The Western Canada Advantage

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▪ Introduction

Much has been said and written about the prospects for the hog/pork complex in Canada over the past couple of years, especially Western Canada because of the removal of the grain transportation subsidy in 1995. Lately, there has been increasing discussion about the possibility that some other pork exporting countries are at or near their capacity to export. At the same time, discussion has begun to surface about the potential cost competitiveness of countries in southern South America. These discussions were all taking place in a context of declining import barriers for pork in a number of, especially, Asian countries because of the WTO agreement in 1995.

The perception has been that a strongly growing market for pork will develop in the Asian countries. Whether or not this supposed growth market is available, it is important to have some idea whether there are regions of the world that have cost advantages in hog and pork production. If the market is available, it is useful to potential investors to determine what regions offer the greatest potential profitability. If markets are limited, then it is important to potential investors to understand what regions may have the greatest opportunity to preserve their investments in the long term. Hence understanding regional cost differences and their sources is important in understanding competitiveness and comparative advantage.

Our objective in this paper is to report an (updated) analysis of relative hog production costs for several regions of Canada, the US and Europe. In the original report on which this paper is based[1], we also included data for Argentina and Chile. It was not possible to update the data for these two countries in the time frame required. Therefore, these two countries are not included in the analysis. However, reference is made to some aspects of the

1 This paper is based on the George Morris Centre report: Martin, Larry; Zana Kruja and John Alexiou *Prospects for Hog Production and Processing in Canada*, which is available from the Centre or its website: www.georgemorris.org

economic environment in these two countries that lead to inferences about their relative costs. Specific objectives are:

- To identify regional factors that can affect production cost differentials
- To quantify regional cost differentials
- To identify the major sources of regional cost differentials.

Approach to the Analysis

Our approach to the analysis is to develop standardized budgets for specific production systems, rather than actual costs from a sample of farms. In one sense, we are asking the question, if we want to produce hogs using specific production systems at the lowest possible cost, where is cost the lowest? The intent is not to develop an investment prospectus but rather to show systematic cost differences across regions.

This approach and its assumptions has a number of implications for the results which should be clearly understood:

- The assumptions about the performance of the various production systems drive the results on relative total costs of production among the systems. Thus, because we assume that larger operations are able to wean more pigs per sow per year, this contributes to a lower cost for larger systems. Whether, in reality, larger operations have better weaning performance is a matter that needs to be investigated.
- The difference in costs across countries and regions is based on their relative factor prices. In other words, since we assume that the same production system is used in each jurisdiction, differences in prices of feed, labour, capital and building materials are what cause one jurisdiction's costs to be different from another's. What the standardized production models do for the analysis is to provide a method of weighting factor prices in ways that make them germane to hog production.
- Only the major categories of cost that may be affected by location are included. The categories include: labour, capital, buildings and feed. A number of costs such as marketing, manure disposal, veterinary and medical costs, which are unique (often within the control of the manager) to the individual farm, are not included. Likewise, costs such as breeding stock that appear to be standard across countries are omitted. Therefore, the totals are less than for actual farm operations. This is because our primary focus is on the factors that make regions different. If one is considering investing in the industry in a specific region, the other costs also need to be investigated. A particularly complex issue is the cost of

environmental management and environmental regulation, which is addressed at the end of the paper.

The cost analysis begins below with a description of the production systems used.

Production Systems

As indicated above, the same production systems are assumed to be implemented in all countries in this study, namely: a 180 sow farrow to finish operation with a single site, and a series of three-site farrow to finish (TSFF) operations for operations of 600 sows or more. Defining a standard set of production processes was considered important in order to make the data comparable across jurisdictions. The system is varied using five different sizes of operation: 180 Sow, 600 Sow, 1200 Sow, and 3000 Sow. Details on the characteristics of the production systems and on the technical coefficients related to herd composition and productivity, are based on the studies by Hurt, Boehlje and Hale, and Hurt and Zering published by the Purdue Cooperative Extension Service in 1995.

The operations are designed as high investment, totally confined farrow-to-finish swine units. General technologies include:

- all-in/all-out production
- less than 21 day weaning with two week age variation
- split-sex and phase feeding
- physical separation of pigs by room and age group and separation by building phase for greater bio-security
- high quality genetics, and
- artificial insemination

Details about the assumptions and data used, as well as the results of the cost analysis.

Herd Assumptions

Hurt, et al did not include the 3000 sow operation, so herd assumptions for this size are based on additional calculations using the relevant literature on existing operations of this size, and also details of other sizes given in the Purdue study.

