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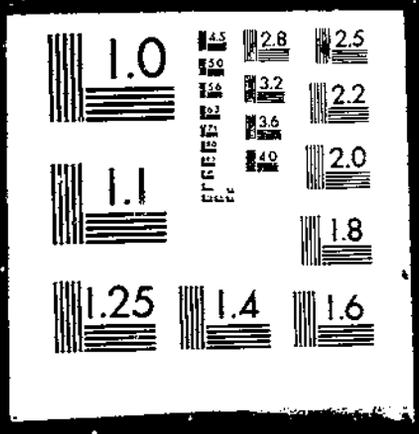
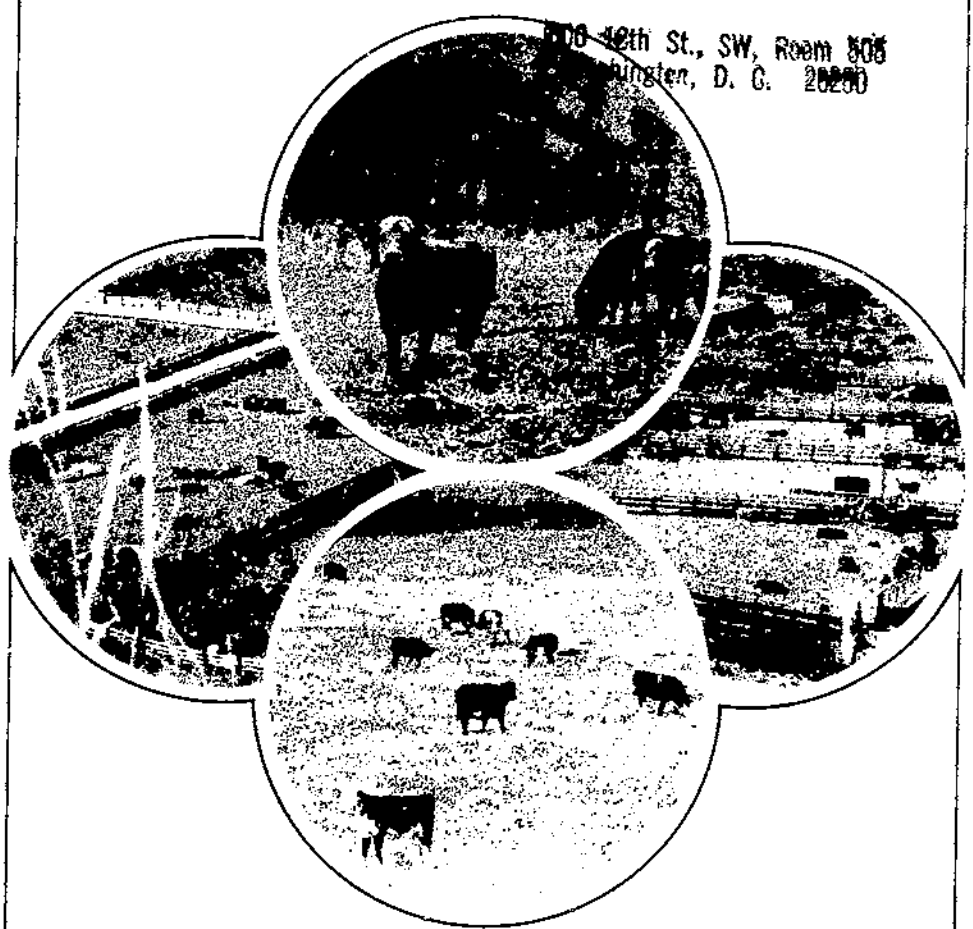


CANADIAN FEED GRAIN POLICY

C. E. Bray



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CANADIAN FEED GRAIN POLICY. By C. E. Bray, Foreign Demand and Competition Division, Economics, Statistics, and Cooperative Service, U.S. Department of Agriculture. Foreign Agricultural Economic Report No. 144.

ABSTRACT

Canada's feed grain policy is analyzed in order to interpret how the policy, as amended in 1976, may be affecting the competitive position of U.S. corn in eastern Canada. Given the new price relationship between U.S. corn and feed grains produced in western Canada, according to econometric analysis in the report, the U.S. share of Canada's feed grain imports will have declined to 10 percent for 1976/77. This contrasts with 23 percent in 1975/76, and an average of 37 percent since 1970/71. In fact, for the first three quarters of 1977, U.S. corn exports to Canada were valued at $22.7 million, running 50 percent behind the year-earlier value.

Key words: Canada, feed grains, policy, corn, U.S. agricultural exports.

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FOREWORD

This study describes and analyzes recent developments in Canadian feed grain policy. These developments are of interest to the United States because of the substantial quantity of U.S. corn exported to Canada, and the volume of bilateral trade in livestock and livestock products.

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Note: Metric units and Canadian dollars are used. The average U.S. dollar/Canadian dollar exchange rate was 1.014 in 1976. Split years (e.g., 1975/76) refer to August-July marketing years.

SUMMARY AND CONCLUSIONS

The latest phase of Canada's feed grain policy is a factor making Canadian feed grains more competitive with U.S. corn in eastern Canada. Since August 1976, when the corn-competitive policy was implemented, the price of feed grains produced in western Canada has declined relative to the price of U.S. corn landed in Montreal. Given this new price relationship, according to the analysis in this report, the U.S. share of Canada's feed grain imports will have declined to 10 percent for 1976/77. This contrasts with 23 percent in 1975/76, and an average of 37 percent since 1970/71.

Eastern Canada, a feed grain deficit area, but with a farm economy based largely on livestock production, has traditionally imported wheat, oats, and barley from western Canada and corn from the United States.

