

THE GLOBAL PORK SITUATION – WHERE DOES CANADA FIT?

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ABSTRACT

Pork production is global in nature with trade occurring relatively freely around the world. Most countries now have access to the same genetics and have similar productivity potential. Food safety regulations and health protocols are standard requirements. Industry shocks such as disease (i.e. H1N1) or feed shortages that occur in one country have the ability to affect markets around the world. It is speculated that the main differentiating factors in global pork production are housing standards/animal welfare issues, producer management ability and government policy (i.e. environmental standards, financial support, trade barriers).

Canadian pig producers have faced many challenges during the last few years due to a stronger Canadian dollar, country of origin labelling, feed cost volatility, low market prices, H1N1, and so on. As a result, there has been and will continue to be attrition of producer numbers. Amid these challenging times however it is important to assess the attributes of the Canadian industry, to find light at the end of the tunnel for those with the stamina to remain in the business. What strategies will be needed to set Canada apart from other pork producing countries in the future and to be competitive at a global level?

WORLD PIG INVENTORIES

The pig production industry is global in nature. Table 1 shows beginning inventory numbers for major pig producing countries from 2005 to 2009. China is, by far, the largest producer with nearly 463 million pigs or 59% of the world's pig inventory in 2009. In comparison, the EU-27 countries are reported to have about 19.5% of the world's inventory, the US 8.6% and Canada 1.6% in 2009.

Of the major pig producing countries, Canada experienced the largest decline in pig inventories between 2005 and 2009 (i.e. a decline of 17.8%). The EU-27 declined by 2.6% but China increased by 9.9%, the US increased by 10.1% and Brazil grew by 18.6%.

ESTIMATED PORK COST OF PRODUCTION

Canada has always been viewed as one of the lowest pork production cost regions in the world. Table 2 shows the estimated cost of production in \$/kg carcass weight for Canada and selected countries for 2006 and 2007. The figures have been converted from local currency to Canadian

currency using the Bank of Canada average annual exchange rate between Canada and the specific country.

Table 1. Beginning inventory by country and % change, 2005-2009 ('000 head).

'000 head	2005	2006	2007	2008	2009	% Change 2005 to 2009
China	421,234	433,191	418,504	439,895	462,913	9.9%
EU-27	156,973	159,115	161,526	159,732	152,960	-2.6%
Brazil	32,323	32,938	33,147	32,947	33,892	4.9%
Russia	16,500	16,550	17,180	18,187	19,562	18.6%
Canada	14,810	15,110	14,907	13,810	12,180	-17.8%
Japan	9,600	9,620	9,759	9,745	9,899	3.1%
Mexico	9,068	8,911	9,021	9,401	9,310	2.7%
Others	64,456	67,653	70,566	20,765	16,930	-73.7%
United States	60,982	61,463	62,516	68,177	67,148	10.1%
World Total	785,946	804,551	797,126	772,659	784,794	-0.1%

Source: USDA, FAS

Table 2. Production costs by country, 2006-2007 (\$/kg carcass weight).

Country	2006	2007	% Change 2006 to 2007
USA	1.44	1.54	6.7%
Brazil	1.30	1.62	24.8%
Canada	1.42	1.74	22.5%
Denmark	1.85	2.01	8.7%
Netherlands	1.81	2.16	19.4%
France	1.92	2.22	15.4%
Belgium	1.82	2.23	22.5%
Spain	2.02	2.31	14.1%
Germany	2.08	2.34	12.4%
Britain	2.28	2.62	15.1%

Source: Pig International, March/April 2009 adapted from InterPig reports. University of Guelph-Ridgetown Campus calculations.

Table 2 shows that, of the countries listed, the US had the lowest estimated cost in 2007 at \$1.54/kg. The next lowest cost country was Brazil at \$1.62 followed by Canada at \$1.74. The European countries listed in the table all had costs higher than \$2.00/kg ranging from Denmark at \$2.01/kg to Britain at \$2.62/kg. It should be noted that in 2006, Canada ranked second behind Brazil for the lowest cost of production.

