



University Exemplary Department, 1997



The Department of
Agricultural and Applied Economics

Impacts of US Country of Origin Labeling on US Hog Producers

Prepared for: Canadian Hog Sector Steering Group
Canadian Pork Council
Ontario Pork
Manitoba Pork Council
Saskatchewan Pork
Alberta Pork

Prepared by: Kevin Grier, Senior Market Analyst
George Morris Centre
102-150 Research Lane
Guelph, Ontario
N1G 4T2
Telephone: 519-822-3929 ext 202
Kevin@georgemorris.org

and

David M. Kohl, Professor
Department of Agricultural and Applied Economics
Virginia Polytechnic Institute and State University
Blacksburg, Virginia

Date: April 9, 2003

Foreword

The purpose of this project is to identify the possible economic, structural and social damage Country of Origin Labeling (COOL) could inflict directly on US hog farmers and processors if the imports of Canadian hogs were stopped. This research revealed that as a result of COOL the following developments are expected to occur:

- Loss of over 1,000 independent farms in the mid-west which are likely to be replaced by the large integrators
- Loss of up to five hog packing plants and up to 8,000 jobs mostly in Iowa
- Increased manure production in the US, mostly in Iowa
- Lower hog prices.
- A loss of economic activity to the US economy amounting to over US\$4 billion.

Other studies in recent months have looked at other aspects or developments that are likely to result from the implementation of COOL. It is important to place all of the research of the last six months to one year in perspective and to try and put them together to determine the overall impact of COOL on the US hog industry.

For example, there is the issue of overall costs that are going to be imposed on the US hog and pork industry. In that regard, Sparks Companies of Memphis recently completed research that shows that total pork supply chain costs will increase from US\$3.25 to \$10.25/head and that total sector costs will increase from US\$513.75-\$805.75 million. Sparks notes that the smaller, non-integrated producers and packers will bear the greater cost burden while the larger integrated operations will see costs at the lower end of the spectrum.

Another issue that has been covered in depth has been COOL's impact on US pork exports. Dermot J. Hayes and Steve R. Meyer, completed a study in January 2003 entitled, "Impact of Mandatory Country of Origin Labeling on U.S. Pork Exports." Dermot Hayes and Steve Meyer are Pioneer Chair in Agribusiness, Iowa State University, Ames, Iowa and President, Paragon Economics, Inc., Adel, Iowa, respectively. Based on the findings of the study, the National Pork Producers Council (NPPC) stated that "it is clear that country-of-origin labeling would be very detrimental to pork producers of every size and type with significant losses predicted due to reduced export demand for U.S. pork and the increased costs of implementing a full traceback system."

Of course this legislation is not solely focused on the hog and pork industry and as such it will have impacts on all covered products and industries. The American Frozen Food Institute which represents a cross section of companies in various industries took a broad-based perspective in a report entitled "Bill of Unintended Consequences: How a New Country of Origin Marking Regulation Would Harm American Food and Agriculture," February 25, 2003. In that study the AFFI stated, "Peculiarities of the new country of origin labeling scheme would make it possible for some companies to avoid the logistical quandary and costs associated with it by eliminating U.S.-sourced product from its blends, and/or relocating their blending operations to locations outside the U.S. Furthermore, considered simultaneously with other costs and burdens faced by U.S. businesses, these steps likely would be less costly than maintaining their current sourcing patterns and facility locations under the new requirements."

In addition to the added costs in the pork industry, Sparks also noted that the cattle and beef industry would see their costs rise by about US\$50/head or \$1.6 billion. Meanwhile, Texas A&M University economist Ernie Davis says COOL could cost the beef industry from ranch to retail \$8.9 billion. Davis's COOL cost estimate of \$8.9 billion includes: \$6.9 billion for retailers, \$1.3 billion for cow-calf operators, \$688M for packers, \$23M for feedlots and \$9M for stocker operators. Davis also calculates that if no Mexican cattle entered the U.S. under mandatory COOL, it would cost packers, stockers and feeders \$730M annually and 1985 jobs would be lost just in Texas.

Then of course there is the fact that poultry is not covered by this legislation and the resulting competitive impact on red meat. The added costs imposed on the red meat industry due to COOL are not going to be experienced by the chief competition to red meat, ie, chicken. After years of declining demand, red meat has recently seen an improvement in consumer demand in the United States. Now as a result of COOL-imposed higher costs and prices, those hard fought gains are going to be threatened.

In summary the following George Morris Centre/Virginia Polytechnic Institute and State University* research was very narrowly focused. It looked solely at the impact on US hog producers resulting from COOL's potential elimination of Canadian hog imports. This research showed some very negative impacts, but it needs to be kept in context. That is, this is just one of many important studies that are now published that outline a wide variety of serious negative consequences as a result of COOL.

Table of Contents

Foreword.....	1
Table of Contents.....	3
Executive Summary.....	4
1. Introduction.....	7
1.1 Purpose.....	7
2.0 US Imports of Canadian Weaner/Feeder Pigs.....	9
2.2 US Import and Canadian Export Drivers.....	11
2.3 Summary and Conclusions.....	18
3.0 Profile of US Farms Utilization of Canadian Weanlings.....	19
3.1 Geographic Destinations for Weaner/Feeder Pigs.....	19
3.2 Importers.....	20
3.3 Farmer-Finishers.....	23
4.0 Impact of Eliminating Canadian Feeder Pig Imports.....	24
4.1 Farmer-Finishers.....	24
4.2 Summary and Conclusions.....	27
5.0 US Imports of Market Hogs.....	28
5.3 Impact On US Packers of Eliminating Canadian Hog Imports.....	33
6.0 US Hog Price Impacts.....	40
6.1 Medium Term Price Impacts.....	40
Appendix A.....	42
Long Term Corn and Barley Yields.....	42
Appendix B.....	43
Statistical Overview of the US Hog Sector.....	43
Appendix C.....	51
Appendix D.....	53
Appendix E.....	55
Profiles of the Authors.....	55

Executive Summary

Country of Origin Labeling (COOL) is a component of the 2002 US Farm Bill. The provision requires that fresh meat and produce be labeled as to the country of origin at retail in the United States. For a variety of reasons that have been addressed in previous research projects, (Meyer and Hayes for example) COOL could potentially result in the reduction or elimination of the trade in livestock between Canada and the United States. More particularly, for the purposes of this project, COOL could eliminate the annual movement of up to 6 million hogs from Canada to the United States

The purpose of this project is to identify the possible economic, structural and social damage COOL could inflict directly on US hog farmers and processors if the imports of Canadian hogs were stopped. In order to achieve that purpose, the project had the following objectives:

1. Search and examine existing research on the impact of COOL in the United States.
2. Profile US farms purchasing Canadian weanlings.
3. Determine the economic disadvantage from the loss of Canadian weaner imports due to COOL.
4. Determine the social, environmental and economic cost of building U.S. sow units.
5. Determine the economic disadvantage on the US pork packing sector.
6. Determine the potential hog price impact.
7. Examine cost of compliance issues.

The first phase of the project examined the issue of Canadian weaner/feeder pig imports into the United States. Essentially the research determines that there are logical economic reasons why there has been a large increase in these imports. At the most basic level, the research shows that while Canada is very competitive in producing weaners, the US is more competitive in finishing market hogs. US farmers also demand Canadian feeders because of quality (high health/fast growth) and other factors such as changing demographics. As a result of this combination, weaner and feeder pigs moved south where they are finished on independent farms, mostly in Iowa and Southern Minnesota.

If the free flow of these weaners and feeders is stopped due to COOL, the livelihoods of approximately 1,000 to 1,300 independent farmer-finishers in the US will be placed in jeopardy. This also means that there could be a loss of \$420 million in gross farm income in the states of Iowa, Minnesota, Nebraska and South

Dakota (this estimate may include other affected states). Furthermore, based on US Bureau of Economic Analysis (BEA) multipliers, if \$420 million in revenue were lost from the hog farming sector as a result of COOL, then a further \$1.3 billion would be lost to the US economy.

Furthermore, research at Iowa State generated employment multipliers for a wide variety of enterprises that are based in Iowa (An Introduction to Economic Impact Assessment, Swenson 2002). If around 1,300 farms are jeopardized due to COOL, based on employment multipliers for hog farming, a further 1,045 jobs are at risk in those sectors that supply the farms.

Given that the pigs are imported due to demand for those pigs, it is evident that eventually those pigs will be produced in the United States. Over a period of time from one to three years, the US industry would replace the lost weaners. The question is who will produce those hogs? Based on factors such as the ability to raise capital and current trends, it is clear that those independent farms could be readily replaced by a relative handful of fully integrated hog production corporations. This conclusion is strengthened by the fact that COOL, because of the trace back procedures that are required, already gives a cost advantage to integrated operations. If it also increases risk for non-integrated operations who have less access to capital, it implies an end to independent family hog production businesses.

Another phase of the project examined the issue of US imports of market hogs and what will happen if those imports are stopped due to COOL. As with weaner pigs, there are logical economic reasons why market hogs flow south. That is, US market hog prices are slightly higher than in Canada and Canadian marketings are greater than total slaughter. These trends are beginning to change and the flow of market hogs is slowing but those market factors are still driving these imports.

If the flow of market hogs were stopped, in combination with the elimination of the feeder pigs, the first result would be the loss of US pork packing capacity. Plants would close because there would be insufficient supplies. Based on the lack of supply, approximately 3-4 plants could close in the US. Given expected COOL-induced changes in finishing and packing capacity in Canada, it is forecast that US imports of Canadian pork would significantly increase. This in turn would jeopardize the production capacity at another US plant. In effect, COOL would endanger five US pork-packing plants due to lack of supply and increased pork imports. Plants in Iowa were seen as particularly vulnerable.

The potential closures mean that the US packing industry stands to lose about US\$1.2 billion in revenue as a result of COOL. Losses to the US economy, however, do not stop at the plant. Based on BEA multipliers the loss of \$1.2 billion will multiply to \$4.386 billion for the overall US economy. Furthermore if five US plants were jeopardized by the lack of Canadian live hog imports and the increased pork imports, it would result in 4,500 jeopardized jobs. Of course the potential job losses are not limited to the packing plants alone. There will be multiplier effects of job losses and plant closures. If 5,000 jobs were lost in meatpacking due to COOL, another 8,000 or more would be lost elsewhere in the economy.

As noted above, given that these hogs are in demand, eventually they will be produced by the US industry. That will result in increased manure production of almost 2.1 million tons in the US, particularly in Iowa as a result of COOL. This manure will need to be managed in areas of relatively high human population. Moreover, concentrating more livestock in the upper Midwest increases the risk of the spread of communicable diseases in the US, and makes bio-terrorism potentially easier and more effective.

The research indicates that while US hog production increases, Canadian production will decline, but not by the same amount. This is because COOL provides an incentive for Canadian hogs to be finished and processed in Canada for export. As a result COOL will result in increased production of pork in North America. This will have negative price impacts. It is estimated that North American hog prices will be approximately 30% lower than they would have otherwise been without the implementation of COOL.

In summary, COOL is likely to have the following impacts:

- Loss of over 1,000 independent farms and the growth of large integrators in their place.
- Loss of up to five hog packing plants and up to 8,000 jobs mostly in Iowa
- Increased manure production in the US, mostly in Iowa
- Lower hog prices.
- A loss of economic activity to the US economy amounting to over US\$4 billion.

1. Introduction

This project is the second phase of research into the impact of the Country of Origin Labeling (COOL) provision of the 2002 US Farm Bill. The COOL provisions are now voluntary but will become mandatory in 2004.

The George Morris Centre, on behalf of Manitoba Pork Council, conducted the first phase. The purpose of the first phase was to examine the impact of COOL on the Canadian hog and pork industry. The basic conclusion of that research was that COOL has the potential to inflict serious harm on the Canadian hog production and processing sector. Hundreds of millions of dollars of farm income could be lost and livelihoods of hundreds or thousands of farm operations could be jeopardized.¹ At the same time, it provides considerable incentive for more Canadian hogs to be finished in Canada, processed in Canada, and exported offshore or to the US. From a Canadian perspective, the question is whether the negative offsets the positive or vice versa.

Based on phase one, it was determined that a COOL “Mitigation Strategy” was required. This mitigation strategy had two components:

1. Prepare to deal with the COOL provisions if they become mandatory in 2004.
2. Work with partners in the United States to identify and communicate the potential damage that COOL could inflict on the US hog industry.

The first component is the domestic Canadian actions that must occur to lessen the COOL impact on the Canadian industry. The second component involves a detailed evaluation and exposition of the potential negative impact of COOL on the US hog and pork industry.

1.1 Purpose

The purpose of this project is to identify the possible economic, political and social damage COOL could inflict directly on US hog farmers and processors. Describing the negative impacts of COOL and then communicating those impacts to policy makers, will help in the effort to overturn or neutralize the regulations.

Objectives

1. Search and examine existing research on the impact of COOL in the United States.
2. Profile US farms purchasing Canadian weanlings.
3. Determine the economic disadvantage from the loss of Canadian weaner imports due to COOL.
4. Determine the social, environmental and economic cost of building U.S. sow units.
5. Determine the economic disadvantage on the US pork-packing sector.
6. Determine the potential hog price impact.
7. Examine cost of compliance issues.

¹ Country of Origin Labeling: Implications for the Manitoba Hog Industry, Kevin Grier, Larry Martin and Holly Mayer. December 2002; www.georgemorris.org
Virginia Polytechnic Institute and State University 7 *George Morris Centre*

Methodology

In order to meet the objectives the following methods were pursued:

1. Evaluate existing research papers on the topic.
2. Conduct interviews with US farmers, importers and packers.
3. Conduct interviews with Canadian exporters.
4. Research and evaluate economic data on industry factors and trends.

Based on the data, research and interviews, analysis of the information was conducted in order to derive relevant conclusions and intelligence.

2.0 US Imports of Canadian Weaner/Feeder Pigs

The purpose section 2 is to assess the volume and reasons for the flow of weaner and feeder pig exports to the United States. The methods/approach used for this component of the research are as follows:

- Describe the product being imported to the US
- Determine the volume of imports
- Review current and past research that outlines the economics of imports

This section of the research is imperative, as understanding the rationale behind imports is necessary to identify the impacts of import restrictions on US producers.

Provinces of Origin

The following graph (Figure 2.1) illustrates the provinces of origin for US imports of pigs of less than 50kgs.

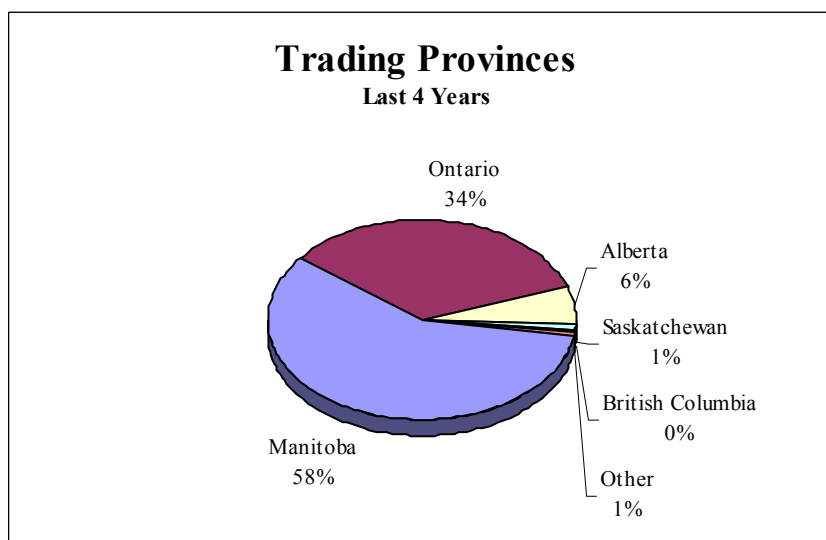


Figure 2.1 Source: USDA FAS

The data indicates that approximately one-third of the pigs originate from Ontario and two-thirds flow from the prairies. Beyond that fact, however, the data are less clear. The lack of data clarity occurs because the USDA treats the province of origin as the address of the exporter. In cases where Alberta hogs from an Alberta exporter flow through Manitoba or Saskatchewan ports of entry, the pigs are regarded as originating from Alberta. In cases where Alberta pigs are assembled and exported by a Manitoba trader, the Alberta pigs are listed as originating from Manitoba. As a result, the data likely overstates the Manitoba exports and understates the exports from Alberta and Saskatchewan. Nevertheless, for the purpose of this research, there is no debate that the overwhelming majority of prairie pigs (likely 75-80%) originate from Manitoba.

Pig Description/Characteristics

Pigs are generally weaned at 3 weeks of age when they weigh 10-15 pounds. At this time, they are moved to either a nursery or directly to a finishing building modified to meet the needs of young pigs. In a nursery, diets consisting of grain, plant proteins and milk products. Pigs are moved out of the nursery facility at 8-10 weeks of age and weigh 40-60 pounds. From the nursery stage, pigs move to the growing and finishing phase of the facility. The “grow-finish” phase is comprised of two to nine phases in which unique diets are fed which closely match the pigs’ nutritional requirements.²

Prior to the 1990’s the terms weaner pig and feeder pig were used interchangeably in Canada. The terms referred to a pig that weighed from 40-60 pounds but more typically 50-55 pounds. US producers generally used the term feeder pig while Canadian producers tended to refer to the pigs as weaners. During the late 1980’s and early 90’s as segregated early weaning and multiple site systems evolved (as described above), the terms used to describe the pigs also changed or evolved.

Today the word weaner is becoming ambiguous but for different reasons than those noted above. Terminology today more clearly focuses on feeder pigs as weighing over 40 pounds and having gone through the nursery stage. The weaner ambiguity exists due to the growing importance of “isoweans.” Some industry participants refer to weaners as isoweans and vice versa. An isowean, however, is a very specific term used to describe a specifically raised piglet. An isowean is a baby pig that has been separated and isolated from the sow at the time of weaning. This occurs prior to 21 days of age, with 18-21 being the average and some as low as 14 days. After 21 days the risk of cross transference of disease significantly increases. The isolated rearing after weaning is the key feature that allows piglets freedom from disease sources present in the source herd. If the piglet is 23-25 days of age, it will no longer have its “isowean” status. If the piglet is taken off the sow sooner than 18 days, rebreeding risk to the sow often increases. In addition, there are generally pricing deductions for pigs less than ten pounds. The husbandry challenge is to produce a healthy piglet that is as large as possible while still maintaining its isowean status.

The USDA data on Canadian live swine exports only classifies the animals as above or below 50kgs. As a result, there is no official data on the number of isoweans or feeder pigs within that <50kg category. According to exporters surveyed for this research in Canada,³ about two-thirds of the exports are isoweans and the remaining third are feeder pigs.

Volume of Weaner/Feeder Imports

The US has imported weaner and feeder pigs in very large and growing quantities on a year over year basis. The volume of imports accelerated particularly in the mid-1990s. The following graphs in figure 2.2 illustrate the volumes and rates of growth of imports of pigs less than 50 kilograms from 1992 through 2002*.