Table 1. Herd Assumptions

	Size of Operations			
	180 Sow	600 Sow	1200 Sow	3000 Sow
Pigs Marketed / Litter	8.51	9.025	9.025	9.2
Litters / Sow / yr	2.35	2.67	2.66	2.66
Pigs marketed per Sow	20	24.05	24.04	24.47
Market pigs	3600	14431	28853	73416
Sows	197	706	1412	3540
Boars	10	18	35	71

Rations

The base rations used in each of these operations are taken from the Purdue Study and are given in average form in Table 2. These rations are used to calculate feed costs in the US and Eastern Canada.

Table 2. Rations Used in the US and Eastern Canada

		Size of Operation			
Feed type	Unit	180 Sow	600 Sow	1200 Sow	3000 Sow
Corn	bu / litter	95.4	95.18	95.18	95.18
Soybean Meal	ton / litter	0.73	0.72	0.72	0.72
Other Feed	cwt. / litter	2.51	2.5	2.5	2.5

Rations in Europe present a particular problem. As a result of the Common Agricultural Policy (CAP), grain and soybean price relationships within the EU are distorted. Farmers in these countries rarely use grains in their feed. Rather, they use commercial feed mixes that contain high levels of products such as tapioca. Ration contents change from time to time as relative ingredient prices change. It is not relevant, therefore, in this study to use a corn or barley and soybean meal based ration. Rather we use an average feed cost for various rations based on 1995 data. This may have two offsetting impacts for the comparisons. First, it may inflate them slightly because it is a “retail” price compared to the implicit ‘wholesale’ prices used in other regions based on

market prices for corn and soybean meal. On the other hand, we were unable to find comparable feed cost data for 1996 in Europe, while for the other countries feed prices are based on the average of 1995 and 1996. Since 1996 included record high corn prices in world markets, this may underestimate the feed price for Europe. Table 3 contains the average feed intake for the European models, as quoted by the EuroporC study.

Table 3. Ration used in Europe

	Denmark	Netherlands
Feed intake, kg / sow / year	1071	1042.86
Feed intake piglets, kg/sow/year	626.25	835.04
Feed intake finishing pigs, kg/sow/year	4998.23	3642.23

Since Western Canada uses barley instead of corn, barley is substituted for corn in the base ration. The ration used for Western Canadian production models is 85 percent barley and 13 percent soymeal. This is considered equivalent to the corn ration used in the US and in Eastern Canada.

The main components of production costs are analysed in order to determine the cost competitiveness of different countries. These elements include: labour costs, feed costs, facilities and equipment depreciation costs, and interest costs. All costs are reported in Canadian dollars. The average annual exchange rate is used for the conversion. A series of assumptions are used to make the costs comparable.

Labour Assumptions:

Estimated labour requirements are based on the assumption that operations use the same technology in all countries, as defined in the Purdue Study. The resulting person equivalents for each size operation are shown in Table 4.

Table 4. Use of Labour (person equivalents)

	Size of Operation			
	180 Sow	600 Sow	1200 Sow	3000 Sow
Manager		1	1	1
Assistant Manager	1	1	1	1
Production Assistant I			2	4
Production Assistant II	0.5	2	2	5
Total	1.5	4	6	11

In calculating labour costs, it is necessary to estimate both salaries and benefits. From the Purdue Study we used the basic labour cost structure and the proportions are shown in Table 5.

Table 5. Assumptions about Labour Cost Proportions

	Salary	Benefits	Benefit in %
Manager	40,500	6,075	15
Assistant Manager	20,250	3,037	15
Production Assistant I	19,125	4,781	25
Production Assistant II	14,625	3,656	25

The Purdue study includes data only for Indiana. For our purposes, we need data on several regions. Farm Labour, a publication of Agricultural Statistics Board, USDA reports average wage rates for livestock workers by region. We used January 1998 wages from this publication These wages were applied to the lower pay position (Production assistant II). Wages for all other positions as well as benefits were calculated based on the ratios obtained from the Purdue study mentioned above.

Table 6. Labour Costs in the US (salaries & benefits, US $, 1998)

	Indiana & Ohio	Missouri & Iowa	N.Carolina	Utah	Michigan & Minnesota
Manager	54,600	46,073	47,721	49,370	51,304
Assistant Manager	27,300	23,037	23,861	24,685	25,652
Production Assistant I	28,025	23,649	24,495	25,341	26,334
Production Assistant II	21,431	18,084	18,731	19,378	20,138

Labour costs in Canada were calculated by using Statistics Canada hourly wages reported for livestock care by province. The minimum was used to calculate the wage for Production Assistant II, and the salaries for the other positions were then calculated based on the respective proportions in the Purdue Study (as given in Table 5). In addition, province specific information on benefits was received from industry sources in each province.