The table also shows the % change between the two years which is positive for all of the countries listed as a result of increased feed costs. The change figures shown account for both changes in the cost of production within the specific country and any change in the currency conversion between Canada and the specific country from 2006 to 2007. The change in costs

from 2006 to 2007 showed Canada had the second largest increase at 22.5% after Brazil's increase of 24.8%. The US had the lowest increase at 6.7%. When the changes in the currency conversion between Canada and the specific country are removed, Canada had the largest change in production costs based on local currency at 22.5%. The country with the smallest change was Denmark at 5.3%.

For comparison purposes, China, the world's largest pork producing country had an estimated cost of production as of mid-2007 ranging from \$45-\$52 per hundred pounds while US production costs were just under \$50 per hundred pounds (\$US). These costs would convert to approximately \$1.44-\$1.67/kg for China (i.e. \$1.55/kg average) and just under \$1.60/kg for the US (all figures in \$C/kg carcass weight). The US figure is higher but comparable to that for 2007 in Table 2 above while the estimated average of \$1.55/kg for China would place it between the US and Brazil for 2007.

In summary, Canada is still among the world's lowest cost pork producing regions. A comparison between Canada and selected countries showed that, in 2006, Canada ranked 2nd behind Brazil and in 2007, Canada ranked 3rd behind the US and Brazil in terms of cost of production in \$C/kg carcass weight of pork. From 2006 to 2007, Canada's production costs increased 22.5% but costs increased in the other countries in the comparison as well. This allowed Canada to maintain its relative standing as a low production cost region.

GLOBAL TRADE

Table 3 provides information on the top 4 pork exporters. In 2009, these 4 countries represented 90% of global pork exports and the US accounted for 35% of all exports. The US has had significant growth in its pork exports increasing by 56.1% from 2005 to 2009. The EU-27 and Canada increased at much more modest rates while Brazil decreased from 2005 levels.

Table 3. Top 4 pork exporting countries ('000 tonnes).

Exports	2005 (‘000 t)	2009 (‘000 t)	% Change 2005-09	% of World Exports 2009
1. US	1,209	1,887	56.1%	35%
2. EU-27	1,143	1,250	9.4%	23%
3. Canada	1,084	1,130	4.2%	21%
4. Brazil	761	645	-15.2%	12%
Top 4	4,197	4,912	17.0%	90%

Source: USDA – FAS. Ranked according to 2009 data.

Table 4 shows the top 4 importing countries. Japan is the largest pork importer accounting for 23% of world imports in 2009. The top 4 countries represented 55% of all imports. Mexico reported the largest increase in imports (i.e. 42.9%) between 2005 and 2009 while Japan and Russia decreased by 7.9% and 0.3% respectively.

Table 4. Top 4 pork importing countries ('000 tonnes).

Imports	2005 (‘000 t)	2009 (‘000 t)	% Change 2005-09	% of World Imports 2009
1. Japan	1,314	1,210	-7.9%	23%
2. Russia	752	750	-0.3%	14%
3. Mexico	420	600	42.9%	11%
4. S Korea	345	375	8.7%	7%
Top 4	2,831	2,935	3.7%	55%

Source: USDA - FAS. Ranked according to 2009 data.

GLOBAL PORK CONSUMPTION PATTERNS

It is expected that pork demand worldwide will grow in the future as incomes rise in developing countries and populations increase. The U.N. Food & Agriculture Organization (FAO) recently released “The State of Food & Agriculture 2009” report which shows per capita consumption of meat in 2050 compared to 2000. This is shown in Table 5 along with the % change. Significant growth is anticipated in East and South Asia and the Pacific where the increase is believed to be 82.1%, from 28 to 51 kg/person/yr. Meat consumption is expected to double in sub-Saharan Africa although the beginning value in 2000 is quite low. It is difficult to know how pork consumption in particular fits in the projection but it is believed that pork consumption will increase similarly.

Table 5. Worldwide per capita meat consumption levels, 2000 versus 2050 and % change.

	2000	2050	% Change 2000-2050
Central & West Asia & North Africa	20	33	65.0%
East & South Asia & the Pacific	28	51	82.1%
Latin America & the Caribbean	58	77	32.8%
North America & Europe	83	89	7.2%
Sub-Saharan Africa	11	22	100.0%

Source: U.N. Food & Agriculture Organization, “State of Food & Agriculture”, 2009.

