aural	Spoken or heard. Learns best from discussions, oral presentations & feedback, email, cell phone, chat, classes, tutorials and talking with others.	
Read/Write	Displayed word, either written or read.	Places importance on precision of language. Keen to use lists texts, books & manuals.
Kinesthetic	This preference is related to experience & practice (simulated or real). Often referred to by 'learning by doing'.	Use of many senses; sight, touch, taste & smell, taking in their environment to experience & learn new things.
Multimodal	All of the above or combinations of the above learning preferences.	For those who have multiple preferences.

4 FINDINGS

4.1 Dairy Women Learning Preferences

From the 100 surveys completed 51.1% of the dairy women recorded a Multimodal learning preference, which means that they have multiple learning preferences or V, A, R, K. The second preference was Read/Write with 26.7% of the survey population recording this. The third highest learning preference was the Kinesthetic with 13.3% of the population recording this learning preference. The Visual 5.6% and Aural 3.3% were recorded the lowest for the surveyed group.

Figure 6: Summarised learning preferences

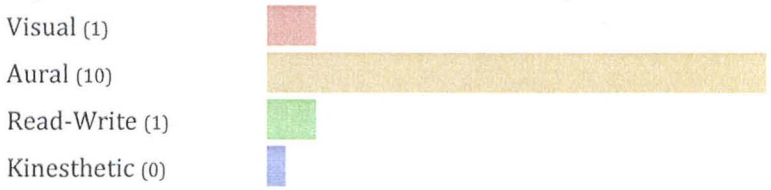


4.2 Zero for Modality

The Zero for Modality result shows that only 11% of the survey population had zero scores within a particular learning preference. The highest being Aural, which correlates with this learning preference being the less selected style from the surveyed group.

VARK data suggests that there are more people who have single preferences in older age groups. 19-25 year-olds had 36% with single preferences and those aged 55+ had 43% in that group.

Figure 7: Students with zero score for modality



4.3 Detailed Learning Preferences

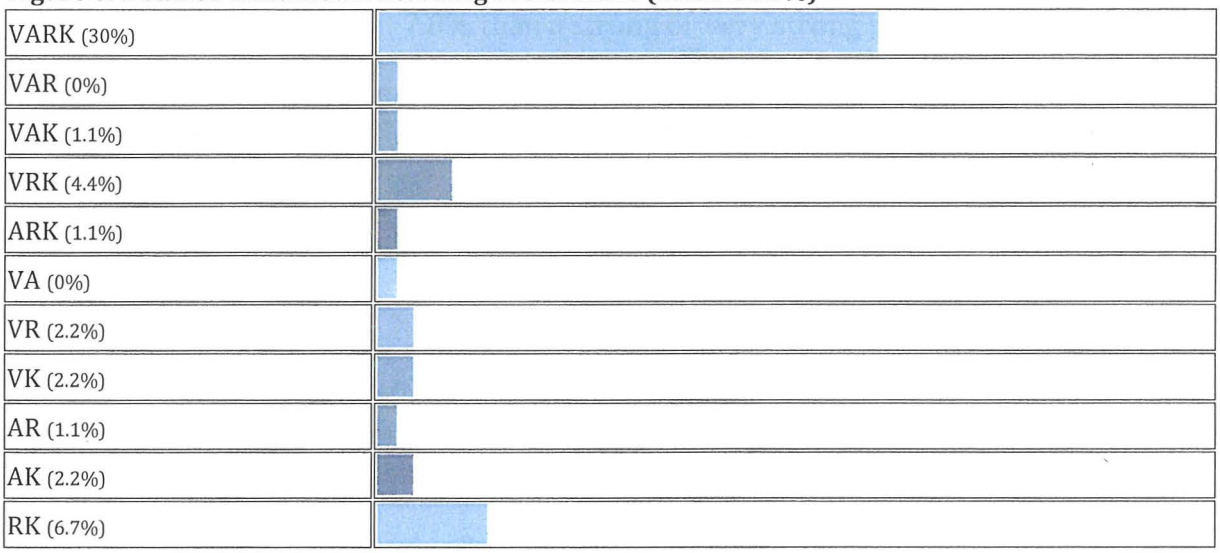
The detailed analysis enables a better understanding of key learning preferences, especially in the Multimodal preference.

4.3.1 Multimodal Learning Preference

The detailed data provides a clearer understanding of learning preferences for the surveyed group. In relation to Multimodal preferences it shows that 30% of the total 51% has the full selection of Multimodal learning preferences; which means they use all four learning styles of V, A,R, K. The balance of the group of 21 % of the 51% has a

varied learning style combination. The second highest multimodal combination was that of 6.7% of the 51% recording an R and K learning style combination. The third strongest multimodal combination of learning preferences for the group with 51% was recorded as V, R, and K at 4.4%. The next strongest learning combinations were VR, VK and AK recording 2.2% each. The weakest combinations recorded were the combinations of VAK, ARK and AR. Two multimodal learning preferences recorded 0% of the surveyed population these being VAR and VA.

Figure 8: Detailed Multimodal Learning Preferences (Total 51.1%)



Those with a multimodal set of VARK preferences need to process information in more than one mode in order to get enough understanding

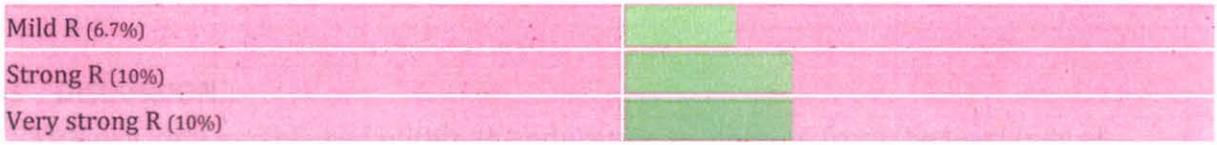
For those dairy women who fall into the multimodal group they will be able to select the mode that best suits the situation of learning or those they are working with. If there is a good match of preferences within the learning situation that is between tutor and student then it is likely that the communication relationship will be enhanced enabling improved learning.

Fleming designed the questionnaire with the expectation that Multimodality would be the dominant preference. The modal preferences of people are seldom singular as people live in a multimodal world. In the majority of cases people will have preferences for a number of modes and they will use strategies associated with their preferences depending on the context or situation.

4.3.2 Read/Write Learning Preference

The dairy women surveyed showed that they had preference for the Read/Write learning style with a total of 26.7% demonstrating this. 10% showed they have very strong preference, with a further 10% having a strong preference and the balance of 6.7% showing they have a mild preference for Read/Write.