In calendar 1976, U.S. corn exports to Canada were valued at $75 million, accounting for 5 percent of all U.S. farm exports to Canada. For the first three quarters of 1977, corn exports were valued at $22.7 million, running 50 percent behind the year-earlier value. Volume was also down about 50 percent to 235,000 tons. Most of the corn exports go to eastern Canada, although there has been an increase in shipments to British Columbia in recent years.

Canada's feed grain policy has undergone three stages of development since 1973, with the result that marketing of domestically used feed grains, which had been under complete control of the Canadian Wheat Board (CWB), now extends to the private grain trade. In the CWB market, prices are determined by the board, and in the nonboard market, prices are market determined.

Each stage of the policy's development has been characterized by implementation of a price-finding mechanism for feed grains produced in western Canada.

From October 1973 to May 1974, the price of feed grains produced in western Canada and sold in eastern Canada was based on an average of monitored prices for feed grains sold on the nonboard market in western Canada. Then from August 1974 to August 1976, this price-finding mechanism was replaced by one that based prices on developments in the Winnipeg Commodity Exchange. It became evident that the prices for western feed grains were above the price of U.S. corn, which was based on world market conditions, and that eastern Canadian livestock producers were substituting U.S. corn for feed grains produced in western Canada.

In August 1976, the CWB began to offer western-produced feed grains in eastern Canada at a price "competitive" with U.S. corn. Although the feed grains could still be purchased through the nonboard market, the CWB prices, in effect, became the ceiling prices, reflecting a change in the competitive position of U.S. corn in the eastern Canadian market.

CANADIAN FEED GRAIN POLICY

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INTRODUCTION

This study describes Canada's feed grain policy in each of its three phases of development—the Interim Policy (October 1973 to August 1974), Phase I (August 1974 to August 1976), and Phase II (August 1976 to present). Particular attention is focused on Phase II in order to analyze its effect on the competitive position of U.S. corn in eastern Canada.

The study deals only with Canadian feed grain policy in relation to the Canadian domestic market for feed grains. Canada is treated as two major regions: western Canada, which generally has surplus feed grain production, and eastern Canada, which imports feed grains from western Canada (wheat, oats, and barley) and from the United States (corn) to supplement local production. It is assumed in this study that the U.S. share of eastern Canada's imports of feed grains is determined mainly by the price of U.S. corn relative to the prices of western Canadian feed grains.

In 1976, U.S. corn exports to Canada were valued at $75 million and accounted for 5 percent of the total value of U.S. agricultural exports to Canada. Indications are that U.S. corn exports to Canada will have decreased in 1977. Exports for the first three quarters of 1977 were about 50 percent below the year-earlier level. An unspecified quantity of the corn shipments to Canada are believed to be used for industrial purposes. The major Canadian market for U.S. corn is eastern Canada, although there has been an increase in shipments to British Columbia in recent years.

This study should be useful in understanding how the Canadian feed grain policy operates, and how that policy may affect U.S. exports of feed grains to eastern Canada.

An understanding of Canadian feed grain policy is also important in assessing Canadian competition with the United States in the livestock industry. In 1976, U.S. livestock and meat exports to Canada accounted for 12 percent of total U.S. agricultural exports to Canada and 30 percent of U.S. agricultural imports from Canada. As an input into livestock production, feed grains are a major determinant of Canadian livestock production costs.

BACKGROUND

Western Canada is made up of four Provinces—the Prairie Provinces (Manitoba, Saskatchewan, and Alberta) and British Columbia. The Prairie Provinces are the main grain producing regions of Canada. They are characterized by extremely cold weather in winter, (0° F on the average, with lows of -40° F),[1] strong winds which result in high evaporation rates and soil erosion, and variable precipitation which makes conservation of moisture from winter snowfall essential. The frost-free period averages 100-120 days. The short growing season, combined with variable precipitation, limits the choice of crop production primarily to grains, oilseeds, and forage. British Columbia is a mountainous Province characterized by mild climate and heavy rainfall. The mild winter temperatures are conducive to production of a wide range of crops, particularly fruit.

Eastern Canada is made up of six Provinces—Ontario and Quebec (the Central Provinces), and New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland (the Atlantic Provinces).[2] The richest yielding croplands in Canada are located in the southwest corner of Ontario and along the St. Lawrence River in Ontario and Quebec, where climatic conditions are relatively less severe than those of the Prairie Provinces. The frost-free period along the St. Lawrence is generally over 100 days, facilitating the production of soybeans and winter wheat, which cannot be grown as well in other parts of Canada. Geography, soil, and climate are considerably less conducive to agricultural production in the Atlantic Provinces than in the Central Provinces (*8*).[3] One of the major commercial crops in the Atlantic Provinces is potatoes.

The Canadian population is mainly located in eastern Canada, mostly in Quebec and Ontario. Over half of the Canadian farms, however, are located in western Canada. At the time of the 1976 census, eastern Canadian farms averaged 82 hectares, considerably smaller than the western Canadian average farm size of 332 hectares.

Over the past 16 years, farmland has been steadily decreasing in eastern Canada and increasing in western Canada. In 1961, farmland in eastern Canada totaled 15.5 million hectares, or 22 percent of total Canadian farmland. By 1976, it had decreased 31 percent to 10.7 million hectares, or 16 percent of total Canadian farm area. Farm area in western Canada accounted for 78 percent of total Canadian farm area in 1961, and by 1976, it had increased to 56.5 million hectares, or to 84 percent of the total.

Livestock production is extremely important to the eastern Canadian farm economy, accounting for about two-thirds of the area's farm receipts. Sixty-two percent of Canadian hogs, 61 percent of Canadian

[1] -18° C on the average with lows of -40° C.

[2] Newfoundland will not be included in this report because of the lack of available data on the Province.

