

Hog Production Costs – What is needed to stay competitive?

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■ Context and Objective

The construction moratorium, environmental requirements, the PRRS crisis, the structural adjustments of slaughtering capacity, hog price collapse and production cost increase have all negatively affected hog producers' competitiveness. For example, Quebec lost its position as Canada's largest pork producer since 2003. In 2007, Manitoba and Ontario produced, respectively, 10.2 million and 7.3 million hogs, while Quebec production was estimated at 7.2 millions of hogs¹. Quebec pork export sales into its main market, which is US market, have decreased by 42% over the last 5 years. This decrease is admittedly due to the appreciation of the Canadian dollar compared to the US dollar, but it is also due to a fall in export quantities, i.e. 32% over the same period. The rest of Canada followed the same trend but less significantly, 30% drop of export sales and 4% drop of export quantities.² In addition to the decrease in the export market share, local market share has decreased. Indeed, US pork exports into Quebec market have steadily increased. On the Canadian scale, figures are following the same trend; between 2004 and 2007, US pork exports into Canada increased by 32% while Canadian pork exports into US market have decreased by 14% over the same period³. In 2007, US pork products represented 20% of Canadian consumption⁴.

Given this economic context, Quebec hog producers undertook a comparison of their production costs to their main competitors across North America, i.e. Ontario, Manitoba, Iowa and Minnesota.

¹ Agriculture and Agri-Food Canada, Red Meat Market Information, compiled by CDPQ, 2008.

² Agriculture and Agri-Food Canada, Agri-Food Trade Service, compiled by CDPQ.

³ US Meat Export Federation, www.usmef.org/TradeLibrary/Statistics.asp. Agriculture and Agri-Food Canada, <http://www.ats.agr.gc.ca/stats/pork-e.htm>, consulted on August 7, 2008.

⁴ US Meat Export Federation and Statistics Canada, compiled by CDPQ, 2008.

The objective of this production cost comparative analysis is mainly to understand where comparative advantages are and where efforts need to be made to lower costs against the competitors' ones. In order to reach this purpose, only main cost items have been considered, namely:

- Feeder pig
- Feed
- Labour
- Heating, electricity and fuel
- Investment (Buildings and equipment)

In 2007, the proportion of the costs, mentioned above, in the total cost of production varied between 80% and 95% depending on the region. Also, this comparative analysis focuses on the hog finishing stage. It may seem that analyzing all stages of hog production would have been more relevant to better understand the strengths and weaknesses of each region. However, this may be avoided as the degree of efficiency of upstream stages from hog finishing stage is factored into feeder pig price. As a matter of fact, feeder pig price reflects demand conditions but also the efficiency of input use on the supply side.

■ Methodology

Methodology used in this comparative analysis encompasses the following steps:

- Collect and compile input cost data related to feeder pig, feed, labour, energy (heating, electricity and fuel) and investment (buildings and equipments);
- Collect and compile data related to indicators of productivity (feed conversion ratio, labour productivity, barn turnover) given their impact on selected cost items;
- Convert price and cost data from US dollar into Canadian dollar using the 2007 annual average exchange rate from the Bank of Canada;
- Standardize cost data to facilitate the comparison across targeted regions;
- Use of a tool developed by CDPQ which aims at adjusting feed conversion ratio to take into account the animal weight differences across regions;
- Complete cost comparison analysis by the understanding of key elements that influence costs, namely production organisation (concentration and degree of specialization) and market structure (farm size). Information is

based on Internet literature review and communications with staffs from government and university extension services.

■ Comparative Analysis of Production Costs

This analysis targets the main hog-producing regions in North America, i.e. Manitoba, Ontario, Quebec, Iowa and Minnesota⁵. In Canada, in 2007, Manitoba came in first position with 33% of the national production, followed by Ontario, 24%, and Quebec, 23%. Alberta was in fourth position with 12% (3.6 millions hogs)⁶. In the United States, Iowa and Minnesota represented in 2007, 44% of national market hog inventory⁷. Therefore, these five regions play a key role in North American hog production and their costs of production deserve to be analyzed in order to highlight the competitive position of a region relative to another one.

Costs are usually expressed in dollar per hog sold/removed. However, this unit makes data interpretation difficult when feeder pig weight and market hog weight are different depending on regions. Accordingly, cost items are expressed into CA\$/kg of weight gain (liveweight basis). This unit, indeed, facilitates comparison across regions while highlighting the notion of economic efficiency (which is the long-run average cost). This unit is, therefore, an economic indicator of input use efficiency. Thus, considering a comparable technology of production across regions, the input cost to weight gain ratio should decrease when a producer is capable of producing more kilograms without increasing its input costs⁸. This notion differs from the long-run marginal cost which refers to the change in cost when the quantity of kilo produced increases by one unit.