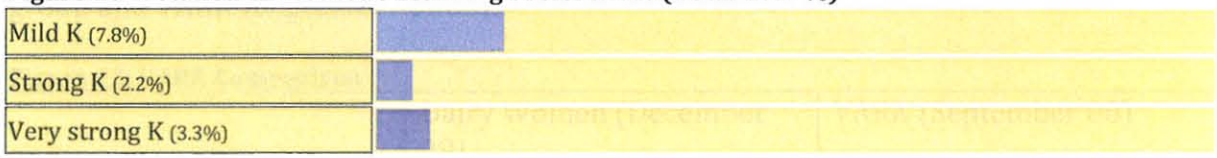
Figure 9: Detailed Read & Write Learning Preferences (Total 26.7%)



4.3.3 *Kinesthetic Learning Preference*

The dairy women surveyed showed that the third highest learning preference was Kinesthetic, with a total of 13% selecting this style. This preference showed that more scored a mild preference at 7.8% than a strong or very strong preference totaling 5.5%.

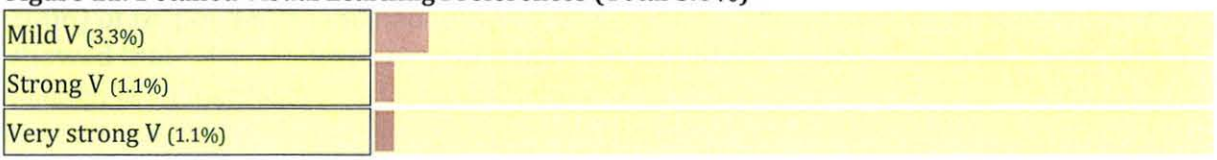
Figure 10: Detailed Kinesthetic Learning Preferences (Total 13.3 %)



4.3.4 *Visual Learning Preference*

The dairy women surveyed showed that the visual learning style was not high recording 5.5% of women selecting this type of learning preference.

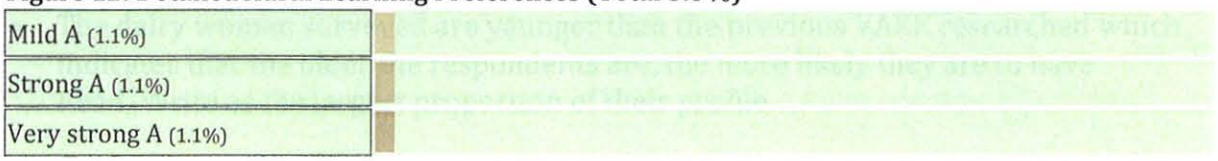
Figure 11: Detailed Visual Learning Preferences (Total 5.6%)



4.3.5 *Aural Learning Preferences*

The Aural learning style was the least preferred style of learning for the dairy women surveyed, with only 3.3% of the population selecting this type.

Figure 12: Detailed Aural Learning Preferences (Total 3.3%)



5 DISCUSSION

VARK was first established within the education profession from the learnings of teachers and students. It is today a tool used by many still within the education area. The VARK questionaire is most helpful to understand learning preferences; however it must be remembered that it is not accurate for a description of a person's strengths or weaknesses.

5.1 VARK Comparisons

The following assumptions can be made by comparing the data from the dairy women's group and VARK (September 2008).

Figure 13: VARK Comparison

	Dairy Women (December 09)	VARK (September 08)
Multimodal	51.1	63
Visual	5.6	3
Aural	3.3	8
Read Write	26.7	14
Kinesthetic	13.3	12

Fleming added the fifth category of Multimodal to cater for the 55%-70% (October 2006) of respondents who had multiple preferences. The VARK data of September 2008 showed that 63% of survey respondents have a multimodal learning preference, which in itself is an increase from October 2006.

Comparing the data from the dairy women's survey group, the result of 51% recording multimodal learning preferences is much lower than Fleming's latest review of findings in 2008. This result could be due to:

- The age of the dairy women who completed the survey and
- The industry type they come from.

This result maybe due to:

- VARK being originally designed for the education sector, or
- The dairy women surveyed are younger than the previous VARK researched which indicates that the older the respondents are, the more likely they are to have Read/Write as the largest proportion of their profile.

The survey result for the visual preference was higher at 5.6% than the VARK result at 3%. This result could be due to the VARK result coming predominantly from the education sector. The reason for a higher result in this survey compared to VARK is that many activities within a dairy operation utlise this style, including some industry training.

Comparing the data from this research against the VARK data showed that the Aural learning preference of 3.3% for dairy women and 8% from VARK shows that dairy women don't learn best from discussions, oral presentations, feedback, tutorials and

talking with others. Again the learning preference style should not be confused with women's need to network.

The dairy women's survey result for the Read/Write learning preference at 26.7% was almost double the VARK results of 14%. This result is surprising when you analyse the audience, as the VARK data is heavily reliant on the education segment of the population. The reasons that the dairy women have a heavily reliance on this style of learning could be:

- That most are 'in charge' of the farm office and recording for the farm.
- A number of the women come from other backgrounds bringing additional skills to their role
- Some extension information is communicated through the web, newspapers and magazines
- The age of the audience is older; however this is in contradiction to multimodal findings.

The result of the Kinesthetic learning preference of 13.3% is close to the VARK results of 12%.

Both the VARK and dairy women's survey groups had the same order of learning preferences with Multimodal first, Read/Write second and Kinesthetic third. However the last two learning styles were reversed for the dairy women's survey with Aural being the least favoured learning preference and Visual rating higher.

The surveyed dairy women's population showed a high percentage for Zero for Modality results at 11% of the survey population. However VARK data suggests that there are more people who have single preferences in older age groups. 19-25 year-olds had 36% with single preferences and those aged 55+ had 43% in the surveyed data. This could suggest either:

- That the age of the group completing the survey was younger, or
- That the industry they belong to has an impact on this.
- The education level of the dairy women is lower than the VARK data

5.2 Research Question & Answer

The research problem that this project considered was:

"What are the preferred learning styles of women in NZ dairying?"

The research findings do show that women in NZ dairying have a range of preferred learning styles, these being:

- Multimodal at 51.1% However 30% of the women within the multimodal group learn from the full range of VARK preferences, which mean that they will be able to adapt their style to that of the person delivering the training. An additional 6.7% from the multimodal group have a Read/Write & Kinesthetic preference and further 4.4% through Visual, Read/Write and Kinesthetic style.
- Read/Write at 26.7%
- Kinesthetic at 13.3%

These three learning styles cover over 91.1% of the dairy women surveyed, meaning that a greater part of the dairy women audience can be covered in upskilling if these techniques are included in the training and communicating.

The research showed the industry a person works in, has an impact on the way they learn.

Further research needs to be completed on the age of the dairy women participants, so that the results can be better aligned to that of the VARK results.

