A REVIEW OF THE

WORLD SHEEPMEAT MARKET

NORTH AMERICA, JAPAN AND THE MIDDLE EAST

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THE AGRICULTURAL ECONOMICS RESEARCH UNIT
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The Unit has on hand a programme of research in the fields of agricultural economics and management, including production, marketing and policy, resource economics, and the economics of location and transportation. The results of these research studies are published as Research Reports as projects are completed. In addition, technical papers, discussion papers and reprints of papers published or delivered elsewhere are available on request. For list of previous publications see inside back cover.

The Unit and the Department of Agricultural Economics and Marketing and the Department of Farm Management and Rural Valuation maintain a close working relationship in research and associated matters. The combined academic staff of the Departments is around 25.

The Unit also sponsors periodic conferences and seminars on appropriate topics, sometimes in conjunction with other organisations.

The overall policy of the Unit is set by a Policy Committee consisting of the Director, Deputy Director and appropriate Professors.

CONTENTS

PREFACE

This volume is the fourth in a series of five reviewing the world sheepmeat market. Other volumes in the series are as follows: Volume 1 gives an overview of the world sheepmeat market. In this respect, Volume 1 can be considered a summary for the whole series. Volume 2 presents a review of sheepmeat production, consumption and trade in the major exporting countries of New Zealand, Australia and Argentina. Volume 3 reviews the sheepmeat market in the EEC whilst Volume 5 deals with East European countries.

The present paper (Volume 4) concentrates on North America, Japan and the Middle East; these areas are net importers of sheepmeat and have grown as markets for sheepmeat from major exporting countries over past years. Although diverse in many other ways, they have been loosely grouped together here as 'development' markets.

The five volumes of this Discussion Paper form part of the AERU's programme of research in the marketing and international trade area. Other papers relevant to sheepmeat markets published recently by the AERU include Research Report No. 109 by R.L. Sheppard on Changed in U.K. Meat Demand, Discussion Papers No. 51 and 59 by N. Blyth on the EEC Sheepmeat Regime and Discussion Paper No. 52 on Future Directions for New Zealand Lamb Marketing.

P.D. Chudleigh,

Director.

SUMMARY

This paper reviewsthe sheepmeat markets in three importing regions (North America, Japan and the Middle East) over the period 1960-80. These regions form so-called 'development' markets for N.Z. sheepmeat exports as much of N.Z.'s traditional trade with the U.K. is being diversified into them.

The U.S.A. has a large number of sheep but its production has declined markedly; consumption has followed a similar trend and per capita consumption of sheepmeats is very low. Imports are currently well below levels in the mid-1960's but considerable potential exists for future expansion in the import market.

Canada's sheepmeat market is of relatively minor importance but it has characteristics similar to those of the U.S.A. Imports have been quite substantial at times, though have declined recently. In both countries, N.Z. is now the main import supplier.

A large and possibly expanding import market exists in Japan for sheepmeat but up until now it has been an erratic purchaser, especially in the mutton market. Changes in consumption are directly transmitted to exports as there is no domestic production. Promotion is needed to expand the

market. Imports consist largely of mutton for manufacturing and Australia and N.Z. are the two main suppliers. However, it is possible that N.Z. could capture the growing market for lamb with Australia continuing to supply the mutton market.

Finally the Middle East market has developed rapidly since the oil-price rise in 1973/74. The Moslem peoples have a strong preference for sheepmeats so increasing incomes necessitated imports of large quantities of sheepmeat to satisfy demand as domestic supplies are limited. The main markets are Iran and Iraq while Saudi Arabia, Kuwait and other states also provide lucrative markets. Although it is planned to increase production in the Middle East, the potential for doing so is limited and domestic supply is unlikely to be able to satisfy increasing demand. The outlook is for continued expansion in imports therefore, though the market has a high potential risk due to political instability in the region.

1. INTRODUCTION

Sheepmeats constitute a minor category of world meat production accounting for only 7% in 1980. Production and consumption of sheepmeats on a significant scale are confined to relatively few countries. The U.S.S.R., Australia, N.Z.,China, Turkey and the U.K. produce more than half the world output of sheepmeats. Consumption is slightly less concentrated, with countries such as Japan and Iran being major consumers.

International trade in sheepmeats is small; only about 12% of world production enters international trade. This trade has traditionally been dominated by the flow of sheepmeats from N.Z. to the U.K. (70% of world trade in 1960). N.Z. and Australia are the major exporters, and up to the early 1970's the U.K. and Japan were the main importers. During the 1970's however, N.Z.-U.K. trade has diminished to about 25% of world trade, and other countries have increased their imports. Individually, none of these markets are as sizeable as the U.K., but collectively, they provide an alternative market for the Southern Hemisphere's growing exports. Several countries are consistent sheepmeat importers. However, for these countries, Canada, the U.S., Greece and several

other EEC member states, quantities imported are small in relation to local production.

A few new sheepmeat importers have emerged during the 1970's. The U.S.S.R. has become an important, but unpredictable, importer of frozen mutton. South Korea also buys growing quantities of mutton, but a large proportion of this is processed and re-exported to Japan. In many markets, such as the U.S. and Canada, there has been a shift away from imports of mutton towards higher quality lamb.

The greatest and most sustained growth in sheepmeat imports has occurred in the Middle East, where several countries have become major importers since the rise in oil prices. The largest market in the region is Iran; Iraq and Saudi Arabia are rapidly growing importers. N.Z. has for a number of years operated a diversification scheme for its lamb exports to reduce reliance on the U.K. market. It is to these new and developing markets which it has turned, though the extent and stability of each market may not have been fully assessed.

The situation in some of these alternative markets is discussed here in order to provide background information on which future policy can be based. The markets dealt with specifically are the U.S., Canada, Japan and the Middle East. These

markets are amongst the main so-called 'development areas'. The production, consumption and trade trends of each are analysed for the period 1960-80. Some implications for past and future trade with N.Z. and other exporting countries are discussed with a brief consideration of how N.Z. sheepmeat trade will fit into the scenario up to 1985.

2. U.S.A.

2.1 Production

Sheep farming in the U.S. has never been a major agricultural enterprise and its importance has declined considerably in recent years. In 1867, when records started, sheep numbers were in fact greater than numbers of cattle and hogs. The situation was rapidly reversed as cattle numbers increased. The long term trend in sheep numbers up to World War II was irregular and has declined since (McCoy, 1979; HMSO, 1935).

Originally sheep were kept in the Eastern States, mainly for wool; pressure from increasing population, competition for land from dairying and arable farming forced up rents, and the sheep industry moved westwards. Now, Columbias and Rambouillets predominate in the west - the warm, dry climate being ideal for extensive grazing. In the Eastern States there are mainly cross-breds, fed intensively on the grain produced there. Thus, the main types of production systems are rangeland (in the West), grain-fed lambs (in the East) and farm-flock production with sheep incidental to other enterprises in both (Edwards, 1970).

Lamb is now the main product of the U.S. sheep industry accounting for 50-80% of income from sheep with wool providing the remainder. Mutton is not an

important product in the U.S.A. except in a few, low income areas and the southern states. Therefore, most of the older sheep are slaughtered for on-farm use, or export. The spread of production systems puts the main supply on the market in two seasons. The spring lambs are slaughtered at 4-5 months, following weaning in April/May. They command a premium and constitute the bulk of domestic production - being marketed from June to August. The second minor period of domestic supply comes from November onwards when the fed-lamb is marketed. This is considered superior to spring lamb though production is more susceptible to changes in input (feed-grain) costs which affect the movement of lamb on to the market.

There is no direct Government assistance for lamb production in the U.S. though monetary assistance is given to wool producers, the U.S. being in deficit in wool.

An American Sheep Producers Council (ASPC) was founded in 1955 with the objective of promoting sales of lamb and wool. Since the decline of the industry it has moved into programmes encouraging production efficiency (ASPC, 1974). More recently sheep producers have formed a strong lobby for control of imports though imports may actually stimulate demand which benefits the domestic industry. More orderly and seasonally controlled imports may give the greatest benefit to domestic

supplies and importers (NZMPB, 1979).

Sheep numbers have declined 63% over the period 1960-80 from 33 to 12 million head (Table 1). There has been a decline in both flock size and in the number of farms with sheep. The main decrease in producers was amongst small-scale producers whilst the decrease in stock was amongst the large-scale producers (USDA, 1976). All regions have reduced numbers but the main fall is in the main sheep population regions in the west.

The decline in sheep numbers is attributed to many causes; a shortage of trained labour, the low price of wool and the returns compared to cattle and other enterprises (Edwards, 1970). Losses to predators (mainly Coyotes) have also been heavy, accounting for 6% of lambs docked and 62% of all lambs lost (Taylor et al., 1979). Several attempts have been made to assess the influence of each of these factors. USDA (1976) conclude that these factors may all be inter-related. It is also suggested that, due to marketing problems where too few buyers actually bid for sheep, prices are lower than they would be under greater competition.

TABLE 1

U.S.A.: Production Statistics

Year	Sheep (million head)	Slaughter (million head)	Average Carcase Weight (Kg)	Production[1] (Kt)
1960	33.17	16.2	21	384
1961	32.72	17.5	22	377
1962	30.97	17.1	21	366
1963	29.17	16.1	22	349
1964	27.12	14.8	22	324
1965	25.15	13.3	22	295
1966	24.73	13.0	23	295
1967	23.95	13.0	23	292
1968	22.22	12.1	23	273
1969	21.35	10.9	23	250
1970	20.42	10.8	23	250
1971	19.73	10.9	23	252
1972	18.74	10.5	24	246
1973	17.64	9.7	24	233
1974	16.31	9.0	23	211
1975	14.51	8.0	23	186
1976	13.31	6.9	24	168
1977	12.76	6.5	24	159
1978	12.35	5.5	24	140
1979	12.22	5.1	24	133
1980	12.51	5.2	24	134

[1] Annual production decline of 2.9%.

SOURCE: USDA

Table 1 also shows slaughter numbers and average carcase weights (24 kg) over the period. Whilst sheep numbers declined at 3% per annum, production of sheepmeat fell at a slightly lower rate, due to heavier carcase weights (Table 1). Production is now only around 130 Kt per year though slaughter rates during the late 1970's suggest that the decline has slowed.

Edwards (1970), using an econometric model, indicated that 83% of variation in production is explained by current stock inventory and a time-trend; he found no conclusive evidence that other factors (wage-rates, wool, lamb and beef returns) influence production in the short-run. The simulation model of sheep production by Roberts and O'Heady (1979) also implies this; 95% of variation in production is explained by stock inventory, time-trend, and lamb prices in the previous period. The econometric model is useful for analysing the impact of Government policies on output; for predictive purposes, a naive extrapolation could be more accurate in this case (CARD, 1975).

The estimated short-run coefficient of adjustment to changes in exogenous factors of 0.16 is consistent with the length of the sheep reproduction and life-cycle. However, large changes in sheep numbers have virtually obliterated cyclical trends in production which were discernible in ten year intervals up to World War II (McCoy, 1979). The declining long term trend though,

appears to be slowing and seems to have reached a turning point in 1980. The outlook for sheep farming is improving, though major shifts back into production are unlikely. Since 1974, farm prices for lamb have improved relative to beef; wool prices have risen and wool faces less competition from man-made fibres; losses to coyotes and other predators have decreased; and productivity is increasing (though it is often obscured by predation losses). Much of the land formerly used could be used again and be stocked more heavily; sheep are good converters of rough forage to meat so if the demand for food and energy increases, the competitive forces could turn in favour of sheep. Indeed, rebuilding of flocks started in 1979/80 (Agra Europe, No. 873).

Projections to 1985 (FAO, 1979) are for a decline in production to 90-100 Kt on the basis of stock of 7-8 million, 52% offtake and carcase weight of 23 kg. The industry is unlikely to decline as far as this, but no major improvement is foreseen.

Sheep farming, it seems, will continue to be a less popular enterprise than cattle ranching, more for historic than economic reasons.

2.2 Consumption

Per capita consumption of all meat in the U.S. is amongst the highest in the world at 118 kg per annum. Of this, only a small proportion (less than 2%) is mutton

TABLE 2

U.S.A.: Consumption Statistics

Year	Population[1] (million)	Sheepmeat Consumption[2] Per Capita (kg)	Total[3] Kt	All Meat Consumption Per Capita
1960	180.6	2.2	423	94.3
1961	183.7	2.3	419	95.5
1962	186.6	2.3	432	96.4
1963	189.4	2.2	413	96.8
1964	192.1	1.9	361	102.6
1965	194.5	1.7	324	100.0
1966	196.9	1.8	351	143.0
1967	199.1	1.8	344	107.3
1968	200.7	1.7	335	109.5
1969	202.6	1.6	311	110.0
1970	204.8	1.5	298	112.6
1971	207.5	1.4	293	115.3
1972	208.8	1.5	310	114.8
1973	210.4	1.2	253	107.6
1974	211.9	1.0	219	113.9
1975	213.5	0.9	195	110.8
1976	215.1	0.8	181	118.3
1977	216.8	0.8	169	118.4
1978	218.1	0.7	156	116.9
1979	220.1	0.7	153	117.0
1980	221.6	0.7	155	118.2

1 Annual rate of population growth = .8%.

2 Per capita consumption sheepmeat decline = 3.5% p.a.

3 Total consumption decline = 2.7% p.a.

SOURCE: Demographic Yearbooks, U.N.; USDA.

and lamb. Whilst consumption of other meats has shown distinct increasing trends over the period 1920-80 (Edwards, 1970; McCoy, 1979) consumption of sheepmeat has been relatively constant in comparison up until 1962 but has decreased since. There was a slight recovery in 1966 followed by a continuous decline to 1980 (Table 2).

