



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Beef Consumption, Supply and Trade in Korea

Jung-Sup Choi ^a, Zhang-Yue Zhou ^b and Rodney J. Cox ^b

^a Korea Rural Economic Institute
Seoul 130-710, Korea
Email: jsupchoi@krei.re.kr

^b The University of Sydney - Orange
Orange NSW 2800
Email: zzhou@orange.usyd.edu.au
rcox@orange.usyd.edu.au

Beef Consumption, Supply and Trade in Korea ¹

Abstract

Until recently the Korean beef market was heavily protected. However, since the beginning of 2001 there have been significant changes to the protection of this market. In January 2001 beef import quotas were lifted and replaced by an import tariff. The dual retail system – where domestic and imported beef are sold separately – was abolished in September 2001 and now domestic and imported beef can be sold in the same outlet. In addition, any retailer is now permitted to sell imported beef. As a major beef producer and exporter, Australia can benefit from the changes in the Korean beef market. In this study, we examine beef consumption trends in Korea; Korea's beef cattle production and its beef supply potential; beef import prospects; likely responses in the Korean beef industry as a result of the beef import tariffication; and beef trading arrangements in Korea. We also draw implications on how the Australian beef industry may capitalise on the opening up of the Korean beef market.

1. Introduction

Korean beef production experienced some major fluctuations in the 1990s. The number of beef cattle increased from 1621 thousand head in December 1990 to a peak of 2891 thousand head in September 1996, and then started to decline. By June 2001, it had dropped to 1507 thousand head. On the other hand, the demand for beef in Korea has been on the increase, at a rate of 8.6 per cent per annum during 1990-2000. This increase was met by increased

¹ Paper presented to the 46th Annual Conference of the Australian Agricultural and Resource Economics Society, 13-15 February 2002, Canberra, Australia. This project was sponsored by the Australia–Korea Foundation. The research was undertaken primarily at the Asian Agribusiness Research Centre of the University of Sydney – Orange while Dr Jung-Sup Choi was an International Visiting Scholar, August 2001. Professor Choi wishes to thank the Australia–Korea Foundation for financial support for the visit. The authors thank Marjorie Wilson for her editorial assistance.

beef imports. Beef imports grew from 82 thousand tonnes in 1990 to over 188 thousand tonnes in 2000, increasing at an annual growth rate of 8.7 per cent.

Until the end of 2000 the Korean beef market was heavily protected. As a result, beef prices were high in Korea – several times higher than in Australia. However, beef market protection underwent a major change on 1 January 2001, when beef import quotas were lifted and replaced by an import tariff. In addition, the dual retail system – where domestic and imported beef are sold separately – has been regarded as inconsistent with WTO rules. As a result, since 10 September 2001, this dual system has been abolished and any retailer is now permitted to sell imported beef.

As a major beef producer and exporter, Australia is significantly affected by what is happening in the Korean beef market. Australia produces approximately two million tonnes of beef per annum of which 65 per cent is exported. The changes in the Korean beef market are likely to offer Australia with enormous business opportunities. Hence it is extremely advantageous for the Australian beef industry to explore further the Korean beef market. In this study, we examine beef consumption trends in Korea; Korea's beef cattle production and its beef supply potential; beef import prospects; likely responses in the Korean beef industry as a result of the beef import tariffication; and beef trading arrangements in Korea.

2. Beef Consumption in Korea

2.1 Current Status

In Korea, beef is regarded as a very expensive food compared to pork and chicken. Nonetheless, in recent years beef has become an integral part of the Korean diet. The traditional Korean diet has three components: (1) a staple food dish of rice, (2) side dishes of various vegetables, fish, and meat, and (3) a bowl of soup. At home, people eat beef as a major side dish or as beef soup.

Restaurant prices for beef are very expensive in Korea. In restaurants, Koreans barbecue the seasoned beef (*bulgogee*) or prime rib (*galbee*) on a grill. Although beef steaks are not used in traditional Korean dishes, they are served in the many western style restaurants that have opened recently in urban areas and are enjoyed by the younger generation.

A recent survey of housewives regarding their families' beef consumption, conducted by the National Agricultural Cooperatives Federation (NACF) in

2000 in Seoul area, shows that some 74 per cent of respondents' families eat beef mostly at home and 14 per cent eat beef mostly at restaurants (NACF 2000). In addition, 30 per cent of the surveyed households purchase beef at least once a week and 33 per cent purchase beef once a fortnight. Forty six per cent of the surveyed households eat beef one to two times per two months at restaurants. Households with higher incomes purchase more beef. In addition, older housewives tend to purchase more beef than do younger ones. Younger housewives with a job, higher incomes, and fewer family members tend to consume more beef outside the home.

The NACF survey also revealed some other interesting beef consumption details. For example, the popular beef recipes at home are beef soup (69.3%), bulgogee (34%), and barbecue (29.5%) [multiple choices]. In contrast, the favourite beef dishes at restaurants are barbecue (72.8%) and bulgogee (32.3%). Some 73 per cent of the surveyed households regard the quality of beef as more important than the price of beef, with 84 per cent preferring domestic Hanwoo beef to imported beef. Hanwoo beef is believed to be more suitable for Koreans' tastes. More than half of the surveyed households prefer Hanwoo beef for cooking soup, presenting as a gift to others, or treating guests at home. For bulgogee and barbecue, there is little difference to Koreans between domestic Hanwoo and imported beef.

Coupled with the rapid economic development and improved consumer income in Korea in the past three decades, Koreans' beef consumption has increased steadily (see Table 1). Per capita beef consumption increased from 1.2 kg in 1970 to 8.5 kg in 2000, at an annual growth rate of 6.8 per cent. Total national beef consumption increased from 37 thousand tonnes to 402 thousand tonnes during the same time period (at an annual growth rate of 8.2 per cent). Out of the 402 thousand tonnes total beef consumption in 2000, 214 thousand tonnes were domestically produced and 188 thousand tonnes were imported.

2.2 Trends

Pork, beef and chicken are the major meat items consumed in Korea. Per capita annual consumption of pork, beef and chicken was 16.5 kg, 8.5 kg, and 6.9 kg, respectively, in 2000. Although the per capita consumption of pork is still the highest at present, the increase in its consumption has slowed down in the past decade. On the other hand, the increase in beef consumption has been the fastest (see Table 2). During 1970-2000, the annual growth rate of beef consumption at both the national total and per capital levels was the

highest of all the meats. In the past decade, while the growth rate in consumption of other meats has slowed down, the growth rate of beef consumption has increased, being much higher than the growth rates of any other meat consumption (Table 2).

Table 1. Beef Consumption in Korea, 1970-2000

Year	Per Capita Consumption (gram)	Total Consumption (tonnes)	Domestic Produced (tonnes)	Imported Beef (tonnes)
1970	1188	37340	37275	65
1971	1201	39484	38867	617
1972	1201	40229	40229	-
1973	1317	44919	44919	-
1974	1485	51506	51506	-
1975	1992	70292	70292	-
1976	2107	75533	74833	700
1977	2242	81624	77424	4200
1978	3103	114731	74287	40444
1979	3033	113827	86494	27333
1980	2622	99974	93098	6876
1981	2407	93202	69272	23930
1982	2708	106506	61496	45010
1983	2891	115497	66089	49408
1984	2627	106581	90032	16549
1985	2923	120342	115660	4682
1986	3559	147934	144343	3591
1987	3600	151926	151926	-
1988	3372	141536	132261	9275
1989	3382	143312	90051	53261
1990	4129	176988	94924	82064
1991	5160	223270	98529	124741
1992	5196	226891	99577	127314
1993	5293	232998	129625	103373
1994	6100	269811	147274	122537
1995	6720	301217	154722	146495
1996	7136	322870	173666	149204
1997	7930	361953	227728	134225
1998	7441	345486	260070	85416
1999	8381	392714	239721	152993
2000	8510	402381	214247	188134
Annual Growth Rate (%)	6.8	8.2	6.0	30.4

Source: NACF, *Materials on Price, Supply and Demand of Livestock Products*, various issues.