5.3 Implications for Theory

A finding of this project showed that the surveyed dairy women's group was 'normal' in that they displayed a range of differing scales of learning styles, which was demonstrated in the theory.

The finding of a higher result for the Read/Write preference aligns with the theory that the older generations enjoy a more formal communication style, therefore more older women completed the survey. However as most of the surveys were completed online the theory suggests that a young generation completed more of the surveys. The results therefore show a conflicting outcome when aligned with the theory. However it is anticipated that this conflict can be resolved when the age of the dairy women is calculated, rather than the theory it is aligned to.

It was not hard to get 100 dairy women to participate in this survey. The theory would suggest that this result reflects a high proportion of Generation X who participated as they like to use technology as a means for accessing and sharing information.

5.4 Implications for Practice

As this group is influential in their contribution to the industry it would be valuable to:

- Share the results with industry players: The industry has for many years delivered upskilling via consulting officers, field days and short courses, but is always seeking ways in which it can improve delivery of information and training to participants. It is important for the industry to be able to recognise and tailor delivery to the groups with the different learning preferences. It was identified that even though the industry recongises that learning is important and is investing in it, there seems to be little established in the way of previous research and measurement of learning achieved. Using the VARK system and increased investment the industry should be able to implement an improved delivery of learning for the dairy women.

- Analyse the current industry training programmes being delivered to dairy women classifying each programme under the four learning styles of VARK. Once this is complete and by comparing the learnings from this study it would provide key information about the potential success of the industry training and education strategy currently in place. It would also be of benefit to understand under the VARK model how dairy farmers who are male learn.

- With a bench mark for learning preferences for dairy women established, it would be beneficial for a follow survey to be completed in two years time, as well as establishing a benchmark for dairy farmers who are male.

6.0 References

Baird, D, Fisher, M. (2007), Neomillennial User Experience Design Strategies: *Utilising Social Media to Support "Always On" Learning Styles*

Barsch, JR. (1996). *Barsch Learning Style Inventory.* Academic Therapy Publications: Novato CA

Coffield, F., Moseley, D., Hall, E. and Ecclestone, K. (2004), *Learning Styles and Pedagogy in post-16 learning: a systematic and critical review.*

Corbett, S. (2008). Targeting different generations http://coe.sdsu.edu/eet/articles/generationtrgt/start.htm

Dairy Women's Network. (2005), *Colmar Brunton Survey on New Zealand Dairy women's involvement in the farming business.*

Duff, A. Duffy, T. (2001), *Psychometric properties of Honey & Mumford's Learning Styles Questionnaire*

Dunn, R., & Dunn, K. (1978), *Teaching students through their individual learning styles.* Reston, VA: Reston.

Fleming, N. (2010) VARK – A Guide to Learning Styles. www.vark-learn.com

Fleming, N. (2006). *Teaching and Learning Styles VARK Strategies (rev. ed)* The Digital Print and Copy Centre, Microfilm Ltd

Fleming, N.D. (1995), *I'm different; not dumb. Modes of presentation (VARK) in the tertiary classroom*, in Zelmer, A., (Ed.) Research and Development in Higher Education, Proceedings of the 1995 Annual Conference of the Higher Education and Research Development Society of Australasia (HERDSA), HERDSA, Volume 18, pp. 308 - 313

Fleming, N. Baume, D. (2006). *Learning Styles Again:* VARKing up the right tree!, Education Developments, SEDA Ltd, Issue 7.4, Nov. 2006, p4-7.

Fleming, N. Mills, C. (1992). *Not Another Inventory, Rather a Catalyst for Reflection.* To improve the Academy, Vol 11, Page 137

Fox, R.D., (1984) *Learning styles and instructional preferences in continuing education for health* professionals: a validity study of the LSI. Adult Education Quarterly, 35(2). 72-85

Fleming, N., and C. Bonwell. (2001). *VARK: How Do I Learn Best?* Christchurch, New Zealand

Honey, P. & Mumford, A. (2000). *The learning styles helper's guide.* Maidenhead: Peter Honey Publications Ltd.

King, E. (2009). TRENDWATCH: *Matching Learning Styles and Generational Preferences*

Knowles, M.S. 1970. *The Modern Practice of Adult Education: Andragogy vs. Pedagogy.* New York: Association Press.

Kolb, D. (1984). *Kolb Learning Styles.* http://www.businessballs.com/kolblearningstyles.htm

Marton, P.Saljo, R. (1976). *On qualitative differences in learning*: 1- Outcome and process. British Journal of Education Psychology. 46, 4-11

Penman, M., Maclean, J. (2002): *Do occupational therapy students have a preferred learning modality? – An exploratory study of learning style preferences of occupational therapy students in Edinburgh, Scotland and Dunedin, New Zealand.*

Reynolds, M. (1997). *Learning styles: A critique.* Management Learning. 28(2), 115-134

Rivers, MK. Pomeroy, A. Buchan, D. Pomeroy, B. Fogarty, R., *Change and Diversity: Opportunities for and Constraints on Rural Women in New Zealand*, MAF Policy Technical Paper 97/11, Ministry of Agriculture and Fisheries, www.maf.govt.nz. October 1997

Stellwagen, J.B. (2001). A challenge to the learning styles advocates. The Clearing House Washington, 70(5), 265-268

Training & Design Suite (2009). Implications for Training Design *http://trainingpd.suite101.com/article.cfm/designing_training_for_gen_y*

Vella, J. (1994). *Learning to Listen, Learning to Teach.* San Francisco: Jossey-Bass, 3-22.

Zohar, D. (1997). Rewiring the corporate brain: Using the new science to rethink how we structure and lead organizations. San Francisco, CA: Berrett-Koehler. Zohar

7. Appendices

- VARK Results – Chris's learning preferences
- Women in Dairy VARK Survey Results

The VARK Questionnaire Results

Chris's VARK results

Your scores were:
Visual: 8
Aural: 8
Read/Write: 5
Kinesthetic: 10

You have a multimodal (VARK) learning preference. Use the following helpsheets for study strategies that apply to your learning preferences:

- Multimodal
- Visual
- Aural
- Read –write
- Kinesthetic

Kinesthetic Study Strategies

If you have a strong **Kinesthetic** preference for learning you should use some or all of the following:

Intake

To take in the information:

- all your senses - sight, touch, taste, smell, hearing ...
- laboratories
- field trips
- field tours
- examples of principles
- lecturers who give real-life examples
- applications
- hands-on approaches (computing)
- trial and error
- collections of rock types, plants, shells, grasses...
- exhibits, samples, photographs...
- recipes - solutions to problems, previous exam papers

SWOT - Study without tears

To make a learnable package:

