Report on Canadian Beef Supply and Disposition with Beef Quality Categorization

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Background

The Canadian beef industry has undergone extensive structural change during the past ten years. There has been a significant westward shift of production, primarily from Ontario and Manitoba to Alberta. Cattle feeding and slaughter activities have concentrated in Alberta with producing units becoming larger in size and fewer in number. International trade has become an increasingly important component of the Canadian market with beef imports almost doubling in the 1988-1994 period while beef exports essentially tripled during the same time span. Live cattle imports and exports more than doubled in the 1988-1994 period, however cattle imports are small relative to exports.

During the past five years, Canadian imports of high quality beef, mainly from the United States, increased dramatically. This development can be attributed, in large part, to the benefits of trade. The major consumption centres in eastern Canada (Montreal and Toronto), are located closer to U.S. beef production centres than to Alberta, Canada's major producing region. Conversely, Alberta is closer to U.S. west coast and central beef consumption centres than the major U.S. production centres are. Regional differences in tastes and preferences also provide incentives to trade. For example, Select and No-roll product from the United States, which is discounted in the U.S. relative to Choice grade on the basis of lack of fat marbling, has found a market in Canada where it competes in the lean end of the domestic fed beef market.

The development of a more open international trading environment, primarily resulting from the Uruguay Round, CUSTA and NAFTA agreements, has resulted in a more open and competitive North American beef market. Canada's imports of beef from the U.S. have increased in recent years compared to the levels of the late 1980s. Non-NAFTA beef imports, mainly lower quality manufacturing cuts and grinding meat from Oceania, increased sharply in 1993 - 1994 when access to the U.S. market was more restricted but have since declined as North American manufacturing beef production has increased.

The pressures for changes in beef trade policy from different segments of the Canadian beef industry gave rise to the need for a better understanding of the domestic supply and disposition of beef by major quality types. The initial results of the work on this project were reported to the Beef Industry Trade and Development Committee which was responsible for making recommendations to the Minister of Agriculture on Canada's beef trade policy. This current project builds on the initial work that was reported to the committee.

Objective

The primary objective of this project is to develop an accounting system which provides estimates of Canadian beef production, imports, exports, stocks, and consumption classified by three major quality types: High Quality, Manufacturing Cuts and Grinding beef.

The main outputs of this report are results of the calculations for the components of the supply and disposition for the period 1990 -1996 and a forecast for these components for the 1997 - 1999 period.

Overview of Methodology

The calculations are based on the estimates of the supply and disposition of Canadian beef which are published annually by Statistics Canada (STC), Catalogue 23-603. The STC beef supply and disposition calculation is based primarily on survey data with beef consumption being calculated as the residual of supply minus exports and ending stocks. The supply and disposition calculations developed in this project mirror the STC calculations with the additional feature that each of the components is resolved into its three quality components, plus fat trim and bone. The results are reported on a product weight basis.

Product Weight and Composition

The definition of beef used in this project does not include veal. These calculations are made on a “product weight equivalent” basis whereas the STC calculations are based on a “cold carcass weight” basis. Carcass weight specification has some advantages when the focus of analysis is on production at the farm or slaughter plant level. The initial use of these calculations was for trade policy development, therefore it was decided to use the product weight basis which closely approximates the “as shipped” weight reported by STC for international trade. This allows users to view the total product flow for the industry on the same basis as international trade is reported. This served to facilitate the use of this work for policy development related to the beef Tariff Rate Quota. The conversion of beef carcasses to product (cuts and grinding meat) results in an average of approximately 25% of the carcass weight being removed as fat and bone. The trade data is factored into the three quality types using the relative proportions developed by Paul D. MacInnes & Associates and reported in Supply & Disposition of Canadian Beef, March 23, 1995 and in the update to this study dated April 30, 1996. For more details on this aspect of the calculations, see Appendix C.

Definitions of Beef Quality Types

High Quality - beef which generally comes from youthful, grain fed cattle and is predominantly used for high quality table cuts.

Manufacturing - beef which is produced from cull cattle, grass fed youthful cattle and lower quality cuts from grain fed cattle. Manufacturing beef is further classified into two main groups:

a) *Manufacturing Cuts* which are processed into deli meats and cuts such as those used to produce prepared meals.
b) *Grinding beef* which is used mainly in hamburger patties, ground beef and further processed products such as wieners, sausages and soups.

Stocks

It was assumed that frozen stocks were made up of manufacturing cuts and grinding beef. The proportions of manufacturing cuts and grinding beef in stocks of domestic origin was assumed to be the same as the ratio of these types of beef in domestic production. In the case of stocks of imported beef, the proportions were assumed to be the same as those found in fresh and frozen beef imports.

Imports

The dressed beef import and export quality factors were determined by an independent consulting firm using industry surveys. The data which was reported represented over 80% of the total for both the imports and exports of fresh/chilled and frozen beef. The percentage distribution for each of the qualities of beef was calculated from this data and then applied to the volume of beef imports as reported by Statistics Canada.

Components of Beef Supply and Disposition (1990-1996 & Forecast to 1999)

A summary of the results of the calculations are presented below in the section titled “Beef Supply and Beef Disposition” with more detailed results in Appendix A. The calculations are based on annual data for the historical period 1990 - 1996 (Tables A1 -A11) and the forecast period 1997 - 1999 (Tables 1-8). Please refer to Appendix B for more detailed explanations on methodology and data used in the production calculations.

Supply is calculated as the sum of domestic dressed beef production, beef imports from all countries, and beginning stocks of frozen beef of domestic and foreign origin. (Supply = Production + Imports + Beginning Stocks).