Table 1 shows selected costs in Quebec, Ontario, Manitoba, Iowa and Minnesota. In light of these data, Minnesota appears to be the most competitive, as the average cost to increase the pig weight by one kilo is \$1.06 compared to Quebec where the total cost raises to \$1.47. In Iowa, Ontario and Manitoba, total cost is respectively \$1.24, \$1.39 and \$1.44. The cost breakdown reveals that Minnesota feeder pig cost is the lowest at \$0.48 while it is the highest in Quebec at \$0.64. Feed cost is higher in Quebec (\$0.72) than in Minnesota (\$0.55). Manitoba labour cost is the highest (\$0.05) whereas Minnesota has the lowest cost (\$0.01). Energy cost is the most important in Iowa (\$0.04) compared to Minnesota where it is least, \$0.01.

⁵ North Carolina should be considered among the main producers. However, the lack of available data constrained us to not consider this State in this analysis.

⁶ Agriculture and Agri-food Canada, Livestock and Meat Report. Compiled by CDPQ, 2008.

⁷ United States Department of Agriculture, National Agricultural Statistics Service.

⁸ Pashigian, 1995.

Investment in farm buildings and equipments is higher in Quebec, Ontario and Iowa, where it reaches \$0.05 compared to Minnesota where it is only \$0.01.

Table 1. Cost in Canadian dollars per kg weight gain for feeder pig, feed, labour, energy and interest (bldgs & equip.) in 2007.

Region	Feeder pig	Feed costs	Labour	Energy	Interest bldg & equip	Total
Quebec	0.64	0.72	0.03	0.03	0.05	1.47
Ontario	0.59	0.68	0.04	0.02	0.05	1.39
Manitoba	0.59	0.75	0.05	0.03	0.03	1.44
Iowa	0.58	0.57	0.03	0.04	0.05	1.27
Minnesota	0.48	0.55	0.01	0.01	0.01	1.06

The costs presented above result from the combination of both input prices and efficiency of input use. Input availability, exchange rate, interest rate, hauling costs, climate and policy are factors that have an influence on input price and they can explain the comparative advantage of a region compared to another one.

In Quebec, corn supply (which is the main ingredient of hog feed) is lower than demand (which is mainly based on animal production and industrial use, including ethanol)⁹. Moreover, corn quality varies from one year to another. Quebec must therefore import corn from United States mainly. Ontario hog feed is also based mainly on corn; nevertheless, Ontario has to import corn from the U.S. in order to meet the demand shared between animal feed and industrial use¹⁰. In Manitoba, the hog ration is mostly made up of wheat; because of industrial use, feed use and variable quality, Manitoba imports wheat from the U.S. Depending on the location from U.S. border, grain price will be lower in Manitoba and Ontario that are closer to the border than in Quebec. One also understands that given this dynamic, Minnesota and Iowa benefit from a comparative advantage as farms are located in the Corn Belt area.

In Quebec, Ontario and Manitoba, feeder pig price is mostly based on hog price which is based on the U.S. hog price adjusted by local market conditions and exchange rate fluctuations. Regarding labour cost, wage rates seem to be higher in Ontario and Manitoba compared to other regions. These wage rates

⁹ Fédération des producteurs de cultures commerciales du Québec www.fpccq.qc.ca/Files/Offredemande.pdf, consulted on October 29, 2008.

¹⁰ Vyn & Marchand, 2005.

are influenced by labour availability and economic boom in Alberta. As regards energy cost, oil price contributed to the rising of fuel and by-product prices, however some farming practices enable producers in Minnesota to reduce this cost by using crop residues to heat barns.

Costs, as mentioned above, are also impacted by efficiency of input use which is measured, in this analysis, by feed conversion, labour productivity ratio and barn turnover (**Table 2**). Iowa and Minnesota have higher feed conversion ratio than Canadian regions (except Manitoba). As regards labour productivity, Iowa and Minnesota have an advantage over Canadian regions. Within Canada, Quebec is the less productive followed by Manitoba. Regarding barn turnover, Quebec and Manitoba are riding ahead from Ontario.

