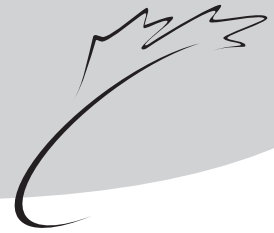




# Bi-weekly Bulletin

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## CANADIAN FEEDGRAIN CONSUMPTION

The reforms to western Canadian grain transportation policy in the 1990s shifted focus away from exports of bulk grain, toward diversification, value-added and adaptation. As a result, livestock production and the domestic use of feedgrain in western Canada generally increased except for the recent drought years. This issue of the *Bi-weekly Bulletin* provides an overview of the utilization of feedgrain in Canada by type of livestock.

The domestic feedgrain market consists of the market for coarse grain (barley, corn, oats, rye, mixed grain) and feed wheat. Soymeal and canola meal are also significant components in livestock rations as a source of protein.

The feedgrain market is dominated by barley in western Canada and corn in eastern Canada. Historically, western Canada produces a significant surplus of barley. However, drought in 2002 and, to a lesser extent, in 2001 severely reduced the availability of feed barley in western Canada. As a result, imports of United States (US) corn and domestic feed wheat have played an increasing role. Due to the unusually low level of barley production in 2002, and the high volume of corn imported from the US, the following discussion will focus on the situation prior to 2002-2003 in examining the distribution of feedgrain use by type of livestock.

Thus the changes brought about by the Bovine Spongiform Encephalopathy (BSE) crisis that began in May 2003 will not be discussed. The use of protein meal will be discussed in a subsequent issue.

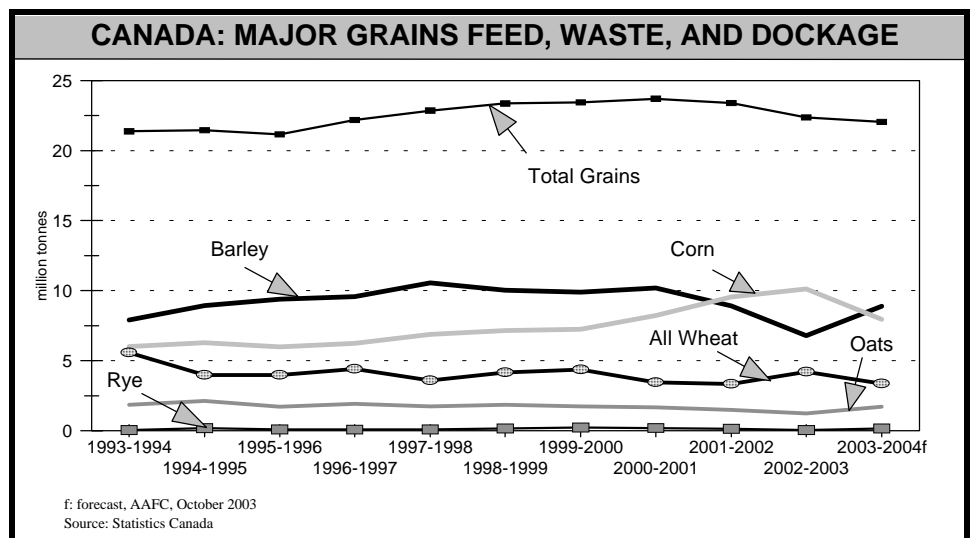
Barley and corn represent about 35% and 40%, respectively, of the feedgrain used in Canada during 1999-2001. Feed wheat, oats and other grains represent about 25%.

In the past, rye was a significant element in the feed market but the production of rye steadily decreased during the 1990s and it is no longer widely used as a feedgrain. The role of oats as a feedgrain has also decreased over the decade with the utilization of oats being increasingly dominated by

exports to the US and domestic food processing.

### PRODUCTION

Due to drought, the production of feedgrain in western Canada decreased to about 14 million tonnes (Mt) in 2001 versus the 10-year average of about 17 Mt. In eastern Canada, the production of feedgrain was about 11 Mt, similar to the 10-year average.