Production

Domestic beef production is defined, for the purpose of this project, as the product weight equivalent (pwe) of beef produced from total cattle slaughter in Canada. This includes beef from the slaughter of cattle of both domestic and foreign origin (e.g., United States).

Canadian beef production fluctuated in the range of 615 kt to 645 kt during the 1990 - 1995 period, then increased to 727 kt in 1996 (Table 1). This increase in slaughter was due to the combination of increased slaughter capacity in western Canada and increased slaughter cattle marketings as the cattle cycle reached the liquidation phase.

Table 1. Domestic Beef Production (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total Product	Fat & Bone Trim	Total Carcass Equivalent
1990	307,576	46,174	287,880	641,629	216,302	857,931
1991	292,837	45,791	277,332	615,960	207,721	823,681
1992	304,252	46,401	288,994	639,647	215,615	855,262
1993	295,455	43,870	276,019	615,344	207,367	822,711
1994	314,579	45,048	285,141	644,767	217,014	861,781
1995	323,615	46,337	294,504	664,457	223,634	888,091
1996	351,965	51,137	324,063	727,166	244,811	971,977
1997	395,515	58,560	369,453	823,528	277,428	1,100,956
1998	402,016	59,226	374,109	835,350	281,344	1,116,694
1999	408,876	56,881	364,474	830,232	278,955	1,109,187

During the 1990 - 1996 period the composition of beef production by quality type remained relatively constant. High quality cuts made up about 48% of total beef production, grinding beef accounting for 45%, and the remainder 7%, manufacturing cuts.

The contributions to total beef production by quality of animal (i.e., fed vs non-fed) has fluctuated slightly, averaging about 81% for fed beef and about 19% for non-fed beef during the 1990 - 1996 period (Table 2). On average, non-fed slaughter was the source of 4.3% of High Quality cuts, 41% of Manufacturing Cuts and 31% of Grinding beef production (Table 2). Although nearly 70% of total grinding beef production in Canada comes from fed cattle, it should be borne in mind that on a lean meat equivalent basis, this percentage would be considerably lower.

Table 2. Fed and Non-Fed Beef Production as Percent Category

	High Quality		Mft. Cuts		Grinding		Total	
Year	**Non-fed**	**Fed**	**Non-fed**	**Fed**	**Non-fed**	**Fed**	**Non-fed**	**Fed**
1990	4.5	95.5	41.3	58.7	31.7	68.3	19.4	80.6
1991	4.8	95.2	43.9	56.1	32.8	67.2	20.4	79.6
1992	4.4	95.6	42.2	57.8	32.7	67.3	19.9	80.1
1993	4.2	95.8	40.5	59.5	31.5	68.5	19.0	81.0
1994	3.9	96.1	38.0	62.0	29.2	70.8	17.4	82.6
1995	3.8	96.2	38.0	62.0	29.4	70.6	17.6	82.4
1996	4.0	96.0	39.0	61.0	30.3	69.7	18.2	81.8
1997	4.2	95.8	40.2	59.8	31.4	68.6	19.0	81.0
1998	4.2	95.8	39.9	60.1	31.1	68.9	18.7	81.3
1999	3.5	96.5	35.9	64.1	27.6	72.4	16.3	83.7

The Canadian cattle herd was in the expansion phase of the cattle cycle during the 1987-1995 period, resulting in a reduced rate of female marketings as cow culling was curtailed and heifers were diverted from the slaughter stream to the breeding herd. Steer marketings began to increase in 1992, however heifer marketings did not show marked increases until 1996 when their retention for breeding purposes began to decline. Cull cattle marketings were low during the 1993 - 1995 period as beef producers extended the production life of their mature cows in order to more quickly increase their feeder calf output. The cost of feed grains began to increase in 1994 and trended upward until the fall of 1996. As a result, the cost of cattle feeding escalated, initiating a sharp decline in feeder prices which curtailed the expansion of the breeding herd. Additional heifers were directed to the fed cattle production stream as retention rates declined. At the same time, increased cow culling contributed to non-fed beef output.

The 1997- 1999 data is based on AAFC forecasts. It is assumed that Canadian cattle slaughter will increase through the forecast period, given the current expansion of domestic slaughter capacity and the expected high level of cattle marketings as the industry reaches the peak in the cattle production cycle later in the decade. Assuming that feed grain prices return to trend line averages, beef herd rebuilding is expected to commence again in 1999, resulting in declines in both slaughter cattle marketings and domestic beef production. Beef production is forecasted to continue to increase, reaching a peak in 1998, after which it is expected to decline as the liquidation phase ends (Table 1).

Beef Imports

Fresh / chilled and frozen beef make up more than 90% of Canada's dressed beef imports with the remainder being processed and cured beef. The main suppliers of fresh and frozen beef to Canada are the United States, Australia and New Zealand (Table 3). Beef imports from the U.S. are mostly high quality cuts, while those from the Oceanic countries are

Table 3. Imports of Fresh/Chilled and Frozen Beef (product weight - tonnes)

	New Zealand				Australia			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	947	10,422	12,317	23,686	629	7,861	22,954	31,444
1991	733	12,705	10,995	24,433	728	8,732	26,925	36,384
1992	801	11,208	8,006	20,015	978	9,776	38,128	48,882
1993	4,615	18,846	15,000	38,462	727	13,092	58,914	72,734
1994	3,195	15,230	33,613	52,038	1,225	13,309	43,508	58,042
1995	3,530	17,069	22,343	42,942	373	9,653	27,680	37,706
1996	3,238	18,502	24,515	46,255	408	6,389	19,534	26,332
1997	3,500	20,000	26,500	50,000	388	6,066	18,546	25,000
1998	3,500	20,000	26,500	50,000	419	6,552	20,030	27,000
1999	3,500	20,000	26,500	50,000	465	7,280	2,256	30,000