The downward trend has been seen in both total consumption of sheepmeats (2.7% per annum) and per capita consumption (3.5% per annum). The low population growth rate (.8%) is not an important factor in changing consumption. Any changes in per capita consumption have a larger effect on total consumption due to the size of the population of 221 million (Table 2). The downward trend in both total (from 432 Kt to 150 Kt) and per capita (from 2.2 kg to 0.6 kg) annual consumption has occurred as a result of both a change in taste and the shift in the supply curve. Actual and real sheepmeat prices have risen since 1963 as supply decreased and demand has become more responsive to price changes.

The main factors on the demand side affecting quantities of sheepmeats purchased are prices of lamb, other meats, tastes and incomes. There has been a shift towards lamb consumption and mutton is now only used in processing. Breimyer (1961) and Edwards (1970) both conclude that consumption is more responsive to the

price level, than to income changes. Variation in consumption patterns between households and regions was revealed by USDA's Household Food Consumption Survey. The survey found rural/urban differences and greatest consumption in the West and North East (where most sheepmeat production is located).

Market surveys of consumer demand for lamb (ASPC, 1974; USDA, 1969) discuss the product's 'luxury' image in the U.S., which implies both high income elasticity and high price-elasticity with respect to itself and to other meats. Most estimates of income elasticity of demand for sheepmeats are around 0.65 (Breimyer, 1961; George and King, 1971; Edwards, 1970; Regier, 1978) and appear to be declining slightly over time (Regier, 1978).

The effect of rising incomes on consumption has been offset by the effects of rising sheepmeat prices. Lamb prices are above, and rising faster than the prices of other meats, and due to the small quantity marketed, its price is heavily influenced by other meats (Breimyer, 1961). Table 3 below gives estimates of price elasticities used by USDA and assumed to be the best available.

TABLE 3

USDA Estimates of the Price Elasticities of Demand for Sheepmeats

Price Elasticity w.r.t.:	Own Price	Beef	Pork	Chicken
Retail - mutton & lamb	-2.626	.589	.891	.234
Farm - mutton & lamb	-1.670	.381	.520	.181

SOURCE: USDA, 1978.

The figures suggest that demand for mutton and lamb is most affected by pork and beef prices and that it is highly sensitive to changes in its own price. Thus, as lamb prices have risen 64% from 1970 to 1980, changes in consumption must have been induced by shifts in supply.

Projections of consumption by FAO (1979) are for a total consumption of 230 Kt or 1 kg per capita by 1985. On current levels this would seem rather high but a decline in supplies of other meats and their relative costs could give such a consumption level.

2.3 Prices

McCoy (1979) states that variation in production is the main factor causing moves in prices. Roberts and O'Heady (1979) confirm this with their estimates of low, short and long-run price flexibilities which imply that lamb prices are not greatly affected by changes in consumption. But if domestic production continues to decline and imports increase, variations in the former will have less and less influence on prices.

Lamb prices tend to fetch a premium over beef and pork at both retail and wholesale levels. Real prices to the consumer and the farmer are increasing rapidly though farm and wholesale prices fluctuate seasonally. Marketing margins are constant, but a declining proportion of the retail price (NZMPB, 1978).

At wholesale level, imported frozen lamb is discounted with respect to fresh domestic lamb; the discount is not constant as the marketing of imports (see below) is carried out in a way that is not influenced by domestic prices. Domestic prices have been consistently above U.K. prices though import prices tend to be similar to U.K. prices.

No data are available for comparisons at retail level of domestic and imported lamb prices.

2.4 Trade

The U.S. is a net importer of sheepmeats. Imported sheepmeat complements domestic production by ensuring a supply in periods of low seasonal production and by partially filling the vacuum left by the secular decline in production.

Until 1958, trade was insignificant relative to the level of domestic production. After that it grew to reach a peak in 1968 of 20% of consumption at over 60 Kt (Table 4). In 1958 lamb prices were high which coincided with the beginning of a depression in the cattle cycle. This prompted imports from Australia of boneless mutton. Mutton imports, up to 1968, were in excess of 80% of sheepmeat imports with Australia as the major supplier. By the late 1970's, mutton imports declined to only 2% of sheepmeat trade.

Mutton is used mainly for manufacturing. As U.S. regulations enforce declaration of contents on the label of processed foods, it is difficult to substitute between meats. The availability of cheap beef makes it unlikely that manufacturers will change to mutton in any major way.

Now, virtually all imported sheepmeat is frozen cut lamb from New Zealand and Australia (Table 4, Figure 1). Lamb imports peaked in 1979 at 13% of consumption with over 20 Kt imported. The majority (over 70%) comes from New Zealand with varying amounts being supplied by Australia, Canada and Iceland.

TABLE 4

U.S.A.: Import Statistics

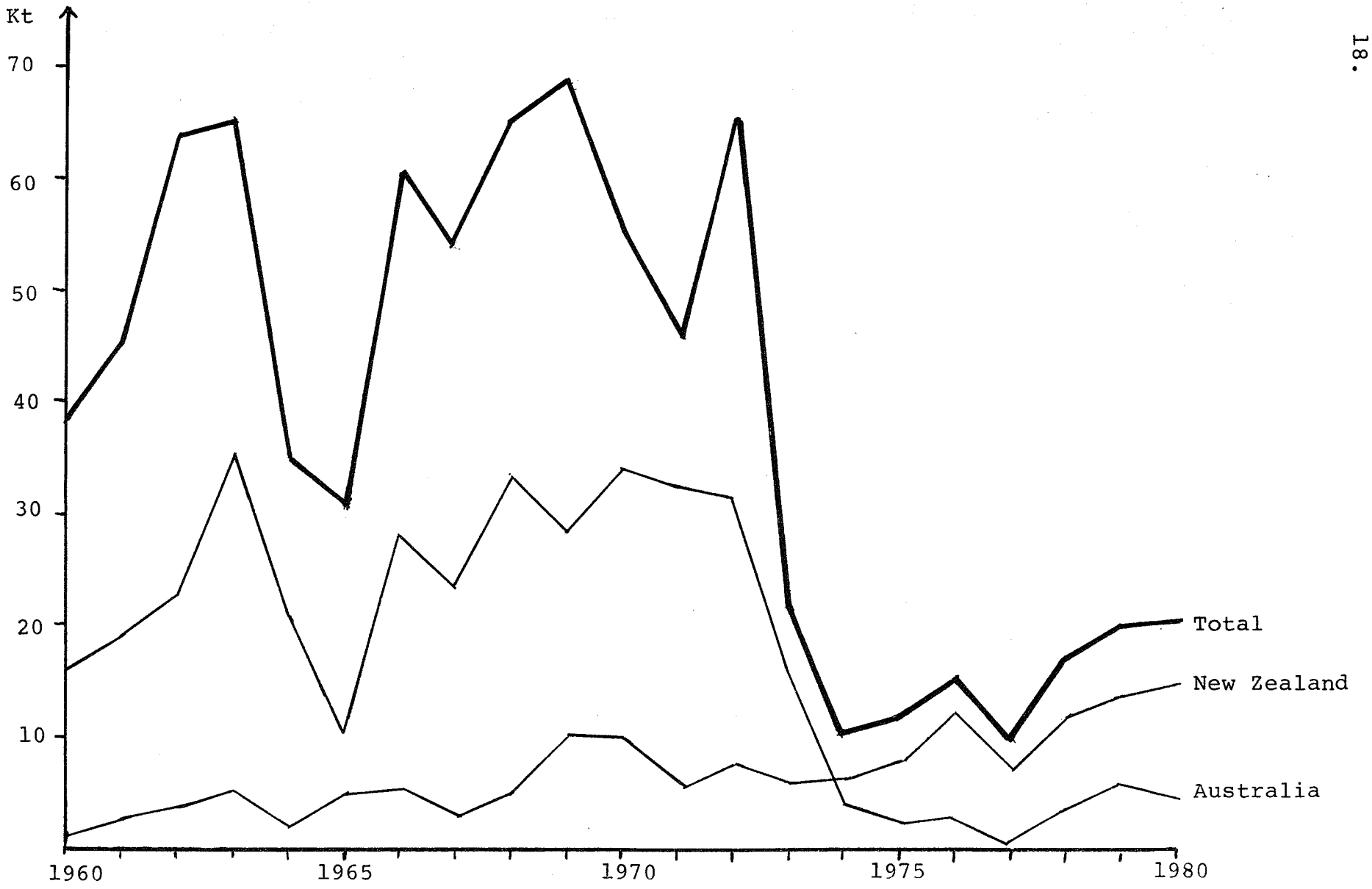
Year	Total	Australia		New Zealand		Other[1]	
		Kt	%	Kt	%	Kt	%
1960	39.0	16.8	43	1.9	5	20.3	52
1961	45.8	19.3	42	3.0	6	23.5	52
1962	64.9	23.9	37	4.3	7	36.7	56
1963	65.8	35.9	54	5.4	8	24.7	38
1964	35.8	20.9	58	2.4	7	12.5	35
1965	32.7	10.1	31	5.7	17	16.9	52
1966	61.7	28.5	46	5.9	9	27.3	45
1967	54.9	23.0	42	3.6	6	28.3	52
1968	66.7	34.1	51	5.6	8	29.3	41
1969	69.4	29.4	42	10.3	15	29.7	23
1970	55.3	34.8	63	10.0	18	19.3	19
1971	46.7	23.2	50	6.0	13	17.5	37
1972	67.1	32.1	47	8.0	12	27.0	41
1973	26.6	16.0	68	6.5	24	4.7	16
1974	11.8	4.7	40	6.2	52	.9	8
1975	12.2	2.7	22	8.2	67	1.3	11
1976	16.4	3.0	18	12.3	75	1.1	7
1977	10.0	0.1	1	7.3	73	2.6	26
1978	17.7	4.0	22	12.4	70	1.3	8
1979	20.3	6.1	28	14.2	72	0	0
1980	20.8	5.0	25	15.0	75	0	0

[1] Mainly Canada and Iceland.

SOURCE: USDA, ABS, NZMPB.

FIGURE 1

U.S.A.: Imports by Source 1960-80



Exports of sheepmeat are small but increasing slightly as stocks of older sheep are slaughtered. The main exports, around 2 Kt per annum, are of mutton to Middle East markets.

U.S. self-sufficiency in sheepmeats is around 87-93% (Table 5). Total USA trade in sheepmeats comprises 2½% of world imports (1980). Projections to 1985, made by FAO (1979) are for an import demand of 130-150 Kt. On 1980 consumption levels, this is extremely high. However, given sufficient imports, increased availability could stimulate demand for sheepmeat to this level.

2.5 Implications for Exporters

Table 5 and Figure 2 summarise production, consumption and import trends. Despite the increase in imports in 1975-80, levels are well below those in 1960-72. Total supplies of lamb available are falling; availability in 1980 was only 37% of that in 1960. Even if trends in domestic supply were reversed, imports would have to be four times the 1980 figure to approach previous availability levels.

Fluctuations observed in consumption of sheepmeats are highly correlated with variations in domestic production (Fox, 1953; Edwards, 1970). Hence, it can be assumed that an increase in imports would cause growth in consumption as sheepmeat availability increased.