## Wheat

The availability of feed quality wheat is largely dependent on weather and growing conditions. Wheat is primarily produced for the more lucrative high quality milling wheat market. However, the demand for feed wheat by the hog and poultry markets is fairly constant, and if the supply of feed quality wheat is insufficient, as is the case in most years, lower quality milling wheat will enter feed channels. The most common types of milling wheat used for feed are Canada Prairie Spring Red (CPSR), Canada Western Red Winter (CWRW), No.3 Canada Western Red Spring (CWRS) and Canada Western Extra Strong (CWES). In some years of tight feed supplies, there have been reports that lower protein No.2 CWRS has even been purchased for feed. Feed wheat for domestic consumption is generally purchased off-Board, with the Canadian Wheat Board normally exporting all feed wheat entering its pool accounts. The off-Board price for wheat would have to be competitive with imported corn. Having a lower starch content than corn, the price of feed wheat is generally lower than the price per tonne of corn. Wheat does however have a higher protein content than corn. Though this is helpful from a feed perspective, the starch content has the most influence on feed prices.

## Barley

Barley is a major feed crop, especially on the prairies. However, in general, 15-20% of the barley produced is selected for malting purposes with the residual going into the feed sector. Due to dry conditions in 2001, barley production in western Canada fell to 10 Mt compared to the 10 year average of 12 Mt. The impact was predominantly felt in the feed industry, although there was also an extreme shortage of barley which was suitable for malting. The selectability of barley for malting is largely determined by whether it is of the proper variety with a sound plump kernel of adequate germination and in the proper protein content range.

## Corn

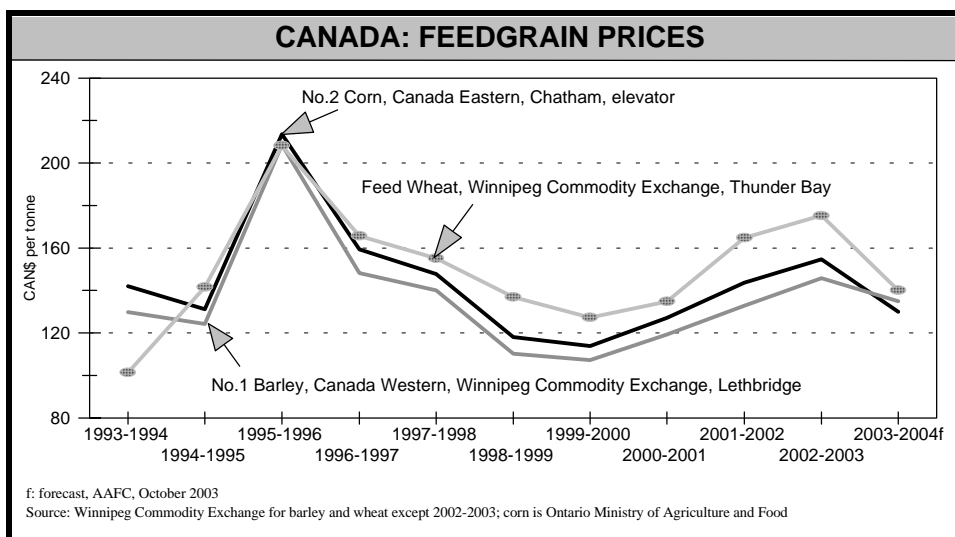
Corn has a high starch content which makes it especially valuable both as feed, and for some industrial uses such as ethanol. The vast majority of the corn produced in Canada, or imported, goes into the feed market. In the crop year 2001-2002, food and industrial use of corn in Canada absorbed 2.385 Mt while the feed, waste and dockage accounted for 10.121 Mt. About 65% of Canada's corn production comes from Ontario and about 30% from Quebec. In western Canada, imported corn from the US is

the most readily available substitute for barley in the livestock feed market. Corn production on the prairies, specifically in Manitoba, has been increasing over the decade due to the introduction of new varieties that require fewer heat units.