	United States				All Countries			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	58,949	1,254	1,254	61,457	60,525	39,204	36,525	136,254
1991	79,912	1,700	1,700	83,313	81,373	35,503	39,620	156,496
1992	74,193	3,124	781	78,098	75,971	32,280	46,915	155,166
1993	71,271	1,500	2,251	75,022	76,614	36,121	76,165	188,900
1994	83,198	1,719	2,807	87,725	87,618	33,820	79,929	201,367
1995	88,948	2,588	3,261	94,797	92,851	32,019	53,284	178,154
1996	84,854	2,109	2,986	89,950	88,500	27,031	47,036	162,567
1997	70,751	1,759	2,490	75,000	74,639	27,855	47,536	150,030
1998	66,035	1,642	2,324	70,000	69,953	28,223	48,854	147,030
1999	66,035	1,642	2,324	70,000	70,000	28,951	51,080	150,030

mainly grinding beef and manufacturing cuts. Australia has supplied mostly grinding beef, while beef from New Zealand has had a higher proportion of manufacturing cuts in recent years. The relative proportions of Canadian beef imports supplied by the major source countries have fluctuated widely, averaging about 19% from New Zealand, 28% from Australia and 48% from the U.S. during 1990-1995. The U.S. was the main source of high quality imports with manufacturing type beef coming primarily from Oceania. The wide variations of volumes, particularly from Oceanic countries is evident in Table 3.

Beef imports increased sharply in the 1993-1994 period, averaging about 211 kt per year compared to 147 kt in 1990 (Table 4). Canada's beef safeguard, which came into effect mid-1993, set a tariff rate quota of 48,014 tonnes for the period of May 1 to December 31, 1993. This quota was filled by July 14, after which a 25% ad valorem surtax was imposed on non-NAFTA beef imports. The safeguard set the 1994 tariff rate quota at 72,021 tonnes, however additional imports under supplementary import permits and beef imported with surtax brought the total to near 114 kt. On January 1, 1995, the GATT Tariff Rate Quota (76,409 tonnes) was implemented with an over-quota tariff rate of 30.3%. No over-quota tariffs were paid on beef imports for either 1995 and 1996.

Imports for the forecast period were assumed to be on a declining trend due primarily to the increased domestic beef production that is expected to take place in western Canada. This scenario would result in beef imports declining from a peak of 218 kt in 1994 to about 160 kt in 1999 (Table 4).

Stocks

Beginning stocks of frozen beef of both domestic and foreign origin have been relatively small, increasing in 1994 and 1995 as market uncertainty increased during the period of development of beef trade policy (Table 5).

Disposition of Beef

Disposition is defined as the sum of ending stocks, exports and domestic disappearance (consumption) (Disposition = Ending Stocks + Exports +Disappearance).
The balance sheet requires that disposition be equal to supply. Given that production, imports, exports and stocks are reported to statistical agencies, domestic disappearance can be calculated from the balance sheet as the residual of supply minus exports minus ending stocks of frozen beef.

Exports

Canadian exports of fresh, chilled and frozen beef grew at higher rates than imports, more than doubling in the 1990 - 1995 period, reaching 189 kt in 1996 which surpassed imports (Table 6). Exports of prepared and cured beef have been very small, representing less than

Table 4. Total Imports of Beef (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
Fresh/Chilled & Frozen				
1990	60,525	39,204	36,525	136,254
1991	81,373	35,503	39,620	156,496
1992	75,971	32,280	46,915	155,166
1993	76,614	36,121	76,165	188,900
1994	87,618	33,820	79,929	201,367
1995	92,851	32,019	53,284	178,154
1996	88,500	27,031	47,036	162,567
1997	74,639	27,855	47,536	150,030
1998	69,953	28,223	48,854	147,030
1999	70,000	28,951	51,080	150,030
Year	**High Quality**	**Mft. Cuts**	**Grinding**	**Total**
Prepared and Cured				
1990	0	9,248	1,335	10,584
1991	0	10,098	1,919	12,016
1992	0	11,721	2,655	14,376
1993	0	13,586	2,972	16,558
1994	0	13,343	3,515	16,858
1995	0	10,592	3,812	14,404
1996	0	6,000	4,000	10,000
1997	0	6,000	4,000	10,000
1998	0	6,000	4,000	10,000
1999	0	6,000	4,000	10,000
Year	**High Quality**	**Mft. Cuts**	**Grinding**	**Total**
Total				
1990	60,525	48,453	37,860	146,838
1991	81,373	45,601	41,538	168,512
1992	75,971	44,002	49,569	169,542
1993	76,614	49,708	79,136	205,458
1994	87,618	47,163	83,444	218,225
1995	92,851	42,611	57,096	192,558
1996	88,500	33,031	51,036	172,567
1997	74,639	33,855	51,536	160,030
1998	69,953	34,223	52,854	157,030
1999	70,000	34,951	55,080	160,030

Table 5. Beginning Frozen Beef Stocks (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
Domestic				
1990	-	1,112	6,936	8,048
1991	-	790	4,924	5,714
1992	-	979	5,927	6,906
1993	-	791	4,925	5,716
1994	-	1,092	6,868	7,960
1995	-	1,311	8,299	9,610
1996	-	1,073	6,821	7,894
1997	-	990	6,273	7,263
1998	-	997	6,288	7,284
1999	-	895	5,651	6,546
2000	-	922	5,906	6,828