TABLE 5

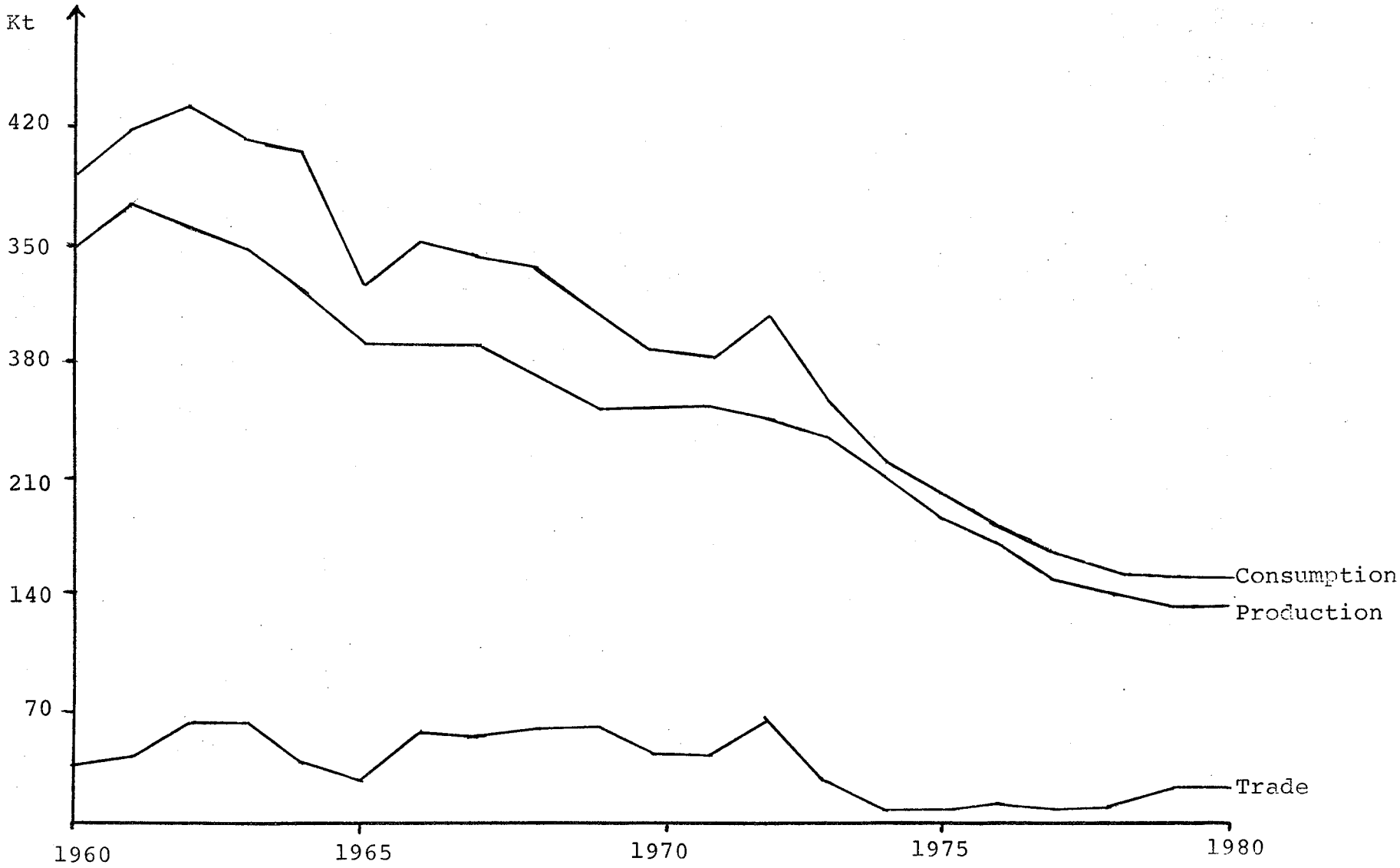
Summary of the U.S. Sheepmeat Market

Year	Production	Consumption	Net Imports	Self-Sufficiency
	Kt	Kt	Kt	%
1960	348	387	39	89.9
1961	377	419	42	89.9
1962	366	432	66	84.7
1963	349	413	64	84.5
1964	324	361	37	89.7
1965	295	324	29	91.3
1966	295	351	56	84.5
1967	292	344	52	84.8
1968	273	335	62	81.4
1969	250	311	61	80.4
1970	250	298	48	87.8
1971	252	293	41	81.5
1972	246	310	64	72.6
1973	233	253	23	89.7
1974	211	219	8	94.5
1975	186	195	9	93.5
1976	168	181	13	90.2
1977	159	169	10	93.6
1978	140	156	10	87.4
1979	133	153	20	86.9
1980	134	155	21	86.4

SOURCE: USDA

FIGURE 2

U.S.A.: Summary of Market Trends, 1960-80



Although New Zealand supplies 70% of U.S. lamb imports, only 4-5% of its exports go to the States. The U.S. is considered by the New Zealand Government to be a "development" market and therefore all trade is carried out by the Meat Export Development Company (see Edwards (1970) and Veeman (1972) for a description and evaluation of the company). On the basis of the foregoing it would seem that a larger proportion of New Zealand's exports could be sold on the U.S. market without reducing the U.S. market price drastically. Any price fall would be more than offset by quantities sold (given the above demand elasticities) thus increasing total revenue.

However, domestic producers with their fixed or declining supply, may face a fall in their revenue. Therefore, any moves to increase imports will undoubtedly be strongly opposed by them. Nevertheless, it has been argued by N.Z. exporters (see Section 2.1) that trade stimulates expansion of the market, improves the market image of sheepmeats and ensures availability of product to the consumer throughout the year (Wakelin, 1978). Threats of a higher tariff imposition have been in evidence for some time supported by American sheep producers. This type of protection is likely to pose an increasing threat in the 1980's and as a preliminary move, a countervailing duty of 6% was imposed on imports in 1981.

3. CANADA

3.1 Production

Canada takes a minor place amongst sheep raising countries; its sheep numbers which were over three million earlier in the century, have declined to less than half a million head (Table 6). Many of the causes of the decline are similar to those in the U.S.

Two-thirds of the sheep are kept in the West but they are dual-purpose sheep kept under range conditions and produce less than half of Canada's sheepmeat. The sheep kept in the East are mainly cross-breeds for mutton and lamb production. Most animals are kept indoors for seven months of the year so the high costs of artificial feeding militate against any large increase in sheep numbers.

As in the U.S., slaughter and marketing systems are highly efficient (OECD, 1977). Only about half of the slaughtering (now only 200,000 head) takes place in registered, inspected establishments, so data on total slaughter and production are at best only informed estimates.

TABLE 6

Production Statistics

Year	Sheep	Slaughter ('000 head)	Average Carcase Weight (kg)	Sheepmeat Production (Kt)	All Meat Production	Sheepmeat As % All Meat
1960	1,052	737	19	14.3	1,397	1.0
1961	974	804	20	15.7	1,508	1.0
1962	904	744	19	14.4	1,504	1.0
1963	848	720	20	14.3	1,536	1.0
1964	778	680	20	13.5	1,653	.7
1965	715	578	20	11.4	1,816	.6
1966	674	480	21	9.6	1,824	.5
1967	609	482	21	9.5	1,860	.5
1968	551	494	21	8.6	1,916	.4
1969	528	437	20	7.8	1,860	.3
1970	546	391	20	7.5	2,007	.3
1971	597	379	19	8.3	2,132	.3
1972	587	423	20	9.0	2,077	.4
1973	562	446	20	9.9	2,073	.4
1974	541	424	20	8.2	2,095	.3
1975	505	410	20	8.2	2,091	.3
1976	458	388	19	7.5	2,240	.3
1977	408	286	19	5.4	2,306	.2
1978	383	221	19	4.3	2,360	.2
1979	410	215	19	4.3	2,386	.2
1980	470	235	19	4.7	2,390	.2

SOURCE: USDA

Sheepmeat production over the period 1960-80 has fallen 3.1% per annum from 14 Kt to 4 Kt. Production of all meat however has increased by 3.1%, an increase of 65% over the period. Sheepmeat has fallen from 1% to 0.1% of all meat produced in Canada (Table 6).

FAO (1979) projections of output to 1985 are for a small increase to 5-7 Kt; the small rise in sheep numbers in the late 1970's would support this projection.

3.2 Consumption

The meat market in Canada resembles that of the U.S. in its consumption patterns; per capita consumption of all meats has been high over the period 1960-80 and has risen 25% to almost 100 kg. Consumption consists mainly of beef and veal.

Sheepmeat consumption is low at 1 kg; it rose from a similar level in 1960 to 2.3 kg in 1969 and then, as in the U.S., declined as domestic production fell. It accounts for only 1% of meat consumption and is something of a speciality food which has become associated with ethnic tastes. Consumption is thus centred on the large population centres with lamb and mutton being non-existent, or in short supply, in the smaller towns.

Total sheep meat consumption was almost double its 1960 and 1980 levels around 1970 (Table 7, Figure 3) due to the increase in per capita consumption at that time and the growth in population of 1.3% per annum. Though production has shown a steady decline, consumption has fluctuated widely with the changes in imports (Figure 3).

Various estimates have been made of price and income elasticities of demand for sheepmeats. Given fluctuations in consumption, it is likely that demand is more responsive to prices than to income levels. Generally the studies agree that prices of other meats do not affect sheepmeat demand as it is such a small part of consumption but mutton and lamb prices affect consumption of other meats.

Estimates of own-price elasticities are: -1.8 (Hassan, 1975); -1.04 (Kulshreshtha and Reimer, 1975); -1.8 (Tryfos, 1973); -0.91 (Greenfield, 1974); -4.95 (Denton and Spencer, 1979).

These estimates imply that demand is responsive to price, but not as responsive as in the U.S. where the price elasticity is estimated to be -2.5 at retail level.

TABLE 7

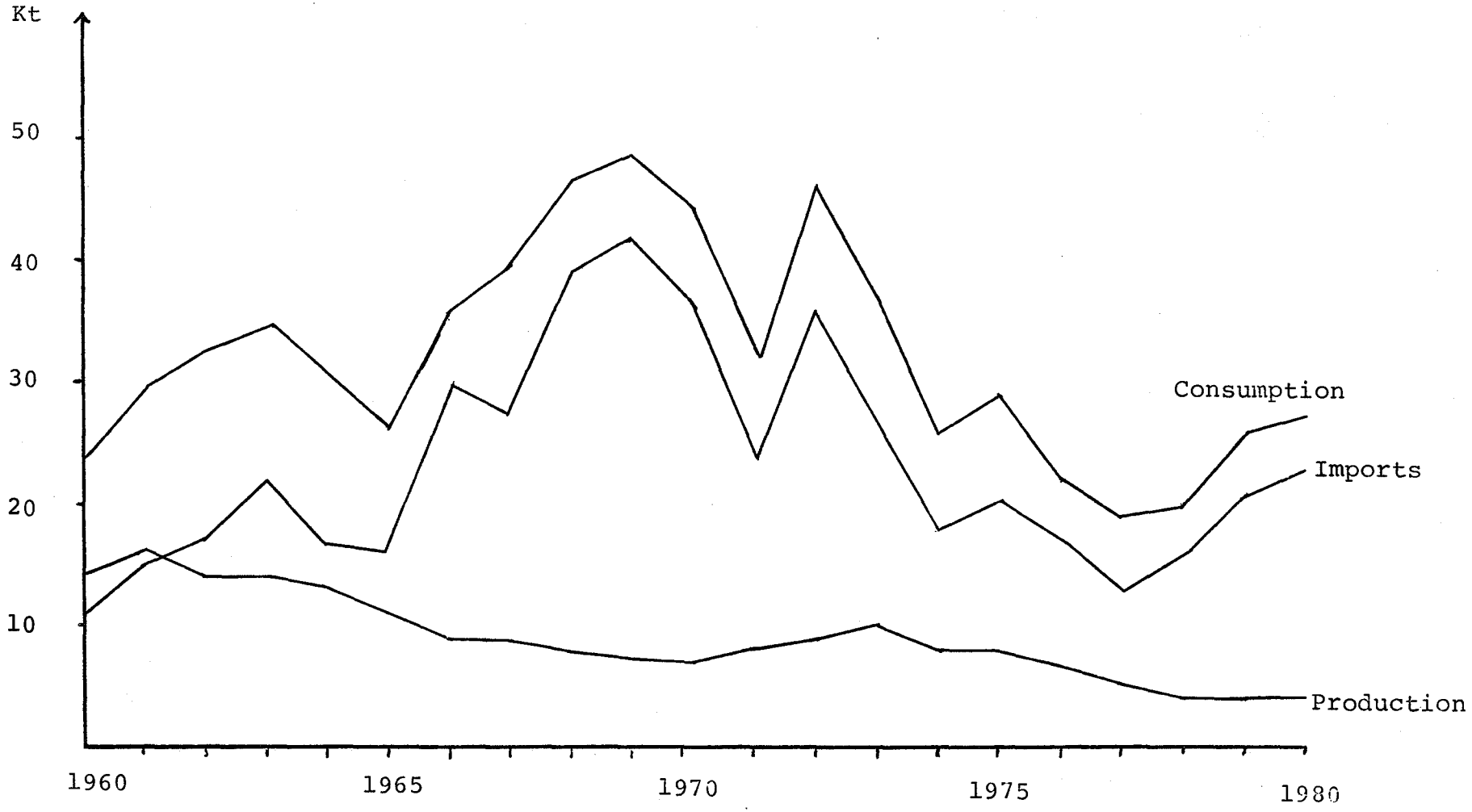
Canada: Consumption Statistics

Year	Population (million)	Sheepmeat Consumption			Consumption All Meat (Per Capita) (kg)
		Total (Kt)	Per Capita (kg)	As % All Meat	
1960	17.8	25.3	1.3	1.7	75.9
1961	18.2	29.8	1.3	2.0	77.3
1962	18.6	32.5	1.6	2.1	77.6
1963	18.9	34.7	1.7	2.1	80.2
1964	19.3	30.2	1.5	1.8	83.9
1965	19.6	26.1	1.3	1.5	84.6
1966	20.0	35.9	1.7	2.1	85.5
1967	20.4	39.3	1.9	2.1	89.7
1968	20.7	46.5	2.2	2.4	89.7
1969	21.0	48.4	2.3	2.5	89.7
1970	21.3	44.5	2.1	2.2	93.0
1971	21.6	32.2	1.5	1.5	97.2
1972	21.8	46.1	2.1	2.2	95.7
1973	22.1	37.2	1.7	1.7	93.8
1974	22.4	25.8	1.2	1.1	94.9
1975	22.8	29.5	1.3	1.3	94.1
1976	23.1	22.1	1.1	.9	94.7
1977	23.3	19.0	.8	.8	98.9
1978	23.5	19.8	.8	.8	95.0
1979	23.6	25.7	1.0	.9	93.7
1980	24.0	27.7	1.0	1.0	92.7

SOURCE: USDA
Demographic Yearbooks, UN.

FIGURE 3

Canada: Summary of Market Trends, 1960-80



Estimates of income elasticity of demand find less agreement. Table 8 below summarises them according to author.

TABLE 8

Summary of Estimated Income Elasticities From Various Sources

Author	Date of Study	Income Elasticity
Agric. Canada	1973	0.68
Brandow	1961	0.65
Denton and Spencer	1979	3.08
George	1969	0.57
Greenfield	1974	0.29
Hassan	1974	0.39
Kulshreshtha and Reimer	1974	-0.11
Tryfos and Tryph	1973	-2.91

The outlook for consumption is difficult to predict. FAO (1979) suggests that by 1985 consumption will have risen again to 1970 levels of almost 50 Kt if imports make this volume available. Denton and Spencer (1979) project a slightly higher level of 53 Kt by 1986 with a per capita consumption of around 2 kg. Since tastes have shifted from mutton to lamb and given the high income elasticity obtained in the most recent study, it would appear

that the Canadian market could expand rapidly in the 80's.