Table 2. Major Meat Consumption in Korea, 1970-2000

Year	Total Meat		Pork		Beef		Chicken	
	National Total (000 t)	Per Capita (kg)	National Total (000 t)	Per Capita (kg)	National Total (000 t)	Per Capita (kg)	National Total (000 t)	Per Capita (kg)
1970	165	5.2	83	2.6	37	1.2	45	1.4
1980	433	11.3	242	6.3	100	2.6	91	2.4
1990	850	19.9	505	11.8	177	4.1	172	4.0
2000	1510	31.9	780	16.5	402	8.5	327	6.9
Growth Rate % (1970- 2000)	7.7	6.2	7.8	6.4	8.3	6.7	6.8	5.5
Growth Rate % (1990- 2000)	5.9	4.8	4.4	3.4	8.5	7.6	6.6	5.6

Note: Beef consumption growth rates for 1970-2000 are slightly different from those in Table 1 due to rounding errors.

Source: MAF 2001b, *Major Statistics of Agriculture and Forestry 2001*, pp. 316-317.

According to a study by Choi and Lee (2000), families with more highly educated parents tend to prefer beef to pork and chicken. Generally, these families have higher incomes. This result is thus consistent with the findings by NACF (2000) that families with higher incomes consume more beef. More income elastic than other meats, beef in Korea has an income elasticity estimated at 1.26, while those of pork and chicken are 0.38 and 0.27, respectively (Choi and Lee 2000).

Koreans' income has increased rapidly in the past three decades. The per capita GNI (Gross National Income) has increased from less than 100 thousand Korean Won in 1970 to 10890 thousand Won in 2000. There was a drop in the per capita GNI in 1998 due to the 1997 financial crisis, but this was soon arrested and the per capita GNI increased in 1999, to a level higher than in 1997. During the past decade, the per capita GNI has been increasing at an annual growth rate of 10 per cent, from 4140 thousand Won in 1990 to 10890 thousand Won in 2000. The Korean economy is expected to grow at a rate of 4–5 per cent per annum in the years to come and hence consumers' income will be expected to increase. Given that the demand for beef is more income elastic and that there is a strong tendency towards westernisation of food consumption (MAF n.d.), it is expected that beef consumption and thus the

demand for beef will increase. A recent projection by the Ministry of Agriculture and Forestry provides further support. The MAF estimates that the annual per capita consumption of beef is expected to increase to 10.6 kg in 2010 from 8.5 kg in 2000. Total beef consumption will increase faster because of population increase and will reach 536 thousand tonnes by 2010 (see Table 3).

Table 3. Projections of Beef Consumption in Korea, 2001-2010

	Total Consumption (000 tonnes)	Per Capita Consumption (kg/year)
2000	402	8.5
2001	410	8.6
2002	426	8.7
2003	442	9.1
2004	459	9.4
2005	476	9.7
2010	536	10.6

Source: MAF 2001a, 'A comprehensive development program for Hanwoo industry'.

The above discussion clearly shows that the changes in Koreans' tastes and preferences in food consumption, combined with a continued increase in consumers' income, are likely to increase future demand for beef. In the next section we address beef supply issues in Korea.

3. Beef Supply in Korea

Supply to the Korean beef market comes from domestic production and imports. Domestic beef supply comes from Hanwoo (the local cattle breed), dairy cows and steers, and cross-breeds. In 2000, of the total slaughtered cattle of 997331, Hanwoo accounted for 816895 (81.9%), dairy cows 165117 (16.6%), dairy steers 10210 (1.0%), and cross-breeds 5109 (0.5%). In this section, we examine: (1) Korea's beef production development, production patterns and potential, (2) beef imports, and (3) the prospects for beef imports.

3.1 Beef Production in Korea

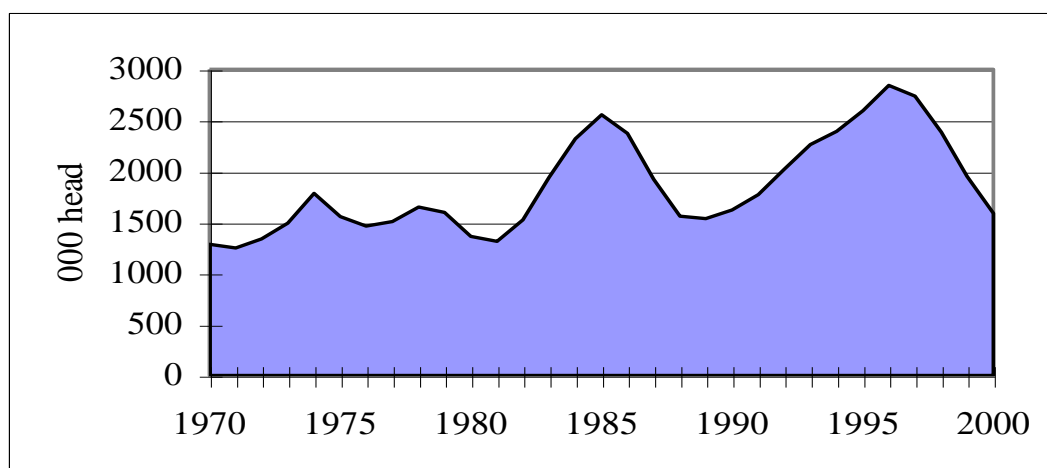
3.1.1 Beef industry development

Historically, beef cattle were raised on farms for draught use, mainly for cultivating land and pulling carts. Hence, beef was a by-product. With increased agricultural mechanisation and increasing demand for beef, farmers

started feeding cattle for beef production. This resulted in demand for a huge amount of cattle feed. The Korean agricultural sector was not able to produce enough feed, due to the need to produce other agricultural products. As a result, Korea depends almost 100 per cent on imported cattle feed, specially feed-grain and hay.

The number of beef cattle has been fluctuating, primarily influenced by cattle prices and some other factors (see Figure 1). During the past three decades, there have been a number of major downturns and peaks. The major downturns took place in 1981 and 1989 while the major peaks happened in 1974, 1985 and 1996. The largest number of cattle was reported in 1996 at 2844 thousand. At present the cattle herd number is at a low level of 1507 thousand on 1 June 2001.

Figure 1. Number of Head of Beef Cattle in Korea, 1970-2000



Source: NACF, *Materials on Price, Supply and Demand of Livestock Products 2001*, p.150.

Korea's total cattle number has been influenced by government programs. For example, under the "Future Farmers' Loan" program initiated in 1980, many eligible young farmers chose to specialise in raising cattle. As a result, the number of beef cattle increased significantly in 1985 (see Figure 1).