[3] Italicized numbers in parentheses refer to references listed at the end of this report.

poultry, and 37 percent of Canadian cattle were on eastern Canadian farms on June 1, 1976 (table 1).

In eastern Canada, farm income from crops derives mainly from crops other than feed grains, such as potatoes, fruit, vegetables, tobacco, and soybeans. Production of oats, barley, and wheat is limited, accounting for only 2 percent of eastern Canadian farm income in 1975, and for 3, 15, and 4 percent of total Canadian wheat, oat, and barley production, respectively (table 2). Some Ontario winter wheat is exported. The most important grain produced in eastern Canada is corn. Almost all of the corn produced in Canada, in fact, is produced in Ontario.

The farm economy in western Canada is highly dependent on income from grain and oilseed crop production. Ninety-seven percent of total Canadian production of wheat, 85 percent of oats, and 96 percent of barley was produced in western Canada in 1976. Only 34 percent of western Canadian farm income derives from livestock production. Nevertheless, western Canada accounts for over two-thirds of Canadian cattle production.

Barley is the major grain used for feed in western Canada. In 1975/76, feed use amounted to 54 percent of western barley production. Feed use of oats equaled 72 percent of the area's production of oats, and feed use of wheat accounted for 13 percent of wheat production.

From 1966/67 to 1976/77, eastern Canada produced between 3.3 and 4.6 million tons of feed grains (table 3), with increases in corn and barley production accounting for the growth in total production (table 2). Area planted to corn increased from 325 hectares in 1966 to 670 hectares in 1976. The expanded area, combined with increased yields due to the introduction of new corn varieties suited to the Canadian growing season, resulted in a more than doubling of corn production between 1966 and 1976. Oat production is second in quantity produced to corn production. Area planted to oats as well as oat production, however, declined significantly from 1966 to 1976.

Partly because of the availability of local supplies, corn and oats are the major grains used for feeding in eastern Canada. Feed use, however, is not completely supplied by local production. From 1966/67 to 1975/76, between 32 and 52 percent of eastern Canadian feed use of feed grains[4] was met through imports of grain, either from western Canada (oats, barley, and wheat) or from the United States (corn).

During 1966/67-1975/76, eastern Canadian imports of feed grain from western Canada amounted to 29 percent of eastern Canadian feed use of feed grains, and imports of corn from the United States amounted to 12 percent.

[4]Oats, barley, and corn, in corn equivalent, assuming that only minor quantities of winter wheat produced in eastern Canada are used for feeding.

Table 1--Livestock on farms, Canada, 1966-76

As of June 1 1/	Cattle			Hogs			Poultry 2/		
	Eastern Canada	Western Canada	Total Canada 3/	Eastern Canada	Western Canada	Total Canada 3/	Eastern Canada	Western Canada	Total Canada 3/
	Million head			Million hogs			Million birds		
1966	5.3	7.5	12.8	3.3	2.1	5.4	48.2	27.0	75.2
1967	5.3	7.4	12.7	3.6	2.5	6.1	51.0	29.2	80.2
1968	5.4	7.1	12.5	3.4	2.4	5.8	50.0	26.8	76.8
1969	5.4	7.0	12.4	3.4	2.4	5.8	54.0	29.3	83.3
1970	5.3	7.5	12.8	3.6	3.5	7.1	59.0	33.5	92.5
1971	5.2	8.1	13.3	3.8	3.8	7.6	56.4	31.8	88.2
1972	5.2	8.4	13.6	3.6	3.4	7.0	22.4	15.4	37.9
1973	5.3	8.8	14.1	3.6	3.4	7.0	23.1	14.9	38.0
1974	5.5	9.5	15.0	3.5	3.1	6.6	22.4	14.6	37.0
1975	5.5	9.8	15.3	3.3	2.0	5.3	20.4	14.0	34.4
1976	5.4	9.3	14.7	3.4	2.1	5.5	20.5	13.3	33.8

1/ Survey date changed from June 1 to July 1 in 1973 for poultry, in 1974 for hogs, and in 1975 for cattle.
2/ Hens and pullets only.
3/ Data for eastern and western Canada may not add to total Canada because of rounding.

Sources: Statistics Canada, Livestock and Animal Products Statistics and Quarterly Bulletin of Agricultural Statistics, various issues.

Table 2--Area and production of principal feed grains, Canada, 1966-76

Year	Wheat			Oats		
	Eastern Canada 1/	Western Canada	Total Canada 2/	Eastern Canada	Western Canada	Total Canada 2/
	1,000 hectares					
Area:						
1966	162	11,854	12,016	973	2,222	3,195
1967	182	12,007	12,190	899	2,087	2,986
1968	165	11,743	11,908	815	2,193	3,007
1969	167	9,935	10,101	725	2,228	2,953
1970	165	4,887	5,052	632	2,153	2,785
1971	167	7,687	7,854	577	2,187	2,764
1972	175	8,465	8,640	559	1,911	2,470
1973	180	9,395	9,575	537	2,173	2,711
1974	205	8,729	8,934	502	1,969	2,471
1975	230	9,249	9,479	505	1,906	2,411
1976	259	10,881	11,140	459	2,012	2,471
Production	1,000 metric tons					
1966	459	22,058	22,516	1,742	3,974	5,716
1967	459	15,679	16,137	1,608	3,046	4,653
1968	448	17,241	17,689	1,593	3,907	5,500
1969	430	17,837	18,267	1,283	4,190	5,473
1970	468	8,557	9,024	1,127	4,318	5,444
1971	442	13,970	14,412	1,084	4,521	5,605
1972	481	14,032	14,514	913	3,716	4,629
1973	456	15,703	16,159	771	4,270	5,041
1974	588	12,707	13,295	821	3,107	3,928
1975	708	16,370	17,078	870	3,596	4,466
1976	771	22,752	23,523	726	4,234	4,960

Footnotes at end of table.