Table 7. Labour Costs in Canada (salaries & benefits, CA $)

	Ontario	Manitoba	Alberta	Quebec	Nova Scotia
Manager	78,348	68,085	73,542	72,349	66,133
Assistant Manager	39,174	34,042	36,771	36,175	33,067
Production Assistant I	36,998	32,151	34,728	34,165	31,230
Production Assistant II	28,292	24,586	26,557	26,126	23,882

For the European countries, wage rates were obtained through contacts with the National Department of Farm Accounting and Management in Denmark. These data were combined with the proportions from the Purdue Study. The resulting labour costs are shown in Table 8.

Table 8. Labour Costs in Europe (salaries & benefits, CA $)

	Netherlands	Denmark
Manager	90,997	103,736
Assistant Manager	45,498	51,868
Production Assistant I	42,971	48,987
Production Assistant II	32,860	37,460

Feed Price Assumptions

As indicated above, the ration is based on the Purdue Study, where a 76 percent corn ration is used. North America is assumed to have the same rations for Corn and Soybean meal, except for Western Canada where barley is substituted for corn. It is assumed that an 85% barley ration is equivalent to the 76 percent corn ration.

US corn prices by State for 1998-99 crop year were obtained through the NASS Crop Values Report. Soymeal (48%) prices for 1998-99 were obtained from ERS Field Crop Branch, via fax for each relevant cash market. Table 9 shows US Corn and Soymeal prices by State.

Table 9. Feed Prices in the US

	Corn Price (US$ / bu)	Soymeal Price (US$ / ton)
Ohio	2.00	145.70
Indiana	2.05	145.70
Missouri	1.90	142.40
Iowa	1.90	145.70
N.Carolina	2.25	146.20
Utah	2.4	162.30
Kansas	1.95	142.40
Nebraska	1.95	134.20
Michigan	1.90	134.20
Minnesota	1.75	134.20

Average 1998-99 cash prices are used for Canadian provinces and regions. We used Calgary, Alberta to represent prices in Western Prairies; Brandon, Manitoba for Eastern Prairies, Chatham for Ontario, Quebec City for Quebec, and Truro for Nova Scotia. Results are summarized in Table 10.

Table 10. Feed Prices in Canada (CA $)

	Barley Price (per tonne)	Soymeal Price (per tonne)
Western Prairies	116.61	261.06
Eastern Prairies	90.98	234.40

	Corn Price (per tonne)	Soymeal Price (per tonne)
Ontario	119.09	223.26
Quebec	144.74	241.63
Nova Scotia	170.72	269.61

Average feed prices for Denmark and the Netherlands are reported as total meal prices by pig type and age group. These prices are obtained via fax from the Research Institute for Pig Husbandry in the Netherlands, and the National Department of Farm Accounting and Management in Denmark. Feed prices for the Netherlands and Denmark are shown in Table 11.

Table 11. Feed Prices in Europe (CA $/100kg)

	Netherlands	Denmark
Sow feed	28.25	29.97
Feeder pigs feed	45.28	45.29
Finishing pigs feed	30.81	29.97

Depreciation Cost Assumptions

Construction and equipment costs were not updated from the first edition. In the first edition, construction and equipment costs were calculated for each country. Based on the total amount of investment and using the linear depreciation method, the amount of depreciation per market pig was calculated. A period of ten years was assumed in all countries.

Sources of data used for construction costs are very different and various assumptions were made to include this information in the analysis. For instance, when the construction cost was given as a range of dollar amounts per head, the minimum was assigned to the largest size of operations, and the maximum cost was assigned to the smallest size of operations. The other sizes of operation were assigned proportionately to cost levels in the given range. This was based on the assumption that larger sizes of operation are more efficient, which is the underlying assumption in the model used in the Purdue Study also.

Construction data were obtained only for four US states. For the purpose of the study, an average of these costs was calculated, in order to be used in a later stage, when the total costs per pig are calculated for each state. While the depreciation costs will not differ among these states, the total calculated in this way will be a more accurate estimate of total costs per pig, and a comparison can be made.

Interest Costs

The study implicitly assumes that each operation in each jurisdiction is new. The important question is to estimate the cost of capital. There are various assumptions that can be made about whether capital is financed with debt or equity, and what interest rate is used.