Other major programs designed by the government to encourage domestic beef production include:²

- Payment scheme for calf production promotion;
- Promotion of high quality beef production;

² Before the market liberalisation, Korean beef policy had focused on trade restrictions and price control, using the imported beef as policy measures to press down the domestic beef prices. With the market opening, the domestic beef policy shifted to non-market measures such as direct payments, disease management, and subsidies for environmental facilities.

- Development of grass fields for feed;
- Promotion of regional co-operation among farmers; and
- Improvement of slaughtering and marketing facilities.

Additional programs included in the 2001 Hanwoo programs (MAF 2001a) are:

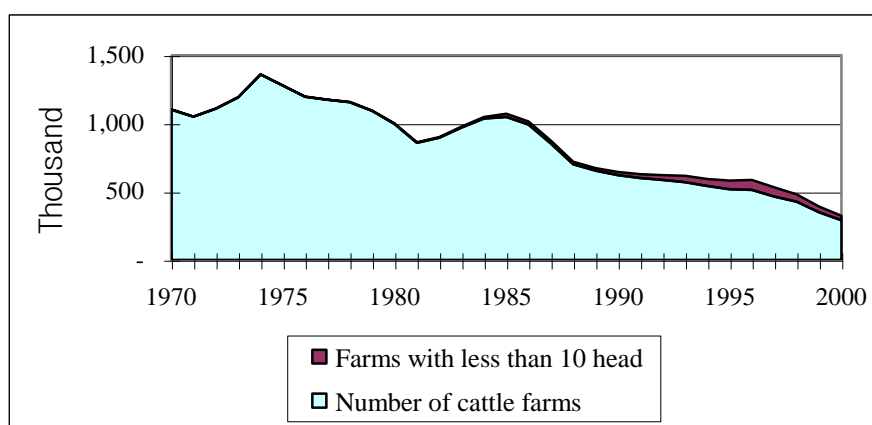
- Establishment of calf-producing base in Cheju province;
- Reinforcement of Hanwoo registration system;
- Evaluation of brand names of co-ops and selective supports of superior brands; and
- Designation of a beef industry information handler.

Despite such government programs that attempt to promote domestic beef production, the number of cattle has been decreasing since 1996. One reason for this decrease was the outbreak of BSE (Bovine Spongiform Encephalopathy) in England in 1996. Due to the fear of BSE, demand for beef dropped quickly and cattle prices started to go down in 1996. On the other hand, a key factor was farmers' fear of a weaker domestic beef sector resulting from the incoming beef trade liberalisation. Expecting an influx of imported beef into Korea, farmers have responded by reducing the number of cattle or leaving the industry. As shown in Figure 1, the number of cattle dropped to a low level of 1507 thousand on 1 June 2001. In the meantime, the number of cows with reproductive capacity also started to decrease from 1996. After reaching a record high of 1225 thousand cows in 1996, the number declined to 651 thousand on 1 June 2001 (Yoo 2000).

The number of cattle farms reached a peak of 1358 thousand in 1974 but has been declining since then (Figure 2). It was 989 thousand in 1980, 620 thousand in 1990, and 364 thousand in 1999. Correspondingly, the proportion of cattle farms out of the total farms also decreased significantly. This proportion was 44.3 per cent in 1970 and slightly increased to 45.9 per cent in 1980. It then decreased to 35.1 per cent in 1990 and 26.3 per cent in 1999. A recent survey shows that the number of cattle farms has further dropped to a mere 273 thousand on 1 June 2001, from 364 thousand in 1999 (MAF 2001, Livestock Statistics).

Dairy cows account for about 17 per cent of total beef supply from domestic sources in Korea. The number is relatively stable, at about 550 thousand during the last decade. The number of dairy farms has also decreased, with a recent survey reporting that there were 13 thousand dairy farms and 544 thousand dairy cattle on 1 June 2001. Average size per farm was 41.8 head (MAF 2001, Livestock Statistics).

Figure 2. Number of Cattle Farms and Farms with Less than 10 Herd, 1970-2000



Source: MAF, *Livestock Statistics*, various issues.

It seems the Korean beef industry is facing a tremendous challenge following the tariff-only beef trade liberalisation that started on 1 January 2001. The impacts of market liberalisation have been clearly felt through the reduction in the number of cattle head and the number of cattle farms – reactions so far from beef cattle producers.

3.1.2 Current production pattern

There are two types of cattle farms in Korea: calf production (cow-calf) and beef cattle feeding (feeding). Cow-calf farms are mostly small-scale farms, with less than 30 cows. Feeding operations usually have 30 or more cattle, sometimes reaching about 500 head.

Farmers sometimes feed dairy bull-calves or hybrid calves, but the number is small and no longer differentiated in the statistics. Farms with 20 to 30 head sometimes switch between cow-calf operation and feeding depending on the relative income from each operation.

Average cattle herd size per farm is extremely small in Korea. It has doubled from 1.2 head in 1970 to 2.0 head in 1983. It reached 3.0 head in 1991, 4.0 head in 1993, and 5.6 head in 1999. The majority of cattle farms are small-scale, operating beef cattle as family side-line businesses. Small-scale farms are predominantly cow-calf farms. Until 1984, the proportion of cattle farms with less than ten head was 99 per cent. Recently, it reduced to a little over 88 per cent.

There have been some changes in the size distribution. The proportion of farms with 40 head of cattle or more are on the increase. The number of

small-scale farms with less than 30 head is declining very fast, dropping from 614800 farms in 1990 to 288500 in 2000, a decrease of 53.1 per cent.

With the scheduled beef market liberalisation, many small-scale, cow-calf farms left the beef industry. Cattle farmers did not envisage a bright future for the domestic beef industry in terms of prices and profitability. When cow-calf farms decide to exit the industry, they usually sell cows after fattening, thus causing a decline in mature cow numbers. Table 4 shows a rapid decrease in cattle farms as well as the number of cattle during 1998 to 2001. Most of the decrease took place in the group with less than 50 head. According to Table 4, the number of cattle farms with 100 or more cattle remains unchanged in 2001 compared to 1998. However, the number of cattle raised by this group of farms has actually increased. This happened while the total number of cattle has dropped from 2383 thousand in December 1998 to 1507 thousand in June 2001 and the number of cattle raised by the other two groups of farms has declined. This may reflect a tendency for Korean beef producers to try to increase their economic efficiency by increasing herd size as a means of staying viable in the industry.

Table 4. Changes in the Number of Cattle Farms and Cattle Herd by Size

		Less than 50	50-100	100 and more	Total
Farms (1,000)	December 1998	422 (98.8)	3.9 (0.9)	1.1 (0.3)	427 (100.0)
	June 2001	256 (98.5)	2.8 (1.1)	1.1 (0.4)	260 (100.0)
	% change in 2001 over 1998	-39.3%	-28.2%	0	-39.1%
Herd (1,000)	December 1998	1,936 (81.2)	254 (10.7)	193 (8.1)	2,383 (100.0)
	June 2001	1,107 (73.5)	188 (12.5)	212 (14.1)	1,507 (100.0)
	% change in 2001 over 1998	-42.8%	-26.0%	9.8%	-36.8%

Source: MAF, *Livestock Statistics*.

Beef production is highly dispersed throughout Korea. All large districts and provinces have cattle. According to a recent survey, the southeast Kyongbuk province has the largest number of cattle (304 thousand or 20 per cent of the national total), followed by Chungnam (Midwest) and Chonnam (Southwest) (218 thousand head each). Cheju province has the highest number of head per farm, 21.5, followed by Kyonggi, 14.1. Kyongnam has the lowest number of head per farm, 4.1 (see Table 5).