Year	High Quality	Mft. Cuts	Grinding	Total
Imports				
1990	-	1,903	2,248	4,151
1991	-	1,804	2,131	3,935
1992	-	2,376	2,056	4,432
1993	-	2,963	2,116	5,079
1994	-	5,094	4,054	9,148
1995	-	3,805	8,397	12,202
1996	-	4,617	6,043	10,660
1997	-	4,219	5,590	9,808
1998	-	4,231	5,606	9,837
1999	-	3,802	5,038	8,839
2000	-	3,966	5,254	9,220

Year	High Quality	Mft. Cuts	Grinding	Total
Domestic and Imports				
1990	-	3,015	9,184	12,199
1991	-	2,593	7,056	9,649
1992	-	3,355	7,983	11,338
1993	-	3,754	7,041	10,795
1994	-	6,185	10,923	17,108
1995	-	5,116	16,696	21,812
1996	-	5,690	12,864	18,554
1997	-	5,209	11,863	17,072
1998	-	5,227	11,893	17,121
1999	-	4,697	10,689	15,385
2000	-	4,887	11,160	16,047

Table 6. Exports of Fresh/Chilled and Frozen Beef (product weight - tonnes)

	U.S.				Japan			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	23,964	6,740	40,438	71,142	1,036	1,838	267	3,141
1991	24,426	6,870	40,455	71,751	1,349	1,263	172	2,785
1992	36,927	11,078	60,315	108,320	1,369	1,369	-	2,739
1993	58,015	10,413	63,965	132,392	849	849	-	1,699
1994	60,877	21,306	66,637	148,820	2,573	495	1,354	4,422
1995	53,687	18,921	74,745	147,353	3,864	689	1,709	6,262
1996	74,500	16,108	86,581	177,189	4,422	819	2,136	7,377
1997	96,938	20,960	112,658	230,556	5,753	1,066	2,779	9,598
1998	101,549	21,379	114,911	237,839	5,868	1,087	2,835	9,790
1999	101,549	21,379	114,911	237,839	5,868	1,087	2,835	9,790

	Other Countries				All Countries			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	177	288	543	1,007	25,176	8,866	41,248	75,290
1991	70	287	276	633	25,845	8,420	40,903	75,169
1992	109	722	18	849	38,406	13,169	60,333	111,908
1993	389	374	89	851	59,253	11,636	64,054	134,942
1994	1,969	467	474	2,910	65,419	22,268	68,465	156,152
1995	2,453	448	623	3,524	60,003	20,059	77,077	157,138
1996	2,822	593	736	4,151	81,744	17,520	89,453	188,717
1997	3,672	772	957	5,402	106,364	22,797	116,394	245,555
1998	3,746	787	977	5,510	111,163	23,253	118,722	253,139
1999	3,746	787	977	5,510	111,163	23,253	118,722	253,139

5% of total beef exports (Table 7). Almost all of Canada's beef exports go to the U.S. with almost half the total being high quality beef. Given that beef production in Canada was relatively constant and consumption declined slightly in the 1990 - 1994 period, increased exports were tied closely to increased imports. This situation is expected to change significantly in the forecast period when slaughter cattle marketings, domestic beef production, and beef exports are forecasted to increase. Imports are expected to decline to the levels of the early 1990s. The major factors in this switch from being a net importer of dressed beef to becoming a net exporter are the increase in modern slaughtering and processing capacity and higher slaughter cattle marketings.

Table 7. Total Exports of Beef (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
Fresh/Chilled & Frozen				
1990	25,176	8,866	41,248	75,290
1991	25,845	8,420	40,903	75,169
1992	38,406	13,169	60,333	111,908
1993	59,253	11,636	64,054	134,942
1994	65,419	22,268	68,465	156,152
1995	60,003	20,059	77,077	157,138
1996	81,744	17,520	89,453	188,717
1997	106,364	22,797	116,394	245,555
1998	111,163	23,253	118,722	253,139
1999	111,163	23,253	118,722	253,139

Year	High Quality	Mft. Cuts	Grinding	Total
Prepared and Cured				
1990	-	1,601	1,406	3,007
1991	-	1,660	1,323	2,983
1992	-	2,033	1,610	3,643
1993	-	4,730	1,716	6,446
1994	-	6,058	2,062	8,120
1995	-	4,566	2,896	7,462
1996	-	4,566	2,896	7,462
1997	-	4,566	2,896	7,462
1998	-	4,566	2,896	7,462
1999	-	4,566	2,896	7,462

Year	High Quality	Mft. Cuts	Grinding	Total
Total				
1990	25,176	10,467	42,654	78,297
1991	25,845	10,080	42,226	78,152
1992	38,406	15,202	61,942	115,551
1993	59,253	16,366	65,770	141,388
1994	65,419	28,327	70,527	164,272
1995	60,003	24,625	79,973	164,600
1996	81,744	22,086	92,349	196,179
1997	106,364	27,363	19,291	253,018
1998	111,163	7,819	121,618	260,601
1999	111,163	27,819	121,618	260,601

Stocks

Ending stocks of frozen beef are taken to be identical to the beginning stocks of the following year.

Consumption

Total consumption of beef in Canada declined in the 1990 - 1993 period, then was relatively flat in the 1994 - 1996 period. The composition of consumption appears to have changed over the 1990 - 1996 period, with both high quality and manufacturing beef declining while grinding beef consumption remained relatively flat (Table 8).