3.3 Trade

Up until the mid 1950's, domestic production of sheepmeats was sufficient to satisfy demand. In the 1960's, production declined and demand increased; self-sufficiency fell to 59% and has since fallen further to only 17% in 1980 (Table 9).

Imports have fluctuated over the period and increased from 11 Kt in 1960 to 41.7 Kg in 1969 and decreased to 16 Kt in 1978. Looked at more closely, the data show that if imports are divided into mutton and lamb, the periods of high imports around 1970 were times of high demand for lower-priced mutton. As incomes rose and cheaper beef became available this demand fell but was compensated for by increasing demand for lamb.

Table 9 gives total sheepmeat imports by exporting country. The trends in volume exported by each country reinforce the above. Australia's exports are mainly mutton and were highest around the 1970's. N.Z.'s exports have been mainly high quality lamb. N.Z.'s market share is increasing as the N.Z. Meat Export Development Company (DEVCO) has actively promoted N.Z. lamb sales and has successfully swayed consumer preference. N.Z. practised a period of voluntary restraint on exports to Canada at the end of 1980 and again

TABLE 9

Canada: Import Statistics

Year	Total Imports (Kt)	New Zealand (Kt)	New Zealand (%)	Australia (Kt)	Australia (%)	Other (Kt)	Other (%)	Self-Sufficiency in Sheep-meat (%)
1960	11.0			4.1	37	6.9	63	59
1961	15.2			7.7	51	7.5	49	52
1962	17.0	5.2	30	9.7	57	2.0	13	44
1963	21.7	5.3	24	14.9	68	1.5	8	45
1964	16.9	5.5	32	11.4	68			44
1965	15.9	6.2	39	9.7	61			42
1966	29.9	8.7	29	12.8	43	8.0	28	24
1967	27.6	4.7	17	15.1	55	7.0	28	20
1968	39.2	10.1	26	16.8	43	13.0	31	18
1969	41.7	1.5	4	22.8	55	17.0	41	17
1970	36.4	2.2	6	34.2	94			17
1971	23.9	4.3	18	18.8	78	1.8	4	26
1972	36.5	3.9	11	25.7	70	6.5	19	19
1973	26.5	5.5	21	18.5	70	2.5	9	26
1974	18.4	5.6	30	12.8	70			32
1975	20.3	7.7	38	9.6	47	3.0	15	28
1976	17.0	7.8	46	5.2	30	4.0	24	34
1977	13.6	8.9	65	2.7	20	2.0	15	28
1978	16.5	9.1	55	7.4	45			22
1979	18.5	8.5	46	6.8	37	3.2	17	18
1980	13.3	9.9	74	3.0	23	0.4	3	17

SOURCE: USDA, ABS, NZMPB.

in late 1981 when the market showed sighs of weakening.

Market prices in Canada are similar to those in the U.S. which are generally above prices in other countries. N.Z.'s revenue from Canada from imports is similar to that from the U.S. and has increased from N.Z.$1.6m in 1970 to $17.8m in 1978. The prospect of market development is not so great, however, as Canada has only a tenth of the U.S.'s population.

Projections for imports of sheepmeat to 1985 (FAO, 1979) depend on demand levels as production is assumed to be constant. This could give an import demand of 40-50 Kt which will be mainly lamb rather than mutton. Actual consumption, as in the U.S., will depend on the availability of this volume and possibly active promotion to encourage regular purchasing.

4. JAPAN

4.1 Production

Production of sheepmeat in Japan is less than 500 tonnes per year; sheep numbers were over 200,000 in the 1960's but have fallen since to only 9,000 head.

Expansion of sheep farming is unlikely due partly to land problems (Olsen, 1978) and partly to lack of Government encouragement which gives greater incentives to cattle production (Lockwood, 1970).

The objective of achieving higher self-sufficiency ratios in food products is discussed by Ogara (1976); both his own and official estimates project greater self-sufficiency in livestock (following the down-trend through the 1970's) but no increase in sheep production. Saxon (1976) also concludes that despite increases in demand for mutton, there will be no increase in domestic output.

4.2 Consumption

Meat consumption in Japan has risen by 330% in total volume over the period 1960-80 (Table 10). Of 1980 meat consumption, 40% is pork, 30% chicken, 15% beef, 7% mutton and 8% whale and horse meat.

TABLE 10

Japan: Consumption Statistics

Year	Population (million)	Total Meat Consumption (Kt)	Sheepmeat		
			Total (Kt)	Per Capita (Kg)	Relative To All Meat Consumption (%)
1961	93.2	442	24	0.2	5.5
1962	94.7	559	25	0.2	4.4
1963	95.8	623	50	0.3	8.0
1964	96.9	702	63	0.7	7.8
1965	97.9	723	56	0.6	7.5
1966	98.9	865	93	0.9	10.7
1967	99.9	910	100	1.0	10.8
1968	101.1	948	110	1.1	11.5
1969	102.3	1,066	130	1.3	12.1
1970	103.4	1,189	110	1.1	9.3
1971	105.6	1,388	131	1.3	9.3
1972	107.1	1,532	152	1.4	9.9
1973	108.1	1,642	135	1.2	8.1
1974	110.1	1,673	91	0.8	6.4
1975	111.5	1,780	131	1.2	7.0
1976	112.7	1,360	136	1.2	10.2
1977	113.8	1,536	148	1.3	9.5
1978	114.9	1,691	139	1.2	8.2
1979	115.8	1,809	145	1.2	7.4
1980	116.5	1,916	136	1.1	7.0

SOURCE: USDA
Demographic Yearbooks, UN.

Per capita consumption of sheepmeats is low at around 1 kg per annum in 1980 but has quadrupled over the period. Total sheepmeat consumption has increased five-fold from 24 Kt in 1960 to 136 Kt in 1980. Population growth accounts for the rest of the increase in total consumption (Table 10). With a growth rate of 1.1%, the population has grown from 93 million to 117 million. Per capita consumption was rising up to 1973 but fell sharply as prices increased. It has since moved back up to previous levels.

The main factors affecting sheepmeat consumption have been:

- Diversification of consumption habits (e.g. more meats eaten away from home).
- Diversification of raw materials - with less concentration on traditional staples, and more on meats etc.
- Increased use of secondary products made from the same basic materials.
- Changes in diet as a result of "modernisation" of the economy and rising incomes.

Very little of the sheepmeat is consumed directly due to the Japanese dislike of the taste and smell and a preference for other meats. The above factors have helped to increase the use of

mutton in processed goods though, which accounts for the increase of per capita consumption from 1964-79.

Kitson (1975) shows that though consumption levels have improved substantially, the level of diet in Japan is still rather frugal. Mutton has therefore been a source of additional meat protein in the processed form of hams and sausages. A fast developing food industry has been stimulated to satisfy the demand and to cater for the needs of a changing society.

Both urban and rural societies encourage the processing industry through changing dietary habits. More women work and have less time to prepare meals from raw materials. Family size is decreasing (3.4 persons per household) so there are no longer economies of scale (Kitson, 1975) and it is cheaper and quicker to eat cooked and semi-cooked food supplied by the food industry who benefit from economies of scale. Due to rising labour costs, much of Japan's sheepmeat imports come via South Korea. It is processed there using (relatively) cheap labour but this operation is becoming less profitable (rising costs in South Korea) and trade has been much reduced.

The output from the ham and sausage industry was 334 Kt in 1976, 12% higher than 1975. Of the 270 Kt of meat used in production, 87 Kt (or 32%) was

mutton. Production rose 14% in 1977, but only 2% in 1978 to 386 Kt due to stagnation in "pressed ham" processing, the major use for mutton. Mutton use fell 6% from 97 Kt to 89 Kt in 1977/78. While the annual usage of mutton for manufacture is fairly stable at around 30-35%, both usage and revenue are affected by moves in the cost of pork-based products. Japanese preference is in fact more for a high priced pork-based sausage and ham, so consumption of these will increase at the expense of the mutton as incomes rise.

The difficulties of calculating the amount of mutton used in processed foods and hence the unreliability of consumption projections, are further discussed by Kitson (1975). He goes on to define the clear distinction between mutton and lamb on the Japanese market; consumption of lamb is low but increasing as a "luxury" meat.

Tables 11 and 12 show the import prices of Australia and N.Z. mutton and the estimated price elasticities. N.Z. prices are frequently below Australian prices (even allowing for exchange values) as N.Z. tends to "off-load" meat on to the Japanese market. A time lag is apparent between price changes and changes in consumption which reflects

TABLE 11

Import Prices of Mutton in Japan

Average Import Price for Mutton in Japan by Source

Year	Australia A¢/kg	New Zealand NZ¢/kg
1970	-	-
1971	-	41
1972	92	65
1973	106	70
1974	72	58
1975	64	72
1976	79	109
1977	114	108
1978	132	104
1979	149	126
1980	168	145

SOURCE: ABS

TABLE 12

Estimates of the Elasticity of Demand with Respect to the Price of Mutton, Pork and Poultry

Elasticity of Demand With Respect To:		Price of: Mutton	Pork	Poultry	Beef
Mutton (USDA)	1978	-0.40	0.20	0.30	-0.40
Mutton	1956-1975	-0.99			1.50
	1975	-0.46			0.77

SOURCE: Ministry of Agriculture, Japan.

the fact that mutton is generally processed, not directly consumed. The lag is the time taken by industry to adjust its output and transmit changes to the consumer. The fact that demand is becoming less responsive to price changes (as shown by the declining elasticity estimates) can probably also be accounted for in the same way. A diminishing proportion of mutton is consumed directly and manufacturers are generally less able and willing to respond to movements in price, especially in the short-run.

The demand elasticity for mutton with respect to its own price would seem to be in the region of -0.4. Estimates of cross-price elasticities have shown no strong significant relationship. It is thought, however, that substitution occurs between lamb and beef at retail level and mutton and pork at manufacturing level.

No estimates have been found of income elasticities with respect to lamb as it is still a minor market (albeit an increasingly important one for New Zealand).

The Japanese MAF (1976) estimated that the income elasticity of demand for mutton is 0.5. This was confirmed by USDA (1978) and is in line with the FAO (1976) estimate of 0.6. However, the figure may be rather low, as it does not appear to account

for the use of mutton in processed goods which tend to be highly income-elastic.

The implications are that as population and incomes rise, demand for sheepmeats will increase (but by a less than proportionate amount). However, as the own and cross price elasticities show, rising prices will tend to decrease demand. The overall effect is likely to be a small increase in total consumption.

4.3 Trade

The problem of trade stability with Japan is especially pronounced in trade of mutton and lamb. It is one of the few commodities in Japan for which the market mechanism is not subjected to Government interference. The usual "stop-go" buying policy is not applied and there are no national policy constraints on imports, only the vicissitudes of the Japanese business system. Kitson (1975) shows how the volatility of the general economy results from the financial structure which makes sheepmeat trade highly sensitive to any change in market conditions.

Figure 4 indicates the fluctuating trade in sheepmeats. This can have an important effect on world trade as Japan's imports account for nearly 20% of world imports of all sheepmeats. Japan is the world's largest importer of mutton, taking some 30% of world mutton exports annually (Table 13). Imports have increased from 18 Kt in 1960 to 130 Kt in 1980.

FIGURE 4

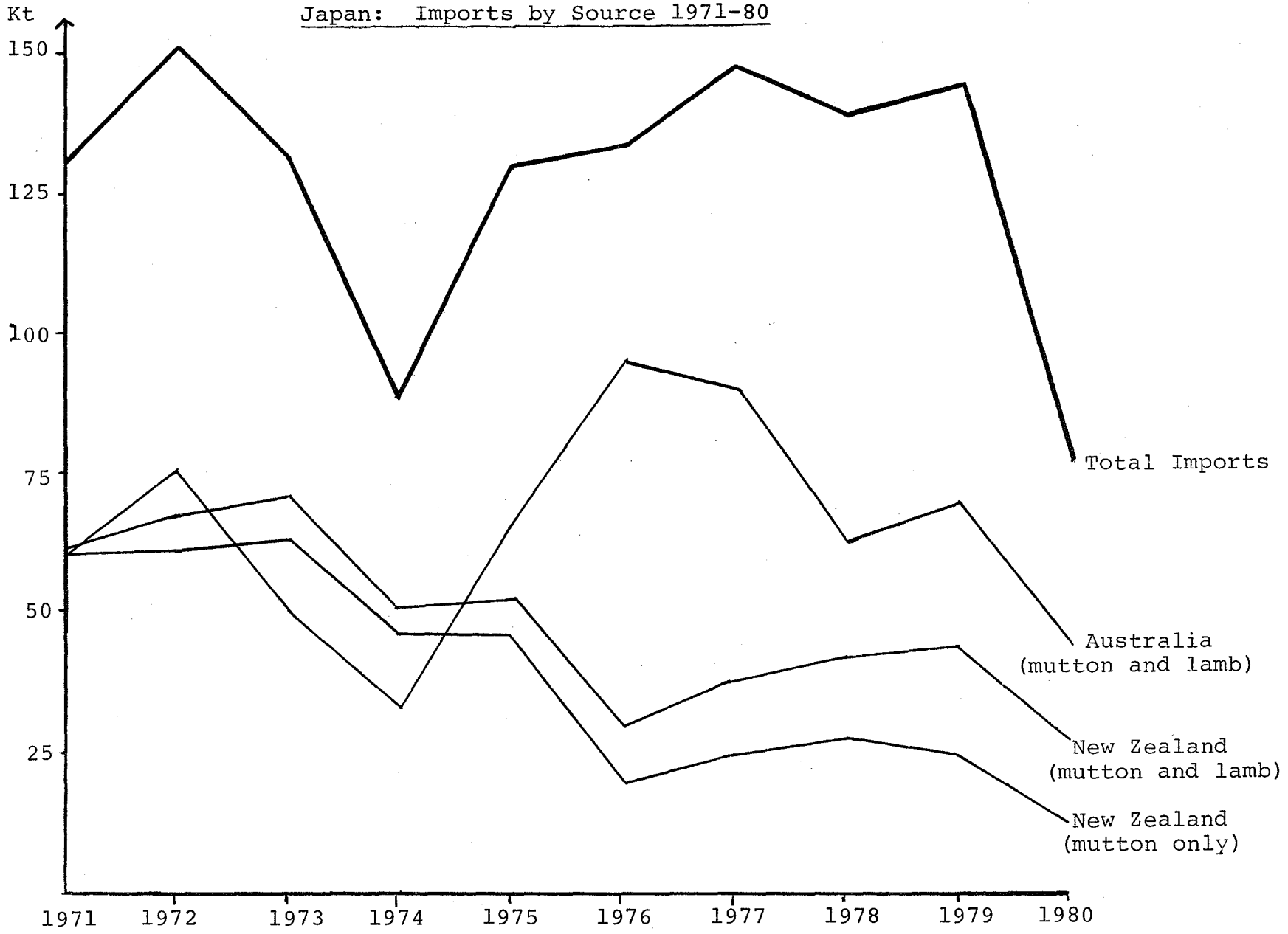

Japan: Imports by Source 1971-80
Kt
150
125
100
75
50
25
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
Total Imports
Australia
(mutton and lamb)
New Zealand
(mutton and lamb)
New Zealand
(mutton only)