Continued.....

Table 2--Area and production of principal feed grains, Canada, 1966-76-Cont.

Year	Barley			Corn		
	Eastern Canada	Western Canada	Total Canada 2/	Eastern Canada	Western Canada	Total Canada 2/
			1,000 Hectares			
Area:						
1966	122	2,898	3,019	325	1	326
1967	138	3,148	3,287	352	2	354
1968	143	3,440	3,583	389	1	390
1969	157	3,630	3,787	398	1	400
1970	168	3,836	4,004	498	1	499
1971	191	5,466	5,658	567	4	571
1972	186	4,876	5,062	532	5	537
1973	177	4,662	4,839	524	6	530
1974	174	4,601	4,775	589	2	591
1975	183	4,286	4,468	630	5	635
1976	182	4,157	4,339	670	5	675
			1,000 Metric Tons			
Production						
1966	281	6,168	6,450	1,682	3	1,686
1967	328	5,177	5,505	1,876	7	1,883
1968	410	6,688	7,099	2,074	3	2,076
1969	413	7,670	8,084	1,880	3	1,883
1970	442	8,448	8,889	2,630	4	2,634
1971	528	12,571	13,099	2,935	11	2,946
1972	473	10,812	11,285	2,511	18	2,528
1973	426	9,797	10,224	2,781	22	2,803
1974	411	8,391	8,802	2,572	5	2,577
1975	469	9,051	9,520	3,626	19	3,645
1976	419	9,884	10,303	3,650	25	3,675

1/ Primarily winter wheat. 2/ Columns may not add to totals because of rounding.

Source: Canada Grains Council, Statistical Handbook, Winnipeg, 1976.

Table 3--Eastern Canadian production, use, and imports of feed grains, in corn equivalent, 1966/67-1976/77 1/

Year	Production 2/	Feed use 3/	Total imports	Imports from western Canada 4/	Imports from the United States 5/
			1,000 metric tons		
1966/67	3,392	4,725	1,765	1,234	531
1967/68	3,514	5,025	1,990	1,243	747
1968/69	3,774	5,369	1,932	1,129	803
1969/70	3,322	4,918	2,407	1,763	644
1970/71	3,968	4,920	1,995	1,728	267
1971/72	4,314	5,580	1,776	1,542	234
1972/73	3,697	5,267	2,714	1,846	868
1973/74	3,811	6,038	2,620	1,627	993
1974/75	3,625	5,693	2,354	1,559	795
1975/76	4,772	4,115	1,550	1,198	352
1976/77	4,631	n.a.	n.a.	n.a.	n.a.

1/ Oats, barley, and corn.
2/ Source: Statistics Canada, Quarterly Bulletin of Agricultural Statistics, various issues.
3/ Source: U.S. Department of Agriculture, Canadian Market Study, FDCD Working Paper, Econ. Res. Serv., Aug. 1977.
4/ Source: Canadian Livestock Feed Board, Annual Report--Crop Year 1975/76, Montreal, 1977.
5/ Source: Derived from Statistics Canada, Imports by Country, various issues.

FEED GRAIN POLICY

Interim Policy

Prior to 1973, the Canadian Wheat Board was the sole outlet for Prairie-produced feed grains destined for interprovincial or international trade. In eastern Canada, Prairie grains were available only from the CWB. In western Canada, however, feed grains were also available directly from producers within any one Province in the intraprovincial nonboard markets. Prices in the nonboard markets were at times below the CWB initial price because feed grain producers with large stocks and limited CWB delivery quotas were willing to take a lower price in order to sell their grain (*6*). Changes were made in the Canadian feed grain policy in an effort to achieve an equal price for feed grains in eastern and western Canada and reduce the discrepancies which existed between the CWB price of western feed grains and the prices which prevailed in the nonboard markets in western Canada (*9*).

In October 1973, an interim feed grain policy was introduced as a step toward free interprovincial trade. Under the policy, restrictions on interprovincial trade of feed grains were removed in the Prairie Provinces. The CWB still maintained control of Prairie-produced feed grains sold for export and for domestic use elsewhere in Canada. The CWB price at which Prairie-produced feed grains were sold domestically, however, was tied to the price of feed grains sold on the nonboard markets in western Canada (*6*). The CWB price was determined from a weighted average of prices paid by feed mills and large livestock and poultry producers in a designated area. The weighted average was determined every 2 weeks through a survey conducted by the Agricultural Products Board (APB).[5] Handling and marketing charges associated with moving the feed grain into terminal position at Thunder Bay were determined by the CWB and the Canadian Livestock Feed Board (CLFB)[6] and included in the Thunder Bay base price (*14*).

Under the interim policy, feed grain producers had three options for selling their grain. The first was to sell to the local nonboard market. Prices on these local markets have only recently been monitored by the APB in the Prairies.

The second option was for the producers to deliver their grain to the CWB under their delivery quota for the CWB final price, which consis-

[5]The APB is a part of the Federal department of agriculture (Agriculture Canada). It was established to buy and sell agricultural products, to improve producer prices, and to obtain food for Canadian food aid programs.

[6]The CLFB is a Crown Corporation established by the Livestock Feed Assistance Act of 1967. It reports to the Parliament through the Minister of Agriculture. Its mandate is to ensure that there are feed grains and feed grain storage to meet the needs of livestock feeders in eastern Canada and British Columbia, and to ensure reasonable stability and fair equalization of feed grain prices in those areas. It also administered the Feed Freight Assistance Program.

ted of an initial and final payment.[7] The CWB initial price is a guaranteed floor price, usually set at less than the anticipated final price for the crop year, and producers receive it when they deliver the grain (*6*). Producers may also receive a final payment after the crop has been sold. The CWB pools its gross revenue from the sale of grain, and distributes to producers in a final payment, in proportion to their deliveries, that which remains in the pool after the CWB operating costs and initial payments to producers have been deducted (*1*).