Canadian corn imports more than tripled in the period 1999 to 2001, rising from 1.022 Mt to 3.844 Mt. In the period 1989 to 1999 a yearly average of 817,900 tonnes (t) of US corn was imported. The surge of imported corn from the US partially was a result of the droughts experienced in western Canada. This resulted in a shortage of feed grain and prices rising to the point where US corn could be purchased, transported and still be competitive with local supplies. Because of the very large supply of US corn, the landed price of US corn represents the ceiling on Canadian feed grain prices.

## Oats

Oats are a small part of the feed market compared to barley and corn. The high fibre content of hulled oats decreases the nutrient value of oats and increases the time and cost required to reach slaughter weight. There has also been a significant increase in recent years in the use of oats for domestic processing, resulting partly from the increase in shipping costs after the abolition of the Western Grain Transportation Act (WGTA). A significant portion of Canada's oat production is exported to the US, mostly for the food market. The main feed market in Canada for oats is cattle. However race horses and pleasure horses in both Canada and the US are regularly fed on high quality (relatively expensive) oats. Lower quality oats are also used for breeding cattle and younger animals on feedlots.



<b>CANADA: FEEDGRAIN USE*</b>								
1999-2001 average	Wheat	Barley	Corn	Oats	Other <sup>1/</sup>	Total Grains	Protein Meal <sup>2/</sup>	Total
.....thousand tonnes.....								
<b>CANADA</b>								
Beef Cattle	145	3,396	768	1,554	579	6,442	349	6,791
Dairy Cattle	116	952	1,824	60	344	3,295	471	3,765
Hogs	818	2,001	3,676	30	304	6,829	1,396	8,225
Chickens	402	179	836	0	40	1,456	391	1,847
Layers	274	0	250	0	43	566	133	699
Turkeys	100	0	131	0	11	243	81	324
Horses	0	71	22	178	13	285	27	312
Sheep/Lambs	<u>1</u>	<u>34</u>	<u>7</u>	<u>7</u>	<u>4</u>	<u>53</u>	<u>3</u>	<u>56</u>
<b>Total</b>	<b>1,857</b>	<b>6,632</b>	<b>7,514</b>	<b>1,829</b>	<b>1,337</b>	<b>19,169</b>	<b>2,851</b>	<b>22,019</b>
<b>WESTERN CANADA</b>								
Beef Cattle	97	3,253	85	1,492	449	5,377	197	5,574
Dairy Cattle	15	607	39	7	84	752	108	860
Hogs	574	1,811	345	8	278	3,016	505	3,521
Chickens	243	179	0	0	0	422	113	535
Layers	200	0	10	0	1	211	49	260
Turkeys	72	0	0	0	0	72	24	96
Horses	0	50	8	131	3	193	16	209
Sheep/Lambs	<u>0</u>	<u>23</u>	<u>0</u>	<u>4</u>	<u>0</u>	<u>27</u>	<u>1</u>	<u>28</u>
<b>Total</b>	<b>1,202</b>	<b>5,923</b>	<b>487</b>	<b>1,642</b>	<b>816</b>	<b>10,070</b>	<b>1,013</b>	<b>11,084</b>
<b>EASTERN CANADA</b>								
Beef Cattle	48	143	683	61	130	1,065	152	1,217
Dairy Cattle	101	345	1,785	52	259	2,542	363	2,905
Hogs	244	190	3,331	22	27	3,814	891	4,704
Chickens	159	0	836	0	40	1,035	277	1,312
Layers	74	0	240	0	42	356	84	439
Turkeys	28	0	131	0	11	171	57	228
Horses	0	21	14	47	10	92	11	102
Sheep/Lambs	<u>1</u>	<u>11</u>	<u>7</u>	<u>4</u>	<u>3</u>	<u>25</u>	<u>3</u>	<u>28</u>
<b>Total</b>	<b>655</b>	<b>709</b>	<b>7,027</b>	<b>186</b>	<b>521</b>	<b>9,099</b>	<b>1,836</b>	<b>10,935</b>
<p>*These feedgrain use estimates, of about 19 Mt for the period 1999-2001, were derived by Statistics Canada. For each type of livestock, each age group is assumed to consume a specified ration, and the total use is determined by aggregating the use by each animal subset. These estimates are significantly lower than the feed, waste, and dockage (FWD) estimates of about 24 Mt for wheat and coarse grains published by Statistics Canada in its Supply and Disposition tables. The difference in the estimates is partially accounted for by the inclusion of waste and dockage in the FWD estimate and in the fact that the FWD is a residual which would incorporate any estimation errors in production, imports or exports, food/industrial use or carry-in/carry-out stocks. Also, the feedgrain use estimates are dependent on the accuracy of the estimates of the number of animals by age category obtained by survey and the assumed composition of the rations. The animals' weight and stage of development are also very important factors that should be taken into consideration.</p>								
<sup>1/</sup> Other: Rye, Dry Peas, Mill Screenings								
<sup>2/</sup> Meal: Soybean meal and Canola Meal								
Source: Statistics Canada except layers and turkeys which were derived by AAFC.								