TABLE 13

Japan: Import Statistics

Year	Total Imports (Kt)	As % World Trade	Total Value ('000) U.S.$	Value Per Tonne U.S.$
1960	18	3.0	4,876	260
1961	22	4.0	6,994	308
1962	23	4.0	6,918	298
1963	48	8.0	14,834	303
1964	61	10.0	22,760	370
1965	54	9.0	22,050	400
1966	92	15.5	38,963	420
1967	98	15.0	40,629	410
1968	109	16.6	41,144	370
1969	129	18.4	47,113	360
1970	111	16.2	49,951	440
1971	130	17.6	61,892	470
1972	151	19.8	87,388	570
1973	134	20.4	148,152	1,110
1974	90	17.7	108,337	1,210
1975	131	19.7	116,080	880
1976	136	19.5	136,087	1,010
1977	148	20.3	182,216	1,230
1978	139	16.5	204,394	1,460
1979	118	15.0	198,240	1,680
1980	78	9.4	146,528	1,860

SOURCE: FAO, USDA.

The main suppliers to the Japanese market are Australia and New Zealand as is shown in Table 14. The proportion of the market held by each has varied during the 1970's (Table 15). Australia's share, mainly mutton, increased from 47% in 1971 to 70% in 1976. New Zealand's share has only been maintained by the changing composition of its exports. The N.Z. lamb trade increased from 2% to 13% of Japanese sheepmeat imports but its market share for mutton fell by half over the period. Other imports came mainly from South Korea in the form of processed meats.

The value of imports has risen almost 400% over the last decade. Much of the increase is accounted for by the rise in value per tonne imported which rose 300% over the period (Table 13). This follows the same general trend as world prices but is slightly lower due to large imports of mutton which is a lower-priced meat.

Mutton is of course traded in U.S.$ per tonne so that actual price trends (especially in 1978) might not indicate the apparent improvement on previous years if the U.S. dollar had not weakened dramatically.

TABLE 14

Japanese Imports by Source (Kt)

Year	New Zealand Mutton	New Zealand Lamb	Total N.Z.	Australia	Other*
1960			16.2	1.9	0
1965			35.6	18.3	0
1970			66.7	44.1	0
1971	59.6	3.0	62.6	61.5	7
1972	62.5	5.6	68.1	76.6	7
1973	64.5	8.1	72.6	52.2	10
1974	46.8	5.7	52.5	34.4	4
1975	46.4	8.2	54.6	68.7	9
1976	20.9	10.4	31.3	95.6	10
1977	25.5	14.3	39.8	90.9	17
1978	28.0	15.2	43.2	63.0	33
1979	25.9	18.2	44.1	69.8	11
1980	14.3	12.7	27.0	43.5	7

* Mainly from South Korea.

SOURCE: NZMPB, ABS.

TABLE 15

Imports by Source as % of the Japanese Sheepmeat Market

Year	New Zealand Mutton	New Zealand Lamb	Total N.Z.	Australia	Other*	Total
1971	45	2	48.1	47.3	4.6	100
1972	41	3	44.9	50.5	4.6	100
1973	48	4	54.3	39.0	6.7	100
1974	52	6	58.4	38.3	3.3	100
1975	35	6	41.7	52.5	5.8	100
1976	15	8	23.0	70.3	6.7	100
1977	17	10	26.8	61.3	11.9	100
1978	20	11	30.9	45.3	23.8	100
1979	18	13	30.4	59.1	10.5	100
1980	18	16	34.6	55.7	9.7	100

* Mainly from South Korea.

SOURCE: Compiled from Tables 13 and 14.

As yet there are no quantitative or price restrictions imposed on Japanese trade by either importers or exporters. In this it is one of the few markets to have no effective protection on trade which means that it has often been used as a dumping ground by exporters. This has led to problems of quality and price cutting and has prevented orderly market development (especially for lamb) despite attempts by the NZMPB.

4.4 Implications for Exporters

Table 16 shows the proportion of each country's exports sold to Japan. At this stage it is useful to distinguish between mutton and lamb as they are obviously not similar products on the Japanese market, and trade patterns for each are developing differently.

Australia's expanding share of the Japanese market has meant an increased proportion of sheepmeat being assigned there with almost 60% of mutton exports destined for Japan.

New Zealand exports a small but increasing proportion of its lamb to Japan. Offsetting this, the diminishing and fluctuating exports of mutton (between 23-62% of mutton exports) mean that between 8-18% of all N.Z. sheepmeat exports have gone to Japan during the 1970's.

TABLE 16

Proportion of Australian and New Zealand Mutton and Lamb Exports Sent to Japan

Year	Australia		New Zealand		
	Total (%)	Mutton Exports (%)	Total (%)	Mutton (%)	Lamb (%)
1970	24.6	32.9			
1971	28.1	34.0	13.8	51.2	0.9
1972	34.4	40.6	15.4	60.5	1.6
1973	38.6	47.9	18.0	61.9	2.6
1974	42.2	51.1	14.5	42.0	2.2
1975	47.2	60.5	13.5	55.5	2.7
1976	48.5	58.8	8.0	23.8	2.0
1977	45.5	55.0	10.0	26.8	4.5
1978	42.0	50.8	11.5	45.9	4.8
1979	29.4	29.8	10.1	22.4	5.7
1980	17.2	20.7	5.9	14.4	3.5

SOURCE: NZMPB, ABS.

This implies that N.Z. in terms of market shares is losing out to the Australians as a supplier of sheepmeat to Japan though this decline has been partially offset by increasing total quantities of imports. Figure 4 demonstrates this more clearly.

A large and possibly expanding import market exists in Japan for sheepmeat but it is also an unstable market which can have important effects on world trade. Changes in consumption are directly transmitted to import demand as there is no domestic production, but promotion is needed to expand the market. It is possible, therefore, that N.Z. could with advertising and promotion capture the growing market for lamb with Australia continuing to supply the major mutton market.

5. THE MIDDLE EAST: AN OVERVIEW

5.1 Introduction

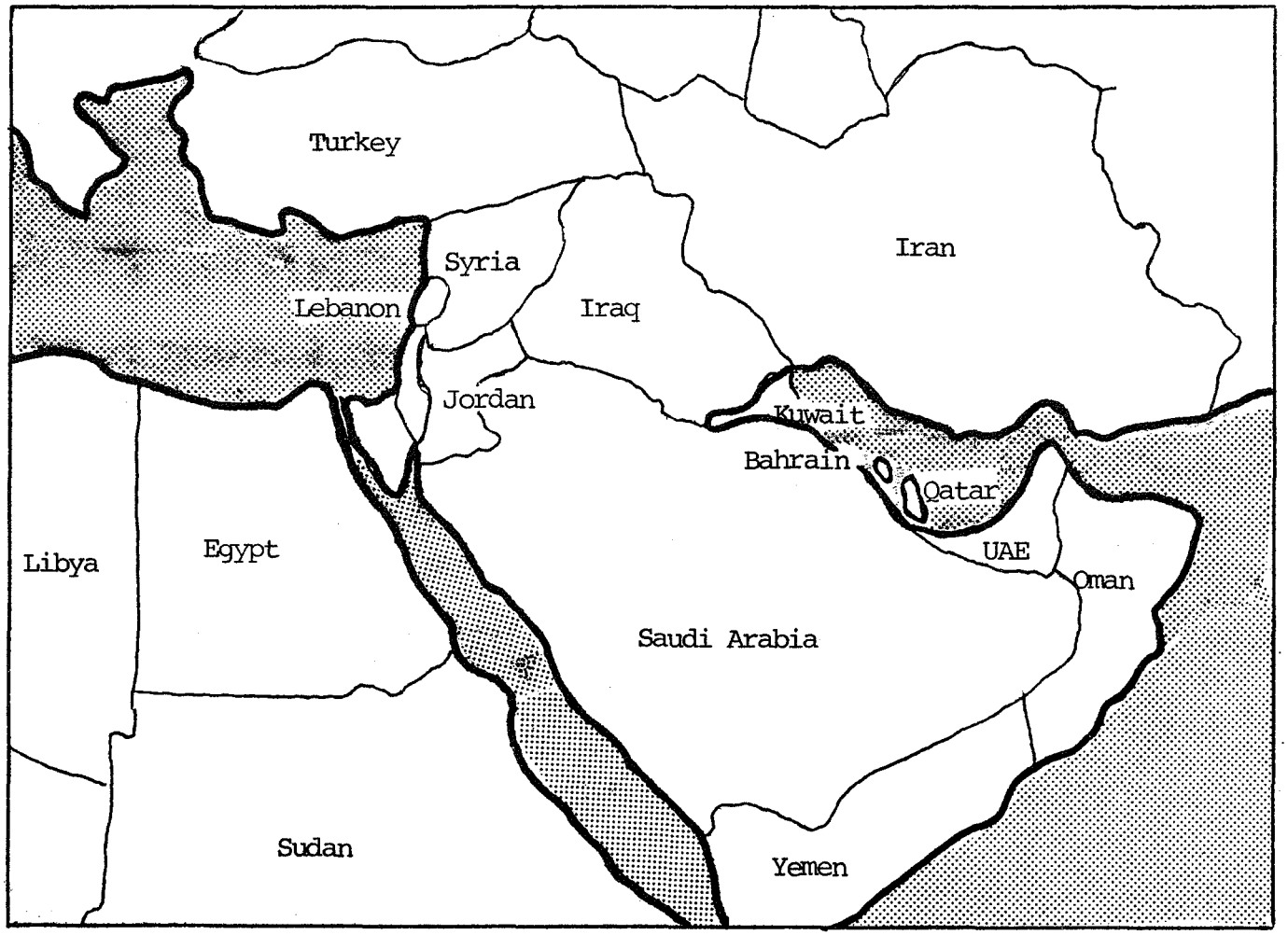
The Middle East (see Figure 5) consists of the countries of the Arabian Peninsula to the west of the Gulf (i.e. Lebanon, Jordan, Saudi Arabia, Kuwait, U.A.E., Oman, Qatar, Iraq), Iran, and the islands of Bahrain.

The Peninsula countries have a population of 31 million and Iran 35 million giving a total of 66 million (1976) with an average population growth rate of 3.4%. Most of the countries have rapidly increasing incomes from oil sales. Together, the rising affluence and growing population have resulted in a surge in demand since 1974 for a diet containing more and better quality meat, especially sheepmeat according to the population's taste and religion.

Despite the region's large domestic flock of sheep and goats, the dry climate, difficult terrain and low productivity make it impossible to expand production fast enough to meet the growing demand for sheepmeat.

There has always been extensive trade of live sheep within the region and with neighbouring countries, but since 1974 there has been an increasing reliance on imported carcase lamb and mutton as well as live sheep from outside the region.

FIGURE 5


Turkey
Iran
Syria
Lebanon
Iraq
Jordan
Kuwait
Bahrain
Qatar
UAE
Oman
Libya
Egypt
Saudi Arabia
Sudan
Yemen

The Middle East countries vary widely in area, affluence, population and type of agriculture. The sheepmeat trade and prospects for the future depend on the circumstances of each country so each country is considered separately in Section 6 of this paper.

5.2 Production

Many of the Middle East countries are largely agriculturally orientated economies. Cultivation of land is limited to coastal strips, oasis regions and more recently the irrigated tracts of land. The majority of the area is semi-desert. Livestock production in the past has been confined to nomadic sheep and goat herding - a system which is characterised by a high mortality rate and low productivity. The various Governments are financing schemes to encourage better management and increase productivity of livestock (Laurie, 1975); they are aware of the need for this to reduce reliance on overseas supply. The establishment of more permanent, intensive farms is also necessary to create employment opportunities for the shift of the population from rural nomads to an urban situation. Detailed analysis of development plans for livestock production in each country have been carried out by the World Bank (Vol. II, 1977).

Sheep and goat meat are more important than production of beef; beef and veal appear to be inferior goods within the region as prices are lower than those of sheepmeats and their share in total meat expenditure declines as incomes rise.