The argument has been made in the literature that equity capital has a **lower** cost than debt capital in the case of family farm operations. Frankly, with the

current generation of farmers, this argument is hard to accept because most are as astute with business management skills as the rest of the population. We doubt that the long run expectation of earnings from owner's equity is below recent short term interest rates. Similarly, the argument can be made that equity capital, especially institutional equity providers, want a higher return than interest rates because of the risk that is entailed. The problem is to arrive at an interest premium that is widely representative of investors' expectations.

To address this issue, we assumed that the model operations are financed 60 percent by debt and 40 percent by equity. However, the same interest rate of prime plus two percent was used for both the debt and equity portions.[2] Also, the average interest charges for the life of the loan were calculated only on 50 percent of the amount of initial investment. This is to represent the fact that the principal on loans is paid down over time and that the asset becomes depreciated.

This cost element is also calculated on a per pig basis. The differences between countries and states/provinces are reflected by the long term interest rates used. Interest rates were calculated as prime rate (during 1998) plus two percent.

Table 12. Interest Rates by Country

Country	Long Term Interest Rate
US	10.31 %
Canada	8.6 %
Netherlands	7.2 %
Denmark	8.3 %

▪ Discussion and Implications

Interregional comparisons are made of total cost and its various components on a per market hog basis. Again, we point out that the "total" is the total of the components included. They do not include marketing costs, veterinary and medicine or manure disposal cost. All of these are largely unique to the farm

[2] In an earlier version, we estimated capital costs in one run of the spread sheet model at prime plus two for the debt portion, and prime plus 10 for the equity portion (the difference in interest rates reflects the different cost of debt and equity financing). This procedure clearly raised capital costs over the one shown in the study, but it did not affect the relative standing. Since our intent here is to represent relative costs, and especially since it is likely that each investor's actual or imputed cost is unique, we chose to adopt a standard of prime plus two for each country.

operation and not to the jurisdiction. Manure disposal is sometimes seen as a cost and sometimes as a return depending upon the situation. The most important point here is that operations that are set up in a sustainable fashion (where the operation produces enough feed for the hogs to produce enough manure to provide nutrients for the feed) would likely see manure as a valuable asset. Those that are not set up this way likely see manure disposal as a cost. Again, this is a local issue, not one of jurisdiction.

In order to avoid political boundaries, where possible economic regions form the basis for the comparisons. Thus for Western Canada and the US, costs are reported on a regional basis that make sense from an economic (climate, grain price) perspective. For Eastern Canada, costs are calculated for Ontario, Quebec and the Atlantic provinces because political boundaries are roughly consistent with economic differences.

Comparing Labour Costs

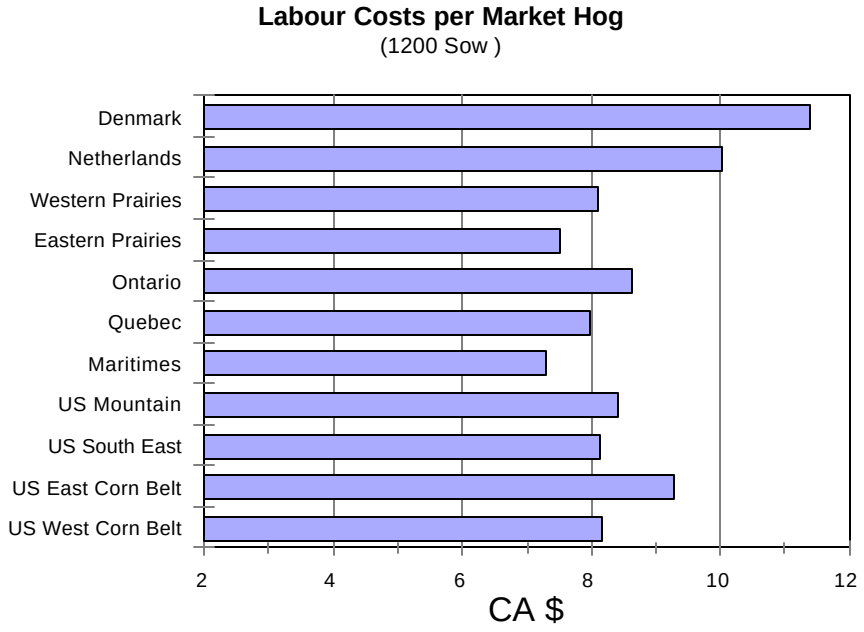
As indicated in the previous section, the assumptions about labour employed by each size of production unit has a major impact on unit (i.e. per market hog) labour costs (See Table 13 and Figure 1). In general, the larger the size of operation the lower the labour cost. This is a result of the assumed improvement in labour productivity in the model operations. The largest operation employs 11 people compared to 1.5 for the smallest, a ratio of about 7.5:1, while the number of market hogs produced by the largest operation is more than 20 greater than the smallest. In general, the estimated labour cost per market hog of the smallest operation is between three and four times greater than the largest operation.