In terms of historical per capita consumption of pork, Table 6 shows pork consumption by country between 2005 and 2009. Hong Kong, EU-27 and Taiwan reported the highest per capita consumption of pork in 2009 at 65.1 kg, 42.3 kg, and 41.7 kg/person/yr. Canada was similar to the US, South Korea and Russia at 24.9 kg/person/year. Russia has experienced the most growth in consumption increasing by 21.8% from 17 kg/person in 2005 to 20.7 kg/person in 2009. Hong Kong and South Korea also reported strong growth with increases of 9.2% and 7.0% respectively.

Table 6. Per capita consumption of pork by country (kg/person/yr) and % change 2005 to 2009.

	2005	2006	2007	2008	2009	% Change 2005-09
Canada	25.0	25.2	26.6	25.5	24.9	-0.4%
China	34.6	35.0	32.3	34.9	36.1	4.3%
EU-27	42.2	42.1	43.9	42.8	42.3	0.2%
Hong Kong	59.6	60.4	61.5	65.0	65.1	9.2%
Japan	19.7	19.2	19.4	19.5	19.6	-0.5%
Korea South	27.3	29.5	31.1	31.4	29.2	7.0%
Mexico	14.7	14.3	14.0	14.6	15.0	2.0%
Russia	17.0	18.2	19.4	21.7	20.7	21.8%
Taiwan	41.6	40.7	40.5	41.2	41.7	0.2%
United States	29.3	29	29.8	29	29.1	-0.7%

Source: USDA – FAS

CONCENTRATION IN THE GLOBAL AND NORTH AMERICAN FOOD SYSTEM

The many participants in the Canadian pork industry supply chain include producers, processors and retailers. The largest Canadian pork processor in Canada is Maple Leaf Foods and the largest food retailer is the Loblaw Companies. As a participant in the global food system, the Canadian pork industry is affected by the intense competitive factors that Canadian based processors and retailers like Maple Leaf and Loblaw face from large international competitors.

Global Retailers

Table 7 shows the largest food retailers in the world ranked by 2008 sales in \$US billions. The US based Wal-Mart is far and away the world leader at \$401.2 billion and has a large presence in Canada. Ranked number eight in the world is US based Costco with sales of \$71 billion. Costco also has stores throughout Canada. Canada's Loblaw Companies rank number 24 in the world with sales of \$28.9 billion.

North American Retailers

If the focus shifts to North America, the food retail sector is dominated by US based companies. Table 8 shows the largest North American food retailers and wholesalers ranked by estimated 2009 sales in \$US billions. Total sales includes both food and non-food merchandise in North America. The top 75 companies are estimated to have had \$891.4 billion in total sales in 2009, which is down 0.2% from 2008. Wal-Mart is the dominant market leader with North American sales of \$262.0 billion or 29% of the total for the top 75. The ten largest companies on the list represented \$606 billion in sales or 68% of total sales of the top 75 companies. The top 20 companies accounted for \$727 billion in sales or 81.6%.

Table 7. Largest global food retailers, 2008.

Rank	Company	2008 Sales (\$US billions)	Number of Stores
1	Wal-Mart Stores (USA)	401.2	7,873
2	Carrefour (France)	117.3	15,430
3	Tesco (UK)	99.7	4,300
4	Metro Group (Germany)	98.6	2,195
5	Schwarz Group (Germany)	80.9	9,300
6	Kroger (USA)	76.0	3,637
7	Rewe (Germany)	73.4	13,000
8	Costco (USA)	71.0	544
9	Aldi (Germany)	65.7	9,000
10	Auchan (France)	57.8	2,777
24	Loblaw (Canada)	28.9	1,036

Source: SupermarketNews.com.

Table 8. Largest North American food retailers and wholesalers, 2009.

Rank	Company	Estimated 2009 Sales (\$US billions)	Corporate Stores
1	Wal-Mart Stores (USA)	262.0	4,624
2	Kroger (USA)	76.0	3,634
3	Costco (USA)	71.4	527
4	Supervalu (USA)	41.3	2,450
5	Safeway (USA)	40.8	1,730
6	Loblaw (Canada)	29.9	1,036
7	Publix Super Markets (USA)	24.3	1,018
8	Ahold USA (USA)	22.3	707
9	C&S Wholesale Grocers (USA)	19.0	n.a.
10	Delhaize America (USA)	19.0	1,608
14	Sobeys (Canada)	12.7	1,325
17	Metro (Canada)	10.7	747
46	Overwaitea Food Group (Canada)	2.7	123

Source: SupermarketNews.com. Note: n.a. – not available.