Goats have an important role within the traditional flocks; they number about half of the number of sheep. Given their ability to survive on poor quality pasture, goats provide security to owners during drought years. Despite Government policy to encourage better management, producers have made no move to cull goats in favour of sheep production.

Accurate data on sheep numbers and production for the Middle East have not yet been found. Best estimates from FAO and USDA are given in Section 6 with projections to 1985.

Aggregate output was thought to be 870 Kt in 1970, 1,100 Kt in 1980, and is projected to be 1,500 Kt in 1985. Iran and Iraq are the main producers in the region, and also the main importers of live sheep. Since the aggregate production data covers all sheep slaughtered within a country and as such includes live imports, the volume of domestic production in Iran and Iraq appears to be higher than it actually is.

5.3 Consumption

The people of the Middle East have always been large sheepmeat consumers - little beef or other meat is consumed. There is a strong preference for fresh meat and government policies, assistance and subsidies are designed to encourage the production and importation of live sheep or fresh meat as per capita consumption levels are still extremely low in several of the States. Table 17 shows the variation in sheepmeat consumption between countries.

There are many reasons why these countries have a high demand for live sheep. The main one is that the population is largely Moslem, and requires its meat slaughtered by a ritual method. Also of importance is the observance of the religious festival Ramadham when each household slaughters a live sheep. Over 1 million sheep are slaughtered each year at Mecca where every pilgrim is required to kill a sheep as a sacrifice. Hence the demand for live sheep is greatest at these times (October - April).

Another reason is that a sheep slaughtered and sold on the same day is considered a clean animal; this may change as refrigeration facilities improve with rising living-standards.

TABLE 17

The Middle East: Consumption Statistics

	1975 Population (million)	1960-75 Average Annual Growth Rate %		1975 Per Capita GNP (U.S.$)	Per Capita Consumption of Sheepmeat (kg)	
		Pop'n	GNP		1971/3	1979*
Bahrain	0.26	3.7	20	2,207	20.3	30.7
Iran	33.02	2.9	19	1,605	7.8	12.5
Iraq	11.12	3.3	16	1,152	8.2	18.6
Jordan	2.71	3.2	10	456	5.2	5.2
Kuwait	1.00	8.4	18	10,904	13.5	14.0
Lebanon	3.16	2.8	11	1,145	7.0	11.4
Omen	0.77	3.1	28	2,291	3.5	3.5
Qatar	0.20	8.7	39	10,850	29.1	29.1
Saudi Arabia	8.28	1.9	25	4,005	5.3	10.9
U.A.E.	0.65	14.1	53	13,594	23.8	24.1

* Estimated.

SOURCE: World Bank, 1977.

The people are used to eating the indigenous fat-tailed sheep which produce a lean carcase. Import demand tends to be for this type of high priced, good quality sheepmeat rather than cheap bulk protein in the form of mutton. Work has been done elsewhere to assess the particular quantity and quality requirements of these markets and on the ability of producing countries to supply them (Bishop, 1978; Cornell and Hone, 1978; Laurie, 1975; Neil, 1974).

Not only is the indigenous population increasing (total population growth rates vary between 1.9 and 14.1% per annum (see Table 17)) but there is also an influx of immigrant workers from India and Pakistan into the area. They too are sheepmeat eaters, thus increasing the effective level of demand. However, even though total income in the region is growing, most of the gains will be concentrated in the hands of the upper income groups (thus distributional adjustments need to be made to any average estimates of income elasticities). Not all countries have rapidly increasing GNP; Jordan, Lebanon and the Trucial states are without oil reserves. Consequently their average income elasticity of demand for sheepmeats tends to be greater than unity. In the oil rich countries though, income elasticities are estimated to be around 0.5 (FAO, 1976). Table 17 shows the variations in per capita incomes and growth rates between the countries.

Increases in real prices will tend to have a depressing effect on meat consumption, especially among poorer households which account for 70% of the region's population. FAO estimates suggest that purchases are responsive to price as mutton has an own-price elasticity of -1.3. Other meats seem to have little effect on consumption of sheepmeat and as would be expected, FAO found cross-price elasticities to be extremely low.

The price of sheepmeats in several Middle East countries is subsidised by Governments to raise the standard of living. The extent of the subsidy varies with the country and the type of meat. For example, in Saudi Arabia, frozen meat is subsidised by 40% of its retail value, chilled meat by 27% and there is no subsidy on fresh meat. This is partly to offset the import duties, which are greatest on frozen meats and raise the import price considerably (Berner, 1977).

Projections by FAO (1979) were made on the basis of data (and price and income elasticity estimates) collected before 1975. The market has shown enormous and rapid changes over the period 1974-80 so the relationships may no longer hold true. However, their estimates were for consumption of 1,465 Kt of sheepmeat in 1980 and 2,400 Kt in 1985. In the light of recent trends, the latter level could be achieved. Section 6 describes how total consumption may be distributed.

5.4 Trade

The countries of the Middle East have traditionally been traders and producers of sheep. Before the advent of oil wealth, Rumania, Turkey, Sudan and Somalia were the main suppliers of imported animals with considerable intra-regional trade also taking place. There were small imports of mutton and lamb during the early 1970's from Australia and Argentina.

The market developed quickly after 1974 with Iran, Iraq and Kuwait providing the largest markets for sheepmeats and Iran and Saudi Arabia, the largest for live sheep. Imports of sheepmeats increased from 20 Kt per annum in 1970-74 to over 150 Kt in 1978. Live sheep imports trebled from 2½ million in 1970 to 7 million by 1980. Table 18 gives annual imports of sheepmeat by country from 1968 to 1980.

FAO (1979) estimates imports of sheepmeat (including live sheep) will be 320-370 Kt by 1980 and over 1,000 Kt by 1985. Self-sufficiency is projected to fall from 96% to 78%.

5.5 Implications for Exporters

Tables 19, 20 and 22 show the sheepmeat exports of Argentina, Australia and New Zealand to the Middle East over recent periods. These three countries account for the majority of mutton and lamb imports.

TABLE 18

Imports Into Middle East Countries (Kt)

Country	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Bahrain	1.5	1.6	1.8	3.0	1.5	2.1	1.8	2.3	5.2	4.4	6.0	1.2	0.8
Iran	1.1	5.9	15.4	6.7	7.6	12.1	18.8	38.0	33.7	59.9	49.7	54.7	105.0*
Iraq							6.3	10.2	.02	15.0*	3.0*	14.0*	14.0*
Jordan	1.7	2.0	2.4	1.3	1.6	2.1	1.7	2.5	2.7	4.3	11.5	12.8	15.0*
Kuwait	7.4	7.1	7.6	7.1	7.2	7.9	9.2	13.2	13.3	16.6	17.0	11.7	10.0*
Lebanon	1.2	3.1	3.2	2.6	4.4	3.1	4.0	4.3	4.6	1.4	3.3	3.6	5.0*
Oman							1.0*	1.5*	1.8*	2.0*	2.5*	3.0*	5.0*
Qatar	0.3	0.3	0.6	0.7	0.6	0.5	0.6	0.7	0.8	1.0*	2.0*	3.0*	3.7
Saudi Arabia	0.4		0.1	0.6	0.6	1.0	0.5	1.8	4.4	10.5	14.4	19.3	24.1
U.A.E.	0.3	0.3	0.4	0.4	0.5	0.8*	2.1*	5.8*	5.2	6.9	6.1*	11.0*	22.8

* Estimated.

SOURCE: FAO, 1981.

TABLE 19

Argentine Exports of Sheepmeat to the Middle East (Kt)

Destination	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
Saudi Arabia									.1	.8
Kuwait			.1	.1			.6	.8	.5	.8
Jordan	2.4	2.4	2.8	1.3	1.5	.3		.1	.4	1.2
Total Asia*	3.4	5.3	5.5	2.5	2.3	1.3	3.1	1.3	1.2	3.4

* Includes Lebanon, Syria, Israel.

SOURCE: Junta Nacional de Carnes, 1978.

TABLE 20

Australian Exports of Mutton and Lamb to the Middle East (Kt)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Iran	7.3	1.8	1.0	6.8	10.4	24.7	31.1	10.1	27.8	21.4	30.5
Other Middle East Countries	3.4	5.8	10.7	6.8	8.8	18.4	24.2	24.9	25.4	33.4	42.4
Total	10.7	7.6	11.7	13.6	19.2	43.1	55.3	55.0	43.2	54.8	72.7

SOURCE: AMPB

TABLE 21

Australian Exports of Live Sheep to the Middle East ('000 head)

Destination	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Iran	268.5	196.3	406.5	410.3	696.6	747.6	1,258.0	2,553,0	2,409.5	1,825.9	1,206.9
Kuwait	191.3	328.7	414.2	317.8	337.1	535.0	692.4	880.9	1,160.5	1,373.0	1,418.5
Saudi Arabia	12.2	19.7	7.0		2.0	54.8	280.2	576.1	875.8	1,220.8	1,515.4
Qatar		1.0	6.2	40.9	25.0	42.7	91.5	86.1	139.5	263.0	243.4
Bahrain	10.7	4.0	4.0	5.3	10.0	4.1	35.0	42.3	49.4	166.7	197.9
U.A.E.	27.0	46.0		25.2	36.2	1.4	19.0	72.8	28.8		
Other Middle East Countries	27.0	47.0					87.0	141.6	125.7	697.3	1,033.7
Total	536.7	642.7	637.9	799.5	1,116.3	1,385.6	2,463.1	4,353.1	4,789.0	4,918.9	5,615.8

SOURCE: AMPB

TABLE 22

N.Z. Exports of Mutton and Lamb to the Middle East (Kt)

Destination	1973	1974	1975	1976	1977	1978	1979	1980
Bahrain		.1	.1	.2	.2	1.7	0.2	0.2
Iran		15.6	3.5	19.5	27.4	27.1	3.6	64.6
Iraq		3.9	10.1	13.8	9.0	2.7	13.1	11.6
Jordan	1.4	1.7	2.4		1.3	1.0	1.0	5.3
Kuwait	0.5	1.3	2.6	.6	1.0	1.0	.8	1.2
Oman					.2	.2	.8	2.3
Qatar						.1	.1	0.2
Saudi Arabia			.3		.3	.5	4.9	11.8
Trucial States					.1	.2	1.1	1.4
U.A.E.			.6		.6	.3	1.0	1.0
Total	1.9	22.6	17.6	34.3	40.1	33.3	22.4	105.0

SOURCE: NZMPB

sales and profit margins in the Middle East carcase meat market is the ability to process and transport chilled meat (see Neil, 1974 for problems of transport, storing and marketing to the Middle East).

To air-freight chilled carcases is expensive - there would be little chance of competing with the Eastern European countries which air-freight to Iran and Kuwait already. Shipping to countries which have no direct access to a sea port is often made difficult by political problems in the region. Imported meat faces a heavy duty which is greater on frozen than on chilled meats. Frozen meat then only fetches half the price of fresh meat; some countries have fixed maximums for prices at both wholesale and retail level.

Imports are often available from China and other neighbouring countries at prices lower than those at which New Zealand and Australia are willing to sell - though, as mentioned above, high prices are paid for good quality meat shipped on a regular basis. Furthermore, all imports must come from sheep killed according to the Halal slaughtering ritual.

The prospect of war in the Middle East is important as trade could be drastically disturbed by conflict in the area. However, trade has not been affected by conflict within Iran to any great extent so far.

It seems likely that in the short to medium term, the market will be dependable for existing traders with high prices being offered. Demand should exceed supply for many years to come so the market is likely to be large. The question about the long term then is not whether the import demand exists but rather who will supply that market.