Table 8. Beef Consumption (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
All Sources				
1990	342,925	84,581	285,214	712,720
1991	348,365	80,551	275,716	704,632
1992	341,818	74,801	277,563	694,182
1993	312,816	74,780	285,504	673,101
1994	336,778	64,955	292,284	694,016
1995	356,463	63,749	275,459	695,672
1996	358,722	62,563	283,751	705,036
1997	363,790	65,033	301,668	730,491
1998	360,805	66,161	306,549	733,515
1999	367,713	64,013	297,935	729,661

Errors in estimating the consumption of the three types of beef are sensitive to the errors in the estimates in the proportions in imports and exports in addition to the errors in estimating the proportions in domestic production. Although the breakout of carcasses into cuts and trim is probably quite constant, economics will determine whether certain cuts are marketed as cuts or as grinding meat. The effects of relative beef prices and supplies on the proportions of grinding beef derived from a carcass have not been determined in this work, therefore the combined effect will show up as errors in consumption.

Conclusions

The period from 1990 to 1995 provided Canadian beef producers with challenges, particularly with respect to imports of manufacturing beef. Disagreements arose within the industry as to the need for imports of non-NAFTA manufacturing beef above the level (76,409 tonnes) established by the tariff rate quota in accordance with the most recent GATT agreement. Cattle producers took the position that there was enough beef being produced to satisfy domestic demand, while further processors maintained that the particular type and quality of beef required for their products was not available in sufficient quantities from domestic sources. The resultant policy development process required a more definitive assessment of the supply and disposition of beef in the Canadian market than had been made to date. This S&D calculation which included three quality types of beef was initially a product of that process. Inputs came from industry, government and private consultants, however the responsibility for errors and omissions which may have occurred are borne by the authors. Despite the faults inherent in a complicated calculation which requires many inputs of a judgmental nature, we hope that this project has furthered the knowledge that is available on the Canadian beef industry. The addition of the forecast is our attempt to extend the utility of the project, but is of course limited by the uncertainty of the assumptions which form the basis of projections.

Data Sources

Total Cattle Slaughter, Statistics Canada, Agriculture Division

Federally Inspected Slaughter by Sex & Average Carcass Weights, Agriculture and Agri-Food Canada, Food Production and Inspection Branch; and Statistics Canada, Agriculture Division.

Carcass Subprimal Yield Factors, Agriculture and Agri-Food Canada, Lacombe Research Station and Paul D. MacInnes and Associates.

Beef Quality Yield Factors, Paul D. MacInnes and Associates.

Average Head Meat Weight, Statistics Canada, Agriculture Division.

Beef Trade Statistics, Statistics Canada, International Trade Division, Trade Tapes.

Beef Trade Quality factors 1990-1993, Paul D. MacInnes & Associates, Supply & Disposition of Canadian Beef, March 23, 1995.

Updated Beef Trade Quality Factors 1994 & 1995, Paul D. MacInnes & Associates, Supply & Disposition of Canadian Beef 1994 & 1995 April 30, 1996.

Frozen Beef Stocks, Statistics Canada, Catalogue 23 - 603.

Appendix A

(Tables A.1 -A.11)

Table A.1 Domestic Beef Production (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
1990	307,576	46,174	287,880	641,629
1991	292,837	45,791	277,332	615,960
1992	304,252	46,401	288,994	639,647
1993	295,455	43,870	276,019	615,344
1994	314,579	45,048	285,141	644,767
1995	323,615	46,337	294,504	664,457
1996	351,965	51,137	324,063	727,166

Notes:

1) Domestic beef production is the output of carcass beef from the slaughter of cattle of both domestic and foreign origin. It includes inspected and other slaughter as defined in the Statistics Canada (STC) Agriculture Division's beef supply and disposition report.

2) Whereas the STC production estimates are on a carcass weight equivalent, the calculations in this report are done on a product weight equivalent. The product weight equivalent of production is equal to the carcass weight less the fat and bone trim that occurs when carcasses are converted to cuts and grinding meat. The trim averages about 25%, which accounts for the fact that the total of Table 2 is about 75% of total beef production reported by STC.

Table A.2 Imports of Fresh/Chilled and Frozen Beef (product weight - tonnes)

	New Zealand				Australia			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	947	10,422	12,317	23,686	629	7,861	22,954	31,444
1991	733	12,705	10,995	24,433	728	8,732	26,925	36,384
1992	801	11,208	8,006	20,015	978	9,776	38,128	48,882
1993	4,615	18,846	15,000	38,462	727	13,092	58,914	72,734
1994	3,195	15,230	33,613	52,038	1,225	13,309	43,508	58,042
1995	3,530	17,069	22,343	42,942	373	9,653	27,680	37,706
1996	3,238	18,502	24,515	46,255	408	6,389	19,534	26,332

	U.S.				Nicaragua			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	58,949	1,254	1,254	61,457	-	15,606	-	15,606
1991	79,912	1,700	1,700	83,313	-	10,606	-	10,606
1992	74,193	3,124	781	78,098	-	6,039	-	6,039
1993	71,271	1,500	2,251	75,022	-	119	-	119
1994	83,198	1,719	2,807	87,725	-	-	-	-
1995	88,948	2,588	3,261	94,797	-	-	-	-
1996	84,854	2,109	2,986	89,950	-	-	-	-

	Other Countries				All Countries			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	-	4,061	-	4,061	60,525	39,204	36,525	136,254
1991	-	1,759	-	1,759	81,373	35,503	39,620	156,496
1992	-	2,133	-	2,133	75,971	32,280	46,915	155,166
1993	-	2,563	-	2,563	76,614	36,121	76,165	188,900
1994	-	3,562	-	3,562	87,618	33,820	79,929	201,367
1995	-	2,709	-	2,709	92,851	32,019	53,284	178,154
1996	-	30	-	30	88,500	27,031	47,036	162,567

Notes:

1) The volumes of Canadian imports of fresh / chilled and frozen beef by quality types are presented in Table A.2. The volumes by quality type are determined by applying the quality proportionating factors which were developed by Paul D. MacInnes and Associates (Appendix B).