Table 2. Indicators of productivity

Regions	Feed conversion ratio	Labour Productivity (hr/hog sold)	Turnover
Quebec	2.80	0.47	3.1
Ontario	2.85	0.28	3
Manitoba	3.02	0.29	3.09
Iowa	3.02	0.20	<i>nd</i>
Minnesota	2.91	0.21	<i>nd</i>

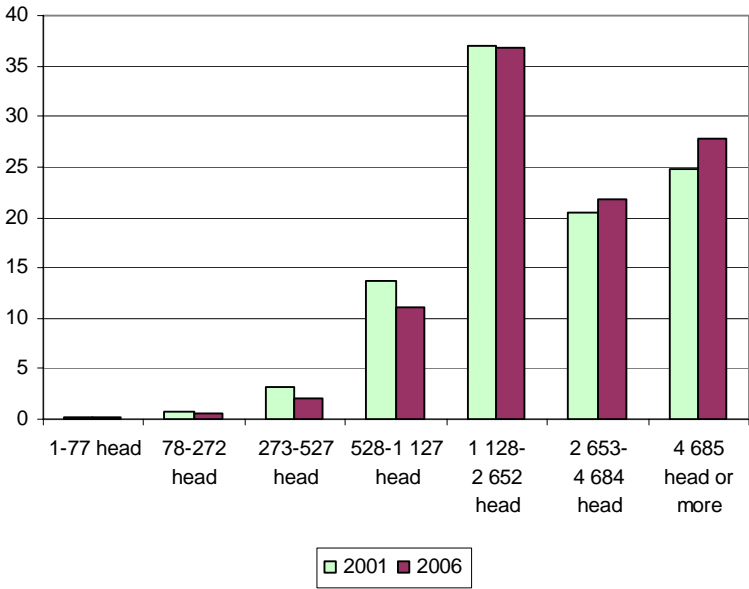
This section shows that regions from United States benefit from a comparative advantage (especially for grain price) over Canadian regions. This advantage results in low costs compared with Canadian regions. Thus, the cost to increase weight gain by one kilogram is much lower in Iowa and Minnesota than in Quebec, Manitoba and Ontario. The improvement of productivity, especially labour productivity, can help reduce the gap but this is not the only factor Canadian regions should put the emphasis on. Indeed, despite lower feed conversion ratio and higher turnovers, Quebec, Manitoba and Ontario are lagging behind Iowa and Minnesota. With this observation in mind, one may wonder whether hog market structure may also explain cost differences between regions.

■ Hog Market Structure across North America

Market structure can not be ignored in this analysis because it impacts indirectly on production costs. In this section, we focus mainly on farm size, concentration, and specialized operations.

Figures 1, 2 and 3 illustrate the increase of operation sizes and the hog production concentration across Canada. Hog production in Manitoba is particularly dominated by operations with 4,685 head or more which represented 73% of Manitoba inventory in 2006. Quebec, and especially Ontario, fall behind with 4,685 head or more representing, respectively, 28% and 30% of inventory. In Iowa and Minnesota (**Figure 4**), operations with 5,000 head and more dominate, with more than 45% of hog and pig inventory. As regards specialized operations, U.S. hog market structure is characterized by an increase in specialized hog-finishing operations. Production from this type of operation increased from 22 to 77 percent while the proportion of total market hogs produced from farrow-to-finish operations decreased from 65 to 18 percent between 1998 and 2004¹¹. Large farms and increasing specialization of hog-finishing operations lead to the preponderance of contract production. Thus depending on the US region, hogs finished under contract oscillated between 50 to practically 100 percent¹² in 2004. The importance of the specialization of hog-finishing operations and of contract production extended to the main hog-producing regions of Canada, albeit, in a relatively lesser percentage.