6. THE MIDDLE EAST: SPECIFIC COUNTRY REVIEWS

6.1 Iran

6.1.1 Introduction

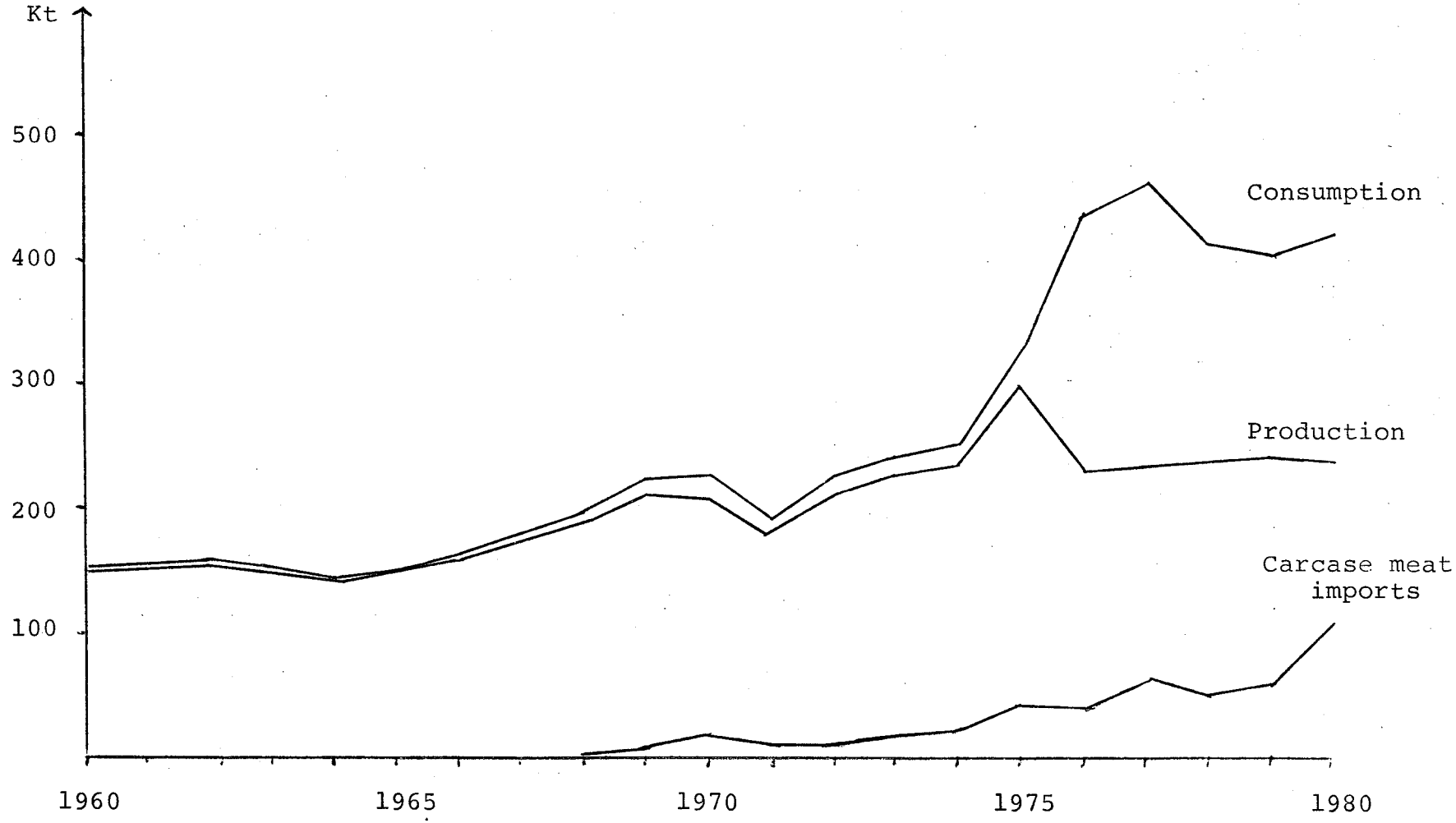
Of the Middle East countries, Iran is the largest in terms of production, consumption and trade in sheepmeats. Figure 6 indicates the trends in the market from 1960-80. According to estimates, it is also the country which, given political stability, has the greatest potential for growth in its sheep industry.

Livestock development carries a special priority to meet the requirements of growing demand. Even so, efforts have not managed to break down the restraining influences of traditionalism among pastoralists and of constraints such as animal health problems and lack of a sound marketing infrastructure. The World Bank report (Vol. I, 1977) discusses each of these problems and the programmes initiated by the government to overcome them.

Before considering production trends, it is worth drawing attention to the unreliability of the statistical base - a factor to be borne in mind in evaluating estimates of future potential. For example, three studies by FAO give stock numbers in 1971 ranging between 30-45 million head. However, the trend in most data is similar, which is more important in evaluating import demand. Throughout this study, USDA data are used.

FIGURE 6

Iran: Sheepmeat Market Trends, 1960-80



6.1.2 Production

Table 23 gives sheep and goat numbers in Iran over the period 1960-80. After an increase from 24 to 36 million in the first decade, sheep numbers fell to around 32 million in 1980. Goat numbers are fairly stable at around 14 million giving a total of sheep and goats of 46 million head. This is a rise from 2% to just over 3% of world numbers of sheep and goats.

Production of sheepmeat has followed a similar trend as regards its relation to total world output and accounted for 3% in 1980. However, the slaughter rate has remained constant (i.e. number of slaughterings as a proportion of numbers at around 1:3 over the period. The increase in output not accounted for by the increase in slaughter is due to animals being killed at heavier weights. Even though numbers are not expected to increase greatly, production probably will as the use of irrigation schemes allows animals reared under nomadic grazing to be carried over to higher slaughter weights. Description of production systems and the sheep industry in general can be found elsewhere (Nyerges, 1979).

The main factor determining production appears to be climatic - from the data (Table 23) years of high output coincide with periods of extreme drought conditions (1962, 1969, 1975). However, there is also a general upward trend in both sheep numbers and production.

TABLE 23

Iran: Production Statistics

Year	Numbers of (million head)			Sheepmeat Production (Kt)[1]
	Sheep	Goats	Total	
1960	23.7	13.9	37.6	150.7
1961	22.0	13.0	35.0	152.3
1962	22.4	13.3	35.7	158.7
1963	22.4	13.3	35.7	154.6
1964	20.2	12.6	32.8	149.9
1965	25.2	12.6	37.8	153.1
1966	29.5	13.5	43.0	166.3
1967	31.0	14.0	45.0	180.9
1968	33.0	14.5	47.5	196.3
1969	34.0	14.7	48.7	218.9
1970	36.0	14.0	50.0	210.5
1971	32.0	14.0	46.0	187.0
1972	32.0	14.0	46.0	219.0
1973	34.0	15.0	49.0	230.0
1974	35.0	15.0	50.0	233.5
1975	30.5	14.5	44.5	294.8
1976	33.5	14.0	47.5	360.0[2]
1977	33.0	13.5	46.5	383.0[2]
1978	32.0	13.5	45.5	377.0[2]
1979	32.5	13.4	45.9	390.0[2]
1980	30.0[2]	13.0[2]	43.0[2]	350.0[2]

[1] 40% increase in production 1960-80. Includes slaughter of imported live animals.

[2] Estimated.

SOURCE: USDA.

A World Bank study (1977) used a simple method of trend-extrapolation to explain and project output. No producer price variable was included explicitly and the use of a more quantitative model was rejected in view of the uncertainty regarding future Government policies. In fact, the projection of 242 Kt being produced in 1980 appears to be close to actual output.

An output of 294 Kt is projected for 1985 and confirms previous estimates made by FAO (1976) which also project an output of 471 Kt in 1990. This is a 5.3% increase per annum from 1980-90 and appears rather high.

The National Cropping Plan (1975) using a Linear Programming model, projects an output of 277 Kt for 1982 - a growth rate of 2.4% per annum which would seem more reasonable.

6.1.3 Consumption

General remarks on sheepmeat consumption in the Middle East are applicable to Iran although it has the largest population and currently one of the lowest per capita consumptions of sheepmeats in the region. The population of 37 million (Table 24) is expanding at a rate of 2.9% per annum. Because of this, and the former low consumption level of 7 kg per annum, rapid increases in total demand are occuring (Table 24).

therefore relatively cheaper than other meats. It appears from most studies though that the cross-price elasticity between meats is extremely low, showing that there is little substitution between them. The own-price elasticity for mutton and lamb is estimated by FAO to be quite high at -1.36 so any change in price will have a more than proportionate inverse effect on consumption.

Various projections of meat consumption in Iran have been made. These are assessed and discussed by the World Bank (Vol. I, 1977). As the studies (mainly IBRD, 1975; FAO, 1975) were not strictly comparable, a "best" estimate was made, allowing also for price effects. This projected a consumption of 492 Kt by 1980 (actual: 415 Kt) and 960 Kt in 1985. The latter would imply a 20% growth in demand per annum.

6.1.4 Trade

With the increase in oil revenues and meat consumption, imports have grown dramatically. The Iranians had just started to import small quantities of meat in 1968; accounting for less than 1% of world trade.

Iranian imports now account for over 10% of world trade in sheepmeats (Table 25). In keeping with consumer preference, imports consist largely (88%) of live sheep, and fresh sheep and goat meat with only a

TABLE 25

Iran: Sheepmeat Import Statistics

Year	Total Sheepmeat Imports[1,2] (Kt)	As % World Imports	Australia (Kt)	N.Z. (Kt)	Other (Kt)
1968	1.1	0.1			1.1
1969	5.9	0.8	2.0		3.9
1970	15.4	2.2	7.3		8.1
1971	6.7	0.9	2.5		4.2
1972	7.6	1.0	0.3		7.3
1973	12.1	1.5	6.8		5.3
1974	18.8	3.1	10.4	6.1	2.3
1975	38.0	5.7	24.7	3.3	10.0
1976	33.7	11.6	31.1	19.4	16.8
1977	65.4	9.9	38.1	27.3	n.a.
1978	54.9	9.5	27.8	27.1	n.a.
1979	54.7	4.5	21.4	3.6	29.7
1980	105.0[3]	7.5[3]	30.5	64.7	9.8[3]

1 Negligible imports pre-1968. 1977-78 total of N.Z. and Australian imports only.

2 Total imports may differ from volumes quoted for individual countries due to timing of recording trade data.

3 Estimated.

n.a. - not available.

SOURCE: USDA, NZMPB, ABS.

small proportion of frozen meat. Iran is now the largest sheepmeat importer in the region, purchasing up to 80 Kt per annum. Imports rose sharply after 1974, but have fluctuated widely. Import data from countries other than N.Z. and Australia are poor, so it is difficult to estimate total imports except by subtracting production from consumption (Table 25). Traditionally, much of the trade has been in live sheep for reasons discussed above and due to the limited facilities for handling carcase meat. Table 26 shows the increase in trade with Australia; data for other imports are unreliable but they are estimated at 3 to 4 million live sheep per year.

TABLE 26

Imports of Live Sheep into Iran

Year	Total (million head)	From Australia
1969	167	
1970	269	268
1971	233	196
1972	447	406
1973	480	410
1974	720	696
1975	1,517	748
1976	1,973	1,258
1977	2,500	2,553
1978	2,800	2,409
1979	1,500	1,300
1980	n.a.	n.a.

n.a. - not available.

SOURCE: ABS

With rising purchasing power, however, a rising share of imports has come as carcase meat from developed countries. Turkey, Rumania, Bulgaria and Hungary, despite their proximity to Iran, have not been able to withstand the competition from Oceania for the supply of carcase meat. Current trends in the market indicate that Australia and N.Z. are likely to dominate the market in future. Table 27 shows how their share of imports has increased to over 80%; this is only a rough guide as unrecorded trade with other eastern countries may be larger.

TABLE 27

Percentage of Total Iranian Sheepmeat Imports by Source

Year	Australia	N.Z.	Both
1969	33		33
1970	47		47
1971	37		37
1972	4		4
1973	55		55
1974	55	32	87
1975	65	9	74
1976	53	33	88
1977	63	37	100
1978	50	50	100
1979	39	2	41
1980	28	43	71

SOURCE: ABS

The IMO arranges the import and distribution of all meat and allocates imports to the major importers. The largest volume of trade is with Australia; however, long term contracts were negotiated with N.Z. in 1979 to supply 45-50 Kt per year. The share of the Iranian market held by each fluctuates widely with no discernable trend.

A recessionary phase for imports appeared in 1978 with a cut in the growth rate and slower trade which could have been a reaction to the expansion since 1974, particularly the effects of over-importing. Despite the political instability (which temporarily disrupted trade flows in 1979) the market should remain strong as the Iranian people view sheepmeat as an important part of their diet. Production is not capable of expanding at the same rate as consumption, but other suppliers (such as Turkey and Rumania) who continue to trade on a limited basis, have the potential to increase their exports. Large orders for live sheep have been placed with Eastern European countries and the expatriate population from India and Pakistan are interested in their homelands as a source of supply.

6.1.5 Implications for Exporters

As seen above, Australia and N.Z. are now the main suppliers to the Iranian market. Each country's share of the expanding market depends primarily on its ability to produce and export meat and livestock of a type and price suitable for the Iranian market.

Australian exports of all sheepmeats to Iran have shown considerable growth and have been stable since 1976 at around 30 Kt a year. Lamb exports rose 12% per annum from 1970-78, mutton exports grew by a smaller proportion, and live sheep trade increased ten-fold over the period (Table 26). Iran is now the major importer of Australian sheep, taking over 50% of exports, and 25% of sheepmeat exports. Several studies (Cornell and Hone, 1978; Neil, 1974) show that current exports are not being produced specifically for that market but as a by-product of other activities. They conclude that Australia can continue to supply the projected demand from Iran with an internal reallocation of resources. They project an increase in import demand of 15% for meat and 65% for live sheep (1977-82). However, producer confidence in the stability of the market has been slow to develop and price expectations are an important determinant of production for this market (Cornell and Hone, 1978). Supply response is generally inelastic in the short-run to Middle East prices - the response usually being limited to a new product mix, not a higher production level (Thatcher, 1978).

N.Z.'s trade with Iran has been smaller, but is increasing rapidly to Australian levels although there is no trade in live sheep. All trade is effected through the N.Z. Meat Marketing Corporation. Longer term contracts negotiated in 1979 ensure the reliability of N.Z. as a primary supplier to the market as opposed

to a "residual" sub-contract supplier. The advantages to Iran are the lower costs of frozen imports than live sheep and the higher quality of N.Z. lamb to previous imports of lower grade hoggets and ewes. For N.Z. (who has only sold up to 7% of its meat in Iran previously) this is the biggest single sale ever made and will account for over 10% of sheepmeat exports.

Despite the instability of purchases, the attraction of Iran is the high prices paid which are generally above world prices; increased demand may have raised prices of some types of sheep by 50% (Thatcher, 1978).

FAO projections of import demand (1977) for live sheep and meat were for 250 Kt by 1980 and 666 Kt by 1985. BAE estimates (Cornell et al., 1978) were lower at 150-200 Kt by 1982. Extrapolation of current production and consumption trends would suggest that the latter were closest to reality.

Work has been done on the ability of producing countries to meet the quantity and quality requirements (Bishop, 1978; Cornell and Hone, 1978; Laurie, 1975; Neil, 1974). There seem to be no assessments of the corresponding diversions of supply (and increases in world prices) necessary to meet the increased demand, given relatively fixed supplies.