2) Example: in 1990, Canada imported 23.7 kt pwe of beef in the fresh / chilled & frozen categories. MacInnes et al reported that high quality made up 4% of N.Z. imports, manufacturing made up 44 % and grinding beef accounted for 52% . Applying these proportionating factors to total imports from N.Z., results in 0.95 kt of high quality imports, 10.42 kt manufacturing cuts & 12.32 kt of grinding beef as reported in Table A.2.

3) The source of data for imports of beef is International Trade Division, Statistics Canada.

Table A.3 Non-NAFTA Beef Imports (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
1990	1,576	37,950	35,271	74,797
1991	1,461	33,803	37,919	73,183
1992	1,778	29,156	46,134	77,068
1993	5,343	34,621	73,914	113,878
1994	4,420	32,101	77,122	113,642
1995	3,903	29,431	50,022	83,357
1996	3,646	24,922	44,050	72,617

Table A.4 Imports of Prepared and Cured Beef (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
1990	-	9,248	1,335	10,584
1991	-	10,098	1,919	12,016
1992	-	11,721	2,655	14,376
1993	-	13,586	2,972	16,558
1994	-	13,343	3,515	16,858
1995	-	10,592	3,812	14,404
1996	-	6,000	4,000	10,000
1997	-	6,000	4,000	10,000

Notes:

1) Canadian imports of prepared and cured beef are relatively small compared to total beef imports.

2) The source of data for prepared and cured beef is International Trade Division, Statistics Canada.

Table A.5 Total Imports of Fresh/Chilled, Frozen, Prepared and Cured beef (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
1990	60,525	48,453	37,860	146,838
1991	81,373	45,601	41,538	168,512
1992	75,971	44,002	49,569	169,542
1993	76,614	49,708	79,136	205,458
1994	87,618	47,163	83,444	218,225
1995	92,851	42,611	57,096	192,558
1996	88,500	33,031	51,036	172,567
1997	74,639	33,855	51,536	160,030

Notes:

1) Total Imports is equal to the sum of fresh / chilled, frozen, prepared and cured beef, reference Table A.2 and Table A.3.

Table A.6 Beginning Frozen Stocks (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
Domestic				
1990	-	1,112	6,936	8,048
1991	-	790	4,924	5,714
1992	-	979	5,927	6,906
1993	-	791	4,925	5,716
1994	-	1,092	6,868	7,960
1995	-	1,311	8,299	9,610

Year	High Quality	Mft. Cuts	Grinding	Total
Imports				
1990	-	1,903	2,248	4,151
1991	-	1,804	2,131	3,935
1992	-	2,376	2,056	4,432
1993	-	2,963	2,116	5,079
1994	-	5,094	4,054	9,148
1995	-	3,805	8,397	12,202

Year	High Quality	Mft. Cuts	Grinding	Total
Domestic and Imports				
1990	-	3,015	9,184	12,199
1991	-	2,593	7,056	9,649
1992	-	3,355	7,983	11,338
1993	-	3,754	7,041	10,795
1994	-	6,185	10,923	17,108
1995	-	5,116	16,696	21,812

Notes:

1) Stocks are reported for frozen beef. Fresh product, because of its short shelf life, is considered to be for pipeline purposes only.

2) The breakout of stocks into quality types is based on the proportions of manufacturing cuts and grinding beef in the domestic production and imports. It is assumed that high quality cuts are not put into freezer storage.

3) The source of beef stocks data is Agriculture Division, Statistics Canada. (Catalogue number 23-603).

Table A.7 Beef Supply (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
Domestic Sources				
1990	307,576	47,286	294,815	649,677
1991	292,837	46,581	282,256	621,674
1992	304,252	47,379	294,921	646,553
1993	295,455	44,661	280,944	621,060
1994	314,579	46,140	292,009	652,727
1995	323,615	47,649	302,803	674,067
1996	351,965	52,211	330,884	735,060

Year	High Quality	Mft. Cuts	Grinding	Total
Foreign Sources				
1990	60,525	50,355	40,109	150,989
1991	81,373	47,404	43,670	172,447
1992	75,971	46,377	51,626	173,974
1993	76,614	52,670	81,253	210,537
1994	87,618	52,257	87,498	227,373
1995	92,851	46,415	65,493	204,760
1996	88,500	37,648	57,079	183,227

Year	High Quality	Mft. Cuts	Grinding	Total
All Sources				
1990	368,101	97,642	334,924	800,666
1991	374,210	93,986	325,926	794,122
1992	380,224	93,757	346,547	820,527
1993	372,069	97,332	362,196	831,597
1994	402,196	98,397	379,507	880,101
1995	416,466	94,064	368,296	878,826
1996	440,466	89,858	387,963	918,287

Table A.8 Exports of Fresh, Chilled and Frozen Beef (product weight - tonnes)