² National Pork Board, “Pork Facts 2002/2003.”

³ Exporters representing over 50% of weaners/feeders shipped to the US were interviewed.

* 2002 is an annual estimate based on 10 months of data.

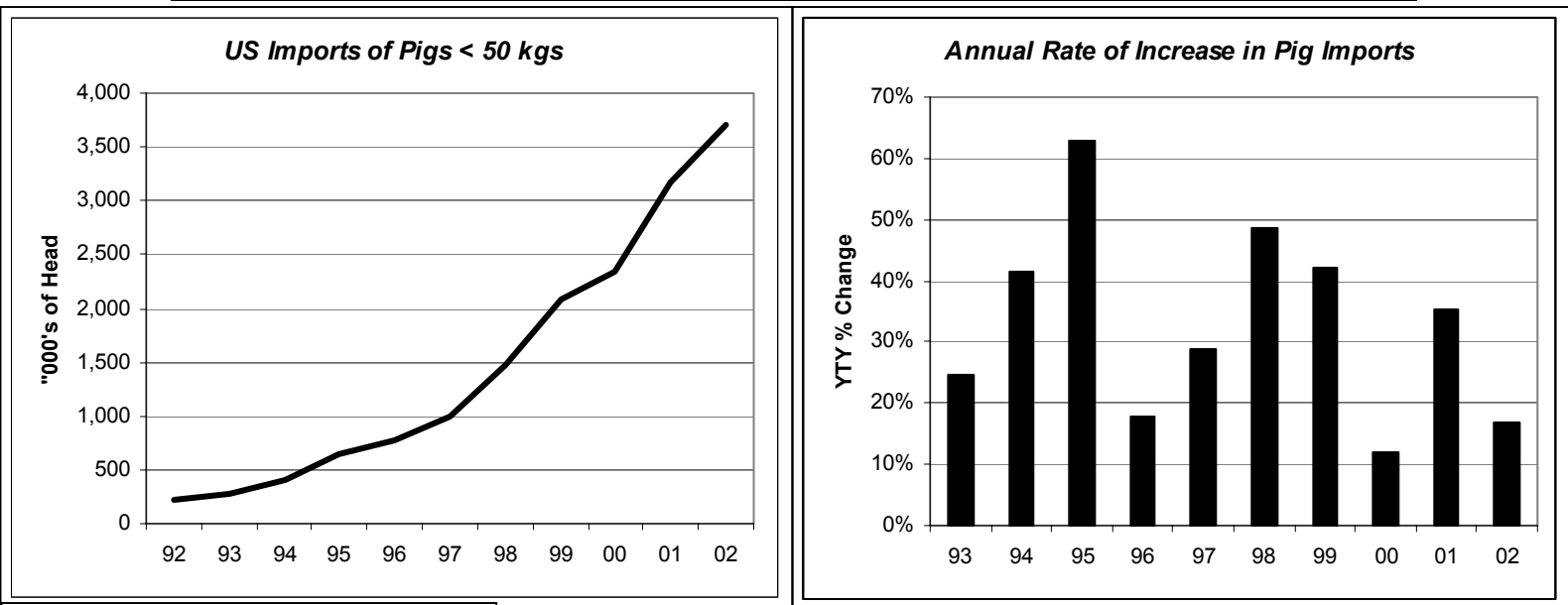


Figure 2.2 Source: USDA FAS

Preliminary data for 2002 shows that US imports of Canadian pigs weighing less than 50kgs will amount to about 3.7 million head. That compares to 3.2 million in 2001, which is an increase of 17%. Five years ago in 1997, US imports were 987,400 head or just over one quarter the size of those in 2002.

2.2 US Import and Canadian Export Drivers

Pig Quality/Herd Health

As noted above, isowean and/or segregated early weaning were developed specifically for elimination of infectious diseases. Isoweans are the building block of multi-site pig production systems. These multi-site systems have become one of two main or standard industry models for hog operations. The second standard is the traditional farrow-to-finish operation. Even in the traditional model, the isowean can play a role in herd health.

One of the main reasons US hog operators demand Canadian isoweans is the high herd health status in Canada. High herd health can be indicated in a number of ways, for example sow productivity. Recent data from Manitoba Agriculture shows that Manitoba sows typically farrow 2.2 times per year with 10 piglets (on average) saved per farrowing for an average of 22 pigs per year. In Iowa, USDA data indicates that sows farrow on average just 2 times per year, with eight average piglets, for a total of 16-18 per year.

Mortality is another measure of herd health. In Ontario and the prairies mortality rates in the range of 2-3% are considered normal. In the United States, mortality rates of 5-10% are more typical.⁴ In addition, the disease free status of the Canadian isowean is also considered a positive demand factor.

⁴ Iowa State University, Livestock Enterprise Budgets for Iowa — 2002, use 7% as a budget tool. Manitoba Agriculture uses a post weaning mortality rate of 3%.

Discussions with major Canadian exporters and US importers indicates similar thinking with regard to the perception of a more robust and reliable Canadian weaner and feeder pig. According to major exporters and importers, part of the explanation for the more robust and reliable status of the Canadian isowean and feeder pig may be due to the following factors:

- Production takes place in less geographically dense environments (see section 5.3 below) Lower pig density in Canada helps the health status of Canadian pigs and leads to a perception of cleaner and healthier groups of pigs
 - Canadians can produce PRRS^α-free isoweans more easily than in the US. The close proximity of sow barns in the US makes it more difficult to control PRRS.
 - Canadian herds do not have pseudorabies and/or brucellosis two common diseases affecting US herds.
- Anecdotal evidence suggests a greater percentage of the Canadian herd and in particular the isowean shipments, are from F1* sow herds than in the United States.
- Genetic lines and in particular UK influenced genetics tend to be less diluted in Canada. In addition, Canadian pigs have had the reputation of being leaner.
- There is a pervasive opinion among US producers, that Canadian producers have more family farm operations, which contributes to a more committed and skilled labour force - resulting in better production. It is also a common belief in the US mid-west that Canadians are able to produce Early Weans and Feeder pigs cheaper with better production, but cannot compete with the Mid-West on the finishing side of production.

Feeder/Weaner Costs of Production

At the end of 2001, the George Morris Centre completed an extensive research project entitled, “Relative Profitability of Hog Production in Western Canada and the US Midwest.”⁵ The research showed conclusively that Manitoba was a low cost region for the production of weaner pigs when compared to Southern Minnesota. Table 2.1 identifies the total farrowing costs for the eastern and western prairies and Southern Minnesota from the research report. It shows that the total cost of production for a farrowing facility is lowest in the Eastern Prairies (i.e., Manitoba), followed by the Western Prairies (Alberta/western Saskatchewan), and then Southern Minnesota. The cost advantage of the Eastern Prairies over Southern Minnesota is over C\$6/pig. This is a surprising result, given that feed costs are lower in Southern Minnesota. The structure of this cost advantage lies in relatively low labour costs, interest costs, and replacement livestock costs.

Further evidence of this eastern prairie or Manitoba cost advantage lies in comparisons of isowean production costs in Iowa and Manitoba utilizing budget analysis from Iowa State University² and Manitoba Agriculture⁶. Making adjustments to the two budgets to account for different assumptions leads to a similar \$Can 6/pig cost advantage in Manitoba.

^α Porcine Reproductive and Respiratory Syndrome. Virus is spread primarily pig to pig but can be carried in manure and possibly as an aerosol infection.

* First progeny of a cross of two pure lines.

⁵ <http://www.georgemorris.org/PDF%20Files/HogprodinWCan1001.pdf>

⁶ Manitoba Agriculture, <http://www.gov.mb.ca/agriculture/financial/farm2002/cac32s00.html>

Table 2.1 Total Farrowing Cost, Three Regions

	Eastern Prairies		Western Prairies		Southern Minnesota	
	\$Can/sow	\$Can/pig	\$Can/sow	\$Can/pig	\$Can/sow	\$Can/pig
1999	65.00	37.49	66.83	38.54	70.64	40.74
2000	69.81	40.26	71.26	41.09	76.20	43.95
Jan-May 2001	70.85	40.86	72.50	41.81	78.80	45.45
Average	68.00	39.22	69.64	40.16	74.39	42.91
Standard Deviation	3.01	1.74	2.85	1.65	3.88	2.24

Finisher Costs of Gain

A key factor in the competitiveness of hog feeding in the US mid-west and in particular the Iowa Southern Minnesota region is the cost of feed. Excluding the cost of the feeder pig itself, feed comprises over three quarters of the variable costs of finishing hogs.⁷ Prior to the 2001 research, the George Morris Centre had determined that the eastern Canadian prairies were the lowest cost region of North America for feeding hogs.⁸ These cost advantages considered all factors such as labour, buildings, medications and grain. However, more recent drought and vomatoxin problems have made the eastern prairie region less competitive than the Iowa Southern Minnesota region. Moreover, the 1996 US Farm Bill encouraged production of corn and, as importantly, encouraged much of each year's crop to be marketed in the late summer because of the marketing loan program. This resulted in a relative decline in feed prices in the US, especially in the summer quarter. These are the reasons Manitoba no longer has the feeding cost advantage that it once enjoyed.*

The following graphs in figure 2.3 illustrate the grain price trends between Manitoba and Iowa, as well as Ontario and Iowa. As can be seen, Iowa enjoys a strong feed price advantage to Ontario and a growing feed cost advantage to Manitoba.

Another point to note is that Iowa appears to be gaining competitive strength over the longer term with regard to grain. Appendix A shows the longer-term trends in grain yields in Iowa compared to Alberta. This trend indicates that Iowa will continue to have a strong comparative advantage in feeding hogs.

⁷ Iowa State and Manitoba Agriculture finishing budgets

⁸ Prospects for Hog Production and Processing in Canada - Update. Larry Martin, Zana Kruja and John Alexiou. March 1999.

* George Morris Centre (footnote 3)

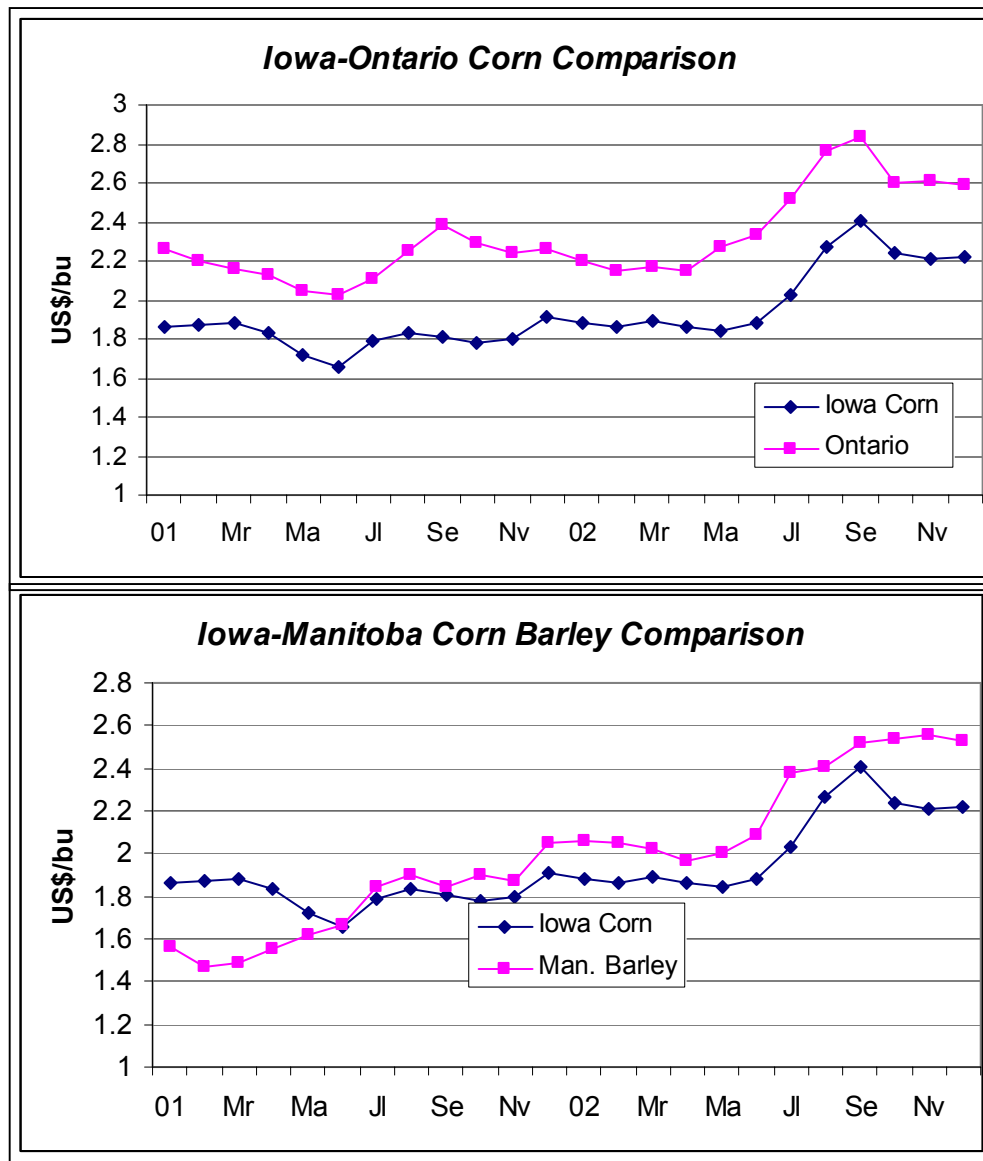


Figure 2.3

Market Hog Prices

The comparison of market hog prices between Canada and the United States has been a subject of debate for many years due largely to the differences in reporting methods. That is, comparison of price between the two regions is difficult due to the different quality basis upon which prices are reported. There is general agreement that US prices on average have tended to be higher than in Canada, but that the differentials have been narrowing. For example, in 2001 Manitoba Agriculture calculated that the price of hogs in Manitoba FOB the plant was US\$54.65/cwt. The Iowa-Southern Minnesota price calculated on an equivalent basis was estimated at US\$56.41/cwt. The same methods applied in 2002 resulted in a Manitoba price of \$43.93/cwt and an ISM price of \$43.80/cwt (see figure 2.4).

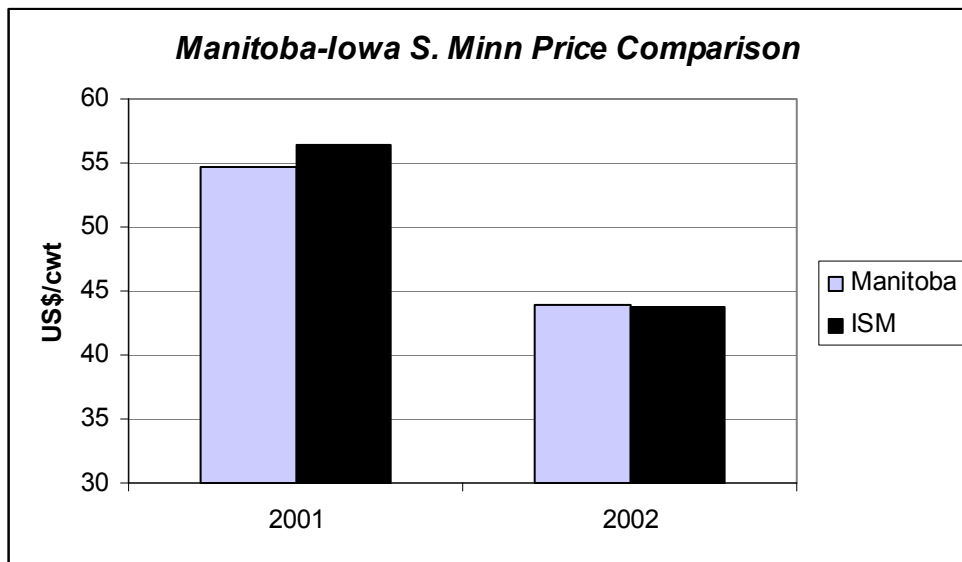


Figure 2.4 Source: Manitoba Agriculture

The key area of disagreement is with regard to the “equivalent basis” of comparison. Based on comparisons of index grids of Canadian and US lean yields, it is likely that in 2002 there was a *real* differential in favor of the ISM region versus Manitoba by about US\$1-2/cwt. Nevertheless, as noted above it is apparent that the differential has narrowed. For example, previous research by the George Morris Centre has shown that since the mid-1990’s the differential was approximately US\$3-4/cwt compared to its current levels of US\$1-2/cwt.*

Weaner Profitability

The following figure (2.5) illustrates weaner prices and profits in Manitoba since 1998. By most measures of comparison, weaner pig production has resulted in strong returns for Manitoba producers. Comparisons to other enterprises including hog finishing on the prairies, indicate that weaner pig production has been one of the most profitable ventures available to producers.