In conclusion, the enormous oil supplies in Iran ensure the wealth of the region for many years to come despite the prospects of continuing political conflict which could disturb the economy and trade in the short-run. However, rising incomes and expanding population suggest an increasing demand for sheepmeat. Thus, the unknown factor is not whether the market exists but rather what will be the size of the future market, and whether N.Z. and Australia will be large suppliers of the market.

6.2 Iraq

Like Iran, Iraq possesses considerable agricultural resources though the climate and environment are more severe. With increased oil revenues, the government is allocating substantial resources for livestock development and has set ambitious production targets (World Bank, 1977). There are many problems in implementing the plans, not least the shortage of water, labour and livestock and underlying political unrest.

Iraq is the second largest country (in terms of population, production, consumption and trade in sheepmeats) in the region after Iran. It has a population of 12.8 million with a 3.3% growth rate. Most of its revenue is earned from oil sales and GNP is growing at 15-18% per annum.

Consumption of sheepmeat in 1970 was 77 Kt which was 8.2 kg per capita. On the basis of an income elasticity of 0.6, and population growth of 3.3%, FAO estimated consumption to be 18.8 kg per capita in 1980 and 207 Kt in total. Consumption is projected to be 275 Kt (23 kg per capita) by 1985 (FAO, 1979).

Production of sheepmeat is also expanding although the flock of 12 million sheep and 3.3 million goats may be decreasing to furnish this expansion. Production was 92 Kt per annum in 1972-74 and was estimated to be 113 Kt in 1980 and 140 Kt in 1985 (FAO, 1979).

These production and consumption levels required an import of 10-15 Kt of sheepmeat in the late 1970's (Table 18) and an import of over half a million live sheep a year. Most of the live sheep were from Turkey (it is unlikely that this trade is sustainable) and there were small re-exports (4%) to Lebanon, Jordan, Iran and Kuwait.

Of the carcase meat, 80-90% was lamb supplied by N.Z. with the remainder from Australia though no meat was purchased from Australia in 1979 or 1980. N.Z. sales have fluctuated (9 Kt in 1977, 3 Kt in 1978, 13 Kt in 1979 and 11.6 Kt in 1980) depending on exporters ability to capture the annual import contracts given by Iraq; market share fluctuates correspondingly. A

contract for imports of 30 Kt was signed between N.Z. and Iraq for 1981.

In summary, it appears that an import market exists currently in Iraq for 15 Kt of sheepmeat, and this is expanding rapidly as live imports decrease and total demand increases. Political conflict with other Middle East countries could seriously disturb the market in the 1980's.

6.3 Kuwait

Kuwait is an important market for imported sheepmeat despite its small population. The market should continue to increase as population, GNP and urban development are all increasing rapidly.

The country is rich in oil but because most of the land is sand and rock, less than 1% is suitable for agriculture. The only livestock kept therefore, are under zero-grazing systems. Sheepmeat production and potential production are virtually zero.

The population is small, at about 1.3 million, but growing dramatically at 8.4% per annum. Incomes are amongst the highest in the world and have been growing at an average of 18% per annum since 1960. However, the income-elasticity of demand for sheepmeat is not high (0.6) as per capita consumption is already greater than in many countries in the region at 14 kg. Total consumption was estimated to be 10 Kt

in 1970, 14 Kt in 1980 and projected to be 20 Kt by 1985 (FAO, 1979).

Kuwait has one of the region's largest ports where many live sheep carriers unload for trans-shipment to other Middle East countries. Because of this, there may be misinterpretation of the import data available. Imports of live sheep appear to have trebled from 1970 to 1980 (Table 18) from 0.25 million to 0.75 million - an increase which is not fully reflected in consumption data. Two points should be made here. Firstly, that any increase in domestic demand must be met by imports of live sheep or carcase meat as domestic supply cannot expand. Secondly, the actual destination is important in market analysis although for projection of effective import demand by Kuwait, an extrapolation of the trend would suffice.

As it is, Kuwait's market is the second largest in the Middle East for Australia and an important one for N.Z. Most of its frozen meat comes from these two exporting countries as well as India and China. Fresh meat is supplied by Sudan, Turkey and Eastern European countries.

The growing ex-patriot population could increase the demand for carcase meat relatively faster than demand for live animals, though as suggested above, it is

unlikely that all imports are destined for domestic consumption in Kuwait.

6.4 Saudi Arabia

Saudi Arabia is the largest country on the Peninsula, though it has a population of only 8 million. Only 1% of the area is cultivated although it is thought that 15% of the area could be used for agriculture, given proper management and irrigation development (World Bank, 1977). Livestock numbers are greater than many in the region with 2 million goats and 3.5 million sheep. The herds are tended by nomadic Bedouins and provide meat, wool and milk. Some 2 to 3 million are slaughtered annually at an average carcase weight of 16 kg. This provided 60% of domestic consumption in 1974 but considerably less by 1980.

Herds are still being rebuilt after the devastating droughts through the 1960's so are unable to expand to meet the growing demand. However, the potential exists to increase land area used, to use it more intensively (by irrigating), to increase the size of the national flock, and to improve the productivity of the flock.

Sheepmeat consumption in Saudi Arabia is growing rapidly, partly because it started from a low base at 4 kg of sheepmeat per capita in 1960-70; total consumption has since doubled due to increases in per capita consumption as well as population increases.

GNP has grown 25% per year since 1960 but since 75% of the population is still in agriculture, income distribution is very uneven. The average income elasticity of demand for sheepmeats is 0.6 so despite the high rate of income growth, demand for sheepmeats has grown less than proportionately. Price may have played a more important part in the increase in consumption. The Government subsidises frozen meat at 40% of its retail value in order to keep down prices and raise living standards. Maximum prices are also set at both wholesale and retail level and imports of fresh meat are encouraged by being duty free.

Import data are not available on the live sheep trade but this trade still dominates the market. Imports have been traditionally the small Somali sheep but almost 1 million are now imported annually from Australia to meet rising demand. Argentina and N.Z. supply only limited quantities of carcase meat and Australia supplied around 7 Kt in 1979 and 1980. Total imports rose rapidly in the late 1970's from 4.3 Kt in 1976 to 19.3 Kt in 1979 and 24.1 Kt in 1980 (Table 18).

Saudi Arabia has the largest known oil-reserves in the world so that incomes are likely to continue to grow. Rising population will also increase total demand for meat (this will be mainly sheepmeat, as consumption patterns are inflexible). Production is not projected to expand to satisfy much of this rise in demand. FAO estimates that imports (including live sheep) will rise

from 60 Kt in 1980 to 130 Kt in 1985. Of this, approximately half will be in carcase meats so though the potential market exists, it has yet to be developed. If not developed, trade in live sheep could probably expand to cover the deficit.

6.5 Jordan

Jordan is a country with a population of 2.9 million, 39% of whom are engaged in agriculture. In spite of the importance of agriculture which provides 20% of the national income, the livestock industry is small, with 670 thousand sheep and half that number of goats. Jordan has no oil reserves unlike the other Middle East countries.

Production of sheepmeat in 1973 was estimated to be 5 Kt and this does not seem to have increased by 1980. FAO projections are for no further growth in domestic production to 1985.

Consumption of sheepmeats has grown over the period 1970-80 though not as dramatically as in other Middle East countries. Total consumption was 8 Kt in 1970, 12 Kt in 1980, and projected (FAO) to be 18 Kt in 1985. Increasing population accounts for much of this; population grew from 2.1 million in 1970 to 3.2 million in 1980 - annual growth rate of 3.2%. Per capita consumption has increased also from 3.8 kg to 4.2 kg over the same period. Sheepmeat consumption is therefore still low compared to other Middle East states even though it is the main meat eaten in Jordan.

The income elasticity of demand for sheepmeat is high at 1.2 showing that demand for such meat in general in Jordan is still growing at a faster rate than incomes. Average annual GNP growth was 10% over the 1960-75 period which suggests that rising incomes were the main cause of increased per capita consumption and not changes in taste.

To meet the rising demand, imports have had to expand and are projected to increase by 90% from 1980 to 1985. Up to 1974, about 2 Kt of mutton and lamb were imported with a contract for a further 3 Kt for the armed forces. Imports rose after 1975 to 4.3 Kt in 1977, 12.8 Kt in 1979 and 15.0 Kt (estimated) in 1980 (Table 18).

Up to 1972, Argentina supplied all imported sheepmeat but trade virtually ceased until 1977 when Argentina supplied half of imports. N.Z. supplied a quarter of imports in 1978 to 1980 (i.e. 1 Kt).

About 0.25 million live sheep and a similar number of goats are imported annually into Jordan. South America, Turkey and the Adriatic countries have supplied them in the past. Because of sheep deficiencies occuring in South America and Turkey, the consequent rise in price, and the political problems encountered in bringing sheep from Eastern Europe through Mediterranean ports, Jordan has started to buy live sheep from Australia.

All trade in sheepmeat has expanded slightly, but not to the same extent as in other Middle East countries due to lower income levels. Incomes are projected by the IMF to grow rapidly in the early 1980's which could stimulate demand for imported sheepmeat.

6.6 United Arab Emirates (U.A.E.)

The U.A.E. consist of 7 sovereign states on the Arabian Gulf, governed by hereditary rulers and their source of revenue is oil. The main state as far as sheepmeat trade is concerned is Dubai as it has half of the total U.A.E. population of 0.75 million people. The population growth rate of the U.A.E. has been 14% per annum but this is mainly due to the influx of ex-patriates. The native population is increasing at only 3% per annum. Consumption of sheepmeat per capita is high at 23.8 kg and was thought to be around 40 kg in 1980 though total consumption is still less than 7 Kt. The estimated income elasticity is low at 0.6, but GNP is growing at an annual 53% so coupled with the growth in population, total demand is likely to grow.

Livestock are seldom kept commercially in the U.A.E. and there has been serious overgrazing, so there is little possibility of expanding sheepmeat production (World Bank, 1977).

Virtually all consumption is therefore imported. Half of all imports are in the form of live sheep. These number about 50,000 head per annum, half of which come from Australia, the rest from Somali, Turkey and India. About 3 Kt of carcase meat is imported for domestic use, mainly from Australia. Recorded imports have increased rapidly in the late 1970's (Table 18) especially into Dubai which re-exports to Saudi Arabia and other U.A.E. states. Re-exports were approximately 3 Kt in 1978, 8 Kt in 1979 and 20 Kt in 1980.

The U.A.E. have established themselves as a merchant community and are becoming the financial trading centre of the Gulf. Imports should continue to grow therefore as a result of expanding domestic demand and for re-shipment to other Middle East countries.

6.7 Bahrain

Bahrain comprises a series of islands on the Arabian Gulf (see map) and has been an independent state since 1971. It has a population of 0.3 million, growing at 3.7% per annum. The majority of its population are Moslems. The state earns considerable revenue from oil which has helped GNP to grow at 19.6% per annum since 1960. Development is being directed towards a manufacturing economy as the oil reserves are not large.

Little livestock is kept on the islands and the majority of food and meat is imported. Consumer preference is for sheepmeats; even though all homes have refrigeration (Neil, 1974) the preference is still for fresh meat. Per capita consumption of sheepmeat was 20.3 kg in 1970 and is now thought to be nearer 30 kg. The income elasticity of demand for sheepmeats is estimated to be 0.6 as in the other oil-rich states, though income distribution is very uneven. Total consumption rose from 1.4 Kt in 1960 to 1974 to 5.5 Kt in 1978, and is estimated to be 7-8 Kt in 1980 to 1985 (FAO).

Live sheep but not frozen meat sales are subsidised at a fixed rate of 15% to raise the standard of living of the poorest majority (70%) of the population.

Imports rose slightly faster than consumption, as much sheepmeat is re-exported to the Arabian Peninsula countries. Imports of carcase meat were 6 Kt in 1978 (Table 18). Of this, N.Z. supplies about 10% - i.e. 200 tonnes per annum. Imports fell in 1979 and 1980 to around 1 Kt because of political unrest in the region. The forecast growth in consumption will be reflected in increased imports of 2-3 Kt in the early 1980's with the greater increase in trade being in live sheep.

6.10 Lebanon

Lebanon has a small agricultural base as little of the land is cultivable. The number of sheep and goats has been stable over the period 1960 to 1980 at 0.25 million. According to a World Bank study (1977), there is considerable potential for increasing livestock numbers and output but it is unlikely to be realised. FAO estimate domestic production of sheepmeat to be 6 Kt and to remain at this level through 1985.

Sheepmeat is the main meat eaten in Lebanon and per capita consumption is about 7 kg. This has increased little since 1970 despite an annual growth in GNP of 10.8% since 1960 (lower than most Middle East countries). The income elasticity of demand for sheepmeats in Lebanon is estimated to be 0.8 (FAO, 1976).

The population of 3 million is growing at a rate of 2.8% per annum. This accounts for the increase in total consumption from 19 Kt in 1970 to 25 Kt in 1980. Consumption is projected to be 31 Kt by 1985 (FAO, 1979).

As production is small compared to demand, Lebanon relies on imports for 80% of sheepmeat availability. A small part of this (3-4 Kt) is imported as carcase meat and the larger (but a declining) proportion as live animals. Imports into Lebanon have remained stable since the late 1960's (Table 18) though they showed some increase in 1980.

For the same reasons as Jordan, Lebanon is no longer able to secure carcase meat from Argentina so Turkey, Eastern Europe and China are the main suppliers. There have been small shipments of mutton from Australia. It is interesting to note the acceptance of frozen meat from these countries although the population is 97% Moslem who generally prefer fresh meat. There is still a preference, though, for lamb rather than mutton. N.Z. does not supply Lebanon in any quantity but trade could expand if demand expands to projected levels.

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