Canadian Retailers

The Loblaw Companies ranked number six in North America at \$29.9 billion in sales or 3.4% of the top 75 total. The next largest Canadian based companies are Sobeys with \$12.7 billion, Metro at \$10.7 billion, and the Overwaitea Food Group with \$2.7 billion in sales. They are ranked number 14, 17 and 46 respectively. The four Canadian companies combined accounted for \$56 billion in sales or 6.3% of the top 75 total.

Research done by Ipsos Reid in Canada in 2008 found that 70% of pork purchases in Canada (in kg) were from Loblaw, Sobeys and Metro stores. The vast majority of pork is purchased at mainstream or discount grocery chains. Loblaw, Metro, Wal-Mart and Costco all buy nationally and combined accounted for 65% of meat buying decisions. In Ontario, these four retailers accounted for 75% of meat buying decisions.

North American Processors

Shifting to the largest North American food processors, we again see US based companies dominating the market. Table 9 shows the largest North American food processors ranked by 2008 food sales in \$US billions. Of specific interest in the list are companies with a significant presence in the North American retail pork sector. These include Tyson Foods (#2), Smithfield Foods (#8), JBS USA (#13), Sara Lee (#16), Hormel Foods (#17), and Cargill (#21). These six US based companies accounted for \$64.134 billion in food sales and \$193.04 billion in total company sales in 2008. By comparison, the largest Canadian based processing company with a pork product presence is Maple Leaf Foods ranked number 23 with \$5.2 billion in food and total company sales.

Table 9. Largest North American food processors, 2008.

Rank	Company	2008 Food Sales (\$US billions)	2008 Total Company Sales (\$US billions)	Food Sales/ Total Sales (%)
1	Nestle	26.477	102.962	26
2	Tyson Foods	26.325	26.862	98
3	Pepsico	25.346	43.251	59
4	Kraft Foods	23.956	42.201	57
5	Anheuser-Busch InBev	15.571	39.158	40
6	Dean Foods	12.455	12.455	100
7	General Mills	12.100	14.691	82
8	Smithfield Foods	10.726	12.488	86
9	Kellogg	8.457	12.822	66
10	Coca-Cola	8.205	31.944	26
11	ConAgra Foods	8.031	12.731	63
12	Pilgrim's Pride	8.025	8.525	94
13	JBS USA	8.000	13.284	60
16	Sara Lee	6.828	13.212	52
17	Hormel Foods	6.755	6.755	100
19	Saputo	5.793	n.a.	n.a.
21	Cargill	5.500	120.439	5
23	Maple Leaf Foods	5.243	5.243	100

Source: FoodProcessing.com. Note: n.a. – not available.

In summary, participants in the Canadian pork industry supply chain face stiff competition from international companies, particularly US based companies. Wal-Mart is the leader in both North American and global food retailing. Canada's largest retailer, Loblaw Companies, ranks 6th in

North America and 24th in the world in retail sales. In terms of food processors, Canada's largest company with a significant pork product presence is Maple Leaf Foods which ranks 23rd in North America. Six US based companies with significant pork product presence in the North American retail market are all larger than Maple Leaf in terms of food sales. This fierce competition at the retail and processing level creates a lot of pressure on the Canadian pork industry supply chain to continually search for advantages in costs, quality, innovation and relationship management.

GLOBAL ISSUES

As shown in the previous discussion the pork industry is a global business. As such, events in one part of the world often have the ability to affect production in other countries. Disease is a prime example of this. When the H1N1 virus was found on a pig farm in Mexico in April 2009, pork markets worldwide suffered as countries closed their borders to imports and consumers lost confidence in the pork supply. University of Guelph - Ridgetown Campus estimated that losses to the Ontario industry alone were approximately \$7 million for the 3 weeks immediately following the announcement of H1N1 in Mexico.