	U.S.				Japan			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	23,964	6,740	40,438	71,142	1,036	1,838	267	3,141
1991	24,426	6,870	40,455	71,751	1,349	1,263	172	2,785
1992	36,927	11,078	60,315	108,320	1,369	1,369	-	2,739
1993	58,015	10,413	63,965	132,392	849	849	-	1,699
1994	60,877	21,306	66,637	148,820	2,573	495	1,354	4,422
1995	53,687	18,921	74,745	147,353	3,864	689	1,709	6,262
1996	74,500	16,108	86,581	177,189	4,422	819	2,136	7,377

	Mexico				Other Asia			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	10	1	5	15	156	69	538	763
1991	6	-	2	8	54	23	274	351
1992	-	-	-	-	85	109	18	211
1993	44	1	5	50	328	107	83	519
1994	-	1	55	56	1,687	442	213	2,343
1995	-	2	139	141	2,228	409	170	2,807
1996	-	2	164	166	2,503	553	250	3,307

	Other Countries				All Countries			
Year	High Quality	Mft. Cuts	Grinding	Total	High Quality	Mft. Cuts	Grinding	Total
1990	11	218	-	229	25,176	8,866	41,248	75,290
1991	10	264	-	274	25,845	8,420	40,903	75,169
1992	25	613	-	637	38,406	13,169	60,333	111,908
1993	17	266	-	283	59,253	11,636	64,054	134,942
1994	282	24	206	512	65,419	22,268	68,465	156,152
1995	224	37	314	576	60,003	20,059	77,077	157,138
1996	319	38	321	678	81,744	17,520	89,453	188,717

Notes:

1) Exports of fresh / chilled and frozen beef by quality type are calculated using the same methodology as for imports.

2) The source of data on exports of beef is International Trade Division, Statistics Canada.

Table A.9 Exports of Prepared and Cured Beef (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
1990	-	1,601	1,406	3,007
1991	-	1,660	1,323	2,983
1992	-	2,033	1,610	3,643
1993	-	4,730	1,716	6,446
1994	-	6,058	2,062	8,120
1995	-	4,566	2,896	7,462
1996	-	4,566	2,896	7,462

Table A.10 Total Exports of Fresh/Chilled, Frozen, Prepared and Cured Beef (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
1990	25,176	10,467	42,654	78,297
1991	25,845	10,080	42,226	78,152
1992	38,406	15,202	61,942	115,551
1993	59,253	16,366	65,770	141,388
1994	65,419	28,327	70,527	164,272
1995	60,003	24,625	79,973	164,600
1996	81,744	22,086	92,349	196,179

Notes:

1) Total exports of beef are the sum of fresh / chilled, frozen, prepared and cured, reference Table A.7 and Table A.8.

Table A.11 Ending Frozen Beef Stocks (product weight - tonnes)

Year	High Quality	Mft. Cuts	Grinding	Total
Domestic				
1990	-	790	4,924	5,714
1991	-	979	5,927	6,906
1992	-	791	4,925	5,716
1993	-	1,092	6,868	7,960
1994	-	1,311	8,299	9,610
1995	-	1,073	6,821	7,894
1996	-	990	6,273	7,263

Year	High Quality	Mft. Cuts	Grinding	Total
Imports				
1990	-	1,804	2,131	3,935
1991	-	2,376	2,056	4,432
1992	-	2,963	2,116	5,079
1993	-	5,094	4,054	9,148
1994	-	3,805	8,397	12,202
1995	-	4,617	6,043	10,660
1996	-	4,219	5,590	9,808

Year	High Quality	Mft. Cuts	Grinding	Total
Total - Domestic & Imports				
1990	-	2,593	7,056	9,649
1991	-	3,355	7,983	11,338
1992	-	3,754	7,041	10,795
1993	-	6,185	10,923	17,108
1994	-	5,116	16,696	21,812
1995	-	5,690	12,864	18,554
1996	-	5,209	11,863	17,072

Appendix B

B1) Domestic Beef Production by Quality Types

Total Canadian production of beef by the three qualities (High Quality, Manufacturing Cuts & Grinding) was determined by calculating the carcass weight equivalent of beef produced from domestically slaughtered cattle, then factoring this production into the three qualities of beef. A description of this methodology is described below:

1) Total production of beef was taken to be that reported by Statistics Canada (STC), Livestock Division, Catalogue 23-603.

2) Production of beef by type was calculated for each of steer, heifer, cow (D1, D2, D3 & D4) and mature bull carcasses. The calculation of production of beef by each carcass type (steer, heifer, etc) requires having the number of steers, heifers, bulls and D1, D2, D3 & D4 cows in the total slaughter as well as the average carcass weights for each of these carcass types.

3) Total cattle slaughter was taken to be that reported by STC, Catalogue 23-603. Since this slaughter is not reported on a sex of slaughter basis, it is necessary to make estimates of the number of carcasses produced by sex types (steers, heifers, etc.) with cows being subdivided by grade. Cattle slaughter reported by STC was then proportioned into federally and provincially inspected (FP&I*) slaughter and other slaughter (mainly uninspected). Slaughter by sex type is reported only for FP&I slaughter, which required that estimates of the composition by sex type be made for “other” slaughter. It was assumed that the mix of carcass types in “other” slaughter was in the same proportions as occurred in provincially inspected slaughter.

4) The majority of cow slaughter is ungraded. It was therefore required that estimates be made of the proportions of D1,D2, D3 & D4 carcasses produced from ungraded cow slaughter. These factors were provided by Paul D. MacInnes & Associates (September, 1995).

5) In order to calculate total dressed beef production, average carcass weights were applied to the total number slaughtered for each of the carcass types (steers, heifers, etc.). Beef quality yield factors were then applied to each of these production classes giving the production of high quality, manufacturing cuts and grinding beef for each of steer, heifer, cow and bull slaughter. Head meat, which is assumed to be of grinding quality, was then added to the production of grinding beef from carcasses.