* George Morris Centre (footnote 3)
Virginia Polytechnic Institute and State University

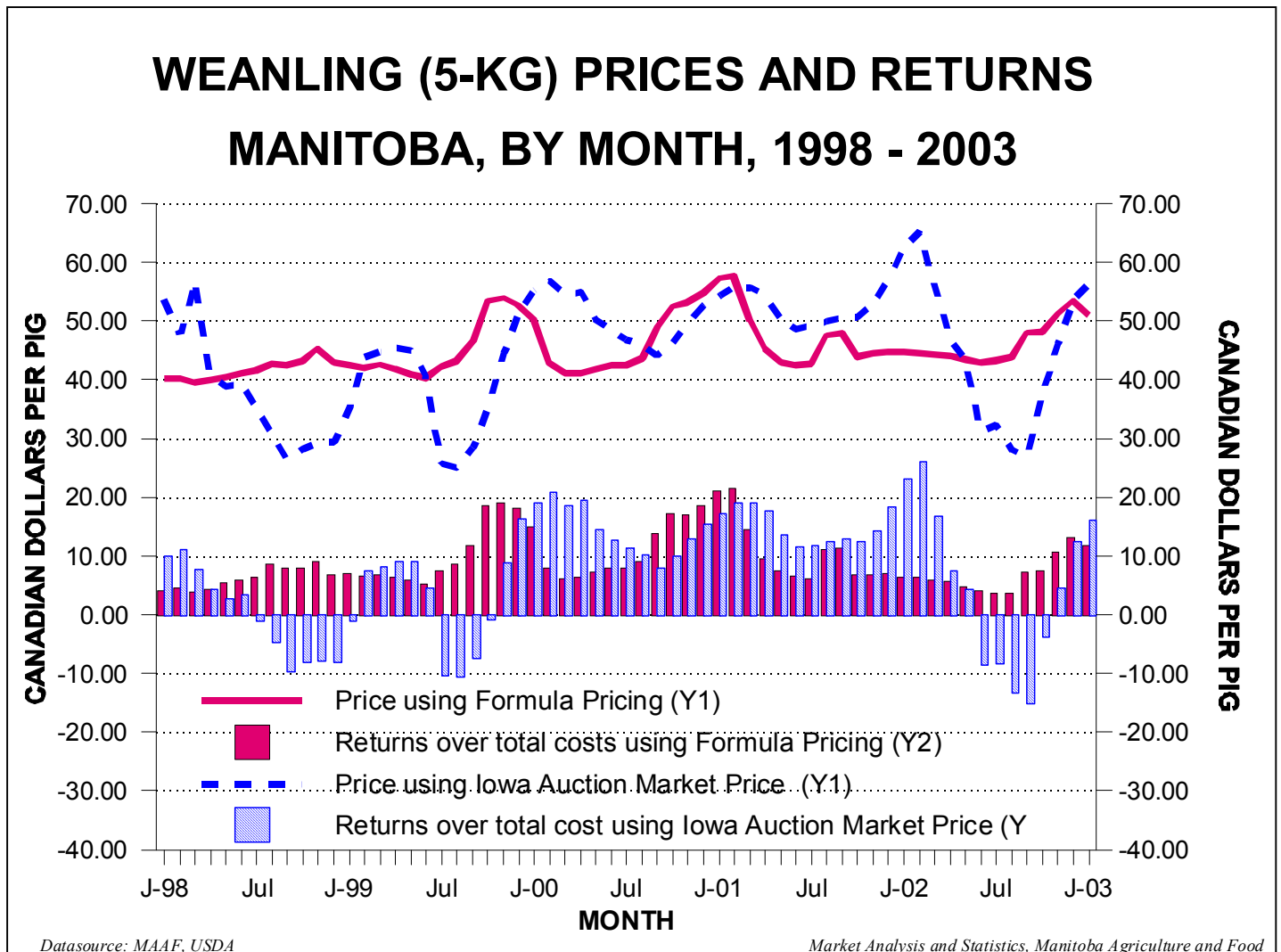


Figure 2.5

Weaner/Finisher Supply

With regard to weaner/finisher supply, the following graph in figure 2.6 illustrates the overall trend in pig crop in the US and Iowa from 1997 to 2002. As can be seen, the supply of pigs, illustrated by the crop born in both the US and Iowa, has declined since 1998. This trend stands in sharp contrast to the pig crop trends in Western Canada. The western pig crop was 2.3 million head in January 1998 and 3.66 million in January 2003. The Ontario pig crop was 1.6 million head in January 1998 and 2.26 in January 2003.

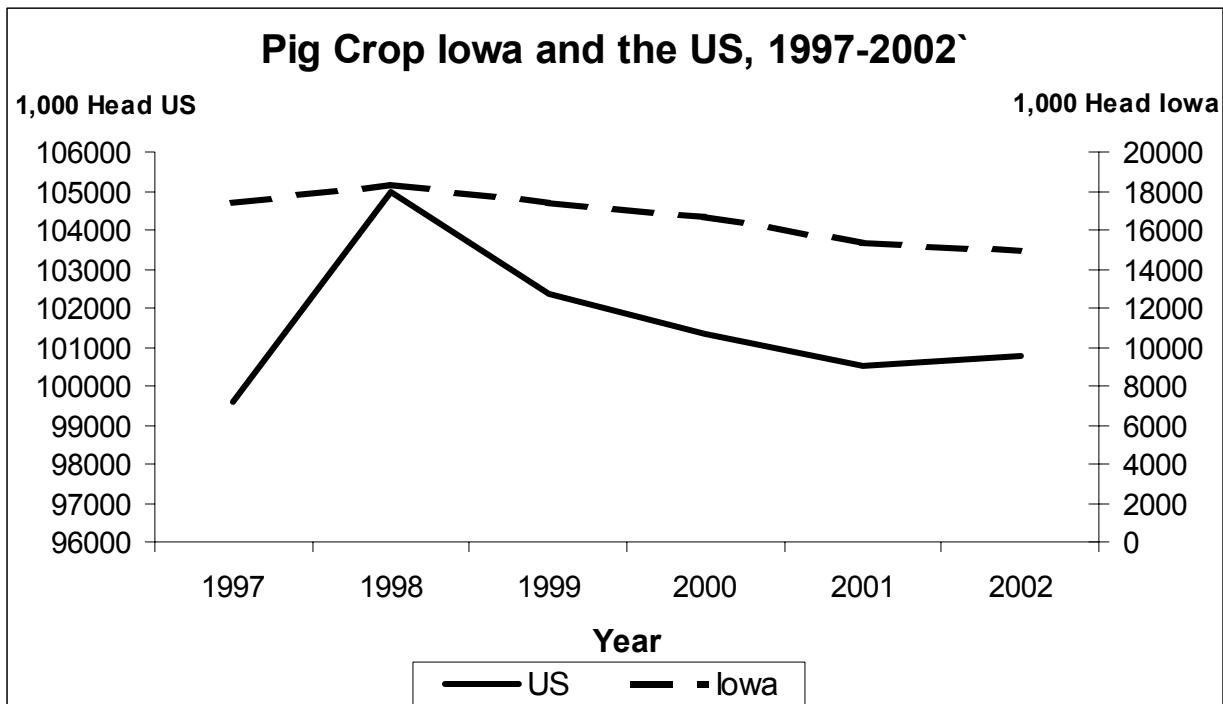


Figure 2.6, Source: USDA Hogs and Pigs Report (December)

Other Factors

In addition to the quality of the product and the economic drivers, there are other reasons why the US Midwest demands feeders and weaners from Canada. These other reasons are the factors that are at play which limit the growth in the industry in that region.

Research by John Lawrence of Iowa State and Glen Grimes of the University of Missouri show that there are a variety of factors that have impeded expansion of the US hog industry.⁹ Lack of profits to sustain expansion plans was the largest growth-limiting factor regardless of size or region. That in combination with financing was the overwhelming reason for limited expansion in the US and in Iowa. Local opposition and environmental regulations were also important reasons for limiting expansion. A lack of labor was another important reason for not expanding.

Industry personnel state that another very realistic reason for the growth of finishing versus farrow to finish in Iowa and Southern Minnesota is the increased age of the operators. In fact data from the University of Missouri shows that the average age of operators in the US is increasing.¹⁰ Interviews suggest that older producers are less interested in the risks and demands of farrowing operations in comparison to the more predictable and less demanding finishing operations.

⁹ Production and Marketing Characteristics of U.S. Pork Producers, 2000 John D. Lawrence Associate Professor, Dept. of Economics Iowa State University Glenn Grimes Professor Emeritus, Ag. Economics Dept. University of Missouri, <http://agebb.missouri.edu/mkt/porkmkt.htm>

¹⁰US Pork Industry Structure Study, Glen Grimes, University of Missouri <http://agebb.missouri.edu/mkt/porkmkt.ppt>

2.3 Summary and Conclusions

The growth of weaner and feeder exports to the US from Canada has been rapid and ranks as one of the most significant developments in Canadian livestock. The rationale for the exports, however, is based on the simple economic factors of supply and demand. The following are the key economic drivers of the exports/imports:

1. US buyers have a high regard for the Canadian pig quality.
2. Canadian weaner/feeder producers have a cost advantage over their US counterparts
3. US and in particular the Corn Belt hog finishers have a cost advantage over their Canadian counterparts.
4. US, and in particular the Corn Belt hog producers have a slight market hog price advantage over their Canadian counterparts.
5. Other factors such as local opposition, financing and labor are also limiting the growth of the US sow herd.
6. The US pig crop, and in particular, the Iowa crop has been declining. Canadian pig crop growth has outpaced US pig crop growth.

As a final point, it is relevant to note that Canadian pigs are not the only pigs flowing to the US. The US corn belt and in particular Iowa, draw pigs from all over the United States in addition to Canada. In fact, the major source of pig sales in Iowa is the southern US. For example, the USDA February report indicates that over one third of the feeder pigs purchased in Iowa were shipped from states such as Oklahoma, North Carolina, Arkansas and Tennessee. In other words, the pigs will flow to the location with cheapest grain, regardless of where the sows are located.

3.0 Profile of US Farms Utilization of Canadian Weanlings

The purpose of this section of the report is to provide an outline of the operations that purchase Canadian weaners and feeders. This section seeks to provide profiles that outline the following:

1. Where are the primary geographic destinations of the weaner and feeder pigs?
2. Who are the primary importers and operations that demand these pigs?
3. How many farms are involved in finishing Canadian pigs?

It is expected that the answers to these questions will help to better understand the impact of restricting the pig imports. The method/approach of this section includes statistical analysis, as well as interviews and surveys with both importers and exporters. Selected interviews included industry personnel that import and export about 50% of total weaner/feeder shipments to the US.*

3.1 Geographic Destinations for Weaner/Feeder Pigs

The following graph (figure 3.1) summarizes the last four years of USDA data (1999-2002) for the state or region of destination for pigs weighing less than 50kgs. As can be seen, the primary destination for pigs is Iowa, with about a 48-50% share followed by Minnesota with about a 28% share. Iowa and Minnesota are the destinations for nearly 80% of the Canadian shipments of pigs under 50kg. In 2002, preliminary data indicated that the US imported 3.66 million pigs less than 50kg. Of those pigs, 2.16 million went to Iowa-Minnesota. All other regions and states combined represented approximately 20% of the imports.

Within the hog industry, Iowa and Southern Minnesota are often regarded as one region. For example, prior to the Mandatory Price Reporting program in the US, the standard USDA price quote was the “Iowa-Southern Minnesota” quote. USDA in Des Moines defines southern Minnesota as two tiers of counties in the south of the state. It is effectively the area south of highway 14 in the western part of the state and south of Mankato in the eastern part of the state. With regard to the imports of Canadian pigs, interviews with exporters and importers of pigs indicated unequivocally that it is the Iowa Southern Minnesota region that receives almost all the hogs in the two states. More specifically, the areas south of Mankato, Minnesota and north of Fort Dodge, Iowa, west of Interstate 35. (i.e., Northwest Iowa and Southwest Minnesota).

With regard to the trends over time, it appears that the Iowa-Minnesota region is increasing in share as a destination point. In 1999, Iowa-Minnesota imported 76% of the pigs. In 2002 the region imported 81% of the pigs.

* Interviews were conducted with US traders, feed companies, management companies and farms representing the production of approximately 1.9 million Canadian sourced hogs (total 2002 US imports were 3.7 million). Interviews were conducted with Canadian exporters representing approximately 1.5 million Canadian hogs.
Virginia Polytechnic Institute and State University 19 *George Morris Centre*

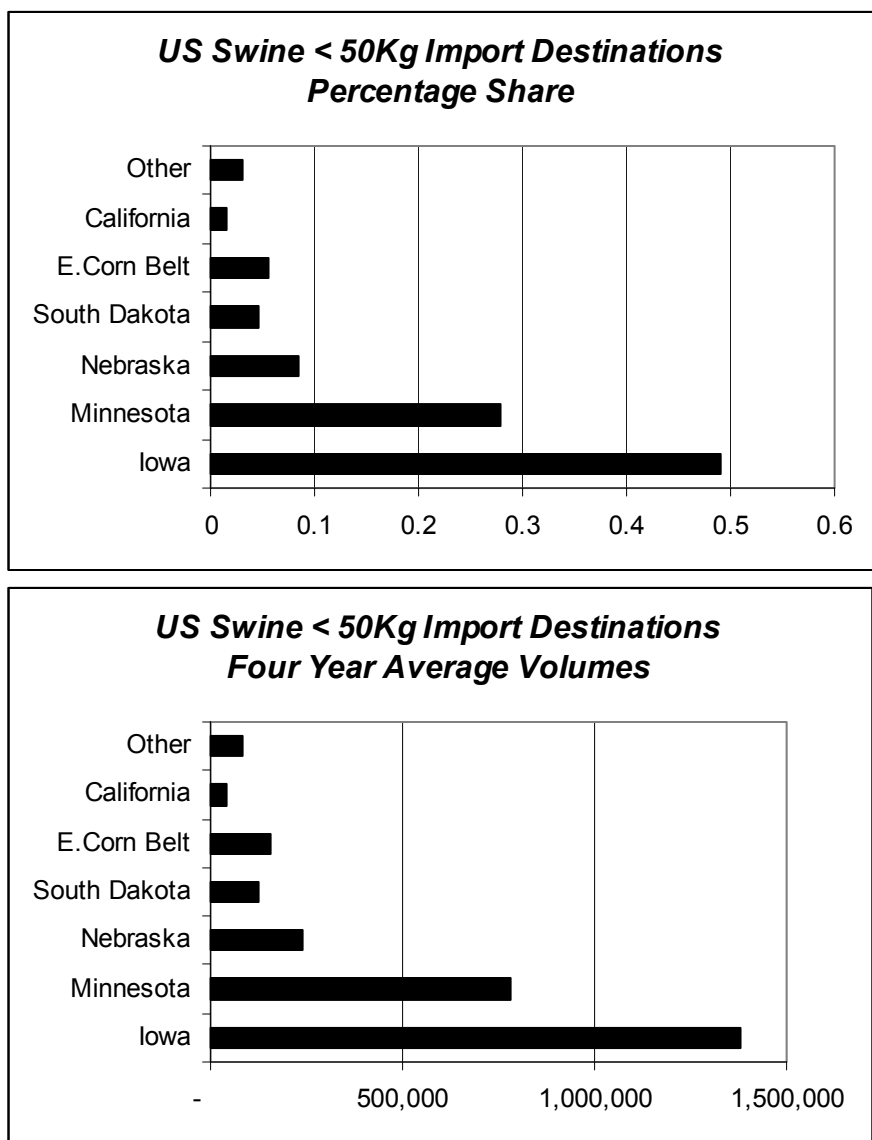


Figure 3.1 Source USDA

3.2 Importers

Discussions with importers and exporters of weaners and finishers indicate that there are a variety of import channels, buyers, traders and sales methods. In other words, there does not appear to be one clear or simple explanation of the business linkages between Canada and the US with regard to weaners and feeders. The following are a listing of some of the vehicles by which Canadian pigs end up in the US for finishing:

Independent Farmer-Finishers

These are farmers who finish hogs on their own land and operations. The feed is usually farm-based. The size of operation can vary but the typical operation has 1-6 barns that have a capacity of 1-2,000 head. There is a great deal of disagreement on whether there is an “average” operation, but if there is an ‘average’, it is likely a 2-3 barn business. These independent farmer-finishers either purchase the hogs directly from Canadians or buy from hog broker/traders who

are located in Canada or the US. These farmer-finishers may also feed the hogs on contract for a fee on behalf of other business entities.

Feed Companies

Feed companies have become active in the hog feeding business in the US Midwest for a variety of reasons including as a means of marketing feed or for diversification of operations. Feed companies may contract directly with Canadian farms or will purchase from hog brokers/traders. Feed companies will either sell to independent farmer-finishers or will contract finishing to farmer-finishers.

Cooperatives

Farmer cooperatives have been formed in recent years for the purposes of grain and hog procurement and marketing. These cooperatives are either independent or aligned with feed mills. These cooperatives are comprised of farmer-finishers who utilize their numbers to leverage purchases and marketing activities. These cooperatives either buy directly from Canadians or purchase from brokers/traders.

Hog Management Entities

Businesses that may have involvement in all or some of the following functions:

- hog procurement
- hog marketing
- feed
- management
- production
- genetics
- facilities

These firms either contract or sell weaners/finishers to independent farmer-finishers.

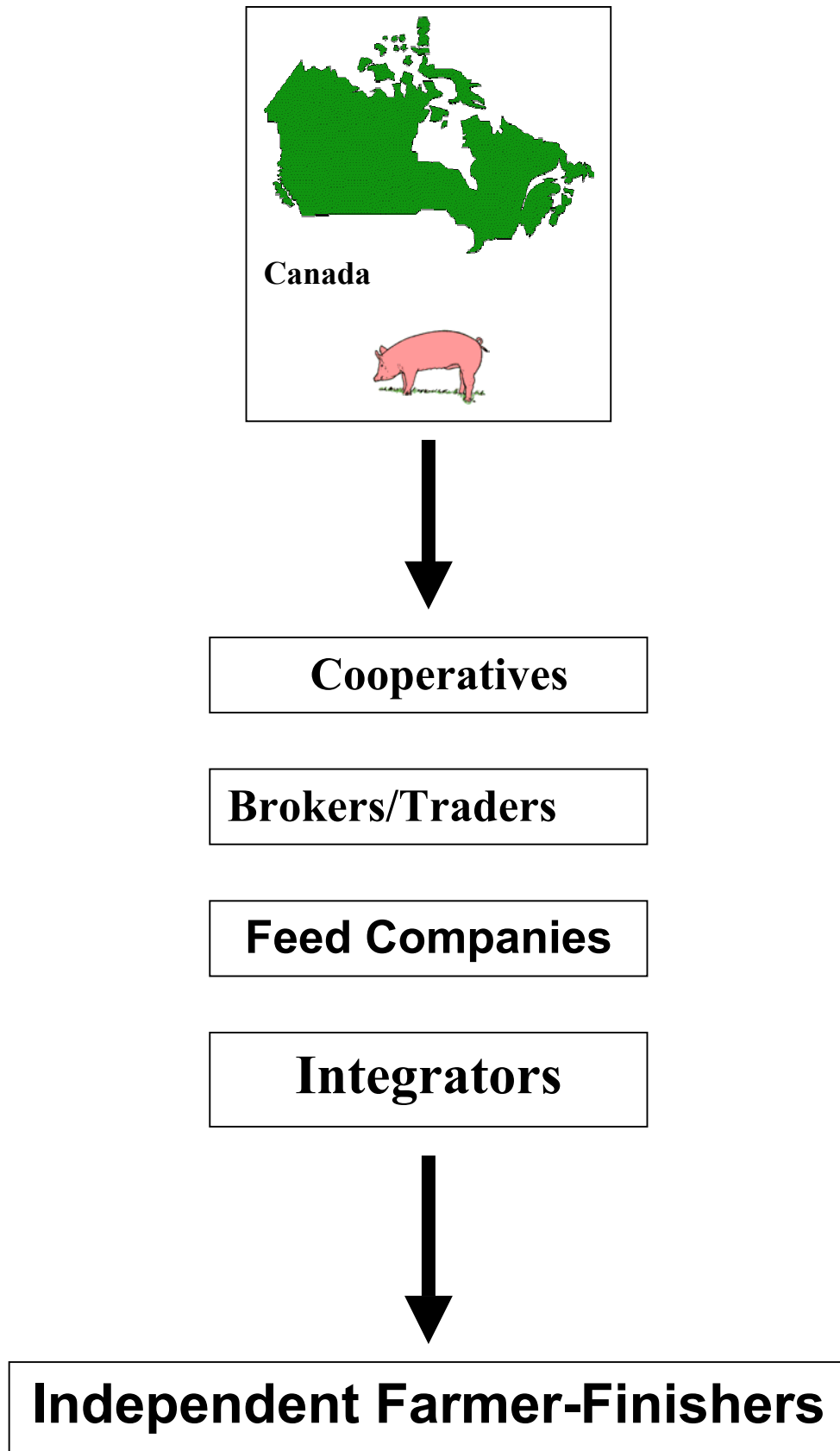
Integrators

These firms may be large or small US based hog business that own sows and keep control of the pigs from farrow through marketing and sometimes beyond. While these operations typically finish their own pigs, they often supplement or augment their needs with Canadian pigs. These pigs are usually procured through brokers/traders and are often finished by independent farmer-finishers.