Feed costs are another issue that affect pig production. Feed represented approximately 64% of the cost to raise a market hog from birth in 2009 (Richards). Table 10 shows US corn supply and demand figures as of February 2010. This information is important because Ontario corn prices are based off US prices and are then adjusted for local factors. Table 10 indicates that prices at this time are projected to be lower in the coming year compared to the previous 2 years due largely to record yields.

Table 10. US corn supply and demand.

	2007/08	2008/09	2009/10 Feb*	2009/10 Mar*
Beginning Stocks	1,304	1,624	1,673	1,673
Production	13,038	12,092	13,151	13,131
Imports	20	14	10	10
Total Supply	14,362	13,729	14,834	14,814
Feed & residual	5,913	5,246	5,550	5,550
Food, seed, industrial	4,387	4,953	5,565	5,565
Ethanol – fuel	3,049	3,677	4,300	4,300
Exports	2,437	1,858	2,000	1,900
Total Use	12,737	12,056	13,115	13,015
Ending Stocks	1,624	1,673	1,719	1,799
Avg Price (\$/bu)	4.20	4.06	3.45-3.95	3.45-3.75

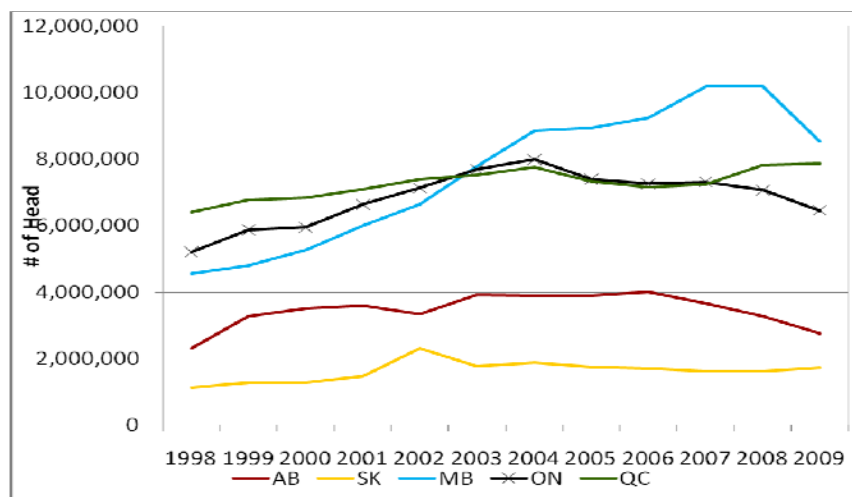
Source: USDA, WASDE, March 2010. * Projections. Numbers may not add due to rounding.

Trade is another challenge for the pork industry. Trade barriers such as country of origin labelling and food safety regulations in other countries can be significant impediments to trade while exchange rate affects price competitiveness in export markets.

CANADIAN PIG PRODUCTION AND TRADE

Total pig production for the major pig producing provinces is displayed in Figure 1. Manitoba increased pig production from approximately 4.6 million pigs produced in 1998 to the peak of 10.2 million in 2007. Canada's total production grew from 20.5 million in 1998 to a high of 31.2 million in 2004 before declining to 27.8 million in 2009.

Figure 1. Total pig production by province.



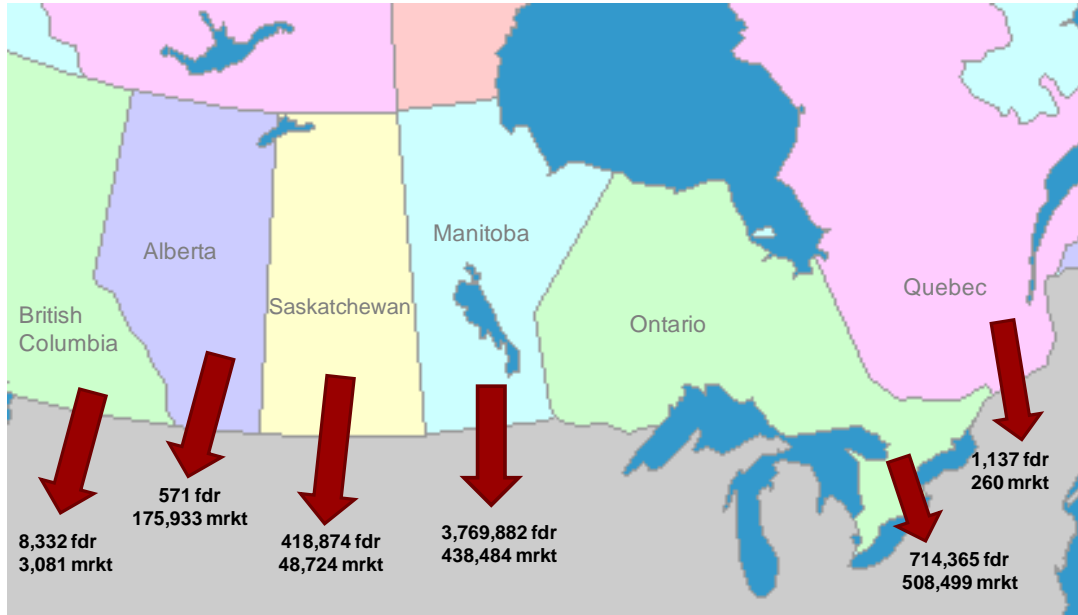
Source: USDA, APHIS; CFIA & provincial governments. Pig production = province of origin hogs slaughtered + weaner exports + market hog exports.