Producers also had the option of selling grain to the APB for a price which was halfway between the CWB initial and estimated final prices. The APB price was considered a final price and did not entitle producers to participate in the CWB final payment. The APB program was established to stabilize the nonboard prices upon which the feed grain prices for the rest of Canada were based. The APB guaranteed that it would buy all grain offered, in order to support prices on the nonboard markets in periods of limited CWB delivery quotas (*10*). The APB did not compete with the CWB in the sale of feed grains, however. Quantities purchased by the APB were stored and then made available to the CWB on request. Because of the market conditions for feed grains which existed when the interim policy was in effect, producers did not extensively use the option of selling to the APB (*2*).

Livestock feeders in eastern Canada could buy western Canadian grain only through the CWB, and the price at which it was offered in Thunder Bay was based on the prices at which feed grains could be bought locally in western Canada.

Phase I

The interim policy did not ensure that the established price for feed grains was less than the price of U.S. corn. It became evident that the prices of western feed grains, which were based on local market conditions in western Canada, exceeded the price of U.S. corn, which was based on world feed grain market conditions. As a result, western feed grains were being replaced in the eastern market by U.S. corn imports (*14*).

In May 1974, a long-term feed grain policy was announced, and between then and the time the policy became effective in August 1974, the CWB offered western feed grains for sale at prices "related" to the price of U.S. corn in eastern Canada.[8]

The long-term feed grain policy came into effect in August 1974. The stated objectives of the policy were to provide "fair and equitable" prices for feed grains across Canada, to provide relief to feed grain producers against relatively low feed grain prices, and to encourage growth of livestock and feed grain production across Canada according

[7]The CWB final price is the initial payment plus the final payment (in dollars per unit).

[8]The CWB did not define how its prices were related to corn. It can be inferred, however, that western feed grain prices were reduced in relation to the U.S. corn price to levels possibly equal to, if not less than, the U.S. corn price.

to the natural endowment of the factors of production, and to the suitability of production in various regions.

Users of feed grain were given access to western-produced grain. The remaining restrictions on the interprovincial movement of feed grains were removed, and responsibility for domestic merchandising of feed grains produced in the Prairies, which had previously been entirely under the charge of the CWB, was extended to the private grain trade. Western elevator companies were permitted to purchase and sell feed grains in the domestic market. Responsibility for the licensing of feed grain handling companies, brokers, and others who purchased feed grains for consumption outside the Prairies was delegated to the CLFB. The CLFB was given the power to intervene directly as a buyer and seller of feed grains in the nonboard grain transfer business (*10*, *14*).

The CWB retained control of the sale of feed grains for export and for domestic nonfeed purposes. The CWB also remained in control of the coordination of feed grain transportation. In addition, the CWB was obligated to assure delivery of grain, for domestic purposes, to Thunder Bay within a specified amount of time after receiving a request for delivery. The CWB could use "switched grain" to assure delivery and efficient use of railroad equipment (*6*). Grain switching involved the paper exchange of nonboard grain in country elevators for CWB grain of like kind and grade already in terminal position in Thunder Bay. At times, it proved easier for the CWB to switch grain rather than move it to terminal position in time for grain companies to fulfill contracts (*11*).

To assure the availability of feed grains in eastern Canada and a degree of stability of feed grain prices, a reserve stock of 272,000 tons of feed grain was set up in Thunder Bay. The stocks were accumulated by the CWB. A committee made up of members of the Canadian Grain Commission (CGC),[9] the CLFB, and the CWB was established to determine the conditions under which the stocks could be released. Storage and interest charges on the reserve were paid by the Federal Government (*6*).

The Winnipeg Commodity Exchange, which reflects Canadian feed grain market conditions in its prices, replaced the APB-monitored pricing system as the price-finding mechanism for nonboard feed grains. The nonboard market thus became defined as the market in which prices were determined on the Winnipeg Commodity Exchange. Trading in domestic feed grain futures at the Winnipeg Commodity Exchange began on July 25, 1974 (*14*).

Provisions were made for the CWB to impose quotas on deliveries of nonboard grain to elevators. These quotas have never been used.

[9]The CGC, established by the Canada Grain Act of 1971, replaced the former Board of Grain Commissioners. The CGC is part of Agriculture Canada. The Commission supervises the handling, inspection, weighing, and storage of grain. It is responsible for fixing maximum tariffs for charges made by licensed elevators and for establishing grain grading standards.

The CGC placed a restriction on the maximum amount of elevator space that can be devoted to nonboard grains. No more than 10 percent of the total facilities of any one elevator company, or no more than 20 percent of the total capacity of any single elevator, may be allocated to nonboard grain (*13*).

It was also announced in 1974 that steps would be taken to modify feed freight assistance in eastern Canada. No changes were implemented, however, until 1976.

During phase I of the feed grain policy, producers had the choice of selling their grain to the CWB, in amounts up to their quota, for a CWB-determined initial price (including the possibility of an additional payment based on CWB net returns), or selling their grain in the nonboard market at market-determined prices (*15*).

Feed grains were available to the eastern Canadian market through several channels—the Winnipeg market, at a price based on Winnipeg futures; the CWB, at a price determined by the CWB; and by direct purchase from western Canadian grain producers.

Eastern Canadian livestock feeders did not have direct access to Prairie grains until the harvest of the 1974 crop. The CWB then made grains available to the private grain trade through the Winnipeg Exchange in amounts specified by the CLFB as necessary to meet non-Prairie feed grain requirements. In mid-September 1974, western elevators began to acquire stocks of nonboard feed grains and offer them for sale. The private grain trade was not able to supply all the feed grain required outside the Prairies, however (*6*). The CWB supplied 34 percent of the commercial feed grain supplies in Canada in 1974/75 and 22 percent in 1975/76 (*3*).