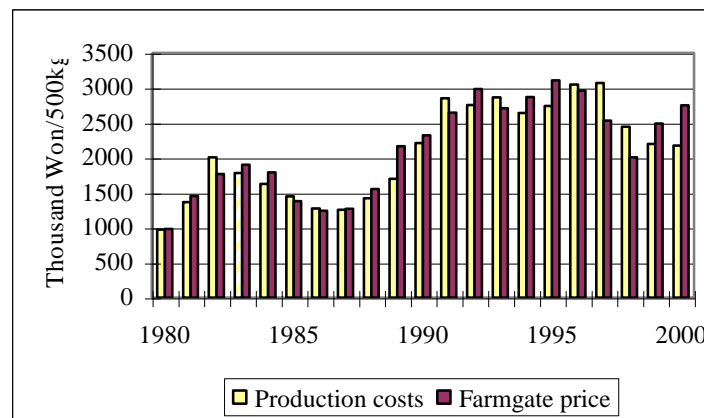
Table 5. Beef Cattle Herd Distribution by Province, June2001

	Cattle Herd	Farms	Head per Farm
<i>Total</i>	1,506,553	259,784	5.8
Seoul	161	12	13.4
Pusan	1,757	374	4.7
Taegu	16,107	1,652	9.8
Inchon	13,035	784	16.6
Kwangju	3,481	497	7.0
Taejon	3,771	555	6.8
Ulsan	22,460	3,551	6.3
Kyonggi	132,775	9,390	14.1
Kangwon	111,681	21,024	5.3
Chungbuk	103,262	16,621	6.2
Chungnam	218,439	31,681	6.9
Chonbuk	140,047	22,387	6.3
Chonnam	218,399	50,228	4.4
Kyongbuk	304,440	52,013	5.9
Kyongnam	196,399	48,070	4.1
Cheju	20,339	945	21.5

Source: MAF, *Livestock Statistics*, 1 June, 2001.

In general, cattle farming businesses in Korea are not very profitable. Neither the cow-calf operation (breeding) nor the cattle feeding operation (fattening) can always cover its costs. During 1980-2000, cow-calf farms experienced a loss in 11 years out of 21 years and cattle fattening farms experienced a loss in 9 years during the same time period (NAQS 2001, p. 79). Cattle production costs and selling prices for cattle fattening farms during 1980-2000 are shown in Figure 3.

Figure 3. Cattle Production Costs and Selling Prices for Cattle Fattening Farms, 1980-2000



Source: NAQS 2001, *Livestock Production Costs 2000*, p. 79.

3.1.3 Beef production potential

The potential for Korea to substantially increase its beef production does not seem to be great. With the opening up of the beef market in early 2001, imported beef has caused a strong downward pressure on the prices of domestically produced beef. Fearing a weaker domestic beef sector resulting from beef trade liberalisation, many farmers are unlikely to invest significantly in the beef industry to improve its productivity. Indeed, as shown in the previous sections, expecting an influx of imported beef into Korea, farmers have responded by reducing the number of cattle or leaving the industry. Both the number of cattle and the number of cattle farms have declined significantly in the past decade, particularly in the late 1990s. Further, cow slaughterings have increased substantially in the past few years.

Another factor limiting the output of domestically produced beef is Korea's heavy dependence on imported feed grains. International prices of feed grains are often unstable and cause great uncertainty and concern to cattle farmers. Further, increased domestic beef production is also likely to be constrained by environmental considerations. With smaller cattle farms leaving the industry, remaining farms tend to become larger. Consequently, the cost of handling wastes may increase significantly.

Being aware of the limited ability to compete in price with imported beef, Korean beef producers have realised that improvement in quality and the production of differentiated products (through branding) can be very important. In the past few years, they have been preparing to position themselves to compete with imported beef in the areas of quality and product differentiation. Many achieve this by forming farmers' cattle cooperatives. Currently, there are 86 such 'brand name beef cooperatives' in Korea (Nongmin-shinmun 2001), each producing and marketing its own branded beef products.³ As a result, the proportion of first grade beef is increasing (see Table 6). However, this does not seem to have contributed to increasing the total beef production of the country.

³ Typically the cooperatives feed castrated bulls to achieve a high-level marbling. Average sales per month for each cooperative are about 60 head. As of early 2001, the number of cattle kept by all brand named cooperatives reached 122456 head, accounting for about 9 per cent of the total cattle herd in Korea. Average cattle herd size is 1,275 per cooperative. Among the cattle herd, 46 per cent were castrated bulls, 22 per cent were bulls, and the remaining 32 per cent were cows.

Table 6. Beef Production and Change in the Proportion of Beef Quality Grades
(1993-2000)

Year	Cattle (000 head)	Slaughter (000 head)	Production (000 t)	Quality Grade (%)*		
				1	2	3
1993	2,260	687	129.6	10.7	49.2	34.5
1994	2,393	778	147.3	12.7	46.1	37.5
1995	2,594	780	154.7	12.8	37.6	45.9
1996	2,844	850	173.9	19.4	32.3	45.5
1997	2,735	1,125	227.8	18.4	30.0	48.8
1998	2,383	1,282	260.1	15.3	28.2	54.0
1999	2,167	1,095	239.7	18.9	31.6	48.3
2000	1,952	831	212.4	24.8	31.9	42.4

* 1 is the highest quality grade. Quality grading is evaluated by licensed inspectors with the Animal Products Grading Service. Grading is based on marbling, colour, fabrication, and maturity.

Source: NACF, *Materials on Price, Supply and Demand of Livestock Products, various issues and Animal Products Grading Service 2001, Animal Products Grading Report 2000*, pp. 187-202.

With the beef market opening up, the Korean government could no longer use certain trade restrictions to protect its domestic beef industry. Nonetheless, some non-market measures such as direct payments, disease management, and subsidies for environmental facilities may be used to provide some indirect support to beef producers. Even with some of these supports, Korea's potential to increase beef production is still very limited. MAF has projected that both the number of cattle and beef production will decline further before they may get reversed (Table 7). The total production, however, is unlikely to surpass its record level any more (in 1998, total domestic beef production reached a record high of 260 thousand tonnes). According to the same projection, the self-sufficiency rate will be about 36 per cent in 2010, slightly higher than that in 2005 but much lower than that in 2000 (53%).

Table 7. Projections of Beef Production in Korea, 2001-2010

	Number of Cattle (000 head)	Total Beef Production (000 t)	Total Beef Consumption (000 t)	Self-sufficiency Rate (%)
2000	1,590	212	402	52.7
2001	1,479	159	410	38.7
2002	1,524	128	426	30.0
2003	1,665	129	442	29.3
2004	1,822	137	459	30.0
2005	1,969	151	476	31.8
2010	2,254	195	536	36.3

Source: MAF 2001a, 'A comprehensive development program for Hanwoo industry'.

According to the above discussion, it is clear that Korea is unlikely to be able to substantially increase its beef production in the future. Beef self-sufficient rate will be lower compared to the current level. Beef import will be unavoidable and will continue to increase.