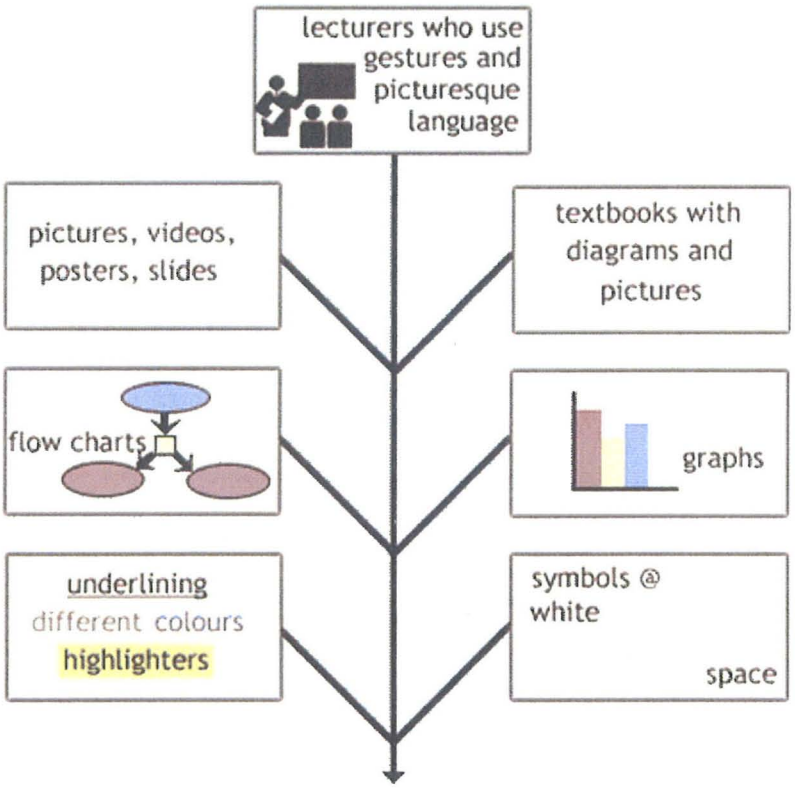
- Convert your "notes" into a learnable package by reducing them (3:1)
- Your lecture notes may be poor because the topics were not 'concrete' or 'relevant'.
- You will remember the "real" things that happened.
- Put plenty of examples into your summary. Use case studies and applications to help with principles and abstract concepts.
- Talk about your notes with another "K" person.
- Use pictures and photographs that illustrate an idea.
- Go back to the laboratory or your lab manual.
- Recall the experiments, field trip...

Output

To perform well in any test, assignment or examination:

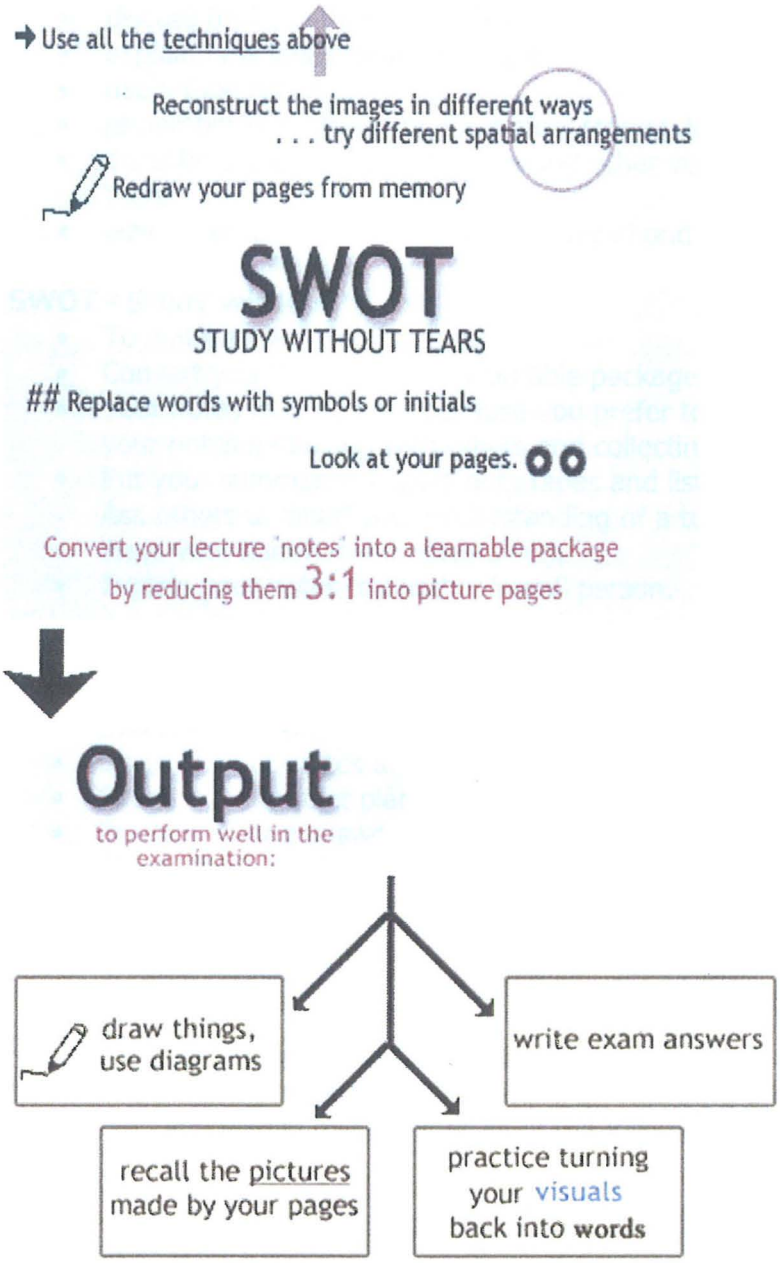
- Write practice answers, paragraphs...
- Role play the exam situation in your own room.
- *You want to experience the exam so that you can understand it.*
  The ideas on this page are only valuable if they sound practical, real, and relevant to you.
  You need to do things to understand.

Visual Study Strategies



Intake

to take in the information:



You want the whole picture so you are probably holistic rather than reductionist in your approach.. You are often swayed by the look of an object. You are interested in color and layout and design and you know where you are in your environment. You are probably going to draw something

Aural Study Strategies

If you have a strong preference for learning by **Aural** methods (**A** = hearing) you should use some or all of the following:

Intake

To take in the information:

- attend classes
- attend discussions and tutorials
- discuss topics with others

- discuss topics with your teachers
- explain new ideas to other people
- use a tape recorder
- remember the interesting examples, stories, jokes...
- describe the overheads, pictures and other visuals to somebody who was not there
- leave spaces in your notes for later recall and 'filling'

SWOT - Study without tears

- To make a learnable package:
- Convert your "notes" into a learnable package by reducing them
- Your notes may be poor because you prefer to listen. You will need to expand your notes by talking with others and collecting notes from the textbook.
- Put your summarised notes onto tapes and listen to them.
- Ask others to 'hear' your understanding of a topic.
- Read your summarised notes aloud.
- Explain your notes to another 'aural' person.