Canada has been heavily reliant on exporting feeder pigs and market hogs to the US. Movement of these pigs by province in 2009 is shown in Map 1. Live exports have decreased in 2009 to 6.2 million pigs (i.e. 5 million feeder pigs + 1.2 million market hogs) from approximately 9.7 million in 2007 (i.e. 6.5 million feeder pigs + 3.2 million market hogs).

Table 11 provides an indication of how reliant on exporting the Canadian pork industry is. In 2008 approximately 62.7% of production was exported as live pigs or pork compared to 57.9% in 2009. Much of the change in export % can be attributed to the decline in total live pig exports which decreased by 32% from 2008 to 2009. The decrease in live exports is largely due to country of origin labelling regulations in the US which has reduced the flow of pigs from Canada.

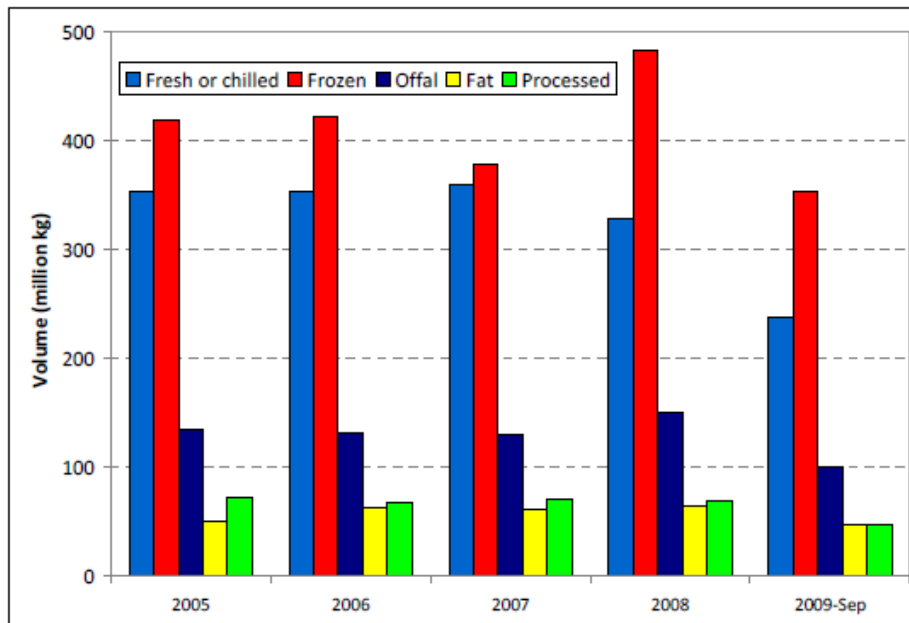
As stated previously, the pork industry in Canada is heavily reliant on the export market. There are 5 categories of export products including: fresh and chilled; frozen; offals; pig fat; and processed. The largest category by volume from 2005 to 2009 is frozen pork which ranged from 379 million kg in 2007 to 483 million kg in 2008 as shown in Figure 2. This represented 42% of all pork exports on average. Fresh or chilled pork ranged from 329 million in 2008 to 359 million in 2007 and represented on average 33% of all pork exports. When combined, the frozen and fresh or chilled pork categories accounted for 75% of total Canadian pork exports by volume.