*Beef Grading Agency.

Appendix C

Supply and Disposition of Canadian Beef 1994 and 1995

Document prepared for
Agriculture and Agri-Food Canada
by
Paul MacInnes
Paul D. MacInnes and Associates Ltd.

April 30, 1997

SUPPLY AND DISPOSITION OF CANADIAN BEEF 1994 & 1995

EXECUTIVE SUMMARY

The objective of this study was to provide percentage breakouts of Canada's imports and exports of beef into the three qualities of high, manufacturing cuts and grinding for the 1994 and 1995 calendar years. The study provides an update to a similar project undertaken in early 1995 for the time period January 1, 1988 to September 30, 1994.

The purpose of the study was simply to provide the data and explain the methodology used to arrive at it.

The major challenge was to source the above data from a multitude of private firms in a timely manner while ensuring a high degree of accuracy.

An industry survey was used to collect the data. The survey was sent to over 100 firms who represent a broad cross section of importing and exporting companies and account for over 90% of Canadian beef imports and exports.

Every effort was made to ensure data integrity. Follow up phone interviews were conducted with participants and where possible secondary industry sources were used for verification.

The information supplied by industry accounted for 90 % and 86 % of Canadian beef imports and exports respectively for the study period.

The data generated by this study is displayed in Attachments A through N.

SUPPLY AND DISPOSITION OF CANADIAN BEEF 1994 & 1995

STUDY OBJECTIVES

Prior to this and it's predecessor study information available to Agriculture and Agri-Food Canada (IAPAD) did not separate imported and exported beef into the three qualities of high, manufacturing cuts and grinding beef.

For the purpose of this study the qualities were defined by usage. Respondents were asked to classify the product they imported or exported into the three qualities as defined by the *end use* rather than it's origin. This is important because the same cut from the same type of animal can be used differently. For instance a brisket point from a youthful grain fed steer or heifer could be used in all three quality ranges. It could be sold to a retailer who would in turn sell it as a roast of beef to a consumer. It could also be sold to a manufacturer where it would be used to make corned beef brisket. At certain times of the year it could be sold to a patty manufacturer for grinding.

The three qualities were defined by usage as follows:

1. **High -** used for steaks, roasts, stirfrys, kabobs, consumer made stews, etc.
2. **Manufacturing -** cuts sold to further processors for the manufacture of roast, cooked, corned, or smoked beef, deli meats, pastrami, soups, stews, entrees, etc.
3. **Grinding -** any beef that will be ground prior to consumption .i.e. for hamburg patties and ground beef.

The objectives of this study were to:

- provide percentage breakouts of Canada's imports and exports of beef into the three qualities for calendar 1994 & 1995.
- where veal was include in the statistics determine the percentage and deduct it to arrive at the net quantity of beef
- provide country specific information for the imports from Australia, New Zealand, U.S.A. and the exports to U.S.A., Japan, other Asia and Mexico.
- break down the total import and export volumes into the major beef cuts and
- provide percentages of the cuts by the three qualities

SUPPLY AND DISPOSITION OF CANADIAN BEEF 1994 & 1995

METHODOLOGY

Introduction

The chosen vehicle to achieve the study's objective was to survey a broad cross section of Canada's meat import and export trade. There are well over 100 firms in Canada that deal in imported beef and / or export beef. The quantity and quality of statistics available within these firms varies widely. Some firms needed to spent a great deal of time to complete the survey. The consultant received excellent cooperation from the Canadian meat trade.

Data Available

Agriculture Canada provided the consultant with Statistics Canada import and export statistics. The import data consisted of the Canada Customs Tariff Classification. The export data was the Canadian Export Classification for all countries.

During the course of the 1995 study it was determined that while the total import and export volumes were fairly accurate the data describing volumes of particular cuts was not. This finding was confirmed in the early stages of this study. Therefore the cut volumes shown in this report are extrapolated from the industry survey.

*NOTE- in the case of exports to Mexico the industry survey volume was substantially higher than the Statistics Canada data. There are therefore two sheets for the Mexico data. Attachment "L" details the exports to Mexico based on The Statistics Canada total while Attachment "L.1" shows the same exports based on the Industry survey volume.

Survey Development

As this was a follow up study to one undertaken in 1995 lessons learned during that study were used to adapt the survey form to make it more user friendly and to provide an improved level of accuracy. In developing the survey form the objectives were;

1. a high response rate so as to account for over 80 % of imports and exports

2. user friendliness
3. accuracy
4. brevity and
5. capturing the data required

The major change in format from the 1995 form was that respondents were asked to categorize the individual cuts by quality as opposed to just the total volumes.

The survey was developed by the consultant and then tested and improved with feedback from selected respondents. The survey form was then sent to Agriculture and Agri-Food Canada for final changes and approval.

Survey List

The survey list was developed to

- cover in excess of 80% of beef import and export volume
- include all major importers and exporters
- comprise the various industry sectors and
- include Canada's geographic regions

The final list included 100 firms.

Survey Distribution And Follow Up

The survey was faxed out in early March. Follow up phone calls were made throughout March and in early April.

SUPPLY AND DISPOSITION OF CANADIAN BEEF 1994 & 1995

STUDY RESULTS

Thanks to the excellent co-operation received from the firms within the Canadian meat industry we were able to achieve results which accounted for 86 % of exports and 90 % of imports.

The results which are tabled in attachments A through N break out Canada's beef imports and exports for 1994 & 1995 by cuts and qualities.