Phase II

The feed grain policy was further modified on August 1, 1976. The CWB once again offered feed grains at Thunder Bay at a price "related" to the price of U.S. corn in eastern Canada (*12*). In contrast to previous periods when the CWB did this, a specific procedure or formula for determination of the "corn competitive"[10] price of western feed grains was developed by the CLFB and the CWB, and widely publicized, partially in an effort to legitimize CWB pricing practices to eastern Canadian livestock producers. The CWB moved to a pricing formula which was based on the price of U.S. corn in Montreal, because the prices of Canadian feed grains determined on the Winnipeg Commodity Exchange were averaging higher than the price of U.S. corn, which had the potential of reducing the proportion of the domestic market supplied by domestic production (*5*).

[10]"Corn competitive" was not defined by the CWB. It can be inferred, however, that the anticipated effect of the formula was at least a reduction in the price of western feed grains relative to the price of U.S. corn, if not in fact the achievement of prices for western Canadian feed grains equal to or less than the U.S. corn price.

The CWB price is in effect the ceiling price for western Canadian feed grains. Feed grains can still be purchased from the Winnipeg or local markets, but nonboard market prices for feed grains have to remain less than CWB feed grain prices or the CWB will become the only source of western Canadian feed grains (*7*). Since the CWB price is based on the price of U.S. corn, the Chicago Board of Trade rather than the Winnipeg Commodity Exchange is in effect the price-finding mechanism for Canadian feed grains.[11]

A formula is used to determine the CWB price for western feed grains. It is based on the relative feeding values of western Canadian feed grains and U.S. corn as derived from the value of energy and protein contained in each of the individual grains. In addition to oats, wheat, barley, and corn, the formula incorporates soybean meal as an indicator of the value of protein (*4*). The value of units of protein and energy are determined from the relationship between the prices of soybean meal and U.S. corn in Montreal. The feeding values of western Canadian oats, wheat, and barley in relationship to corn, therefore, vary according to the market price of corn and soybean meal, which are used together to achieve an energy balance in feeding rations comparable to that which would have been achieved if wheat, oats, or barley had been used instead (table 4).

The CWB maintained a degree of flexibility in the formula by indicating that the price of wheat, barley, and oats can fluctuate by ±2 percent for wheat and barley and ±4 percent for oats from the actual prices for these grains derived from the formula.

If the price of soybean meal in Montreal, for example, is $282.19 per ton and U.S. corn in Montreal is $130.69 per ton, the meal/corn price ratio is 2.2:1. Taking the values from table 4 for wheat, barley, and oats in relation to corn for a 2.2:1 soybean meal/corn price ratio, the derived Montreal prices for Canadian feed grains are:

Wheat = 106 percent of $130.69 = $138.53/ton
Oats = 90 percent of $130.69 = $117.62/ton
Barley = 95 percent of $130.69 = $124.16/ton

Once the "corn competitive" prices for western Canadian feed grains have been determined for Montreal, the CWB selling price for the grains in Thunder Bay is found by deducting the cost of transportation and handling from Thunder Bay to Montreal, as follows:

Wheat = $138.53 - $10.65 = $127.88/ton
Oats = $117.62 - $9.55 = $108.07/ton
Barley = $124.16 - $9.92 = $114.24/ton

[11]The Montreal price of U.S. corn is determined from prices on the Chicago Board of Trade plus transportation and handling charges to Montreal converted to Canadian dollars and an 8-cent-per-bushel import duty.

Table 4--Relationship between the value of Canadian domestic feed grains and the value of U.S. corn in Montreal

Ratio of soybean meal price to U.S. corn price, Montreal	Feed grain prices expressed as a percentage of the price of U.S. corn in Montreal		
	Wheat	Oats	Barley
3.0:1	114	95	100
2.5:1	109	92	97
2.2:1	106	90	95
2.0:1	104	89	94
1.8:1	102	88	93
1.6:1	100	86	91
1.5:1	99	86	91
1.4:1	98	85	90
1.2:1	96	84	89
1.0:1	94	82	87

Source: Peter R. Perkins, "New Feedgrain Pricing Mechanism," Grain Facts, Vol. VIII, No. 2, Aug. 27, 1976, pp. 9-12.

The inclusion of soybean meal in the pricing formula means that a change in the price of soybean meal will result in a change in the price of grain offered by the CWB in Thunder Bay, even though there has not been a change in the price of U.S. corn in Montreal (*7*).

Feed Freight Assistance

Feed freight assistance is a subsidy paid on the cost of transporting western grains to points east of Thunder Bay. It was first introduced in 1942 as a temporary measure to assist livestock producers outside the Prairie regions in obtaining feed grains to keep up production to meet wartime needs for meat (*16*). In 1966, the feed freight assistance program was placed under the jurisdiction of the CLFB. Annually, the CLFB calculated the cost of transporting western feed grains to various eastern points, then set the feed freight subsidy such that the private cost of transportation of feed grains was approximately equal for all locations (*6*). From 1966/67 to 1975/76, an average of 2.5 million tons of feed grains were moved under the subsidy program at an average annual Government cost of $20.4 million.

The feed freight rate subsidy was a subject of considerable controversy between western and eastern livestock feeders. Since the cost of transportation of feed grains—but not livestock—was subsidized, the feed freight assistance program was seen as a factor encouraging livestock production in eastern Canada at the expense of western livestock producers. Higher transportation costs for livestock products relative to feed grains were seen to encourage production close to final consumer markets—i.e., in eastern Canada—since if other production costs were the same, producers near the market would have lower total production and marketing costs. For Prairie livestock producers, a major natural advantage is the availability of feed grains at lower than average transportation costs (*16*). Thus, it was argued that feed grain price differentials in eastern and western Canada should reflect transportation charges, and where transportation was subsidized, offsetting subsidies should be available on meat (*6*).