Retained Ownership

Some Canadian farming operations produce weaners and/or feeders and then ship them south for finishing in either their own facilities or in contracted facilities. These Canadian's retain ownership of the pigs through the finishing process and sell market hogs to packers, usually under longer-term contracts.

The diagram below shows the variety of ways in which Canadian pigs flow to the US and the fact that the typical end point is the independent farmer-finisher.



3.3 Farmer-Finishers

Regardless of all the factors associated with the logistics of export and import, the one common factor is that nearly all the hogs that are imported are ultimately finished on the land of an independent farmer. Based on interviews with US importers, these independent farmers usually own their own land, feed their own corn and grind their own feed. In addition to their land, these farmers provide their own and their family’s labor to the business of finishing Canadian hogs.

There is reticence on the part of surveyed importers and exporters of weaners/finisher to describe an “average” farmer-finisher that ultimately feeds Canadian pigs. This reluctance is based on the fact that these farmer-finishers are involved in a wide variety of businesses in terms of size and method of operation. Nevertheless the information obtained from surveyed importers and exporters make it clear that those who finish Canadian pigs are reflective of the US industry as a whole. That is, the interviews lead to the conclusion that the average finisher of Canadian weaners is in fact an average US hog farmer in most ways, but slightly larger than average in terms of size of operation. Therefore, the USDA statistics on hog operations and inventories can provide the basis for determining the numbers of operations that are involved in finishing hogs, and in particular, Canadian hogs.

Appendix B provides a detailed overview of trends in hog farm size in the US and Iowa. The important point to derive from this is the size of operation. The following graph (figure 3.2) illustrates the size of an average operation in each of the main states that import Canadian pigs.

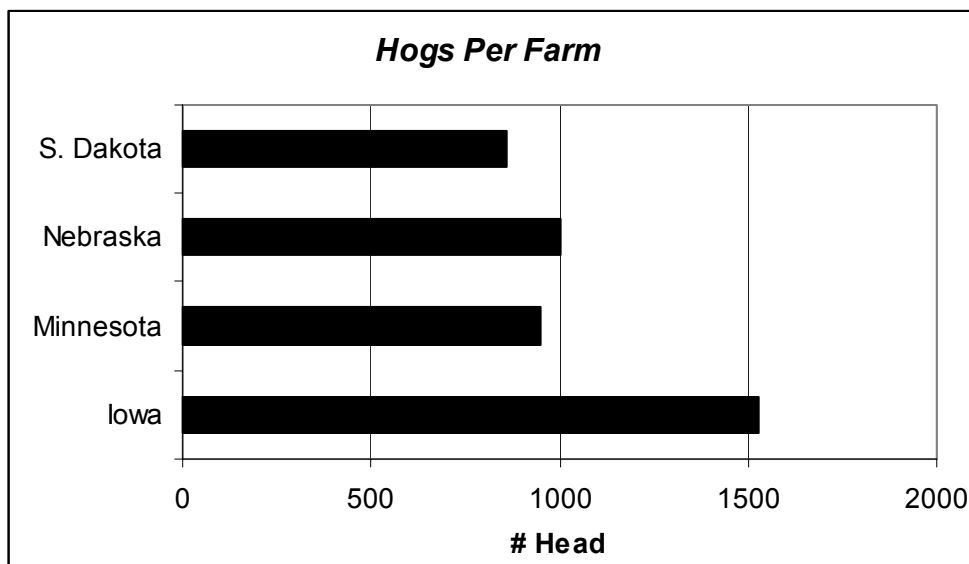


Figure 3.2 Source: December Hogs and Pigs Report

Statistically, if the hogs are weighted based on state destination of Canadian pigs, the average per farm amounts to less than 1,200 head. As noted above, the interviews lead to the conclusion that the finishers are likely larger than average. Therefore, for the purpose of this analysis, it can be concluded that the average farm that feeds Canadian pigs has approximately 1,500-2,000 head at one time. Assuming the inventory is turned twice per year, the average sales per year will amount to approximately 3,000-4,000 head.

4.0 Impact of Eliminating Canadian Feeder Pig Imports

Previous research by the George Morris Centre as well as others (Meyer and Hayes 2003) indicate that there is a high probability that Country of Origin Labeling will result in the elimination of Canadian hog imports to the US. The purpose of section four is to evaluate the impact of eliminating the import of Canadian weaner and feeder pigs.

There are two basic events (both are examined in section 4.0) that will ultimately result if Canadian hog imports are eliminated. The first is that independent farmer-finishers will no longer have the same volume of business due to reduced supply. The farmers that lose this business may or may not be those that finish Canadian pigs. The second event is that the weaners will eventually be produced in other regions of the US. This will impact the structure of the US pork industry.

4.1 Farmer-Finishers

Farms At Risk

Mandatory Country of Origin Labeling will come into effect October 1, 2004. Based on the factors that are limiting expansion in the United States (see section 2.1), there is no possibility that the 3.76 million weaner/feeder pigs from Canada (2002 data) can be replaced by 2004 through increased US farrowings. As further evidence of this fact, US hog producers remain in a loss position (noted as of early 2003), implying that they are reducing sow numbers. Furthermore, based on conservative projections, it is expected that by 2005, the first full year of COOL implementation, the US will be importing over 5 million weaner/feeder pigs¹¹. This projection is based on pre-COOL industry trends. It is noted that the flow of weaners is already slowing as Canadian producers work towards finishing more hogs in Canada.

There are two key assumptions that must be addressed before assessing impacts:

1. By 2005, the US finishing sector will be short four million weaner/feeder pigs. Based on pre-COOL projections this assumption is conservative. It also assumes sow rebuilding of approximately 50,000 head in anticipation of COOL.
2. Each farmer-finisher sells 3,000-4,000 hogs per year.

Based on these assumptions, it can be conservatively asserted that about 1,000 to 1,300 independent farmer-finishers will be impacted by the elimination of the Canadian pig imports. Depending on the type of operation, it could mean that farmers are forced to leave the business or find alternatives. Either way, it means there will be 1,300 farmers jeopardized. As noted, these farmers may or may not be those currently feeding Canadian pigs. For perspective, 1,300 farms represent about 6% of hog farms in Iowa, Nebraska, Minnesota and South Dakota - the states that import 90% of the weaner/feeders. Based on trends in hog farm numbers, by 2005, 1,300 farms would represent about 8-9% of hog farms in the states identified.

¹¹ This projection is based on an annual growth rate of 12%, which is the lowest growth rate in the last ten years.
Virginia Polytechnic Institute and State University 24 *George Morris Centre*

Economic Implications

There is a variety of ways to assess the revenue that is generated by the independent hog farm operations. The simplest is to look at the average revenue per market hog over the last three years¹². From 2000 to 2002, the National Base Lean 51-52% price has averaged US\$56.45/cwt. Assuming an average carcass weight of between 185-190 pounds, a market hog generated revenue of about \$105/head.

Applying this figure to the potential of lost marketings in 2005 from the elimination of weaner imports, implies that there could be a loss of \$420 million in gross farm income in the states of Iowa, Minnesota, Nebraska and South Dakota (this estimate may include other affected states).

The US Bureau of Economic Analysis (BEA) has developed input-output tables that measure the economic impact of a variety of industries. In essence, the tables provide economic impact multipliers, which measure the economic impact of a wide variety of industries on the total US economy¹³. The hog production industry has a 'Total Industry Output Multiplier', of 3.113 according to the BEA. This means that for every dollar of income or output in the hog-farming sector, it generates or causes \$3.113 dollars in the overall economy. This is the amount of activity that is generated directly and by suppliers (feed, veterinary, fertilizer, machinery etc). Therefore, if \$420 million in revenue were lost from the hog-farming sector as a result of COOL, then a further \$1.3 billion would be lost to the US economy.

The BEA has not published or developed employment multipliers but work in this regard was developed at Iowa State University¹⁴. The research at Iowa State generated employment multipliers for a wide variety of enterprises that are based in Iowa. The direct employment multiplier for hog farming is 1.804. This means that for every job on a hog farm, it generates .804 jobs in the supplier sectors. If we conservatively assume that the 1,300 farmers that are jeopardized by COOL are the only jobs on the farm, implications are that a further 1,045 jobs are at risk in those sectors that supply the farms.

Structural Implications

The elimination of weaner/feeder imports from Canada will eventually result in increased sow production in the United States to meet the demand for these pigs. The question then becomes who or what entities will produce the sows that generate the weaners.

Anecdotal evidence as of early 2003 suggests that the larger integrated operations and packing plants have already decided that they are going to produce the sows necessary to meet the packing demand. This evidence is referred to as anecdotal as no company has officially stated that they are going to produce sows to make up for the lost imports. One packing company officially informed George Morris Centre staff (in confidence for the previous research into

¹² Three years was selected as it represents both good and bad years of the current hog cycle and the period of time between 2002 and 2005.

¹³ The hog production industry is included in the industry classification named, "Animal production, except cattle and poultry and eggs." The tables can be accessed from:
http://bea.gov/bea/industry/iotables/prod/table_list.cfm?anon=324

¹⁴ An Introduction to Economic Impact Assessment, Dave Swenson, Regional Scientist, Department of Economics Iowa State University, February, 2002

COOL) that sows would be placed to make up for lost imports that they use. Other industry sources have indicated that other packers and large integrators, such as those listed in Successful Farming's Pork Powerhouses Top 40, have plans to increase sow production¹⁵.

Beyond the anecdotal, there is also the practical financial reality of the industry. Data from Iowa State shows that the industry has been in a loss position for three of the last five years¹⁶. It is likely that 2003 will be a loss or very close to a loss year. The question then becomes the reality of generating capital to finance further hog production. In addition, as noted in Appendix B, the only category of operation that is growing in the US is the larger categories. These factors indicate that there is a greater likelihood that only larger operations will have the resources to expand to meet the needs of the diminished supplies as a result of COOL.

Further supporting evidence that it will only be the largest of the large firms to expand, exists in the share of the top 40 firms listed by Successful Farming. The top forty consist of firms such as Smithfield Foods (744,341 sows), Premium Standard Farms (225,000 sows), Seaboard Farms (212,000 sows), Prestage Farms (122,000 sows) and Cargill (104,500 sows). The following graph (figure 4.1) illustrates the estimated share of the US sow herd held by the top 40 firms. It is important to note that the share of the top five firms is also growing. In 2000 the top five firms had 22% of the inventory compared to 24.3% in 2002.

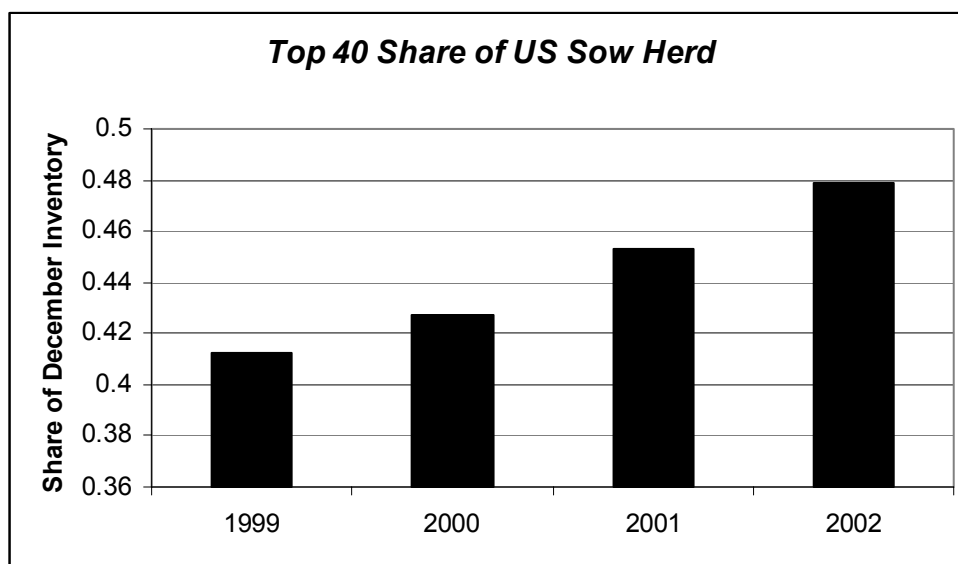


Figure 4.1 Source: Data compiled from Successful Farming and USDA

While the industry has undergone severe and prolonged losses, the only expansion that has occurred has been by the largest firms. As such, the largest integrated firms is the practical answer to the question of who will produce the hogs that are required when Canadian imports stop. This stands in contrast to the current model where independent farmers in Iowa, Minnesota, Nebraska and South Dakota are producing hogs on their own land.

¹⁵ http://www.agriculture.com/sfonline/sf/2002/october/0210pork_powerhouses.html

¹⁶ <http://www.econ.iastate.edu/faculty/lawrence/EstRet/frames.html>

Furthermore, the typical operating model utilized by the large integrated operation is to farrow and finish the hogs, even through slaughter. This means that when the larger operations expand their sow herds to meet the market demand in 2004/5, there will be little room for the independent farmer-finisher in the system. The following factors indicate the relative ease with which the top integrators in the US could replace the production from the 1,300 independent farmers:

- Assuming 20 pigs per sow per year, this means that approximately 183,000 sows will be required to replace the Canadian weaners. This is just 10% of the number of sows that are under the ownership of the top ten integrated firms in the United States.
- The top five firms increased their sow numbers by 105,000 head in just two years.
- 183,000 sows is less than the production of each of the top three firms.

Additional evidence that it will be the large integrators that will expand is provided by the costs associated with COOL itself. Research conducted by Meyers and Hayes, as well as Sparks Companies in Memphis, all provide evidence that COOL will increase the production costs of hog farmers and packers. Sparks says the costs will increase from \$3.25 to \$10.25. It is interesting to note however, that in fully integrated operations, the costs associated with COOL will be less. Sparks notes that the smaller, non-integrated producers and packers will bear the greater cost burden while the larger integrated operations will see costs at the lower end of the spectrum. That is, because the operation is fully integrated most of the costs of proving the animal and meat's origin will be diminished at a minimum. Independent farmers on the other hand will still bear the full cost burdens of COOL, which in turn will increase their vulnerability relative to the integrators.

4.2 Summary and Conclusions

Feeder and weaner pigs are the beginning point in the hog and pork production value chain. The pigs that are shipped to the US from Canada have had very little economic value-added in Canada. All of the feed grains, labor, processing and overall economic value-added that is required to turn these pigs into pork is occurring in the United States. Reducing or eliminating these imports means eliminating all the economic benefits associated with this value-adding process. Furthermore, it means directly jeopardizing the livelihoods of those farmers that are in the hog finishing business in the US Corn Belt. The following are some of the implications of eliminating the weaner/feeder imports to the US:

- Farm income of over \$420 million will be lost.
- Economic activity of over \$1.3 billion will be lost.
- Up to 1,300 farming operations or 6-8% of the hog farms in Iowa, Minnesota, Nebraska and South Dakota will be jeopardized.
- Over 1,000 jobs in sectors that supply impacted farms will be jeopardized.
- Independent farmer business structures in Iowa, Minnesota, Nebraska and South Dakota could be replaced by large scale integrated operations.

5.0 US Imports of Market Hogs

Previous research by the George Morris Centre as well as by Meyer and Hayes indicated that because of COOL, US packers are not likely to want to slaughter pigs that were of Canadian origin. This includes those feeder pigs that were finished in the US as well as market hogs that were finished in Canada. The reason is that the packer operating costs associated with the logistics of Canadian pigs will be deemed as too prohibitive. The purpose of section 5.0 is to evaluate the implications of eliminating Canadian hog imports for the US pork packing industry.

The first part of this section of the report evaluates the volumes and the economics of why slaughter hogs are shipped south. The second part of this section evaluates the impact on the US packing and producing sector of not slaughtering both weaners/feeders and slaughter hogs from Canada

Market Hog Import Volumes

The following graph (figure 5.1) illustrates the volumes of market hog imports from 1992 through 2002.

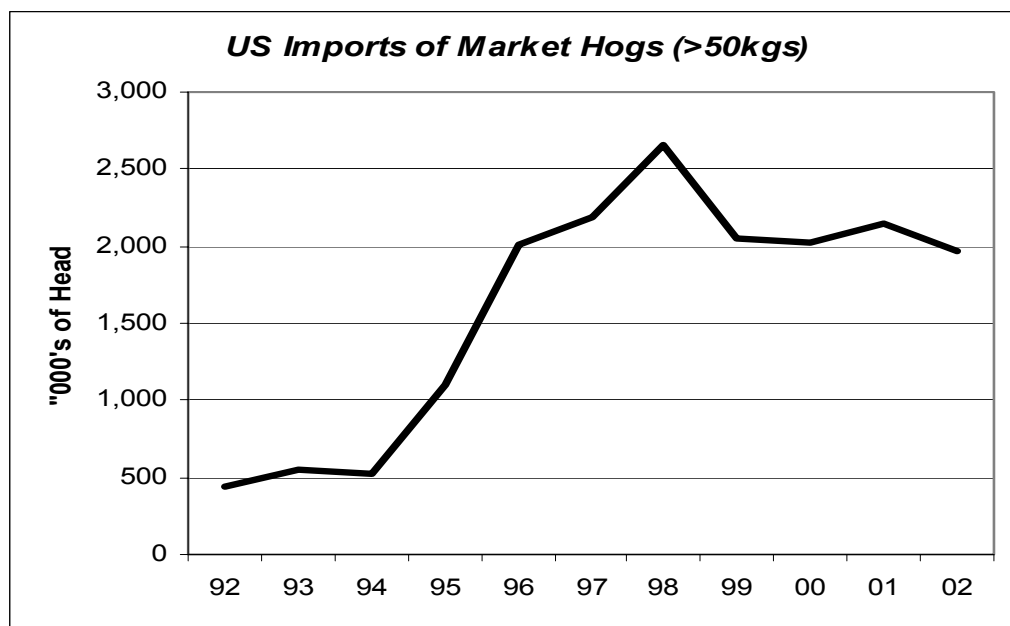


Figure 5.1

After peaking at roughly 2.7 million head in 1998, market hog exports have declined almost every year to 1.97 million head in 2002.

Provinces of Origin

The following graph (figure 5.2) illustrates the provinces of origin for hogs weighing over 50 kilograms (i.e., slaughter hogs).