Table 13. Labour Costs (per market hog)

Production Systems	180 Sow	600 Sow	1200 Sow	3000 Sow
US West Corn Belt	13.69	11.21	8.12	4.69
US East Corn Belt	15.63	12.80	9.27	5.36
US South East	13.66	11.18	8.11	4.68
US Mountain	14.13	11.57	8.39	4.84
Maritimes	12.50	10.18	7.26	4.13
Quebec	13.68	11.14	7.94	4.52
Ontario	14.81	12.06	8.60	4.89
Eastern Prairies	12.87	10.48	7.47	4.25
Western Prairies	13.90	11.32	8.07	4.59
Netherlands	17.20	14.01	9.99	5.68
Denmark	19.61	15.97	11.39	6.48

Wage costs clearly make a difference. As expected, the European countries have the highest labour costs. Within North America, labour costs in the Maritimes are estimated to be the lowest, while the Eastern Corn Belt states are the highest.

Figure 1.



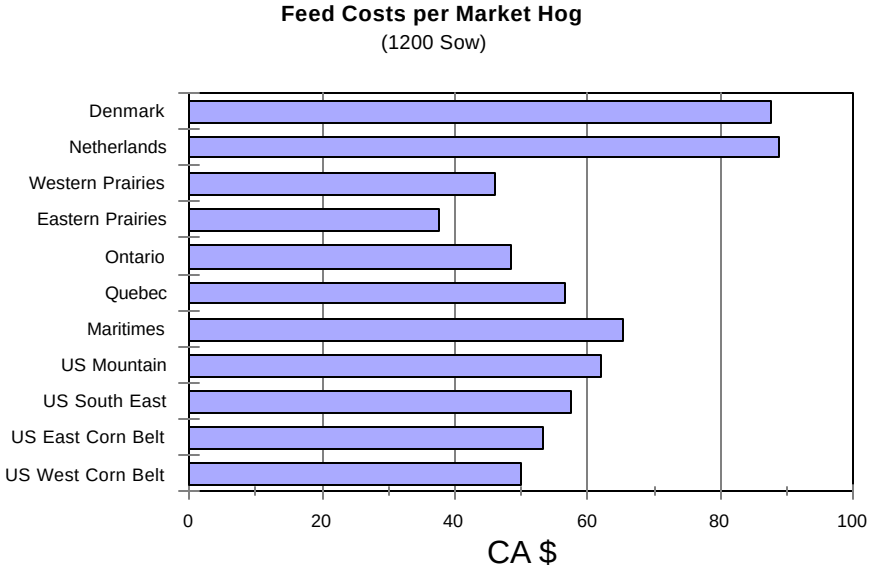
Comparing Feed Costs

Feed costs per hog are not highly correlated to the size of operation. However, they are highly correlated with feed prices. Western Canada enjoys a very significant advantage in feed costs over all the competitor regions. This is consistent with the argument that removing Canada's former Western Grain Transportation subsidy conferred a significant livestock cost advantage for the Prairie provinces. Ontario and the US Western Corn Belt are next at $12-15/hog higher cost. It is interesting to note that, while feed costs in Quebec and the Maritimes are higher than the Prairies, Ontario and the US corn belt, they compare quite favourably to the US Southeast and the Mountain states. Denmark and Netherlands have the highest feed cost per pig. This is a result of the European Union's Common Agricultural Policy, which results in artificially high feed prices within the EU.

Table 15. Feed Costs (per market hog)

	Production Systems			
	180 Sow	**600 Sow**	**1200 Sow**	**3000 Sow**
US West Corn Belt	49.84	49.52	49.52	49.52
US East Corn Belt	53.47	53.13	53.13	53.13
US South East	57.36	57.01	57.01	57.01
US Mountain	62.01	61.63	61.63	61.63
Maritimes	69.59	65.23	65.23	63.99
Quebec	60.09	56.31	56.31	55.24
Ontario	51.47	48.22	48.22	47.31
Eastern Prairies	39.31	36.89	37.22	36.19
Western Prairies	48.51	45.54	45.90	44.67
Netherlands	106.29	88.39	88.42	86.87
Denmark	105.12	87.41	87.44	85.91

Figure 2.