## DEMAND FOR FEED

Feed demand has been steadily increasing over the past few years. A dramatic increase in the size of the hog industry has contributed to this trend.

As well, steady growth in cattle production has pushed up the level of feed demand. The livestock sector has benefited considerably from both the abolition of the WGTA and the resulting interest in value-added activity.

### Cattle

The cattle industry has grown significantly to 15.3 million head (Mhd) in 2002 versus 12.7 Mhd in 1995. Most of the increase consisted of beef cattle, as rising dairy productivity more than made up for increased demand. From 1995 to 2002 the number of cattle increased significantly in Manitoba and Alberta. In total, dairy and beef cattle consumed about 50% of the feedgrain during 1999-2001.

Cattle are ruminants, multi-stomach animals, that make use of bacteria to break down feed. For cattle, roughage can be substituted for feedgrain. For health reasons some roughage is required in a cattle ration. As a result, relative prices of the various feedgrains and roughage sources (various hays and straws) have a significant impact on the composition of the feed ration. Barley's high fibre content accounts for the popularity of barley in cattle rations. Corn makes up much of the rest of the grain fed to cattle.

### Hogs

The Canadian hog population has grown from 11.5 Mhd in 1995 to 14.7 Mhd in 2002. Hogs are the second largest consumer of Canadian feed and feedgrains, consuming approximately 36% of the feedgrain consumed during 1999-2001. Nutrition

is very important to the hog industry, owing to the rapid growth and mono-gastric nature of hogs.

Corn, barley and wheat are all used for hog feed. In eastern Canada, corn is the primary feedgrain. Both domestic and imported corn contribute to the eastern feed market. In western Canada, the market is slightly more complex with both imported corn and domestic wheat and barley going into the feed market.

The prairie hog industry has grown enormously in the past few years, with the number of "pigs on farms" growing by 76% in Manitoba, 39% in Saskatchewan and 11% in Alberta from 1995-2002. The growth rate was 16% in Ontario and 34% in Quebec. Much of this growth, especially on the prairies, has been directed towards the export market.

### Poultry

Poultry is another large consumer of feed. Supply management has led to a relatively stable poultry industry, growing with population over time. Chickens are the primary poultry product and consume the vast majority of feed, with turkeys consuming the bulk of the remainder.

Total chicken production has increased to 954

million kilograms (Mkg) in 2001 from 686 Mkg in 1995. Turkey production increased to 146 Mkg in 2002 from 142 Mkg in 1995. All poultry accounted for about 15% of feed consumption for 1999-2001.

### Other

Other noteworthy consumers of feed are sheep, lambs and horses. Horses are primarily used for recreational purposes. The numbers are relatively steady, and they represent a small but premium portion of the overall feed market. Sheep and lambs are also a small portion of the feed market, however this portion is growing. From July 1995 to July 2002, sheep and lambs on Canadian farms grew by over 50% to 1.25 Mhd. Both sheep and horses are sensitive to fusarium.