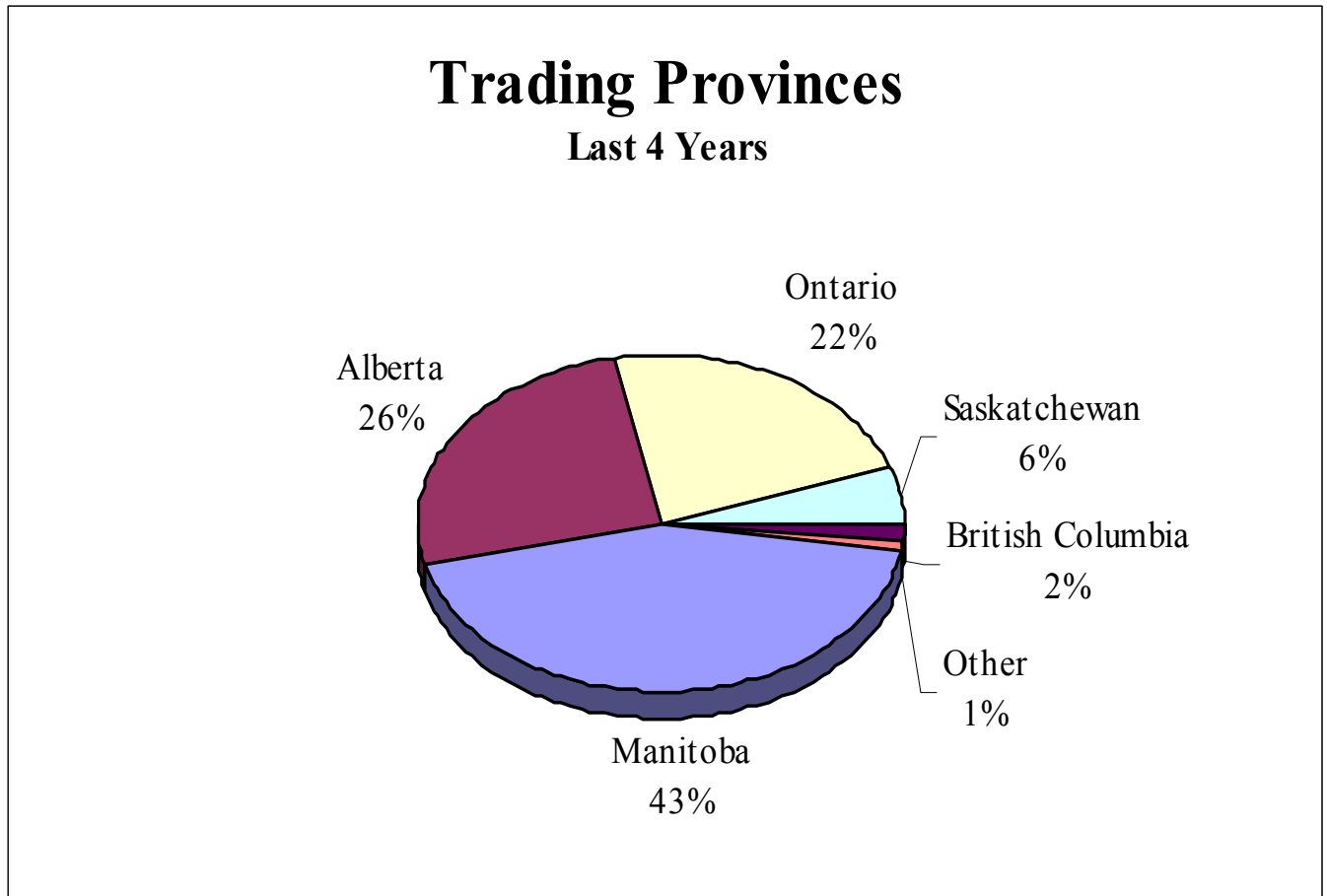


Figure 5.2 Source: USDA FAS and Manitoba Agriculture

As can be seen, the predominant source of the slaughter hogs is in the prairies with approximately 75% of total exports. The other leading source is Ontario with just less than one quarter of the total exports. Within the prairies, Manitoba is the leading exporter with 43% of the total (recall from section 2.0 that data collection methods may distort actual province of origin information).

US Regional Destinations

The following graph (figure 5.3) illustrates the US destinations for slaughter hogs. The graph shows the average volumes arriving in each state over the last four years. South Dakota was the leading destination with over 30% of the imports. The next largest was California at about 16%. The volume of imports is very similar in the remaining ten states on the graph. In other words, Canadian slaughter hogs are imported by a wide variety of states and plants across the entire country.

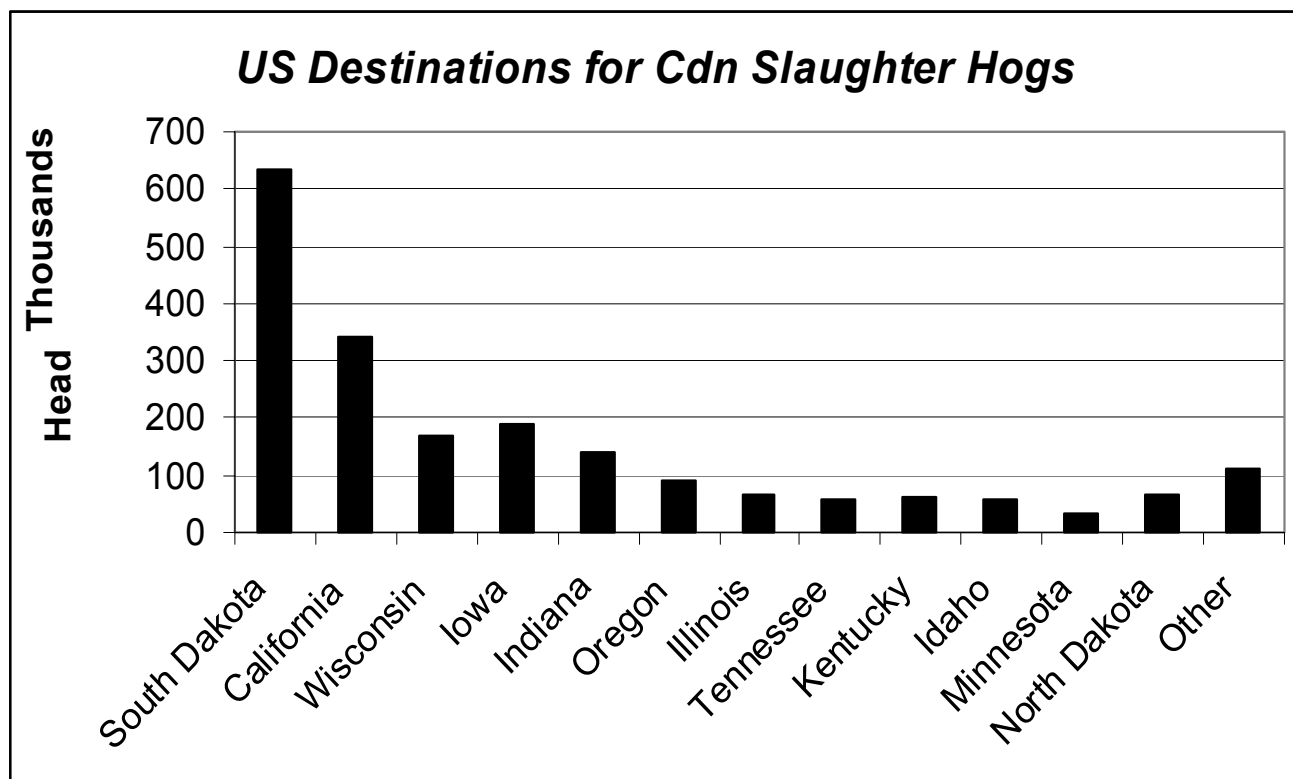


Figure 5.3

5.1 US Import and Canadian Export Drivers

Unlike the feeder/weaner sectors of the industry, the export of market hogs is not a relatively new phenomena and it does not require extensive analysis to determine the economic rationale. The key reasons that Canadian pigs have gone south in the past are because US prices were often higher than Canadian prices and Canadian pig production exceeded packer capacity. This section of the report examines these issues.

US-Canadian Market Hog Prices

Section 2.1 has already shown that US market hog prices have typically been higher than prices in Canada. This factor appears to be changing in recent years however, as the price spread for market hogs in Canada and the US is becoming increasingly narrow. The narrowing price differential between Manitoba and the US was illustrated graphically in section 2.2. The differential in favor of the US is not just narrowing in Manitoba, however. During the last two years Ontario prices have also moved much closer to that of the US than has historically been the case. In Alberta and Saskatchewan price spreads are also narrowing.

The key point is that the US does still have a market hog price advantage over most areas of Canada, but the advantage has narrowed in the last two years.

Canadian Capacity Versus Hog Production

Appendix C contains a list of the larger Canadian hog slaughter plants and their capacities. The total weekly capacity of these plants is about 447,000 head. As is the case with the US plants listed in Appendix D, the total slaughter capacity of the plants listed is less than the actual volumes slaughtered in certain weeks as reported by Agriculture and Agri-Food Canada. For example, in 2002, slaughter was over 484,000 head in one week. Part of the explanation for the difference is the presence of many provincial plants that are not included in the Appendix. They often slaughter over 20,000 head per week. The other major factor is that actual slaughter capacity of some of the listed plants can be stretched when markets dictate.

For the purposes of this discussion, capacity is defined as potential kill on the plants' normal number of shifts. The best guide to the estimate is the highest weekly kill in the year. The potential of double shifting in more plants is discussed later. Based on current shifts at Canadian plants and maximum weekly kills, Canadian slaughter capacity is considered to be 475,000 head per week. This compares to 450,000 in 2001 and 410,000 in 2000. In 1997-98 slaughter capacity was just 350,000 head. From 1997 to 2002, Canadian slaughter capacity grew by forty percent. Over the period from 1997 to 2002, prairie hog slaughter capacity grew from 120,000 head per week to 180,000 head per week, an increase of fifty percent. It is interesting to note that despite the growth in hog slaughter capacity on the prairies, the three provinces still only have the combined capacity of the province of Quebec. Figure 5.4 illustrates the trends in prairie hog slaughter versus Canada as a whole.

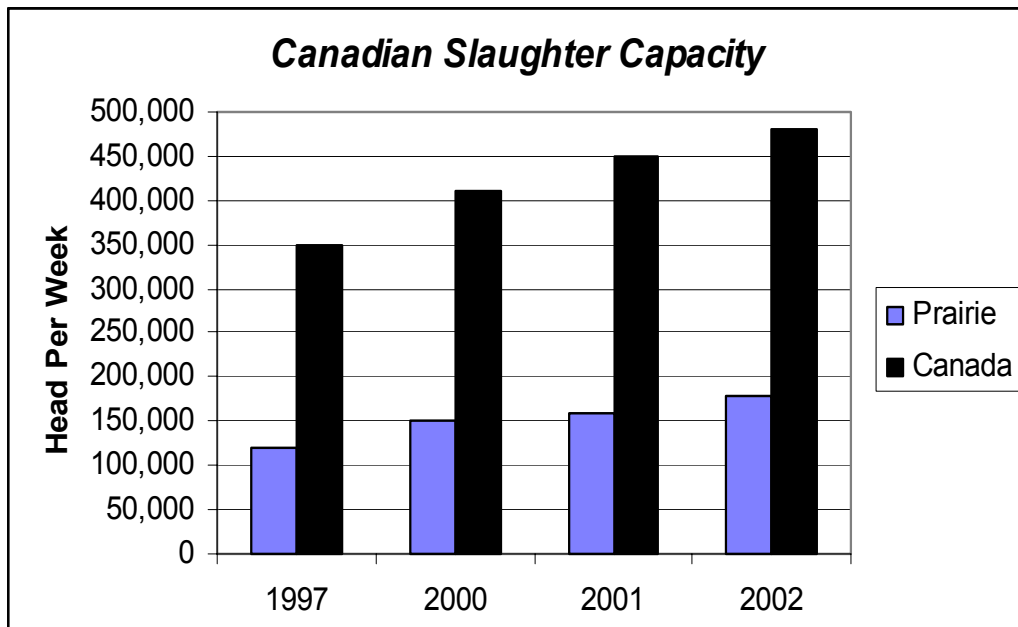


Figure 5.4

As of now, other than one packing plant in Quebec, no Canadian packer is double shifting. This is in contrast to US plants that are almost universally double shifted. Double shifting significantly reduces per head slaughter costs by distributing the fixed overhead over a larger number of hogs. It is expected that Maple Leaf will double shift its Brandon plant (current capacity 45,000 head) within the next two years. It is also expected that this will be accompanied by the closure of the company's Winnipeg slaughter facility (up to 20,000 head). As such, the net gain would be about 25,000 head per week. Olymel has also publicly stated its desire to double shift its plant in Red Deer. This would increase weekly capacity by a further 40,000 head.

A key point to note, however, is that while Canada's slaughter capacity is growing at a rapid pace, it has still not kept pace with overall Canadian marketings. The following graph (figure 5.5) illustrates the ratio of the maximum weekly kill to the average weekly hog marketings in Canada. For these purposes, marketings are defined as the total Canadian slaughter plus all US imports (above and below 50 kilograms).

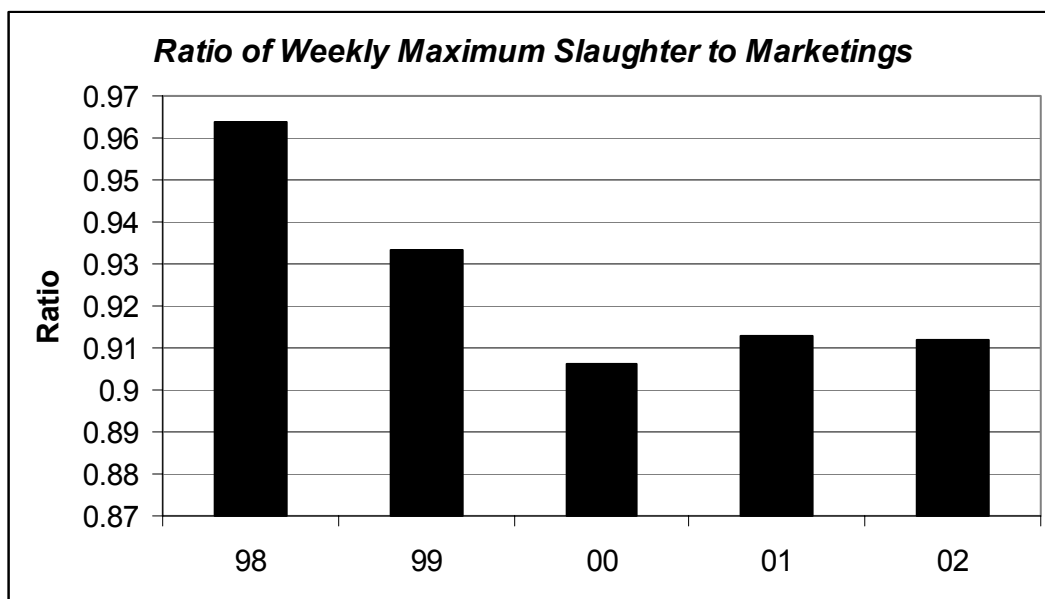


Figure 5.5

As can be seen, marketings continue to exceed slaughter capacity as measured by maximum kill. The situation could reverse however, if Maple Leaf doubled its shifts in Brandon, even with the closure of Winnipeg. That is, if Brandon is double shifted and Winnipeg closes, Canada has the capacity to handle about 95% of total Canadian marketings. If Olymel, Red Deer were to double shift, Canadian packers could handle more than is currently marketed.

5.2 Summary and Conclusions

The following are the key points from the information provided above:

- The prairies are the source of 75% of slaughter hog imports to the US.

- A key driver of Canadian slaughter hog exports has been the price differential between Canada and the United States.
- Another key driver of exports has been the excess of marketings over slaughter capacity.
- Both the price differential and the capacity situation are moving in the direction of a reduced tendency to export slaughter hogs.

5.3 Impact On US Packers of Eliminating Canadian Hog Imports

The previous two sections outlined the volumes and destinations of market hog imports into the US. The sections also reviewed the logical economic rationale behind the import trends. The key direct impact of eliminating market hog imports into the US will be felt by the US hog packer. The US packer will not only be impacted by the elimination of the market hogs, but will also be impacted by the elimination of weaner/feeder imports as well. The purpose of the following section is to evaluate the impact on US packers of eliminating the import of all Canadian hogs.

As a starting point, it is important to reiterate that the current US industry requires Canadian hogs to meet its demand. If these hogs cannot be accessed, then the US industry will have to build its sow herd to meet the demand. As noted above in section 4, the industry will not be able to build its herd in time for the implementation of COOL. Therefore, the lack of imports from Canada will be felt by the US packing industry starting in 2004/5.

US Slaughter and Slaughter Capacity

US hog slaughter during 2000 and 2001 was just under 98 million head. Slaughter in 2002 was 100.3 million head.

US slaughter capacity was at its peak in late 1996-early 1997. At that time, US daily hog slaughtering capacity was estimated at about 412,000 head. It is currently estimated somewhere between 396,000 to just fewer than 400,000 head. Appendix C shows the National Pork Board's listing of plants and their daily capacities from 1995 through 2002. Appendix C shows that total daily capacity as of early 2002 amounted to 381,000. The divergence between the Appendix C value and the overall estimate of 396-400,000 head is explained by the fact that there are plants that have not been listed. Furthermore, as noted earlier, experience has shown that the industry can run 15,000-17,000 head per day above the listed number. For example, on November 1 2002, slaughter was 396,000 head.

There is a wide range of possible ways to assess what the workable or practical US hog packing capacity is over the course of a year. One is to multiply the maximum weekly kill for the year by 52. In 2002, the maximum weekly kill was 2.17 million head. On a 52 week basis, that would imply an annual kill capacity of 112.7 million head. However, it is not possible for the US industry to sustain that pace. The 2.17 million included an unusually large 200,000 head Saturday kill. In addition, that pace does not take into account holidays. Furthermore, the closest the US industry came to this volume was 101.5 million head in 1999. From a practical perspective, a weekly kill of 2 million is more workable and an annual capacity of 108-109 million is likely.

Assuming a 108 million capacity level, that implies that the US industry operated at about 92-93% capacity in 2002. By most industry standards that is a strong capacity utilization rate.

Impact of Eliminating Imports on US Capacity

In 2002, the US imported 5.7 million hogs in the 'greater than' and 'less than' 50 kilogram categories. Based on a forecast of a modest annual decline in market hog imports and a moderating increase in weaner/feeder imports (see section 4.1) by 2005, the first full year of COOL impact, the US could have been importing 6.9 million head. For the purpose of this discussion, it will be assumed that COOL will eliminate the importation of 6 million head.

As noted earlier, for a wide variety of reasons, the elimination of 6 million head cannot be supplemented rapidly by the US industry. As such, the COOL will initially result in a capacity shortfall for US packers of 6 million head. At current capacity levels, the US capacity utilization rate would fall by about 7%. Examining the impact of capacity utilization on US cost structures is beyond the scope of this research. However, previous research by the George Morris Centre, as well as numerous other studies, have shown the impact of capacity utilization on cost structure¹⁷. That is, the lower the capacity utilization the higher the per head costs. This is because fixed costs must be spread over fewer animals. If US packer costs at normal capacity are assumed to be about \$23/head (see Meyer and Hayes), then the reduced capacity would likely result in an increase in costs of approximately \$1/head.