Map 1. Feeder pig and market hog exports to US, 2009.



Source: USDA, APHIS.

Figure 2. Total volume of pork exports by category, 2005-2009.



Source: AAFC Agri-Food Trade Service. 2009 data is for January to September.

Table 11. Canadian hog production.

	Pig #s	
	2009	2008
i) Hogs		
Number Slaughtered*	21,642,151	21,521,403
ii) Pork Trade		
Processed Pork Exported (kg)	1,075,180,822	1,094,500,865
Processed Pork Imported (kg)	169,740,222	174,271,744
Net Processed Pork Trade (kg)	905,440,600	920,229,121
Conversion of net pork exports to live hog equivalents ¹	9,841,746	10,002,490
iii) Consumption		
Consumption (Hogs slaughtered – live hog equivalent of net pork exports)	11,800,405	11,518,913
iv) Live Pig Exports (to all countries)		
Exports – Feeder Pigs	5,221,664	7,036,388
Exports – Live Hogs	1,142,671	2,308,368
Total Live Pig Exports	6,364,335	9,344,756
A. Net Pork and Live Pig Exports	16,206,081	19,347,246
B. Total Production (slaughtered + live pig exports)	28,006,486	30,866,159
C. % of Production Exported as Pork or Live Pigs (C=A/B)	57.9%	62.7%

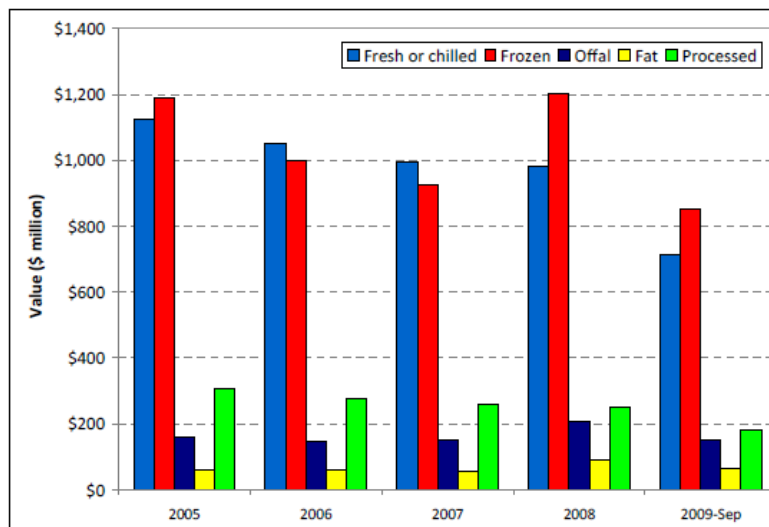
Source: Statistics Canada; ¹ Live hog equivalent = net pork trade/average carcass weight. Carcass weight = 92 kg.

* Province of origin slaughtered pigs - hogs that are slaughtered within Canada.

Frozen pork is also the largest category in terms of total value. This is shown in Figure 3. This category ranged from \$926 million in 2007 to \$1.2 million in 2008. On average the frozen pork category represented 41% of the total value of pork exports. The category fresh or chilled pork was the next largest and ranged from \$981 million in 2008 to \$1.1 billion in 2005. An average of 39% of the value of all pork exports was attributed to fresh or chilled pork. Therefore, 80% of total export value is from fresh, chilled or frozen products. In comparison, 10% is from processed products, 7% from offals and 3% from pig fat.

Japan and the US are the two leading countries that Canada exports to. Japan and the US represented 33% and 32% respectively of the total pork export value however the US represented 31% of the total export volume compared to 21% of Japan. Together, the US and Japan account for 65% of pork exports by value and 52% of exports by volume. The top 5 countries for 2009 by value and volume are shown in Table 12.

Figure 3. Total value of pork exports by category, 2005-2009.



Source: AAFC Agri-Food Trade Service. 2009 data is for January to September.

Table 12. Top 5 destination countries for Canadian pork exports by value and volume, 2009.