Figure 1. Percent of inventory by size group in Quebec



¹¹ Key & McBride, 2007.
¹² Key & McBride, 2007

Figure 2. Percent of inventory by size group In Ontario

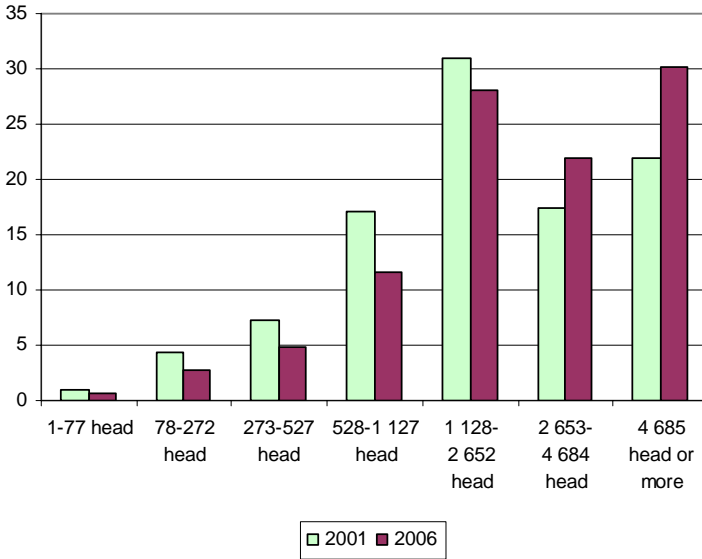


Figure 3. Percent of inventory by size group In Manitoba

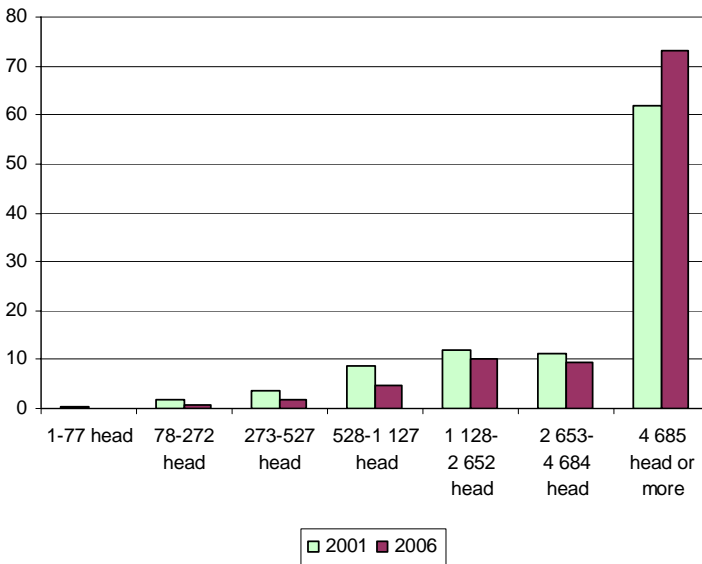
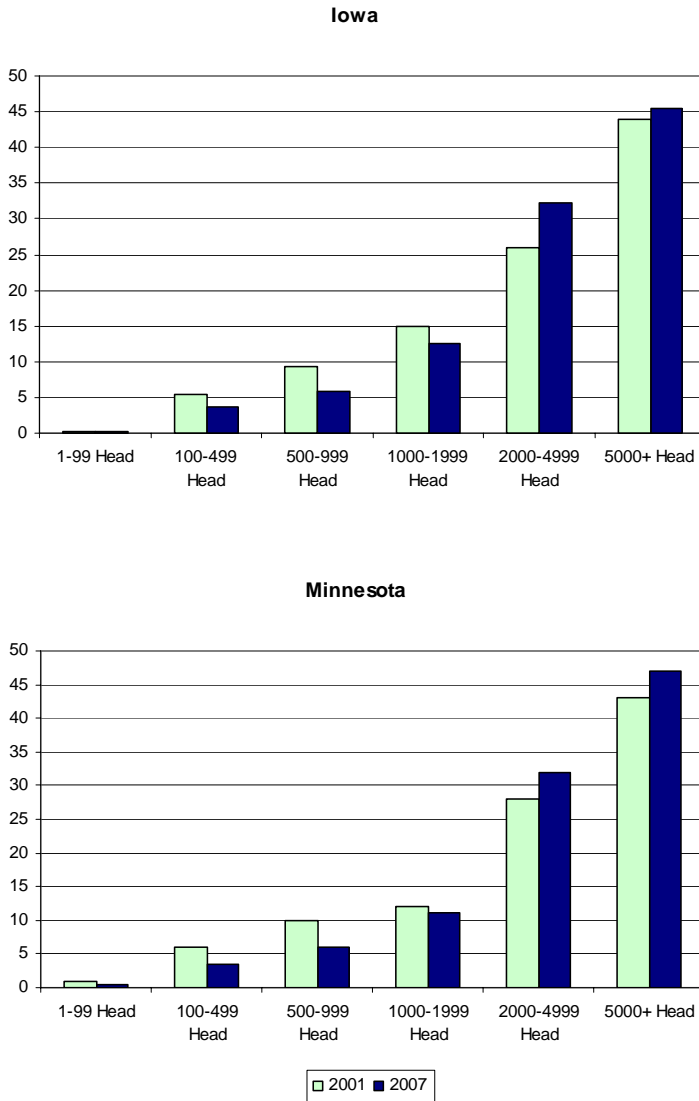


Figure 4: Percent of inventory by size group In Iowa and Minnesota



■ **Conclusion**

Canadian producers compete against U.S. producers on the same markets, whether it is national or international markets, and they are price takers. Pork

products are undifferentiated because they are sold into a mass market. Within this context, Canadian producers must lower their production costs in order to stay competitive and profitable. To achieve this, they must monitor their costs of production and understand factors that impact it. This comparative analysis reveals that US producers benefit from comparative advantage over Canadian producers for hog-finishing operations. Canadian producers have a better productivity in terms of feed conversion ratio and barn turnover. However, they need to improve their labour productivity. Regarding hog market structure, characteristics in terms of farm size, production concentration and specialization of hog-finishing operations enable producers to benefit from return scales or scale economies. These characteristics are similar across North America especially in West Canada and the U.S. Ontario and Quebec are closely following. It is also important to note that it is a combination of factors that impact production costs and producer competitiveness. Therefore, improving costs of production requires addressing all these factors simultaneously.

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