The market hog price impact of the elimination of imports is discussed in detail below, but for the purposes of this section, it is noted that the potential short-term impact (1-6 months) would be higher market hog prices in the US. Depending on the time period, US hog price flexibility (change in price in response to a change in slaughter) could range from 4-10%. Utilizing a modest 6% flexibility means that US hog prices could initially increase by 36%. The combination of higher costs and higher prices would have one clear result. US packers would close plants, at least temporarily, until the supply situation changed. In fact it is likely that the plants would close even before there was a temporary price response.

The average daily slaughter capacity of the 56 plants listed in Appendix D for 2002 is 6,800 head per day. Assuming standard operations of five days per week, a single plant averages about 1.7 million head per year in slaughter. Therefore, the 6 million Canadian hogs represent the slaughter capacity of three to four US plants.

Insights from industry participants as well as independent economic analysis without doubt leads to the conclusion that at least four plants would close as a result of COOL.

Impact of Increased Canadian Pork Imports

As noted above in section 4.1, COOL is going to result in an increase in the cost structure of the US hog industry. As noted Sparks as well as Hayes and Meyer estimate that the costs could increase up to \$10/head. These are additional costs that will not be borne by Canadian

¹⁷ Cost Competitiveness of the Canadian Pork Processing Industry. A report prepared by Larry Martin, Ron Ball and John Alexiou. December 1997.

competitors. In other words, as a result of COOL, US packers and producers are giving Canada a \$10/head advantage that was not previously enjoyed.

Another important point is that under COOL, pork imported from Canada is simply going to be called a product of Canada. Current customs documentation will be sufficient as proof. Therefore, COOL does not impede the flow of pork from Canada and it makes Canadian product more competitive. This, coupled with the fact that more pork is going to be produced in Canada (see argument in Section 6 below*), means that Canada will increase its pork exports to the US.

The important question then becomes how much extra pork will move to the US and what impact will it have on the US packing industry. The argument is made below in Section 6 that Canadian slaughter will increase by up to 4 million head in the post-2004 market as a result of COOL*. Of course it cannot be said what share of the additional production would be imported by US buyers, but logic based on the competitive advantage implies that almost all of the additional pork would move south to retailers and processors in the US. Even if half of the additional pork production moved to the US, negative impacts would still be experienced by US packers.

Based on the arithmetic of plant capacity noted above, half the additional pork production induced by COOL in Canada could jeopardize an additional pork packing plant in the United States.

Summary Impact on Packers

The reduction in Canadian hog numbers flowing to US plants coupled with the added pork from Canada flowing south would clearly jeopardize the viability of 4-5 packing plants in the US.

Economic Impact of Plant Closures

There will be a loss of plants that process up to 8 million hogs per year. The eight million is comprised of roughly 6 million in lost Canadian imports and 2 million due from additional Canadian pork imports as a result of COOL. As noted above in section 4.1, from 2000 through 2002, hogs have been priced at about \$105/head. Generally the hog represents about 70% of plant revenues. Therefore, it can be estimated that the packing plant revenue amounted to about \$150/head from 2000 through 2002. Using that as a gage, the US packing industry stands to lose about \$1.2 billion in revenue (8 million hogs * \$150/head) as a result of COOL.

Losses to the US economy, however, do not stop at the plant. As noted in section 4.1, the US Bureau of Economic Analysis (BEA) has developed input-output tables that measure the economic impact of a variety of industries. The “animal slaughtering industry” has a “Total Industry Output Multiplier,” of 3.655 according to the BEA. This means that for every dollar of income or output in the hog-slaughtering sector, it generates or causes \$3.655 dollars in the overall economy. As such, the loss of \$1.2 billion will multiply to \$4.386 billion for the overall US economy.

* In summary the argument in section 6 says that Canadian capacity expands to meet a share of the hogs that were previously exported.

A rule of thumb in the packing industry is that for every 8,000-head/day single shift plant, approximately 1,000 employees are required. Similarly, a large 16,000 head per day double shift plant usually needs about 900-1,000 staff per shift. One private engineering study has been cited that indicates that 800-850 people are required per shift. The average plants in the US as noted above are slightly smaller than 40,000 head, but are close enough to use that 800-1,000 employee measure as a guide. Therefore, if five plants were jeopardized by the lack of Canadian live imports and the increased pork imports, it would result in 4,500 jeopardized jobs.

Of course the potential job losses are not limited to the packing plants alone. There will be multiplier effects of job losses and plant closures. As noted above in section 4.1, Iowa State University¹⁸ has developed a series of economic multipliers. The direct employment multiplier for meatpacking is 2.824. That means for every job in meatpacking there are another 1.824 jobs created elsewhere in support. Therefore, if 5,000 jobs were lost in meatpacking due to COOL, another 8,000 or more would be lost elsewhere in the economy.

Vulnerable Plants

If plants are to close as a result of the shortage of hogs, the question then becomes which plants are most vulnerable to closure. One way to measure vulnerability is to examine which plants utilize Canadian hogs as a material part of their slaughter mix. While this makes intuitive sense, the fact that the plant utilizes Canadian hogs does not necessarily make it vulnerable to closure. If the plant is efficient (as measured by proxies such as size and age), it might just procure hogs from competing plants.

Nevertheless, a key measure of vulnerability is geography if it is a region that imports Canadian hogs. Other factors of vulnerability to closure include:

- Age
- Efficiency
- Size
- Local hog supplies

The George Morris Centre research evaluated the above noted factors for selected plants listed in Appendix D. The vulnerability of the plant was assessed based on the scores received in the above noted factors. Based on this research and evaluation, it was estimated that two to three plants in Iowa would be vulnerable to closure if the industry did not have access to Canadian hogs. There were also vulnerable plants cited in South Dakota, Indiana, Kentucky, Nebraska, Illinois, California and Ohio. Adding to the evidence of vulnerability is the fact that even without COOL, industry sources indicate there are two or three older facilities currently operating that are considered to be "on the bubble" for closure in the next few years. COOL will be the last straw.

¹⁸ An Introduction to Economic Impact Assessment, Dave Swenson, Regional Scientist, Department of Economics Iowa State University, February, 2002

Environmental Impacts

When the US industry replaces the Canadian imports there will be implications for the environment. Under the current trading regime the US does not have the manure volumes from the following hog sources:

1. Slaughter hog imports
2. Sows that produce the weaner/feeder imports

Therefore, when US production increases to replace the Canadian imports, two additional sources of manure must be accounted for in order to assess the environmental impacts of COOL in the hog industry.

Market Hog Imports

Based on published guidelines, one market hog produces about 1,467 pounds of manure over its six-month life span. In addition, the sow will add another 221 pounds to that individual production for a total accumulation of 1,688 pounds of manure. Assuming two million market hogs, it means that there will be an additional 1.7 million tons of manure produced in the US.

Weaner/Feeder Imports

The additional sows required to produce the weaner pigs that were previously shipped from Canada will generate 221 pounds of manure per pig. In order to replace 3.7 million weaner/feeder imports, the sows will generate 409.5 thousand tons of manure.

Implications

The total annual production of manure will increase in the United States by almost 2.1 million tons.

Iowa and southern Minnesota are the regions that finish about three quarters of the Canadian weaner/feeder imports. Given this information, it is not unlikely to assume that the hogs that replace the Canadian imports will also be raised in Iowa and Southern Minnesota. According to the Iowa Pork Producers Association, Iowa farmers marketed 26.3 million hogs in 2001. If Iowa were the home to 50% of the increased production, it would imply that Iowa's manure production would increase by at least 4%.

The potential to increase manure production in Iowa by 4% must also be considered in light of relative pig densities in Iowa. The graph below shows pig densities in Iowa in comparison to other pig producing regions in the US mid-west and Canada.

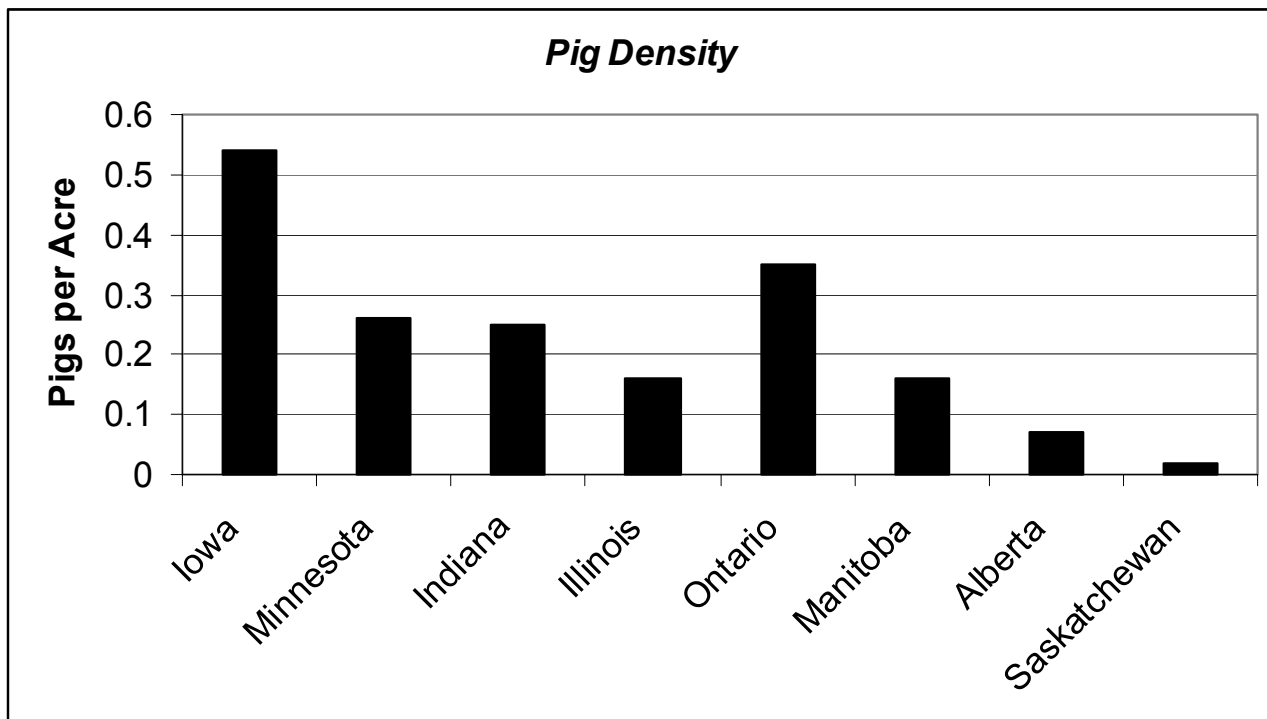


Figure 5.6 Source: Saskatchewan Agriculture and Food

Of the major pig producing regions of Canada and the US mid-west, Iowa is already the most intensively farmed region. Thus, as a result of COOL, manure production will increase in regions that could be more environmental sensitive due to a higher density of animals.

Bio-Terror Risk

The move towards intensive livestock farming and monoculture-cropping systems in the United States has made agriculture more vulnerable to bio-terrorism. In a publication by the Institute of National Strategic Studies, National Defense University, the author writes, "American agriculture is often concentrated, highly accessible, vertically integrated, and of limited genetic diversity; historically it has been free of major disease outbreaks, so vaccines are not routinely used. Consequently, pathogens could be introduced easily and spread rapidly. Widespread use of antibiotics in livestock production makes U.S. animals vulnerable to antibiotic-resistant bacteria. Advances in genetic engineering have raised the prospect of transgenic pathogens and pests that are resistant to conventional control methods." (Review of the publication "Agricultural Bioterrorism: A Federal Strategy to Meet the Threat", by Henry S. Parker, Institute for National Strategic Studies, National Defense University, March 2002, http://www.bfa.com.au/journal/2002-03_summer_bioterrorsam.htm).

Research conducted by Parker (2002) concluded that key targets for terrorist attacks include monoculture croplands, livestock feedlots, poultry houses, and major food processing distributions (Parker, 2002, p.12).

It is clear that large intensive farms are likely to be more susceptible to the threat of agricultural bio-terrorism, as they facilitate the fastest spread of disease and will thus cause the greatest amount of damage. It is also clear that, based on the discussion noted above, COOL will accelerate the move towards more large-scale fully integrated hog production operations. This will increase the risk of bio-terrorism in the United States.

6.0 US Hog Price Impacts

The purpose of section 6.0 is to examine the potential price impact of Country of Origin Labeling on US hog prices.

There are three basic time frames (short, medium and long term) to consider when examining the potential price impacts. The short term or immediately after Canadian hogs stop moving to the US. This is the period in which prices would likely move higher as packers seek required hogs. This is not likely to occur for any material length of time as packers would likely close plants (section 5.3). The medium term is defined as the period in which US production increases to meet demand. While this is occurring, expectations are that Canadian production will decrease, but not as much as US production increases. This period would therefore result in a decline in US hog prices. The longer term is the equilibrium period after more US producers have exited the business as a result of lower prices.

The focus of this section of the report is the pricing situation in the medium and longer term. Short-term impacts are referenced in section 5.3 above.

6.1 Medium Term Price Impacts

US and Canadian Supply Response

The medium term is defined as the period in which the US production has increased to meet the demand formerly met by Canadian imports of slaughter and weaner/feeder pigs. The past offers some guidance as to how long it would take the US industry to produce an extra five to seven million hogs. Over the last twenty years, the US has at various times been able to increase slaughter by at least six million head in just one year. These years have been aided by Canadian imports but not to a material degree in the overall volume. As such, it is evident that the US industry would be able to increase its production volumes by six million head in one year after the full impact of COOL is felt. Therefore, by 2006, it can be expected that the US would replace the Canadian volumes and closed packing plants may be reopened or others added.

In previous research into the impact of COOL on the Manitoba hog industry, the George Morris Centre determined that the Canadian industry would decline as a result of the loss of live hog export opportunities (see footnote number 1). Since the release of the report in late 2002, the Canadian scenarios have become clearer. That is, weaner producers are increasingly focusing efforts on finishing those hogs. Limiting factors are finishing and packing capacities. As noted above, packer plant capacities are poised to increase. Furthermore, as noted in the previous research, finishing capacity needs to increase by 1 million hogs to accommodate the weaner production that previously went south. During the past three to four years there has been precedent for an increase of this magnitude.

In other words, there is the potential for Canada to finish and slaughter all the hogs that it currently imports. In reality, however, the Canadian impact of COOL is likely to cause disruption and losses to Canadian producers (see previous report) through lost production. The amount of lost production is totally speculative and dependent on current actions of producers. The extreme parameters are that Canadian production will decline by the full amount that was

previously exported, or, it won't decline at all. Given what the industry is capable of based on past performance, and given current expansions by producers, it is likely that the Canadian industry will lose about one-third of its current exported production, or approximately two million hogs. The other four million will be finished and processed in Canada. This assessment cannot be validated scientifically, however based on past performance it appears reasonable.

In the US, as noted above, the industry will be short six million hogs. This can be produced, albeit by different entities, in about one to two years. As such, the net North American hog production is likely to increase by about four million head (US increases six million and Canada decreases two million).

Price Impacts

North American hog price determination is based on the world supply and demand for pork. Pork supply is based on hog slaughter. While COOL is likely to stop the free trade of pigs, it is unlikely to stop the free flow of pork. COOL will increase the supply of pork in North America but it won't impact demand. As such, there is going to be more supply for the same level of demand. This implies that North American prices will decline or be lower in the medium term as a result of COOL.

An indication of how much lower prices will go in the medium term as a result of COOL can be estimated by the sensitivity of hog prices to hog slaughter. Previous research by Sparks Companies in Memphis showed that in the last four years, hog prices have been increasingly sensitive to production increases. In the 1980's, for every one percent change in production, prices changed by less than two percent. During the last four years, however, that ratio has changed to 1:10. That is, for every one percent change in production, price changed by 10%.

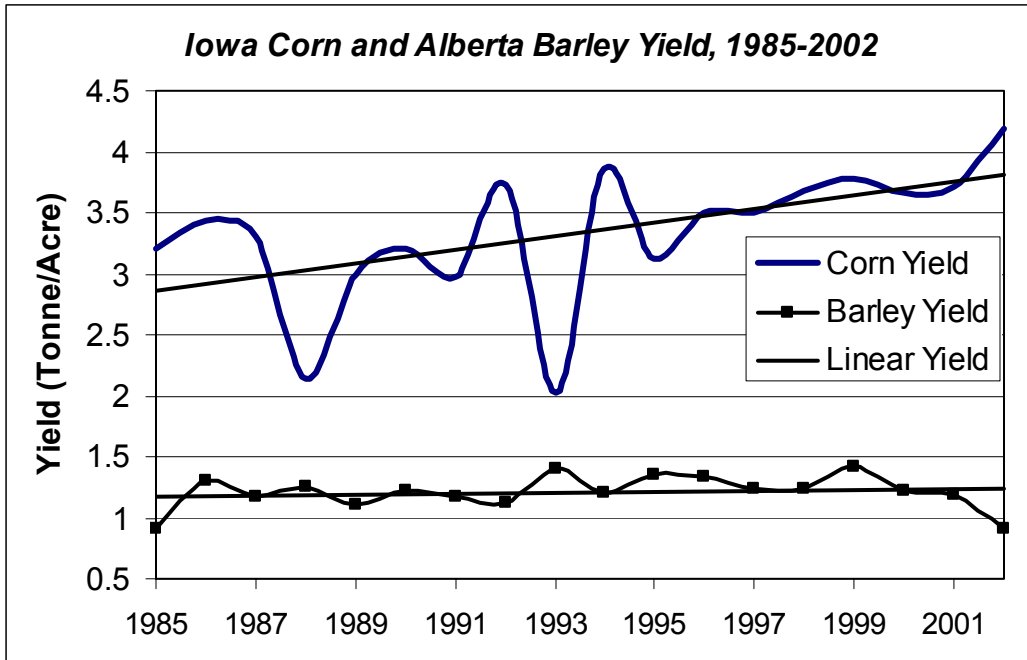
Based on simple long-term trend analysis, during the first year of COOL, total North American slaughter would have been about 123.4 million head. As a result of COOL, slaughter will increase by about four million head (as noted above). In the medium term under COOL, total North American production will be in the range of 127.4 million head. As a result of COOL, North American hog production will be 3% greater.

The production increase described will have price impacts. Based on the Sparks research on price flexibility, prices will be under downward pressure by approximately 30%. That is, in the medium term hog prices will be 30% less than they would have otherwise been without the implementation of COOL.*

* Note that while hog prices are lower than they would have been without COOL, consumer prices are probably going to be higher than they would have been without COOL. That is due to the higher system costs imposed by COOL. These higher costs will become part of the overall structure and given that packers and retailers are margin participants that means the higher costs will be borne by both consumers in the form of higher pork prices and by producers in the form of lower hog prices (see section 4.1). While there are strong and intuitive economic explanations for these statements, the analysis is outside the scope of this project.