Output

To perform well in any test, assignment or examination:

- Imagine talking with the examiner.
- Listen to your voices and write them down.
- Spend time in quiet places recalling the ideas.
- Practice writing answers to old exam questions.
- Speak your answers aloud or inside your head.
- *You prefer to have this page explained to you.*
  The written words are not as valuable as those you hear.
  You will probably go and tell somebody about this.

Read/Write Study Strategies

If you have a strong preference for learning by **Reading** and **Writing (R & W)** learning you should use some or all of the following:

Intake

To take in the information:

- lists
- headings
- dictionaries
- glossaries
- definitions
- handouts
- textbooks
- readings - library
- notes (often verbatim)
- teachers who use words well and have lots of information in sentences and notes
- essays
- manuals (computing and laboratory)

SWOT - Study without tears

To make a learnable package:

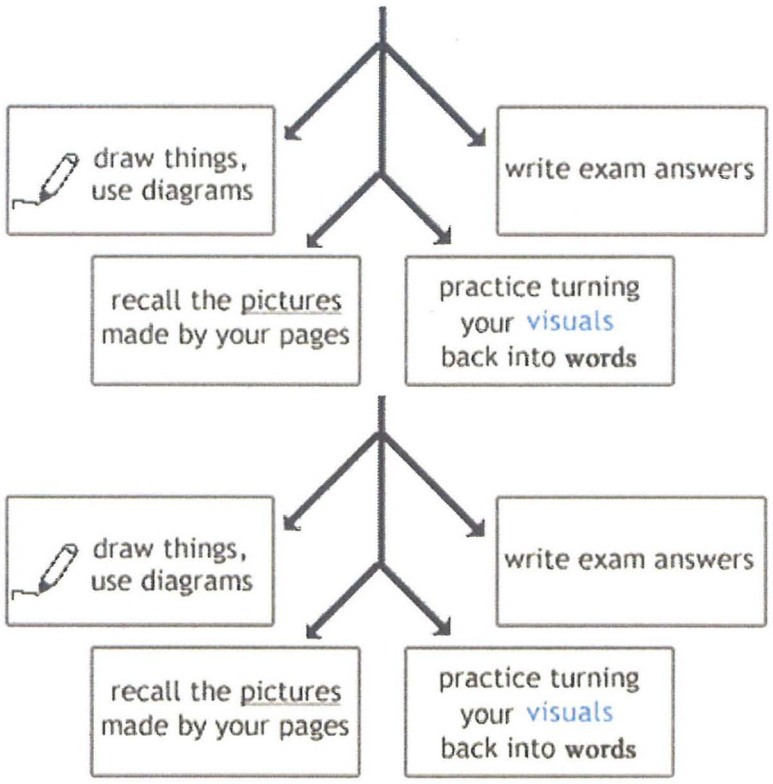
- Convert your "notes" into a learnable package by reducing them

- Write out the words again and again.
- Read your notes (silently) again and again.
- Rewrite the ideas and principles into other words.
- Organize any diagrams, graphs ... into statements, e.g. "The trend is..."
- Turn reactions, actions, diagrams, charts and flows into words.
- Imagine your lists arranged in multiplechoice questions and distinguish each from each.

OUTPUT

To perform well in any test, assignment or examination:

- Write exam answers.
- Practice with multiple choice questions.
- Write paragraphs, beginnings and endings.
- Write your lists (a,b,c,d,1,2,3,4).
- Arrange your words into hierarchies and points.
- *You like this page because the emphasis is on words and lists.*
  You believe the meanings are within the words, so any talk is OK but this handout is better.
  You are heading for the library.



Multimodal Study Strategies

If you have multiple preferences you are in the majority as approximately 60% of any population fits that category. Multiple preferences are interesting varied. For example you may have two strong preferences V and A or R and K, or you may have three strong preferences such as VAR or ARK. Some people have no particular strong preferences and their scores are almost even for all four modes. For example one person had scores of V=6, A=6, R=6, and K=6. She said that she adapted to the

mode being used or requested. If the teacher or supervisor preferred a written mode she switched into that mode for her responses and for her learning.

So multiple preferences give you choices of two or three or four modes to use for your interaction with others. Positive reactions mean that those with multimodal preferences choose to match or align their mode to the significant others around them. But, some people have admitted that if they want to be annoying they may stay in a mode different from the person with whom they are working. For example they may ask for written evidence in an argument, knowing that the other person much prefers to refer only to oral information.

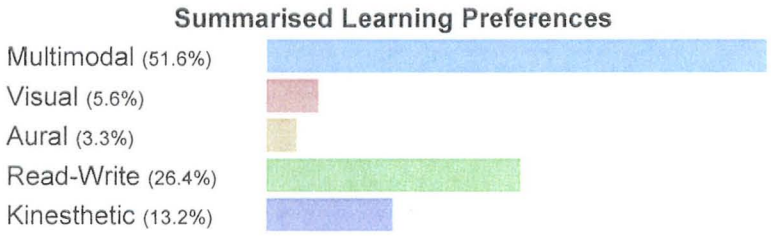
If you have two almost equal preferences please read the study strategies that apply to your two choices. If you have three preferences read the three lists that apply and similarly for those with four. You will need to read two or three or four lists of strategies. One interesting piece of information that people with multimodal preferences have told us is that it is necessary for them to use more than one strategy for learning and communicating. They feel insecure with only one. Alternatively those with a single preference often "get it" by using the set of strategies that align with their single preference.