In 1976, the Government announced that the feed freight assistance was contrary to one of the stated objectives of the feed grain policy—i.e., to encourage growth of livestock and feed grains across Canada according to natural factors and suitability of production in various regions. Subsidies were removed from the shipment of western Canadian feed grains to most points in eastern Canada west of Montreal, with reductions for shipments to central Quebec and the Atlantic Provinces. Funds released by this modification are to be used over a 5-year period in Federal projects to assist in developing feed and livestock industries in the provinces where the freight was removed or reduced (*12*).

But the removal of the subsidy on feed grain transportation did not raise the price of western grains in eastern Canada, because to establish the Thunder Bay price, the CWB now deducts the entire cost of transportation from the formula-determined Montreal price. Under the feed freight assistance program, a subsidy of approximately $6.00 per ton

was deducted from the price of western feed grains in Montreal. Since the removal of the feed freight assistance program in 1976, approximately $10.65 per ton for wheat, $9.55 for oats, and $9.92 for barley has been deducted from the formula-determined Montreal prices. The effect of such an increase in the subsidy is to provide even more incentive to produce livestock in eastern Canada.

Payment of the feed freight subsidy seems in effect to have shifted from a direct Federal Government payment to an indirect payment by Prairie feed grain producers in the form of possible lower prices for feed grains sold domestically. The full impact of this shift on the Prairie feed grain producers' income cannot be quantified, however, due to the price pooling arrangement for all grains sold domestically or for export by the CWB, and the fact that not all the feed grain sold domestically is sold through the CWB.

U.S. AND WESTERN CANADIAN COMPETITION IN EASTERN CANADA

There are two major issues underlying the Canadian feed grain policy—the domestic issue of competition between western and eastern Canada in grains and livestock, and the international issue of competition between Canada and the United States in grains and livestock. In the market triangle of western Canada, eastern Canada, and the United States, there are two grain-surplus areas (western Canada and the United States) and one grain-deficit area (eastern Canada). Traditionally, western Canada has supplied wheat, barley, and oats to eastern Canada, and the United States has supplied corn.

The first stated objective of Canada's feed grain policy reflects the issue of regional and international competition in feed grains. The first objective is to provide fair and equitable base prices for feed grains across Canada. Fair price has been defined as a price that is competitive with the price of U.S. corn landed in eastern Canada (the landed price includes transportation and handling charges and an 8-cent-per-bushel tariff). An equitable price is defined as an equal base price for feed grains across Canada (*6*). According to these definitions, feed grain prices under the feed grain policy will be equally based in eastern and western Canada, and will be reduced in relation to, if not in fact made equal to the price of the major competitive grain—U.S. corn—in the deficit area. As mentioned above, the Canadian feed grain policy is presently in its third stage since the introduction of the interim policy in 1973. During the interim period, prices were based solely on nonboard market conditions in western Canada. From August 1973 to July 1974, the average price of barley and oats in Montreal (in corn equivalent) was $7.00 and $15.00 per ton above the price of U.S. corn, respectively. The wheat price in corn equivalent was almost equal to the price of U.S. corn during the period.

During Phase I, feed grain prices were based on the Winnipeg Commodity Exchange and reflected domestic supply and demand conditions for feed grains. Operation of the Canadian nonboard market was largely influenced by the existence of the CWB, which traded grain at prices that were not entirely market determined. Periods of price inversions, during which nearby futures prices for feed grains were lower than cash prices, developed because the price relationships between nonboard determined prices to producers and CWB initial prices to producers induced producers to sell their grain to the CWB (*14*). In 1974/75, 11.8 percent of marketed feed grains went through the nonboard market; in 1975/76 producers sold 12.3 percent of their total marketings to the nonboard market (*3*). Prices of feed grains in Montreal in 1974 and 1975 were affected by conditions on the Winnipeg Commodity Exchange, as well as by disruptions in grain transportation in 1974/75 as a result of labor strikes which lasted approximately 146 days (*2*).

The Montreal price of barley (in corn equivalent) during 1974/75 averaged $7.83 per ton higher than U.S. corn; oats were $19.75 per ton higher, and wheat $15.92 per ton higher. The differentials between the U.S. corn price and western Canadian feed grain prices (in corn equivalent) declined somewhat in 1975/76. The price of barley exceeded corn by an average of $6.28 per ton; oats by $16.00 per ton, and wheat by $13.89 per ton.

In Phase II of the feed grain policy, the CWB further influenced the operation of the nonboard market by setting ceiling prices for feed grain sold in Canada. The Montreal price of barley (in corn equivalent) during 1976/77 averaged $116.12, oats averaged $119.83, and wheat averaged $116.54. The price of corn averaged $105.49.

The second objective of the policy—to provide relief for the producer against depressed feed grain prices—indicates an ongoing concern for the economic welfare of feed grain producers and is one of the reasons behind the Western Grain Stabilization Act.

The third stated objective of the policy—to encourage growth of livestock and feed grain production across Canada according to the natural endowment of the factors of production and the suitability of production in various regions—seems to also deal with regional competition in grains and livestock. When analyzed in the context of international competition in these commodities, however, the third objective loses some significance. It is argued that western Canadian livestock producers are close to supplies of feed grains. Thus, their cost of producing livestock from Prairie-produced grain is less than the cost to producers in eastern Canada using the same grain source. This gives western livestock producers a natural competitive advantage over their eastern counterparts.[12] Inclusion of transportation costs in the price of western Canadian feed grains sold to livestock producers in eastern

[12]Natural advantage need not be restricted to this definition, however, because once the livestock product is produced, it must be transported to eastern Canada, where most of the population lives.