3.2 Beef Imports

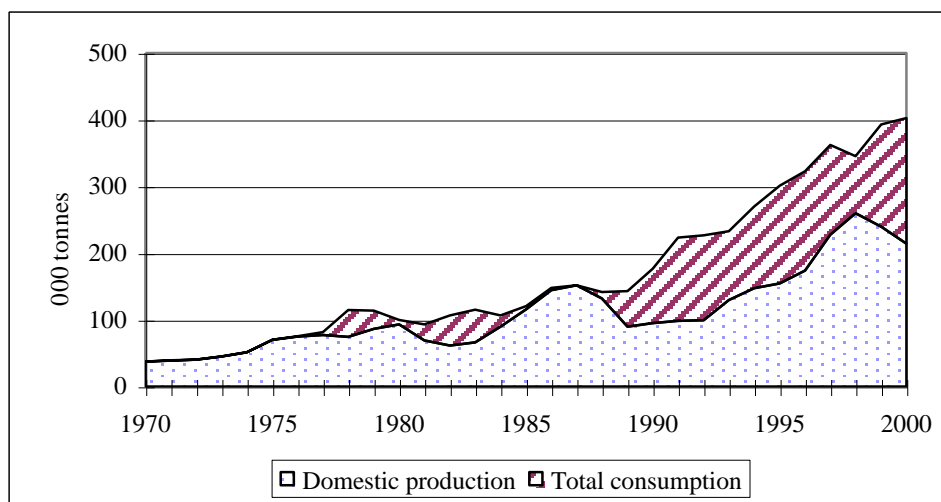
Korea's beef supply has been in deficit in the past few decades. Beef imports to Korea began in 1976 and have since become an essential source of beef supply to the Korean market (Figure 4). In 2000, Korea imported 188134 tonnes of beef which accounted for 47 per cent of total beef supply. In 1996, imported beef supplied 149204 tonnes or 46 per cent of the Korean beef market. As a consequence of the financial crisis in 1997, imports declined in 1998 due to high costs of imports and low household incomes. Beef consumption resumed its increasing trend in 1999, with beef imports increasing in 1999 and continuing to increase in 2000.

However, with the tariffication of beef trade starting from the beginning of 2001, beef imports to Korea had not increased as some might have expected. In fact, beef imports for the first half of 2001 had reduced by 42 per cent compared to the same period in 2000. A number of reasons are responsible for this.

- To prepare for the beef trade opening up, the government accumulated beef stocks (50000 tonnes on 1 January 2001) to curb any undue large quantity of imports.
- The animal disease outbreaks, BSE in EU and FMD in many parts of the world in early 2001, affected the Korean beef consumption significantly.

- Slow economy and weak currency were additional factors for the reduced imports.

Figure 4. Beef Supply in Korea: Domestic Production and Imports, 1970-2000



Source: NACF, *Materials on Price, Supply and Demand of Livestock Products 2001*, p. 102.

By August 2001, government beef stocks had reduced to 20000 tonnes from 50000 tonnes on 1 January 2001. The demand for beef is also recovering from public concerns about BSE and FMD in early 2001. Thus, it has been anticipated that beef imports to Korea will start to increase from late 2001 (Lugsdin 2001).

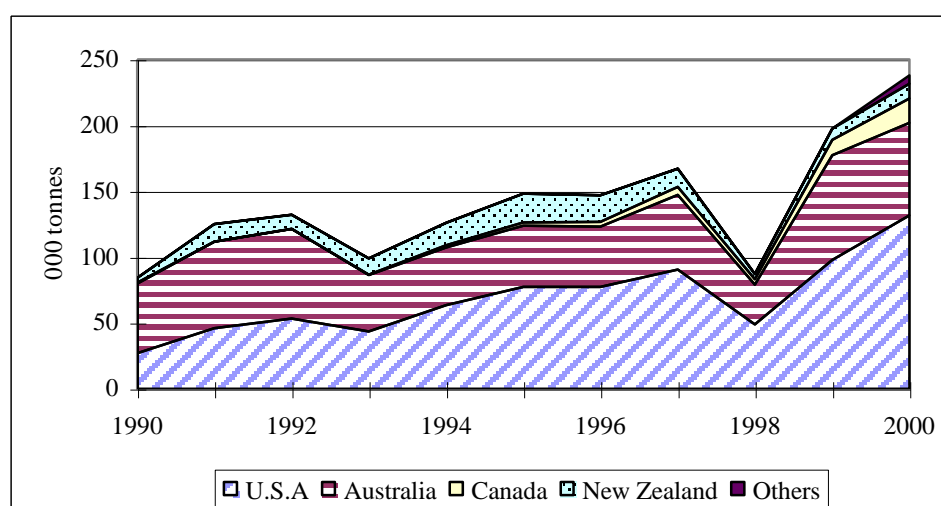
Major beef suppliers to the Korean market are U.S.A., Canada, Australia, and New Zealand. In terms of volume, the largest share was held by Australia until 1992, but since 1993 this has been held by U.S.A. (see Figure 5).

Among the suppliers to the Korean beef market, U.S.A. and Canada receive higher unit beef prices than do Australia and New Zealand (Table 8). Higher priced beef is mostly grain-fed beef and lower priced beef is known to be grass-fed.

For several years, starting in 1985, the Korean government banned beef imports because domestic beef prices had plunged with a surge in supply. In 1989, U.S.A., Australia, and New Zealand filed a complaint to GATT regarding the ban. Following the conclusion of the GATT panel on the disputes, there were a series of bilateral negotiations on how to implement the panel's conclusions. As a result, Korea set up a beef import quota of 186 thousand tonnes for a three-year period from 1990 to 1992 (However, the actual imports were 334 thousand tonnes for this time period; see Table 1). At the same time, the 'simultaneous-buy-sell' (SBS) system was introduced to allow direct

bidding between foreign suppliers and domestic buyers for an agreed portion of the annual quota. The percentage of beef imported under the SBS system was agreed to be at 7 per cent during 1990 to 1992. With subsequent negotiations, the beef import quota was increased and the proportion of SBS trade was also increased up to 30 per cent in 1995.

Figure 5. Changes in Korean Beef Market Share among Major Exporters, 1990-2000



Sources: 1990-1997: personal communications with Livestock Products Marketing Corporation (LPMO) and 1998-2000: Korea Meat Trade Association (<http://kmta.or.kr/kmta.html>).

Table 8. Unit Import Prices by Origin (US\$/kg)

	USA	Australia	Canada	New Zealand	Other	Average
1990	4.10	3.49	4.05	3.38		3.69
1991	4.04	3.29	4.44	3.19		3.56
1992	4.29	3.09	4.12	3.05		3.58
1993	4.25	2.78	3.91	2.55		3.40
1994	3.99	2.93	3.85	2.96		3.48
1995	4.22	2.92	4.48	2.98		3.63
1996	3.92	2.60	3.94	2.62		3.33
1997	3.59	2.50	3.42	2.52		3.12
1998	3.18	1.80	2.94	2.24	2.00	2.65
1999	3.28	1.82	3.21	2.08	5.60	2.64
2000	3.76	2.00	3.40	2.47	1.79	3.10
2001*	3.44	1.99	3.08	2.03	1.87	2.85

* January to August

Source: 1998-2000: Korea Meat Trade Association (<http://kmta.or.kr/kmta.html>); 1990-1997: personal communications with Livestock Products Marketing Corporation (LPMO).