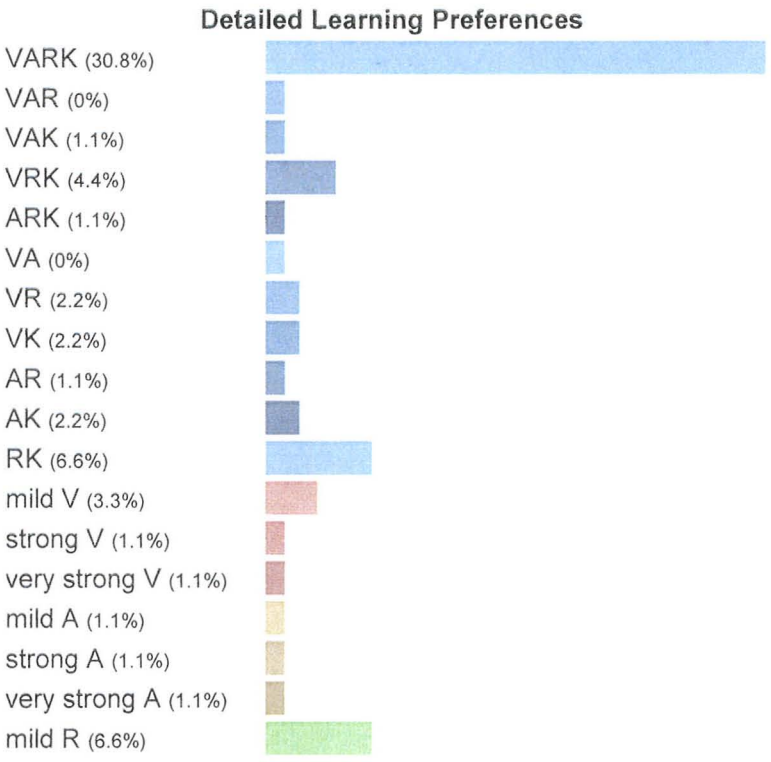
We are noticing some differences among those who are multimodal especially those who have chosen fewer than 25 options and those who have chosen more than 30. If you have chosen fewer than 25 of the options in the questionnaire you may prefer to see your highest score as your main preference - almost like a single preference.

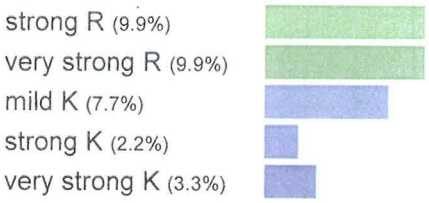
Results for 2009Dairy

Total number of responses: 100
Total number responses from unique students: 92

- The following graphs show the results for the students who have filled in the questionnaire.
  Where a student has filled in the questionnaire more than once, only the first of that student's responses is included.
  All responses for students who did not fill in a student ID have been included.






strong R (9.9%)
very strong R (9.9%)
mild K (7.7%)
strong K (2.2%)
very strong K (3.3%)

Results for 2009Dairy

Total number of responses: 100
Total number responses from unique students: 92

date-time	version	ID	class	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	V	A	R	K	Pref	Strength
12/06/2009 23:32	standard	Andrea	2009Dairy	V	RK	A	R	K	AK	AK	K	KA	V	AR	V	RVKA	4	6	4	7	VARK	-
12/06/2009 23:34	standard	Cheryl Atkinson	2009Dairy	V	R	R	K	R	A	K	A	R	V	R	R	K	2	2	6	3	R	strong
12/07/2009 5:53	standard	Sue	2009Dairy	R	R	A	R	K	A	K	V	K	R	AR	V	A	2	4	5	3	VARK	-
12/07/2009 6:42	standard	Sue van der Poel	2009Dairy	V	V	R	V	K	V	K	V	R	V	V	R	K	7	0	3	3	V	very strong
12/07/2009 6:57	standard	-	2009Dairy	K	R	R	R	K	K	K	A	K	K	A	V	K	1	2	3	7	K	very strong
12/07/2009 7:20	standard	Julie Pirie	2009Dairy	V	R	A	V	K	R	K	V	K	V	A	R	A	4	3	3	3	VARK	-
12/07/2009 7:20	standard	Barbara	2009Dairy	V	K	A	V	K	R	K	K	K	V	A	A	VKA	4	4	1	6	K	mild
12/07/2009 7:26	standard	Jo	2009Dairy	K	R	A	V	K	A	VK	K	K	V	KR	V	RVA	5	3	3	6	VARK	-
12/07/2009 7:27	standard	pauline hedley	2009Dairy	VA	RV	RV	R	RA	R	VAK	AVK	K	VR	AR	ARV	K	7	6	8	4	VARK	-
12/07/2009 7:34	standard	Chelsea Miller	2009Dairy	V	K	A	K	R	K	K	V	K	A	A	V	K	3	3	1	6	K	strong
12/07/2009 7:43	standard	mary	2009Dairy	V	R	R	R	K	R	VR	K	R	R	R	R	A	2	1	9	2	R	very strong
12/07/2009 7:53	standard	Carol	2009Dairy	V	R	R	R	KR	R	K	V	K	V	R	R	K	3	0	7	4	R	strong
12/07/2009 8:16	standard	Sally	2009Dairy	AR	K	R	V	R	AR	RK	A	KR	AR	A	V	R	2	5	8	3	R	mild
12/07/2009 8:23	standard	Sheryle Henderson	2009Dairy	V	R	A	V	K	RK	R	V	KR	V	AR	R	V	5	2	6	3	VR	-
12/07/2009 8:38	standard	kerstin Williams	2009Dairy	A	R	A	V	K	K	A	A	A	R	R	R	A	1	6	4	2	A	mild
12/07/2009 9:04	standard	Jillian O'Neill	2009Dairy	VA	RK	A	V	KRA	AR	AK	AK	K	VA	AR	R	KA	3	9	5	6	VARK	-
12/07/2009 9:05	standard	SAndra	2009Dairy	R	K	A	V	K	A	K	V	K	R	A	V	K	3	3	2	5	K	mild
12/07/2009 9:05	standard	Jillian O'Neill	2009Dairy	VA	RK	A	V	KRA	AR	AK	AK	K	VA	AR	R	KA	3	9	5	6	VARK	-
12/07/2009 9:25	standard	Georgie Templeton	2009Dairy	VAR	R	ARK	R	KVRA	RK	VK	K	KR	VR	KA	V	KA	5	5	8	8	VARK	-
12/07/2009 9:51	standard	Annemarie Wratt	2009Dairy	K	RK	R	R	-	R	K	K	KR	V	A	V	-	2	1	5	5	RK	-
12/07/2009 10:04	standard	Karen M	2009Dairy	V	R	R	R	K	K	A	A	K	V	R	R	K	2	2	5	4	RK	-
12/07/2009 10:08	standard	stacie	2009Dairy	R	R	K	V	KR	ARV	VR	A	R	A	RV	V	R	5	3	8	2	R	mild
12/07/2009 10:09	standard	Bridie Dunn	2009Dairy	A	K	A	K	K	A	K	A	K	A	R	V	K	1	5	1	6	AK	-
12/07/2009 10:13	standard	honor dunn	2009Dairy	V	V	K	K	A	K	K	K	K	V	V	V	K	5	1	0	7	K	mild
12/07/2009 10:25	standard	Angela Fullerton	2009Dairy	V	RK	R	R	K	R	R	K	K	VR	KR	RV	K	3	0	8	6	RK	-
12/07/2009 11:07	standard	gay smith	2009Dairy	V	R	R	K	R	R	R	A	R	A	R	R	A	1	3	8	1	R	very strong
12/07/2009 11:07	standard	Kym D	2009Dairy	V	RK	K	KR	K	AK	AK	AK	KA	V	KAR	AV	RVKA	4	7	4	10	VARK	-
12/07/2009 12:12	standard	Lyn	2009Dairy	K	A	R	K	K	A	K	A	K	R	R	V	-	1	3	3	5	K	mild
12/07/2009 12:14	standard	Sue Kernot	2009Dairy	VA	RK	A	R	K	A	VK	V	K	A	RV	V	K	5	4	3	5	VARK	-
12/07/2009 12:19	standard	Danielle	2009Dairy	V	R	V	V	R	A	R	V	K	R	R	A	K	4	2	5	2	VR	-
12/07/2009 12:38	standard	Helen Cameron	2009Dairy	VA	R	AR	R	RA	R	R	AV	KR	A	A	RV	KA	3	7	8	2	AR	-
12/07/2009 12:40	standard	Antonia Craig	2009Dairy	V	R	V	V	R	K	V	K	R	V	A	R	K	5	1	4	3	VRK	-
12/07/2009 13:02	standard	Deb Washington	2009Dairy	R	K	A	K	K	K	RK	A	K	R	RV	RV	RA	2	3	6	6	RK	-
12/07/2009 13:22	standard	Kellie	2009Dairy	V	V	R	K	K	A	K	K	R	A	A	R	A	2	4	3	4	VARK	-
12/07/2009 13:36	standard	-	2009Dairy	V	R	A	R	K	K	R	V	K	V	R	R	K	3	1	5	4	VRK	-
12/07/2009 13:41	standard	-	2009Dairy	VA	R	A	R	K	K	R	V	K	VA	R	R	RK	3	3	6	4	R	mild
12/07/2009 14:39	standard	Wendy	2009Dairy	R	R	R	V	K	A	A	K	R	R	R	V	K	2	2	6	3	R	strong
12/07/2009 15:29	standard	Nikki Verbeet	2009Dairy	R	K	R	R	R	R	R	V	R	R	R	R	R	1	0	11	1	R	very strong
12/07/2009 16:07	standard	-	2009Dairy	R	K	R	R	K	A	R	V	K	R	A	R	R	1	2	7	3	R	very strong
12/07/2009 18:15	standard	bridget	2009Dairy	R	K	A	V	K	K	VK	A	K	A	A	V	KA	3	5	1	6	AK	-