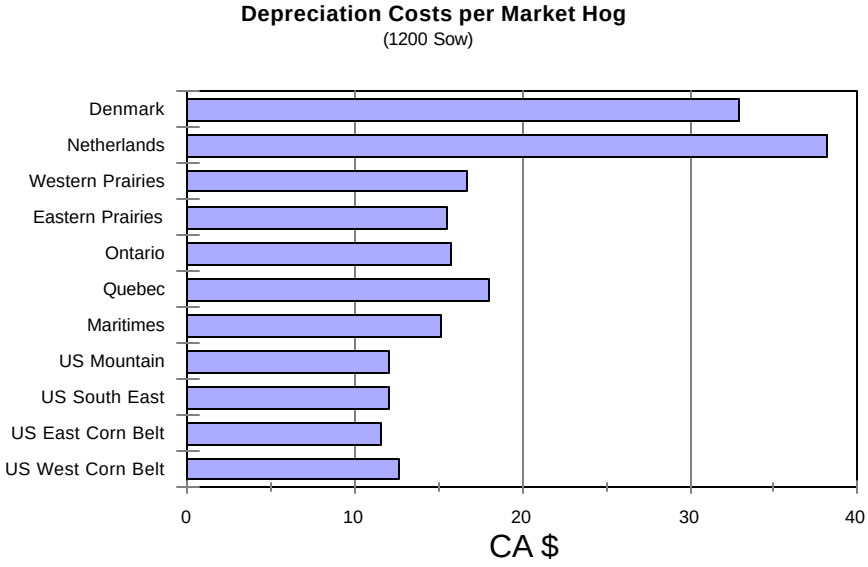
Depreciation and Interest Costs

Depreciation costs include both facilities and equipment. Construction costs (and, therefore, depreciation) are very similar in each of the Canadian regions, somewhat lower (but similar across regions) in the US, and much higher in the Netherlands and Denmark (see Table 16 and Figure 3).

Table 16. Depreciation Costs (per market hog)

	Production Systems			
	180 Sow	**600 Sow**	**1200 Sow**	**3000 Sow**
US West Corn Belt	13.56	12.53	12.53	12.31
US East Corn Belt	12.97	11.52	11.47	10.70
US South East	13.49	11.86	11.83	11.24
US Mountain	13.49	11.86	11.83	11.24
Maritimes	16.28	15.04	15.05	14.78
Quebec	19.34	17.87	17.87	17.56
Ontario	18.38	16.75	15.71	14.13
Eastern Prairies	16.65	15.38	15.39	15.12
Western Prairies	18.00	16.63	16.64	16.35
Netherlands	45.83	38.11	38.12	37.45
Denmark	39.47	32.82	32.83	32.25

Figure 3.

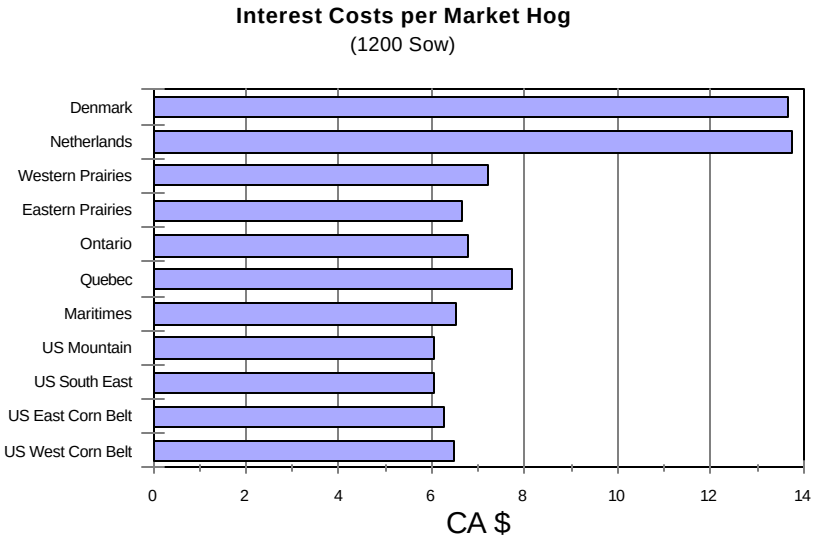


After addressing depreciation costs, it is interesting to see the pattern of interest costs. Several things are apparent (see Table 17 and Figure 4). First, interest costs are highest in the two European countries. This is not surprising given the interest rates and capital requirements used in the analysis. Second, much of the difference that occurred in depreciation between the US and Canada is made up in interest cost; Canada's lower interest rate largely offsets its slightly higher building costs. Fundamentally, there is not much difference in interest costs in North America because of this.