Following the conclusion of the GATT Uruguay Round in late 1993, three changes were brought to Korea's beef trading: (1) Korea's annual beef import quota was to be increased, (2) the tariff rate and mark-up level was to be gradually scaled down, and (3) the proportion of SBS trade was to be increased up to 70 per cent of the total annual quota by 2000 (Table 9). Actual imports equalled or exceeded the quota in most years but were below the quota in the years following the financial difficulties in 1997. On 1 January 2001, beef import quota, SBS, and the mark-up system were all abolished. Beef can now be imported to Korea with a tariff only, at a rate of 41.2 per cent.

Table 9. Tariff, Quota, and Imports of Beef, 1994-2001

	Tariff Rate (%)	Mark-up (%)	% of SBS	Quota (000 t)			Imports (000 t)		
				Total	LPMO	SBS	Total	LPMO	SBS
1994	20.0	95	20	106	85	21	120	100	20
1995	43.6	70	30	123	86	37	148	111	37
1996	43.2	60	40	147	88	59	147	88	59
1997	42.8	40	50	167	83	84	152	75	77
1998	42.4	20	60	187	75	112	87	35	52
1999	42.0	10	70	206	62	144	168	60	107
2000	41.6	0	70	225	67	158	225	67	158
2001	41.2	n.a.	n.a.	n.a.	n.a.	n.a.			

Note: n.a. is not applicable. Mark-up is a levy charged to imported price in order to cover the gap between domestic and world price.

Sources: Tariff rate, mark-up and quota: Livestock Bureau 2000, *Livestock Handbook*, p. 95. Imports data (total, LPMO, SBS): personal communications with agents in the Livestock Products Marketing Corporation (LPMO).

3.3 Prospects of Beef Imports

The tariffication of beef trade will have a significant impact on the Korean beef industry and market. The Korean government has responded to the opening up of the beef market by devising non-market measures such as direct payments, disease management, and subsidies for environmental facilities in order to encourage domestic beef production. However, producers have largely responded to the market opening up by moving out of the beef industry or shifting to the production of better quality beef. In the past three years, beef production has shown a clear declining trend (Table 1). While government's non-market supporting measures may help to curtail or reverse this trend to some extent, overall, there will still be a significant gap between beef demand and supply as projected by the government (Table 7). At best, the self-

sufficiency rate can be optimistically projected to be at 36.3 per cent by 2010, when the consumption will be 536 thousand tonnes while the total production will only be 195 thousand tonnes.

As a whole, Koreans are very patriotic and prefer to buy domestically produced beef. However, with the removal of the dual retail system, domestic and imported beef are no longer sold separately. Consumers have the opportunity to compare the quality and the price of the imported and domestically produced beef. Assuming quality difference is minimal, ultimately, price may become the major determining factor that influences consumers' decision in buying imported or domestically produced beef. A study of the cross price elasticity between domestic and imported beef tends to suggest that, for the same percentage price increase, an increase in domestic beef price will result in a larger demand for imported beef (Choi and Lee 2000, p. 84). According to the findings by Choi and Lee, the cross price elasticity between domestic and imported beef is 0.57; that is, a 10 per cent increase in the price of domestic beef results in a 5.7 per cent increase in imported beef consumption. However, the cross price elasticity between imported and domestic beef is only 0.23; that is, a 10 per cent increase in imported beef price only results in a 2.3 per cent increase in domestic beef consumption.

Major beef exporting countries, such as U.S.A., Australia and New Zealand, continuously place pressure on Korea for more favourable terms to export their beef to Korea. If there are further cuts in import tariffs, imported beef will become relatively even cheaper compared to domestically produced beef. This is likely to encourage Korean consumers to buy more imported beef.

All the above discussion clearly indicates that, if there is no major world-wide or regional economic and trade turmoil, there will be significant and increased beef imports to Korea. Conservatively, such imports could be in the range of 320–340 thousand tonnes by the late 2010s, according to Table 7.

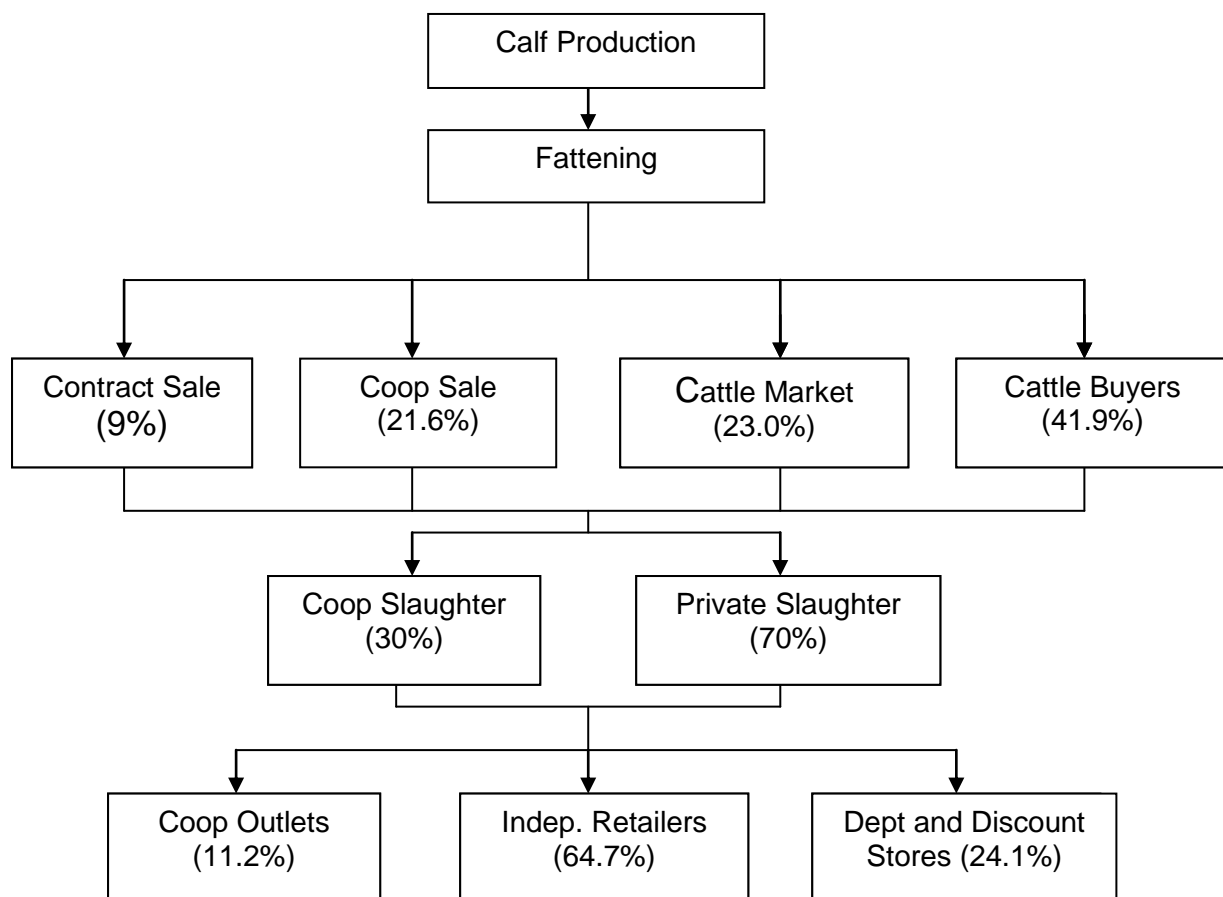
4. Beef Trading Arrangements in Korea

4.1 Supply Chains of Domestically-produced Beef

Domestic beef supply chains are composed of two stages: cattle marketing and slaughtering, and beef retailing. Cattle is sold with a direct contract, through cooperatives or private handlers. Most brand name beef is supplied

through direct contract with large-scale retailers. Private handlers purchase cattle either in major cattle markets or on farms. Cattle procured by the cooperatives or by private handlers are then delivered to slaughterers (Figure 6). There are about 140 slaughterers in Korea, of whom 12 are licensed by local governments as wholesale markets. The slaughterer-wholesaler sets the price of carcasses through an open tender among designated wholesale agents. Beef is graded by inspectors at all slaughterers. There is an over-capacity of slaughtering. Most slaughterers are small in scale and operate in traditional ways. Recently the government started to administer an approval of the HACCP-based (Hazard Analysis Critical Control Point) slaughterers. As of 20 August 2001, there were 20 slaughterers approved as operating under the HACCP principles and of these nine are beef cattle slaughterers.