12/07/2009 18:18	standard	Clare Elizabeth Shortt	2009Dairy	R	RK	K	V	K	AK	A	A	K	R	R	V	V	3	3	4	5	VARK	-
12/07/2009 18:56	standard	cathie	2009Dairy	V	K	A	V	R	A	R	A	K	V	R	A	K	3	4	3	3	VARK	-
12/07/2009 19:02	standard	Angela Blyde	2009Dairy	V	K	R	K	K	K	K	K	K	V	A	V	K	3	1	1	8	K	very strong
12/07/2009 19:30	standard	Adele King	2009Dairy	V	R	R	R	K	R	V	V	R	R	R	R	V	4	0	8	1	R	very strong
12/07/2009 20:09	standard	Lynn	2009Dairy	VR	RK	R	KV	KR	A	AK	V	KRA	VA	AR	V	KA	5	6	6	6	VARK	-
12/07/2009 20:59	standard	Kathy Duxfield	2009Dairy	V	R	A	K	K	R	K	K	K	R	A	R	K	1	2	4	6	K	mild
12/07/2009 21:03	standard	Frances Coles	2009Dairy	A	K	R	R	KR	A	K	V	K	A	R	V	RVA	3	4	5	4	VARK	-
12/07/2009 22:11	standard	Nardene	2009Dairy	V	K	R	V	KV	R	K	V	K	V	R	R	RKA	5	1	5	5	VRK	-
12/08/2009 5:18	standard	vickie	2009Dairy	R	K	R	R	R	R	K	V	K	R	R	R	K	1	0	8	4	R	very strong
12/08/2009 6:39	standard	Flora Bartholomew	2009Dairy	V	V	R	R	K	A	K	K	R	V	K	V	K	4	1	3	5	VRK	-
12/08/2009 8:38	standard	-	2009Dairy	VA	RK	AR	K	VRA	RK	RK	AK	A	VA	AR	RV	RVKA	5	8	8	6	VARK	-
12/08/2009 8:40	standard	-	2009Dairy	VA	RK	AR	K	VRA	RK	RK	AK	A	VA	AR	RV	RVKA	5	8	8	6	VARK	-
12/08/2009 8:40	standard	-	2009Dairy	VA	RK	AR	K	VRA	RK	RK	AK	A	VA	AR	RV	RVKA	5	8	8	6	VARK	-
12/08/2009 9:25	standard	Jan Johnstone	2009Dairy	K	K	A	R	V	K	K	V	R	V	A	A	K	3	3	2	5	K	mild
12/08/2009 11:07	standard	johanna o'callaghan	2009Dairy	R	R	A	V	K	A	K	A	K	R	R	V	K	2	3	4	4	VARK	-
12/08/2009 12:33	standard	boogie	2009Dairy	V	R	R	R	K	K	RK	A	K	V	R	R	K	2	1	6	5	RK	-
12/08/2009 20:27	standard	Marnie	2009Dairy	R	R	A	R	R	R	R	V	KRA	R	R	R	RKA	1	3	11	2	R	very strong
12/09/2009 9:51	standard	Sarah Kennedy	2009Dairy	V	RK	V	K	K	A	K	AVK	K	A	KARV	V	VKA	6	5	2	8	VAK	-
12/09/2009 18:27	standard	Jana	2009Dairy	V	R	K	R	K	K	K	K	K	V	K	V	KA	3	1	2	8	K	very strong
12/14/2009 6:48:15 PM	standard	lynette	2009Dairy	VA	K	A	VR	K	R	VK	A	A	VR	R	R	RA	4	5	6	3	VARK	-
12/15/2009 6:03:54 PM	standard	Marg	2009Dairy	V	R	A	V	K	R	A	V	K	V	R	R	K	4	2	4	3	VARK	-
12/15/2009 8:06:43 PM	standard	cathy	2009Dairy	A	RA	R	R	K	A	R	V	KR	R	A	R	K	1	4	7	3	R	strong
12/16/2009 6:46:14 AM	standard	Marg Douglas	2009Dairy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12/16/2009 6:56:37 AM	standard	Marg Douglas	2009Dairy	V	R	R	V	K	K	RK	V	R	V	R	V	VK	6	0	5	4	VRK	-
12/21/2009 10:31:38 PM	standard	Deryn Brophy	2009Dairy	VR	RK	R	V	R	K	R	A	K	R	A	A	RKA	2	4	7	4	R	mild
12/21/2009 10:32:35 PM	standard	Christina Baldwin	2009Dairy	V	R	A	V	K	A	R	A	K	V	R	R	V	4	3	4	2	VARK	-
12/21/2009 10:38:36 PM	standard	Annette Williams	2009Dairy	A	R	R	V	K	R	K	A	K	R	K	AR	R	1	3	6	4	R	mild
12/21/2009 11:34:14 PM	standard	Jan	2009Dairy	A	R	A	V	A	A	K	A	K	A	R	R	K	1	6	3	3	A	strong
12/22/2009 5:35:09 AM	standard	Ailsa Miller	2009Dairy	V	K	R	VR	R	A	K	V	KA	V	KR	R	R	4	2	6	4	R	mild
12/22/2009 5:38:28 AM	standard	Jane Pike	2009Dairy	A	A	A	R	K	V	K	A	K	R	A	A	A	1	7	2	3	A	very strong
12/22/2009 7:03:13 AM	standard	Wendy Harker	2009Dairy	V	R	A	R	K	A	R	V	K	V	R	R	A	3	3	5	2	R	mild
12/22/2009 8:02:32 AM	standard	Raewyn	2009Dairy	A	A	R	V	K	R	R	A	K	A	R	V	K	2	4	4	3	VARK	-
12/22/2009 8:02:46 AM	standard	Sue Wallis	2009Dairy	V	K	R	R	K	R	R	V	R	V	R	R	V	4	0	7	2	R	strong
12/22/2009 8:18:43 AM	standard	Dawn Dalley	2009Dairy	V	R	R	V	K	K	K	V	K	V	K	V	K	5	0	2	6	VK	-
12/22/2009 8:19:09 AM	standard	Marie Marshall	2009Dairy	AR	R	AR	K	KVRA	AR	AK	AV	K	AR	A	A	RVKA	3	10	7	5	VARK	-
12/22/2009 8:27:34 AM	standard	Hilary Webber	2009Dairy	V	A	R	V	R	AV	K	V	K	V	R	R	VA	6	3	4	2	V	mild
12/22/2009 9:11:13 AM	standard	lisa burns	2009Dairy	V	K	A	R	R	V	K	A	K	R	R	V	A	3	3	4	3	VARK	-
12/22/2009 9:22:50 AM	standard	Hilary	2009Dairy	V	R	R	V	K	V	R	V	K	R	V	V	K	6	0	4	3	V	mild
12/22/2009 10:34:06 AM	standard	Sarah Fraser	2009Dairy	V	R	R	R	K	R	VR	VK	R	V	R	R	VK	5	0	8	3	R	strong
12/22/2009 1:51:12 PM	standard	C Finnigan	2009Dairy	V	V	A	V	K	R	K	V	K	V	R	A	K	5	2	2	4	VK	-
12/23/2009 10:06:48 PM	standard	Tania Fernyhough	2009Dairy	AR	VK	AR	R	R	R	AK	K	RA	R	A	R	R	1	5	9	3	R	strong
12/23/2009 10:46:31 PM	standard	Jocelyn	2009Dairy	V	R	A	VR	KR	R	R	V	R	A	K	A	R	3	3	7	2	R	very strong