Rank	Country	Value (\$ mil)	% of Total	Rank	Country	Volume (mil kg)	% of Total
1	Japan	865	33	1	US	329	31
2	US	834	32	2	Japan	227	21
3	Australia	140	5	3	Hong Kong	79	7
4	South Korea	126	5	4	South Korea	64	6
5	Hong Kong	118	4	5	Russia	59	5
	Total, all countries	2,602			Total, all countries	1,075	

Source: Statistics Canada, AAFC Agri-Food Trade Service. Figures have been rounded. Countries have been ranked according to 2009 export data.

The value per kilogram for exports is broken down by country in Table 13. The 5 countries shown are the countries that had the highest total value of exports in 2009. The highest average values from 2005 to 2009 were realized on products sold to Japan and Australia. The average prices to these two countries were \$3.65/kg and \$3.20/kg respectively. The average price to the US was \$2.75/kg. The average value for all pork exports during the 2005 to 2009 time period was \$2.50/kg.

Table 13. Value of exports for top 5 destination countries (\$/kg), 2005-2009.

	2005	2006	2007	2008	2009	Average
Japan	3.81	3.45	3.44	3.72	3.81	3.65
US	3.06	2.85	2.60	2.71	2.54	2.75
Australia	3.55	3.15	3.30	3.18	2.83	3.20
S Korea	1.67	1.78	1.94	2.15	1.97	1.90
Hong Kong	1.34	1.39	1.36	1.40	1.49	1.40
Total	2.76	2.44	2.40	2.50	2.42	2.50

Source: Statistics Canada, AAFC Agri-Food Trade Service. Figures have been rounded. Top 5 countries determined by value of 2009 exports.

SUMMARY

In summary, pork production is a global business. Pork producers are affected by issues that occur around the world and they must be able to adjust quickly as a result. Canadian producers have been making adjustments as a result of a strengthening Canadian dollar, country of origin labelling, variable feed costs and so on. The industry has relied heavily on the export market for live pigs and pork. Given Canada's current production capacity and "pork for the world" marketing philosophy, it is expected that the export market will continue to be very important in the future.

REFERENCES

- Food Processing. Food Processing's Top 100 2009 Rankings. www.foodprocessing.com
- Haley, Mildred M. USDA Economic Research Service. "Market Integration in the North American Hog Industries", LDP-M-125-01, November 2004.
- MacDonald, James M. And M.E. Ollinger. USDA Economic Research Service. "Consolidation in Meatpacking: Causes & Concerns", Special Article, Agricultural Outlook June-July 2000.
- Mussell, Al and T. Bilyea. George Morris Centre. "Opening the Throttle and Applying the Brakes: The Disconnected Policy to Support (Stifle) the Canadian Pork Sector" August 2009.
- Richards, Doug. OMAFRA. "Summary of the Farrow to Finish Swine Enterprise Budgets - 2004 to 2009", accessed from <http://www.omafra.gov.on.ca/english/livestock/swine/news/janfeb10a3.htm>.
- Siren, Colin and A. Ivanauskas. Pork sales from the retail side; what meats do people buy and why. Presentation at Shakespeare Seminar "Ontario Swine Production – The Road Ahead", December 9, 2009, Shakespeare, Ontario.
- Supermarket News. Top 25 Worldwide Food Retailers for 2009. www.supermarketnews.com
- Supermarket News. Top 75 North American Food Retailers for 2010. www.supermarketnews.com

- Ulmer, Ann et. al. The Missouri Swine Audit: An Analysis of Missouri's Competitive Position in the Swine Industry. The University of Missouri Commercial Agriculture Program. April 2007.
- University of Guelph-Ridgetown Campus, "Canadian Pork Exports", January 2010.
- University of Guelph-Ridgetown Campus, "Hog Processing in Canada", January 2010.
- University of Guelph-Ridgetown Campus, "The Economic Impact of the H1N1 Virus (Human Swine Flu) on Ontario Pork Producers Between April 27 and May 15, 2009".
- University of Guelph-Ridgetown Campus, "Tightening the Market Hog Supply Chain", June 2002.
- United Nations Food and Agriculture Organization, "The State of Food and Agriculture 2009", accessed at <http://www.fao.org/docrep/012/i0680e/i0680e00.htm>.
- USDA Foreign Agricultural Service. The Story Behind China's Rising Pork Prices. August 2007.