Figure 6. Supply Chains of Domestic Beef, 1999



At the second stage of the beef supply chains, about 11 per cent of beef is retailed through cooperative outlets, 65 per cent through independent retailers, and 24 per cent through department stores and discount stores

(Figure 6). The proportion of beef sold through department and discount stores is on the rise.

As mentioned earlier, there are 86 'brand name beef cooperatives'. They market their beef at their own shops (30%) or through department stores or large-scale discount stores (28%). Sometimes they sell cattle to the middle-man at the farm gate (30%), to packers (7%), or to the middle-man at the cattle market (6%). Most brand name cooperatives have difficulties in securing stable outlets for their branded beef. Their small scale also prevents them from marketing their products nation-wide.

Beef prices tend to fluctuate over years (Table 10). In 2000, the farm gate, wholesale and retail prices were 5504 Won/kg, 7414 Won/kg and 17418 Won/kg, respectively.

Table 10. Beef Prices in Korea, 1977-2000

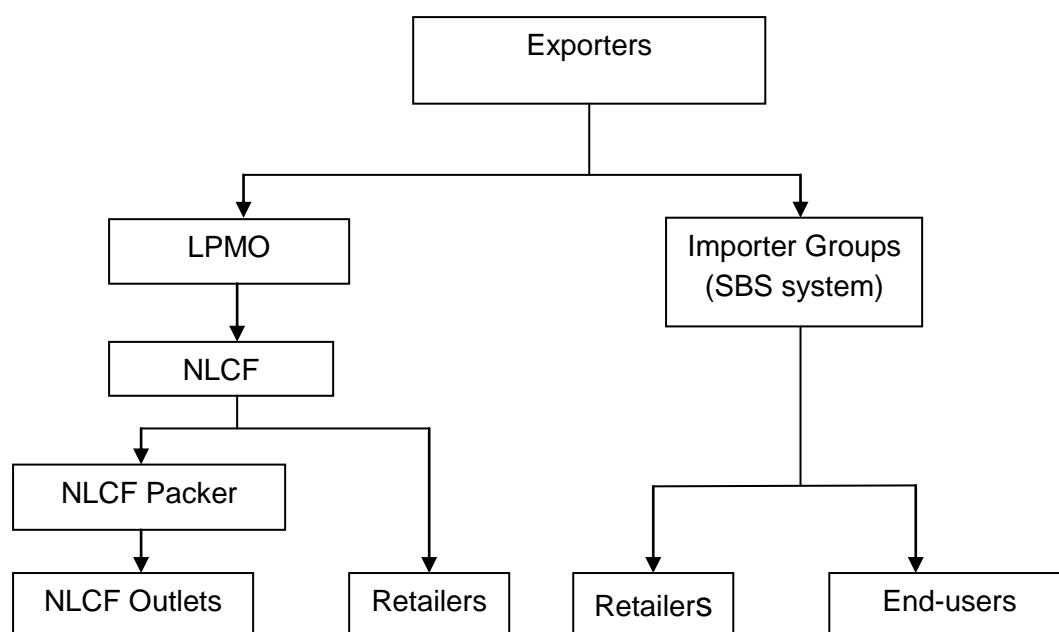
	Farm Gate won/500kg	Wholesale won/kg	Retail won/500g	Calf Male won /head
1977	633,400	2,371	1,380	145,300
1978	855,900	2,729	1,730	291,691
1979	835,500	2,818	1,929	231,700
1980	981,400	3,577	2,410	283,058
1981	1,451,300	4,834	3,232	544,658
1982	1,769,300	5,437	3,716	804,550
1983	1,900,500	5,927	4,118	909,000
1984	1,788,600	5,723	4,158	651,400
1985	1,381,400	4,384	3,527	443,600
1986	1,243,500	3,875	3,117	376,000
1987	1,268,000	3,904	3,198	464,000
1988	1,755,500	5,500	4,138	652,000
1989	2,167,500	6,243	5,213	1,022,000
1990	2,405,500	6,629	5,725	1,217,000
1991	2,740,100	7,328	6,442	1,540,000
1992	3,003,600	7,634	7,085	1,677,000
1993	2,692,600	6,811	7,395	1,375,000
1994	2,917,900	7,244	7,719	1,592,000
1995	3,173,000	7,914	8,093	1,887,000
1996	2,848,000	6,971	8,118	1,562,000
1997	2,426,000	5,618	7,537	1,046,000
1998	2,007,000	5,438	6,911	658,000
1999	2,488,000	7,028	7,235	1,024,000
2000	2,752,000	7,414	8,709	1,294,000

Source: National Agricultural Cooperatives Federation, *Materials on Price, Supply and Demand of Livestock Products*, various issues.

4.2 Marketing Arrangements for Imported Beef

Beef under quota was imported and supplied to the Korean market through two major chains: the state trading agency known as the LPMO (Livestock Products Marketing Organisation), and the private sector through the SBS system (see Figure 7).

Figure 7. Supply Chains of Imported Beef; before 1 January 2001

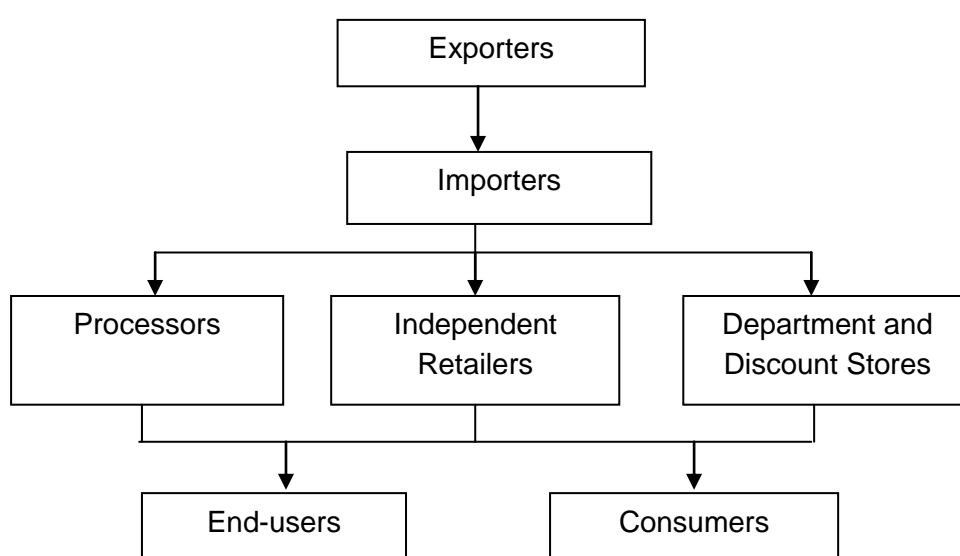


The LPMO, as a state trading agency, imported beef for price control in the domestic market. Beef imported by the LPMO was marketed through outlets of the NLCF (National Livestock Cooperatives Federation). Some beef packed by NLCF was sold at the retailers designated as import beef sellers. There were about 5000 import beef sellers.