12/25/2009 11:19:56 PM	standard	kathryn Dodson	2009Dairy	V	R	R	R	R	R	A	K	A	V	R	R	K	2	2	7	2	R	very strong
12/27/2009 12:39:20 PM	standard	wendy	2009Dairy	V	RK	R	R	R	K	K	AVK	A	V	A	A	K	3	4	4	5	VARK	-
12/29/2009 9:44:34 AM	standard	Kate Lynch	2009Dairy	V	RK	R	V	K	RK	VRK	VK	KR	V	R	-	RKA	5	1	7	7	VRK	-
12/30/2009 11:25:48 AM	standard	Pip	2009Dairy	V	V	R	R	R	R	K	A	K	VR	R	R	RA	3	2	8	2	R	very strong
1/02/2010 15:38	standard	Sarah	2009Dairy	R	K	A	V	A	R	VR	V	R	R	K	R	KA	3	3	6	3	R	strong
1/03/2010 9:19	standard	Jane Baker	2009Dairy	V	VK	R	V	R	AR	R	AV	KR	A	KR	R	RK	4	3	8	4	R	strong
1/03/2010 10:04	standard	M1`	2009Dairy	K	K	V	K	K	K	A	A	A	VK	R	R	A	2	4	2	6	K	mild
1/03/2010 10:12	standard	m2	2009Dairy	K	K	R	V	KA	V	V	V	R	V	K	V	A	6	2	2	4	V	mild
1/03/2010 10:17	standard	M3	2009Dairy	K	R	K	V	K	K	V	A	R	K	R	R	R	2	1	5	5	RK	-
1/03/2010 10:23	standard	M4	2009Dairy	VK	RK	K	R	KR	A	VRA	A	-	VA	A	RV	KA	4	6	5	5	VARK	-
1/03/2010 10:28	standard	M5	2009Dairy	VA	K	ARVK	R	KVR	AR	VA	K	R	-	AR	V	RKA	5	6	7	5	VARK	-
1/03/2010 10:32	standard	M6	2009Dairy	VK	R	R	R	K	K	K	K	K	V	A	A	A	2	3	3	6	K	strong
1/03/2010 10:36	standard	M7	2009Dairy	VR	K	K	K	KVRA	A	V	V	R	VR	R	AR	VK	6	3	6	5	VARK	-
1/03/2010 10:40	standard	M8	2009Dairy	VA	RK	R	VR	KA	AK	AK	AK	RA	VA	RV	R	RVKA	5	8	7	6	VARK	-
1/03/2010 10:44	standard	M9	2009Dairy	VA	R	R	V	K	A	K	V	A	V	V	R	V	6	3	3	2	V	strong
1/03/2010 10:47	standard	Susan	2009Dairy	VA	RK	ARK	VR	RA	RKV	VAK	AV	KA	VA	KR	V	RVKA	8	8	7	7	VARK	-
1/04/2010 14:21	standard	Helen Ellis	2009Dairy	R	RK	RK	R	K	K	K	AK	KA	A	R	AR	A	0	5	6	7	ARK	-
1/04/2010 21:03	standard	Rachel Norgate	2009Dairy	K	R	R	VR	KRA	A	K	VK	R	V	KA	V	RKA	4	4	6	6	VARK	-