## CANADA: LIVESTOCK POPULATIONS

at July 1	1999	2000	2001	2002	2003*
.....thousands.....					
<b>CANADA</b>					
Cattle	14,753	14,968	15,424	15,336	15,728
Hogs	12,688	13,401	14,050	14,668	14,566
Chicken	47,830	50,593	53,216	51,799	49,390
Turkey	20,001	21,159	20,057	19,572	n/a
Sheep/Lambs	979	1,105	1,247	1,252	1,249
<b>WESTERN CANADA</b>					
Cattle	10,975	11,234	11,640	11,533	11,785
Hogs	4,983	5,410	5,882	6,324	6,208
Chicken	16,207	17,359	18,100	17,677	16,152
Turkey	5,819	6,242	5,894	5,781	n/a
Sheep/Lambs	471	534	605	591	555
<b>EASTERN CANADA</b>					
Cattle	3,778	3,734	3,784	3,802	3,943
Hogs	7,705	7,991	8,167	8,344	8,357
Chicken	31,623	33,234	35,116	34,122	33,238
Turkey	14,182	14,917	14,163	13,791	n/a
Sheep/Lambs	508	571	642	661	694

\* Hogs and Chicken are at April

n/a = not available

Source: Statistics Canada, Chicken Farmers of Canada, Canadian Turkey Marketing Agency

## Ethanol

As a result of Canada's commitment to the Kyoto agreement, the ethanol industry appears to be on the verge of expansion, especially in western Canada. Grain or other feedstock is used to produce ethanol which can be blended with gasoline to reduce greenhouse gas emissions. Federal and provincial incentives are available to encourage the expansion of Canada's ethanol production capacity. The main by-product of the ethanol production process, dried distillers grain (DDG), can be used as feed. However, DDG has a lower starch content and, in some cases, a higher fusarium content which limits its value. Ethanol producers are interested in the same starch content as feedlots. If realized, the proposals in Manitoba and Saskatchewan to increase ethanol production are expected to increase the availability of DDG.

## Fusarium

Wheat and barley, primarily in eastern Saskatchewan, Manitoba's Red River valley and parts of Ontario have been affected by a fungal disease known as Fusarium Head Blight - also referred to as "tombstone" kernels or, in the US,

as "scab." High moisture levels, combined with high temperatures during the flowering stage, are ideal climatic conditions for the development of fusarium in wheat and barley. The value of grain containing fusarium depends on the fusarium content and the options for cleaning and blending it with fusarium-free grain. (Fusarium damaged wheat or barley has been traded inter-regionally within western Canada depending upon its fusarium content and which livestock sector can make the best use of grain with a specific level of fusarium damage. Cattle are more tolerant of fusarium than hogs.) Some feed barley from Manitoba and Saskatchewan with a fusarium content that exceeds the threshold for hogs has been shipped to Alberta's cattle sector, while barley from Alberta is shipped to Manitoba hog producers. The prevalence of fusarium in prairie grain has decreased significantly to a minimal level over the last few years, due to dry conditions.

## PRICES

The world price of feedgrain is largely determined by the price of corn on the US Chicago Board of Trade (CBoT)

futures market. However, feed wheat prices are also a factor to consider because wheat can substitute for corn. On a per tonne basis, after accounting for the exchange rate and nutrient quality differences, the landed price of US corn provides a ceiling for the price of feedgrain in Canada. Thus, during periods of high production in western Canada, the price of barley is below the landed price of US corn and during periods of short supply, the landed price of US corn provides a ceiling for the price of barley in western Canada.

## Outlook: 2003-2004

The price outlook for feedgrains in Canada for 2003-2004 is highly dependent on several factors such as US corn prices, the Canada/US exchange rate, and feedgrain production and demand in Canada.

The average **US farm price** for corn is forecast by the United States Department of Agriculture (USDA) at US\$1.90-2.30 per bushel (/bu) in 2003-2004. The nearby CBoT corn futures price is expected to average US\$2.15/bu.