Canada would, therefore, according to this reasoning, discourage livestock production in eastern Canada.

Eastern Canada has an alternate source of feed grains in U.S. corn, however. Thus, including the full cost of transportation in the price of western feed grains would impact on whether eastern Canadian livestock feeders used western Canadian feed grains or U.S. corn. Eastern Canada could continue producing livestock with U.S. corn at the expense of western Canadian feed grain sales. Thus, the issue is not necessarily natural competitive advantage between eastern and western Canada in the production of livestock, but the competition between western Canada and the United States for the eastern Canadian feed grain market. If transportation costs were reduced on the price of western feed grains sold to eastern Canada,[13] or if any action was taken to keep western feed grain prices low in eastern Canada, factors contributing to the natural competitive advantage accruing to livestock producers in western Canada would be removed, but the use of western Canadian feed grains over U.S. corn in eastern Canada would be encouraged.

This argument was tested by means of an econometric model to quantify the effect of Canada's feed grain policy on U.S. corn exports to Canada. It was assumed that feed grains used in eastern Canada are supplied by eastern Canada, western Canada, and the United States. It was also assumed that the U.S. share of eastern Canada's imports is determined mainly by the delivered price of U.S. feed grains relative to the delivered price of western Canadian feed grains.

In view of the lack of perfect substitutability between U.S. and western Canadian feed grains, however, it appears that (in addition to relative prices) eastern Canadian corn production would affect the U.S. share of eastern Canada's feed grain imports, and that eastern Canadian wheat, barley, and oat production would affect western Canada's share.

The following equation was used to estimate the U.S. share of eastern Canada's feed grain imports:

$$Y = f(X_1, X_2, X_3)$$

where Y = U.S. share of eastern Canadian feed grain imports (percent).

X_1 = Price of U.S. corn, c.i.f., Montreal, dollars per ton.

X_2 = Price of western Canadian wheat, barley, and oats, c.i.f., Montreal, simple average in corn equivalent, dollars per ton.

X_3 = Eastern Canadian corn production, 1,000 tons.

[13]In fact, transportation costs are deducted from the formula-determined Montreal price of western Canadian feed grains under the present policy.

Table 5--Data used in the regression analysis

Year	Imports of U.S. corn 1/	Imports of western Canadian feed grains 2/	U.S. share 3/	U.S. corn price 4/	Western Canadian feed grain price 5/	Eastern Canadian corn production 6/
	1,000 metric tons	1,000 metric tons	Percent	Dollars per metric ton	Dollars per metric ton	1,000 metric tons
1968/69	803	1,130	41.5	57.00	63.38	2,074
1969/70	644	1,763	26.8	67.40	71.96	1,884
1970/71	267	1,728	13.4	67.80	72.03	2,630
1971/72	234	1,542	13.2	57.10	62.94	2,935
1972/73	868	1,845	32.0	78.40	90.82	2,511
1973/74	993	1,627	37.9	123.70	136.10	2,781
1974/75	795	1,559	33.8	140.20	154.42	2,572
1975/76	352	1,198	22.7	123.80	144.92	3,626
1976/77	N.A.	N.A.	7/ 10.0	105.49	117.49	3,650

N.A. = Not available.

1/ Includes only corn which cleared customs in eastern Canadian Provinces. Source: Statistics Canada, Imports by Country, various issues.

2/ Freight-assisted shipments of western feed grains to eastern Canadian Provinces, in corn equivalent. Source: Statistics Canada, Coarse Grains Review, various issues.

3/ Column 1 divided by the sum of columns 1 and 2 times 100.

4/ No. 3 corn, c.i.f. Montreal. Source: Canadian Livestock Feed Board, Annual Report, various issues.

5/ Simple average of DGC (different grades combined) feed wheat, no. 1 feed oats, and no. 1 feed barley, each in corn equivalent, Montreal, excluding the freight assistance subsidy. Source: Canadian Livestock Feed Board, Annual Report, various issues.

6/ Source: Statistics Canada, Quarterly Bulletin of Agricultural Statistics, various issues.

7/ Estimated

The parameters of the above equation are estimated by ordinary least squares regression, giving the following results:

$$\widehat{Y} = 58.5347 - 1.63231X_1 + 1.68194X_2 - 0.0203475X_3$$

(t)	(2.37)	(2.68)	(3.80)
(e)	(−5.3)	(6.1)	(−1.9)

$R^2 = 0.82$ $\bar{R}^2 = 0.68$ *C.V.* = 22 *D.W.* = 2.23

Data used to estimate this equation are given in table 5.

Results of the analysis indicate that a change in the price of western Canadian feed grains (c.i.f. Montreal) relative to corn will significantly affect the U.S. share of eastern Canada's imports. For example, a 5-percent decline in the price of western Canadian feed grain imports, all else remaining equal, will reduce the U.S. share by one-third.

The price of western Canadian feed grains has in fact declined in relation to the price of U.S. corn in Montreal since the introduction of Phase II of the feed grain policy. This has contributed to a projected decline in the U.S. share of the eastern Canadian import market from 22.7 percent in 1975/76 to 10.0 percent in 1976/77.

U.S.-Canadian competition in livestock is a natural outgrowth of U.S.-Canadian competition in feed grains. Livestock and livestock products comprise a major proportion of U.S.-Canadian trade. Feed grain prices are an important cost in livestock production. Higher feed grain prices could have an impact on Canada's trade with the United States in livestock and livestock products. The corn price is an important factor in U.S. livestock production costs, against which Canadian livestock producers must compete as importers and exporters. Under the CWB pricing formula for feed grains, the U.S. corn price is now also a major determinant of the cost of livestock production in Canada.

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