Table 17. Interest Costs (per market hog)

	Production Systems			
	180 Sow	**600 Sow**	**1200 Sow**	**3000 Sow**
US West Corn Belt	7.77	6.46	6.46	6.35
US East Corn Belt	7.35	6.50	6.25	6.31
US South East	7.84	6.03	6.01	5.95
US Mountain	7.84	6.03	6.01	5.95
Maritimes	7.78	6.47	6.47	6.36
Quebec	9.24	7.68	7.68	7.55
Ontario	7.90	7.20	6.75	6.89
Eastern Prairies	7.96	6.61	6.62	6.50
Western Prairies	8.60	7.15	7.15	7.03
Netherlands	16.50	13.72	13.72	13.48
Denmark	16.38	13.62	13.62	13.39

Figure 4.



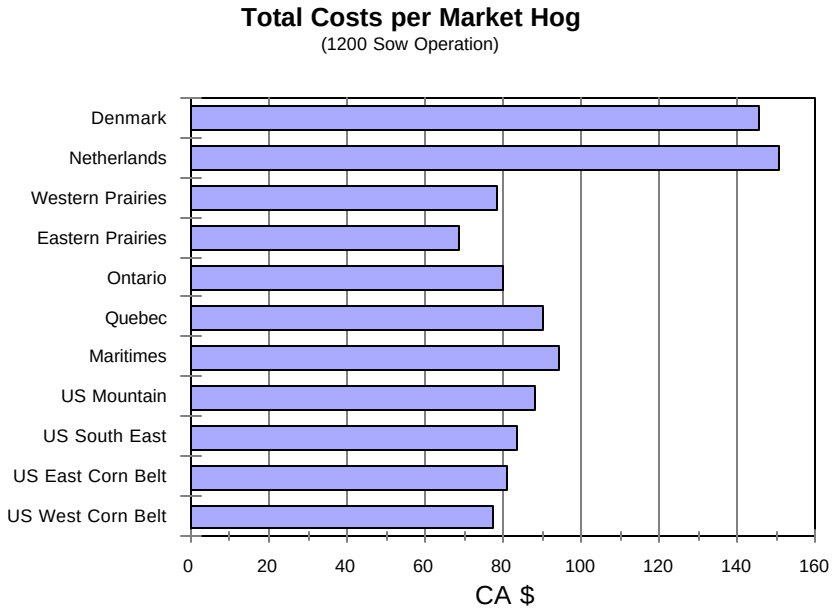
Comparing Total Costs

Table 18 and Figure 5 contain estimated total costs per market hog for each jurisdiction. Note again that "totals" are for only the categories of cost that are included in the analysis. They do not include marketing expenses, breeding stock, veterinary and medical costs, or manure disposal.

Table 18. Total Costs by regions (per market hog)

	Production Systems			
	180 Sow	**600 Sow**	**1200 Sow**	**3000 Sow**
US West Corn Belt	84.86	79.71	76.64	72.87
US East Corn Belt	89.41	83.94	80.13	75.49
US South East	92.35	86.09	82.96	78.88
US Mountain	97.48	91.09	87.85	83.66
Maritimes	106.15	96.92	94.00	89.26
Quebec	102.34	93.00	89.81	84.86
Ontario	92.57	84.24	79.28	73.22
Eastern Prairies	80.78	71.16	68.48	63.82
Western Prairies	89.02	80.64	77.76	72.63
Netherlands	185.82	154.23	150.24	143.48
Denmark	180.58	149.82	145.28	138.03

Figure 5



When all the costs are totalled, there is a clear cost advantage for the Canadian Eastern Prairies. As we have seen, this is mainly because of Western Canada's advantage in feedgrain prices. The US Corn Belt, Western Prairies and Ontario are next lowest, followed by the "new" production areas in the US.

It is interesting to note that much of the current US expansion of hog production is in the Mountain states and recently was in the South East. According to our analysis, neither has a particular cost advantage in hog production. This underlines the suspicion of many people that the main attraction of these areas is space and lax environmental controls.

An issue with which the Canadian industry needs to come to grips is the size of its hogs. For reasons that no one seems to be able to explain adequately, the Canadian grading system discounts heavy carcasses and Canadian carcasses average about 8 kg less than US carcasses. This means that the fixed costs of sow feed, capital, and labour, are spread over fewer kilograms of production in Canada than in the US.