## DRIED DISTILLERS' GRAIN (DDG)

Ethanol is produced mainly from wheat in western Canada and corn in eastern Canada. In 2002, Canada produced about 165,000 tonnes (t) of DDG. One tonne of wheat generates about 370 litres (L) of ethanol and 0.35 t of DDG with an average protein content of 38% versus 35% for canola meal. Assuming a price discount of 10% from its nutrition value, the price of DDG in western Canada should be similar to that of canola meal for which the current price is about \$165/t.

In addition to the protein content, other major factors influencing the price of DDG are: (1) the consistency (stability) of supply, (2) the location of the livestock enterprise relative to the location of the ethanol plant, (3) the type of livestock enterprise, i.e. hogs or cattle, since hogs are not the major consumer of DDG, and (4) the quality and type of grain that was used as feedstock. The fusarium content of DDG is totally dependent on the fusarium content of the feedstock, since the ethanol production process does not alter the fusarium level.

In the US, the majority of ethanol is produced from corn and 1 t of corn yields about 400 L of ethanol and 0.30 t of DDG. The average protein content is 30% for corn DDG versus 48% for soymeal. The current market price for DDG is about US\$120/t, which represents a 10% discount compared to the current price of about US\$200/short ton for soymeal, after adjusting for protein content.

## DRY PEAS AND PROTEIN MEAL

Dry peas are used to a significant extent in Canada and Europe in the hog production industry and, to a lesser extent, for the poultry, cattle and other livestock sectors. Dry peas have a protein content of about 22.5%. They are a good source of energy and contain amounts of digestible energy similar to wheat. Pea protein, protein from cereals, and canola meal are nutritionally complementary, enhancing each one's value when used in rations. Usually peas displace soymeal and high energy grains, such as wheat or corn, in a hog ration. Therefore, a formula of one-third of the price of soymeal and two-thirds of the price of wheat or corn gives an approximation of the opportunity price of peas. For example, in Manitoba, the current price of corn is about \$130/t and the price of soymeal is \$320/t. This implies that the opportunity price for dry peas is about \$190/t versus the current market price of about \$155/t for dry peas and indicates that there is a significant economic advantage to using peas.

An innovative use of dry peas in livestock feed is a mixture of two-thirds ground peas and one-third canola meal. In a mixture of peas and canola meal, peas complement canola meal. Although canola meal is an excellent source of protein, it is low in digestible energy. Peas have high energy digestibility, and the amino acid profile of peas, which is high in lysine, complements the amino acid profile of canola meal, which is high in methionine and cystine.

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The production of **feedgrain** in Canada is estimated to increase significantly, in line with total production of grains, oilseeds and special crops, due to increased yields as the crop in western Canada recovers from the 2002-2003 drought. In general, coarse grain prices in Canada are expected to decrease because of higher domestic feedgrain production and the stronger Canadian dollar.

**Wheat** production has increased considerably in 2003 but the higher quality of the crop will reduce the availability of wheat for feed. The price of No.3 CW Feed Wheat in-store (I/S) Thunder Bay is forecast to decrease to about \$140 per tonne (/t) from \$174/t for 2002-2003.

Domestic use of **feed barley** is expected to increase considerably, displacing imports of US corn and other domestic crops. The average price of barley {No.1 feed, cash, I/S Lethbridge} is forecast to decrease to \$135/t from \$172/t in 2002-2003.

Increased **oat** supplies are expected to lead to a considerable increase in exports to the US, in addition to higher domestic feed use. The average price of oats (US, No.2 heavy, CBoT nearby futures) is forecast to decrease to CAN\$135/t from CAN\$194/t in 2002-2003.

Corn imports to western Canada are expected to decline considerably as they are displaced by increased supplies of domestic feed barley. The average price of

corn (No.2 Canada Eastern, cash, I/S Chatham) is forecast to decrease to \$135/t from \$145/t in 2002-2003.

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