The private sector imported beef through the SBS system. The licensed importing groups (so-called “super group”) included, for example, NLCF, Korea Superchain Store Association (KOSCA), Korea Tourist Hotel Supply Centre (KTHSC), and Korea Cold Storage Co. Ltd (KCSC). The super groups are usually associations representing their end-users. Beef imported through the LPMO could be purchased under an open tender system. Anyone can buy the imported beef from LPMO through NLCF and then re-sell it to end users (The SBS system has been abolished following the beef trade liberalisation). Import prices under the SBS system were negotiated between exporters and the super groups.

With the removal of beef import quotas on 1 January 2001, importers can directly contact exporters (Figure 8). Now tariff is the only restriction to beef import. In addition, with the WTO panel's conclusion against Korea's dual retail system, all retailing butchers will be able to sell imported beef. From September 2001, over 40000 butchers, in addition to about another 5000 exclusively designated as import beef sellers, are eligible to sell imported beef. Furthermore, imported beef can now also be sold in the same outlets as domestic beef.

Figure 8. Supply Chains of Imported Beef; after 1 January 2001



5. Summary and Concluding Comments

In this study, we examined the current status of beef consumption and its trends in Korea; Korea's beef production and supply potential; beef import prospects; responses in the Korean beef industry to beef market liberalisation; and beef trading arrangements in Korea.

In recent years, beef has become an integral part of the Korean diet and Koreans' beef consumption has increased steadily. While the growth rate of consumption of other major meats (pork and chicken) has slowed down, the growth rate of beef consumption has increased. With increasing consumer income and a further tendency towards western style food, beef consumption and thus the demand for beef in Korea is expected to increase.

In spite of the strong demand for beef, the potential for Korea to substantially increase its beef production does not seem to be great. The Korean beef industry has been facing a tremendous challenge in the past

years due to the pressure for liberalisation of the beef trade. Fearing an influx of cheaper imported beef into Korea and subsequently a weaker domestic beef sector, producers have responded to liberalisation by reducing the number of cattle or leaving the industry.

Being aware of limitations in price competition with imported beef, some producers have formed cooperatives, to produce quality beef and differentiated beef products (through branding). However, this does not contribute to increasing the total beef production of the country.

With the beef market opening up, the Korean government could no longer use non-tariff trade restrictions to protect its domestic beef industry. The government has responded by increasingly using some non-market measures such as direct payments, disease management, and subsidies for environmental facilities. Even with these supports, however, Korea's potential to increase beef production is still very limited.

It is projected that Korea's beef self-sufficiency rate will become lower compared to the current level. Hence beef imports are expected to increase. The removal of the dual retail system has allowed imported and domestic beef to be sold in the same retail outlet, and any retailer is now allowed to sell imported beef. These changes in beef marketing arrangements will further contribute to the increase in beef imports. Conservatively, beef imports are expected to increase from 188 thousand tonnes in 2000 to 325 thousand tonnes by 2005.

The changes in the Korean beef market will provide major beef exporters such as Australia with greater export potential. Australia is the largest exporter of disease-free beef in the world. It also has well-established production and feedlot systems to respond to any major changes in the international beef market. It will be most advantageous for Australia to capitalise on these competitive strengths to increase its market share in the Korean market. Currently the Australian dollar is low and this further lends a competitive advantage to Australian beef exports.

To realise the maximum potential of beef exports to the Korean market, it is imperative for the Australian beef industry to form a longer-term business strategy to trade with Korea. The establishment of a sustainable partner relationship with Korean counterparts is very important and will benefit the Australian beef industry immensely. As a means of establishing good relationships, the Australian beef industry could consider providing the Korean beef industry with technical assistance in quality assurance. Such assistance, properly implemented, would also ensure that Australian beef will be handled

and retailed in the Korean market in a manner that assures its quality, thus projecting a good image of Australian beef in the minds of Korean consumers.

The Australian beef industry needs to form long-term alliances with leading beef distributors both within Australia and in Korea. Such alliances in Korea will facilitate the Australian beef industry to identify, in a timely way, any changes in the needs of the markets. Similar alliances in Australia will help the industry to respond rapidly to changes identified in the Korean market.

The opening up of the Korean beef market will provide greater export potential not only to Australia but also to any other beef exporters. Hence, the competition in the Korean beef market between those exporters will be tense. It is important for the Australian beef industry to keep abreast of developments in the Korean beef market as well as activities of the major competitors. As a result of several beef trade liberalisation measures introduced this year, changes have taken place and will continue to take place in the supply chains of imported beef, an area in which further investigation is warranted and should be rewarding to the Australian beef industry.

References

- Animal Products Grading Service (2001), *Animal Products Grading Report 2000*, Animal Products Grading Service, National Agricultural Cooperatives Federation, Seoul.
- Choi, J.H. and Lee, G.I. (2000), 'Meat demand situation and prospects of consumption', paper presented at the annual meeting of Korea Livestock Management Association, September 23.
- Korea Meat Trade Association (KMTA) (<http://kmta.or.kr/kmta.html>).
- Livestock Bureau (2000), *Livestock Handbook*, Ministry of Agriculture and Forestry, Government of the Republic of Korea, Seoul, p. 95.
- Lugsdin, A. (2001), 'Beef market potential in Korea', presentation at the "Understanding the Korean Beef Market" forum, the University of Sydney – Orange, 15 August.
- MAF (Ministry of Agriculture and Forestry) (n.d.), 'Westernisation of food consumption pattern', Government of the Republic of Korea, Seoul. http://www.maf.go.kr/english/maf_2000.asp, accessed on 23 September 2001.
- MAF (2001a), 'A comprehensive development program for Hanwoo industry', Government of the Republic of Korea, Seoul.
- MAF (2001b), *Major Statistics of Agriculture and Forestry 2001*, Government of the Republic of Korea, Seoul.
- MAF, *Livestock Statistics*, various issues, Government of the Republic of Korea, Seoul.
- NACF (National Agricultural Cooperatives Federation) (2000), 'A Survey on Consumers' Purchasing of Beef', Research Report, Research Bureau, National Agricultural Cooperatives Federation, Seoul.
- NACF, *Materials on Price, Supply and Demand of Livestock Products*, various issues, Livestock Bureau, National Agricultural Cooperatives Federation, Seoul.
- NAQS (National Agricultural Products Quality Management Service) (2001), *Livestock Production Costs 2000*, National Agricultural Products Quality Management Service, Ministry of Agriculture and Forestry, Seoul.
- Nongmin-shinmun ('Farmers' Daily') (2001), 'There are 86 brand named Korean beef producers', *Farmers' Daily*, May 29, p. 3.
- Yoo, C.H. (2000), 'Liberalisation of beef market and prospects of the Korean beef cattle sector', *Journal of Rural Development*, Vol. 23. No. 2, pp. 183-208.