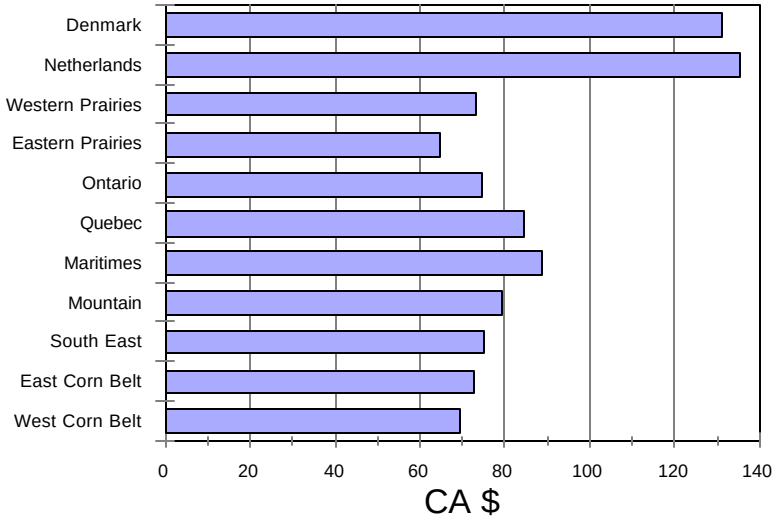
To this point, we have calculated costs per market hog. In Table 19 and Figure 6, total costs are reported again, but per 100 kg of live weight. The Purdue models are structured on the assumption that hogs are marketed at 245lbs live weight. This was used to convert costs in every jurisdiction except Canada. For the Canadian regions, we assumed hogs are marketed at 235 lb., and this is used to convert the unit cost. This assumption is **very** conservative; the difference in average live weights is more than 20 lb per hog. However, the budgets are based on fairly strict assumptions and it was felt that they should not be "pushed" too far outside their base parameters.

Table 19. Total Costs by regions per 100 kg live weight

	Production Systems			
	180 Sow	**600 Sow**	**1200 Sow**	**3000 Sow**
West Corn Belt	76.29	71.67	68.90	65.52
East Corn Belt	80.38	75.47	72.04	67.87
South East	83.03	77.40	74.58	70.91
Mountain	87.64	81.90	78.98	75.21
Maritimes	99.49	90.84	88.11	83.66
Quebec	95.92	87.17	84.17	79.54
Ontario	86.77	78.96	74.31	68.63
Eastern Prairies	75.71	66.70	64.18	59.81
Western Prairies	83.43	75.59	72.88	68.08
Netherlands	167.06	138.65	135.07	129.00
Denmark	162.35	134.70	130.61	124.09

Even with this conservative assumption, there is a difference of about $5 per 100 kg of live hog. Realistically, the difference is higher and, when added to the higher cost of processing in Canadian packing plants because there are fewer kilograms over which to spread the fixed costs of processing, it would appear that this historical aberration results in a substantial dilution of Canada's cost advantages.

Figure 6. **Total Costsper 100 kg live weight**
(1200 Sow Operation)



▪ Conclusion

It is interesting to compare these results to those of our original study. The most fundamental result - that the Eastern Prairies is the lowest cost region, and that North America is much lower cost than Europe - has not changed. However, two things did change. First, the differential between North America and Europe widened. This is mainly because of feed prices. Feed prices dropped significantly in North America, but because of the CAP, this adjustment was not reflected in the European data.

The second change from the earlier study is that the differential between Canadian and US regions narrowed. The reasons for this are two-fold. First, the feed grain price/cost differential narrowed. Western Canada continues to have lower grain prices, but not as much lower as during 1995/96. Second, US interest rates fell marginally and Canadian rates increased. This affects the

interest cost component. This illustrates that cost advantages can be short-lived.

However, these cost advantages and the falling costs of primary processing that are resulting from the restructuring that has been occurring in the Canadian pork industry. Coupled with the cost advantage at the farm production level, it is clear that the Western advantage is one of operating efficiency.

An interesting question remains: if Western Canada has such an advantage, especially over Europe, why does Denmark continue to have such a large share of the export market? Some would say that the answer is European subsidies. We doubt it because the subsidies simply don't explain the difference in performance. Instead, we believe that the highly integrated (through cooperatives) nature of the Danish industry has led to coordination or "system" efficiencies that have not been realized in North America. With the continued integration in North America, we may be gaining on Denmark in this respect, as well as having lower production costs.

Although Western Canada may have an advantage in direct operating costs, the competitors have an increasing advantage in the costs of their market systems. Canada has caught up and passed others in terms of production efficiency. But it has some way to go in developing the appropriate mechanism for system coordination.

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