Appendix A

Long Term Corn and Barley Yields



Source: USDA NASS and Statistics Canada

Barley Highlights:

- The average barley yield between 1985 and 2002 was 1.2095 tonnes/acre. The lowest barley yields occurred in 1985 (0.908 tonnes/acre) and 2002 (0.911 tonnes/acre). The highest barley yield occurred in 1999 (1.426 tonnes/acre).
- Barley production and harvested acres was lowest in 2002. There were 2.69 million acres of barley harvested and 2.46 million tonnes of production. This is a significant decrease from the year before where 4.39 million acres of barley were harvested and there was 5.2 million tonnes of production.

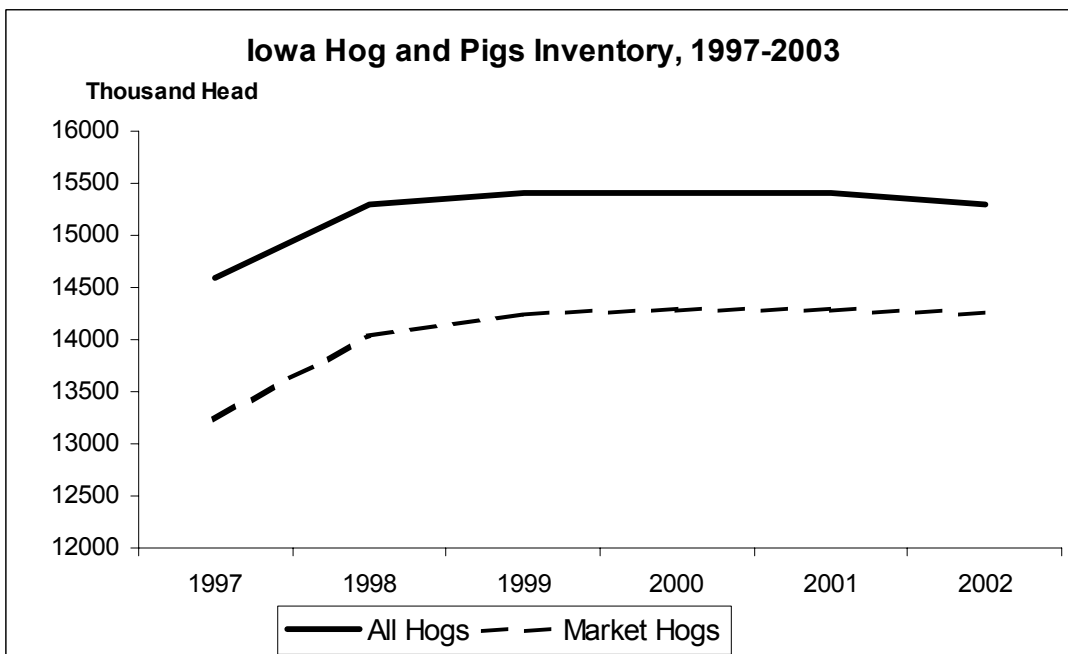
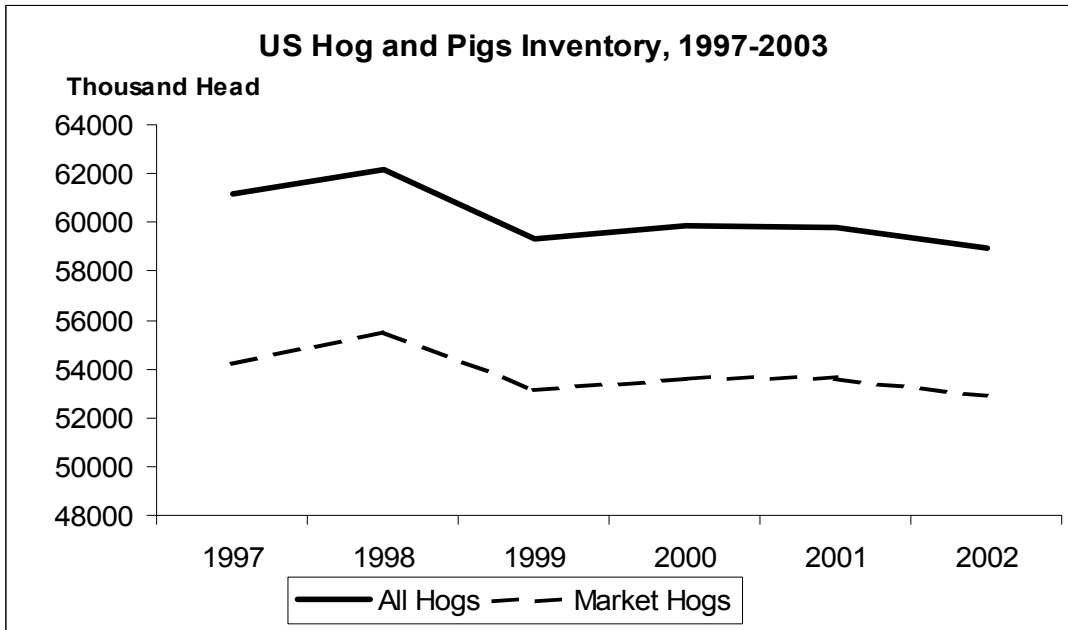
Corn Highlights:

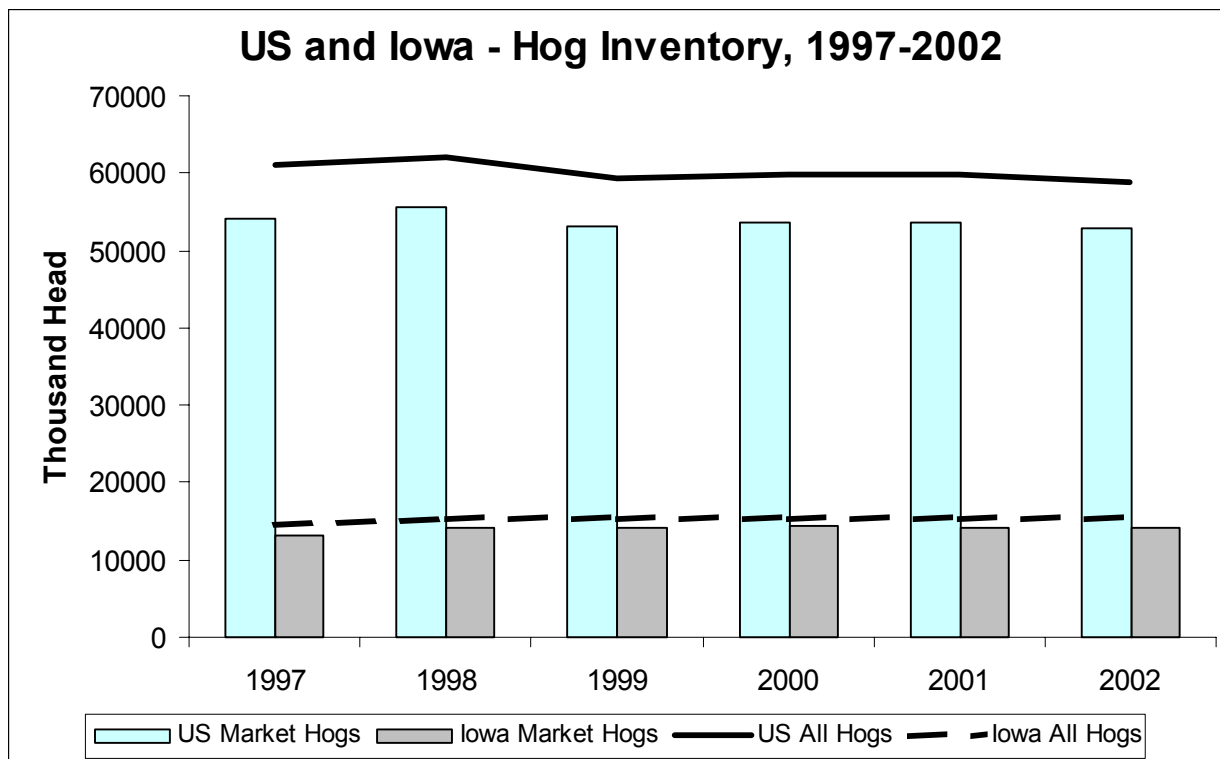
- The average corn yield between 1985 and 2002 was 3.33 tonnes/acre. The highest corn yield occurred in 2002 (4.19 tonnes/acre) and the lowest corn yield occurred in 1993 (2.03 tonnes/acre).

Appendix B

Statistical Overview of the US Hog Sector

Source: USDA Hogs and Pigs Quarterly – December (Source: <http://usda.mannlib.cornell.edu/reports/nassr/livestock/php-bb/>)



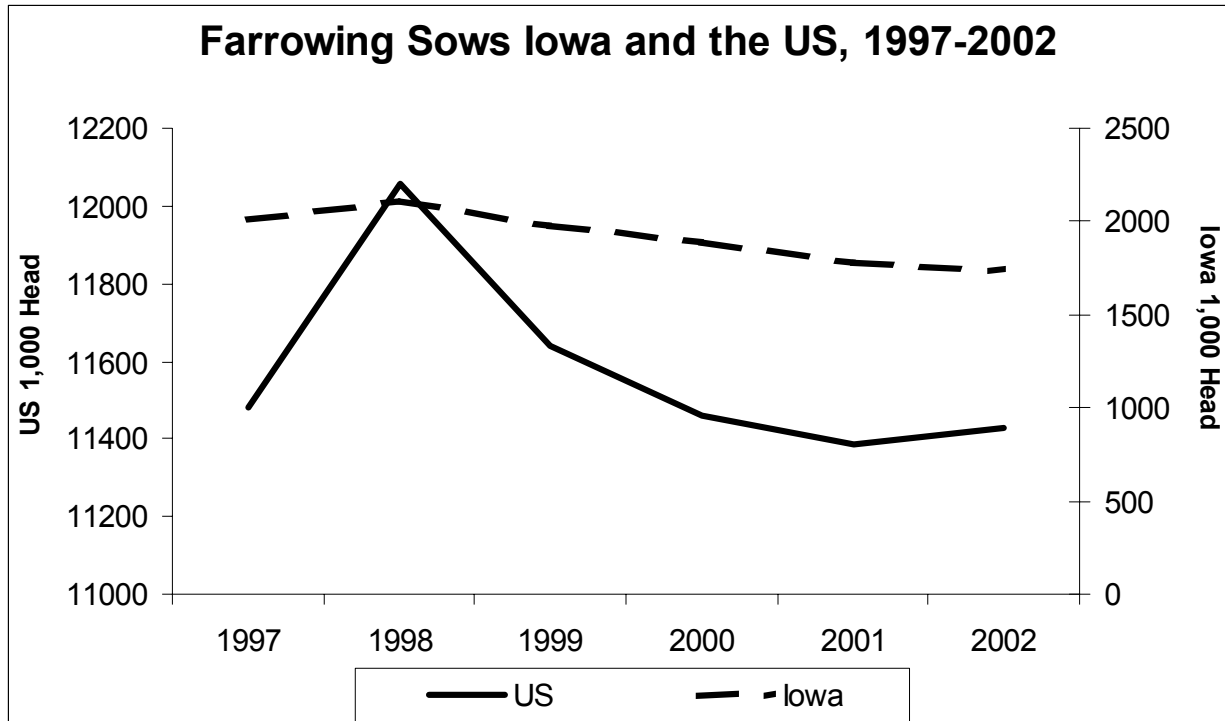


Overview:

- The inventory of hogs in the United States has decreased since 1997. In 1997 there were approximately 61.1 million hogs in the United States compared to 58.9 million in 2002. This represents about a 3.6 percent decline in the hog inventory in the United States
- Iowa, on the other hand, has seen an increase in hog inventory. From 14.6 million head in 1997 to 15.3 million head in 2002, this represents approximately a 4.7 percent increase in the Iowa hog industry. Since 1998 the hog inventory in Iowa has been fairly static at around 15.3 to 15.4 million head.
- The number of market hogs in the United States has also decreased slightly since 1997. 54.2 million market hogs were produced in 1997 compared to 52.9 million market hogs in 2002. Overall, the number of marketed hogs in 2002 decreased 2.3 percent from the number of marketed hogs in 1997.
- As with the overall hog inventory, the marketed hog inventory in Iowa increased in 2002 compared to the marketed hog inventory of 1997. 13.2 million marketing hogs were produced in 1997 compared to 14.2 million in 2002, which represents a 7.6 percent increase in the marketed hogs inventory

Highlights

- Between 1998 and 1999 was the sharpest decline in the hog inventory and marketed hog inventory for the United States.
- Iowa has seen an increase in the total hog inventory since 1997, and between 1997 and 2000 the marketed hog inventory has also increased. 2001 and 2002 numbers are only slightly below the 2000 marketed hog inventory.

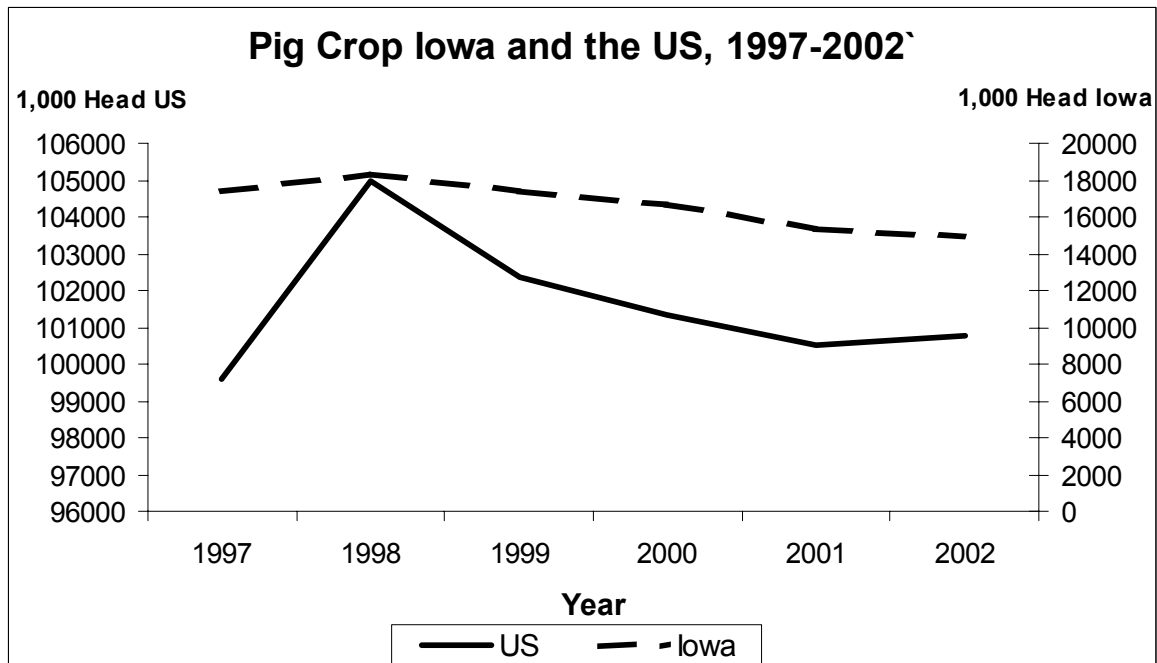
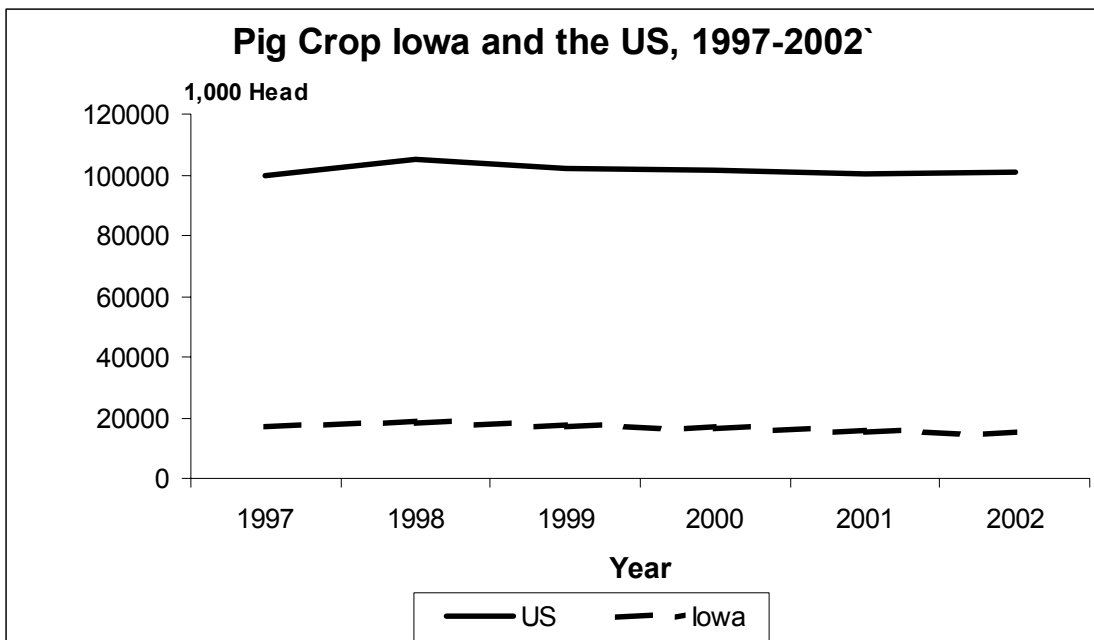


Farrowing Sows Numbers:

- The number of farrowing sows in the United States has only changed slightly since 1997. In 1997 there were 11, 479, 000 farrowing sows compared to 11, 429, 000 in 2002. There has been a decrease of approximately 0.4 percent in the number of farrowing sows since 1997.
- The number of farrowing sows in Iowa has also decreased since 1997. there were approximately 2 million farrowing sows in 1997 compared to 1.7 million in 2002. This is approximately a 13.8 percent decrease in the number of sows in Iowa between 1997 and 2002.

Highlights:

- The number of farrowing sows in the United States and Iowa was at a five-year high in 1998. Numbers since 1998 have been slightly decreasing.

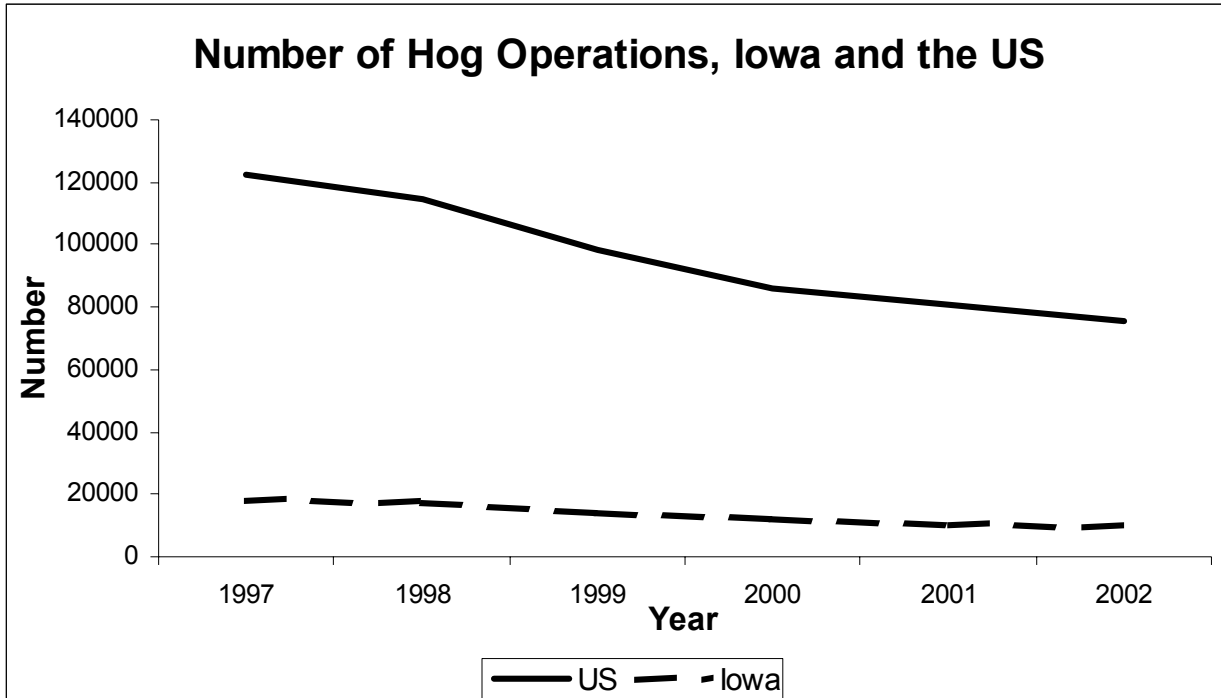


Pig crop numbers:

- The pig crop in the United States has been increasing slightly since 1997. In 1997 the pig crop was 99.54 million head and in 2002 it was 100.7 million head. The percentage increase in the number of head from 1997 to 2002 is approximately 1.2 percent.
- The pig crop in Iowa, however, has decreased since 1997. In 1997 there pig crop was 17.4 million head, compared to only 14.9 million head in 2002. Thus, the pig crop in Iowa has decreased approximately 14 percent between 1997 and 2002.

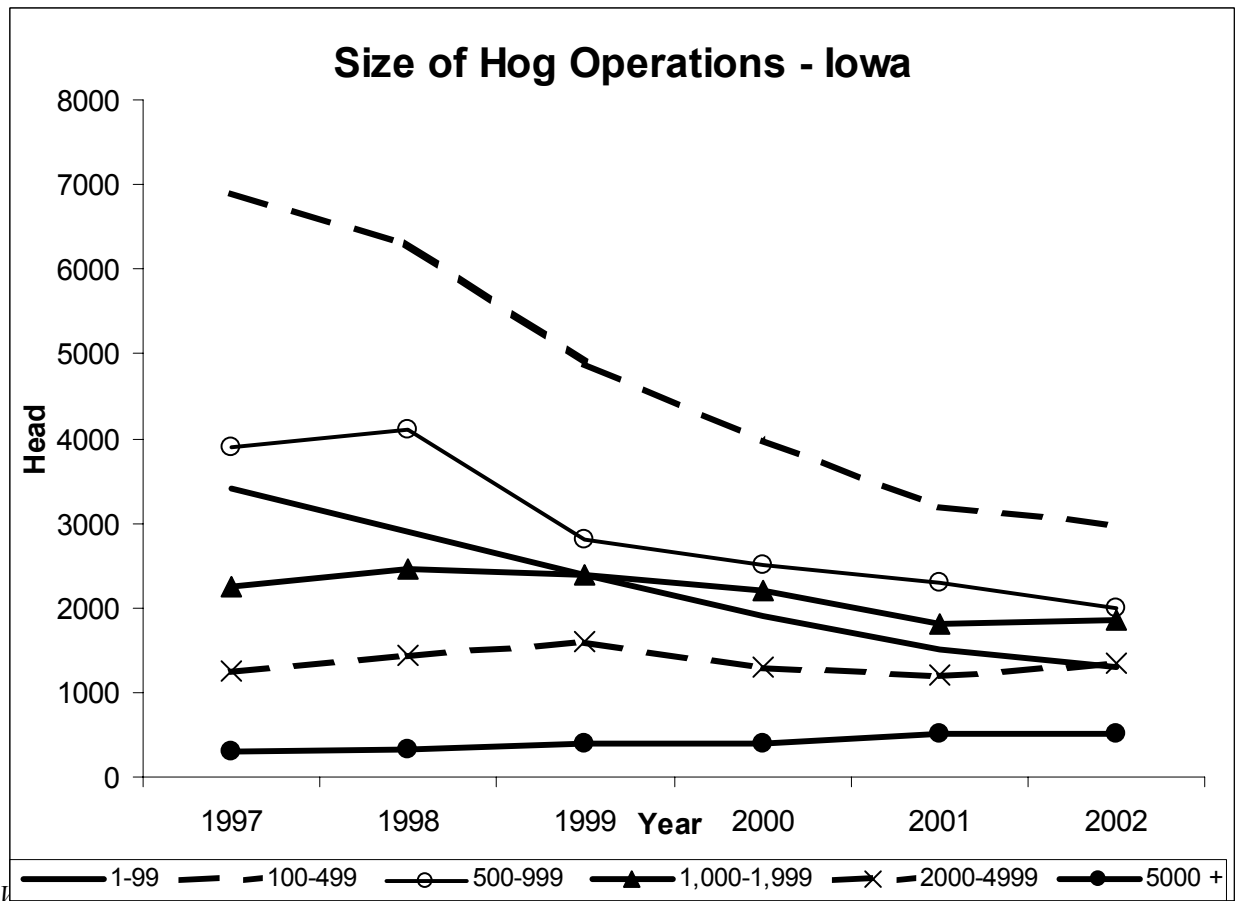
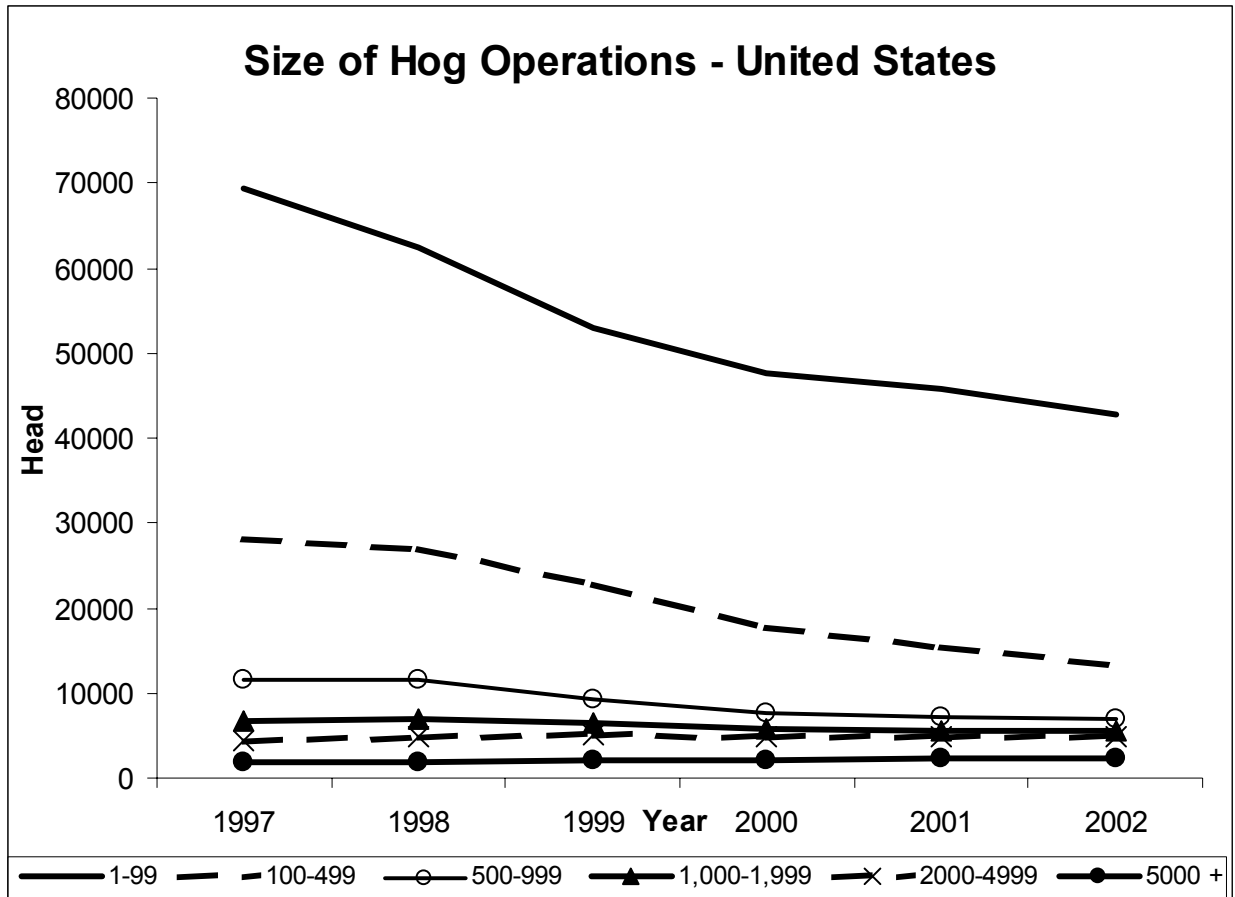
Highlights:

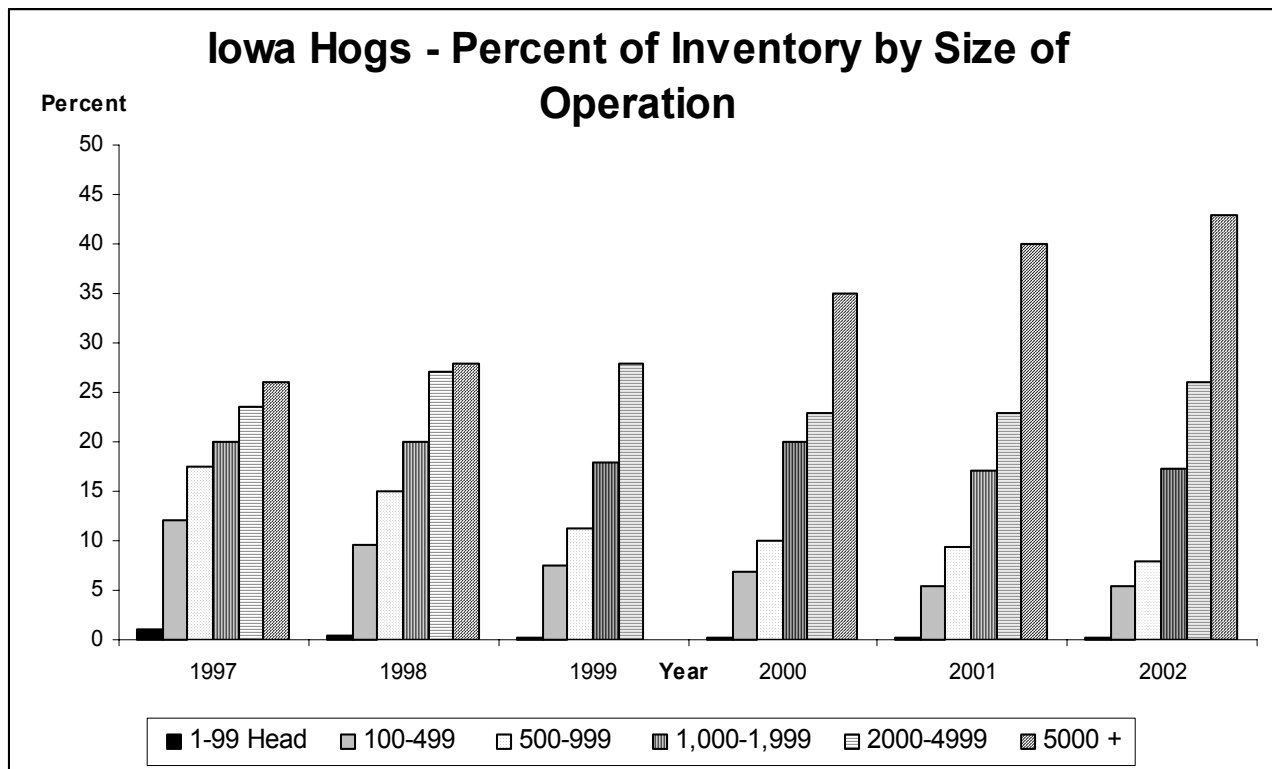
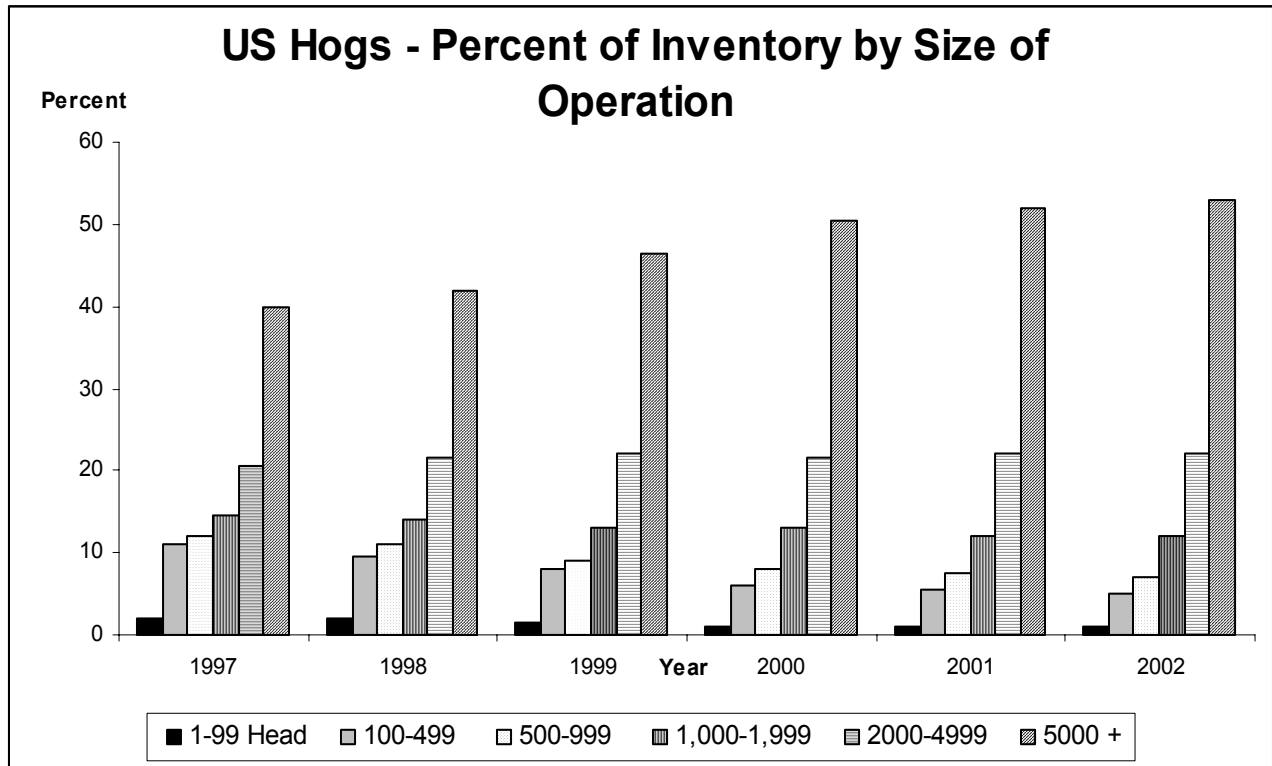
- The five-year high for the pig crops in the United States and Iowa occurred in 1998. Since then pig crop numbers in the United States have not changed much, while pig crops in Iowa have decreased more significantly.



Hog Operations Numbers:

- The number of hog operations in the United States has decreased drastically since 1997. There were 122,160 hog farms in the US in 1997 compared to a five-year low of only 75,350 hog farms in 2002. Between 1997 and 2002 there has been 38 percent decrease in the number of operations with hogs.
- Iowa has also seen a dramatic increase in the number of hog operations between 1997 and 2002. Hog operations have decreased 44 percent, from 18,000 in 1997 to only 10,000 in 2002.





Size of Operations:

- The number of ‘smaller’ (under 1,000 head) hog operations in the United States has been decreasing since 1997 while the number of ‘larger’ hog operations (2,000-4,999 head and 5,000 + head) has been increasing. The number of operations in 1997 with under 1,000 head totalled 109,225 while in 2002 there were only 63,053 hog operations with under 1,000 head. The number of hog operations with between 2,000-4,999 hogs grew from 4,355 operations in 1997 to 4964 operations in 2002 and the number of hog operations with more than 5,000 head also increased from 1,825 operations in 1997 to 2,258 operations in 2002.
- While the ‘smaller’ hog operations are still the more common type of hog operations, they have a fairly small portion of the total hog inventory. In 2002, the ‘larger’ hog operations accounted for 75 percent of the US hog inventory while the ‘smaller’ operations accounted for only 13 percent of the hog inventory. In 1997, the ‘smaller’ operations accounted for 25 percent of the hog inventory while the ‘larger’ operations had 60.5 percent of the hog inventory.
- In 2002, number of hog operations in Iowa with under 1,000 head of hog has decreased significantly from 1997. There were 14,200 operations with under 1,000 head in 1997 compared to only 6,300 in 2002. The number of operations with between 2,000-4,999 head has increased from 1997 (1,250 operations) to 2002 (1,350 operations), as has the number of operations with over 5,000 head (300 operations in 1997 compared to 500 operations in 2002)
- The number of smaller hog operations in Iowa (under 1,000 head) still outnumber the number of larger hog operations (over 2,000 head). However, the larger hog operations have a much larger share of the hog inventory, and this has increased since 1997. In 1997, the number of hog operations with greater than 2,000 head accounted for almost 50 percent of all hogs in Iowa while in 2002 they accounted for 69 percent of all hogs.

Highlights:

- Operations in Iowa with over 5,000 head have grown significantly from 1997 to 2002. In 1997 they accounted for 26 percent of the hogs in Iowa, which increased to 43 percent in 2002.
- There is a shift in both Iowa and the United States from smaller hog operations to larger hog operations. While the number of smaller hog farms still outnumbers the number of larger hog operations, the percentage of the hog inventory located on the larger operations is much greater than the percentage on the smaller hog operations.

Appendix C

(November, 2001)

ESTIMATED CANADIAN SLAUGHTERING CAPACITY, CURRENT & PLANNED (WESTERN CANADA)

Province/Plant BC	Company Name	1996		1996 2002/2003	
		WEEKLY	ANNUAL	WEEKLY	ANNUAL
Langley	Britco Export Packers	4,000	208,000	6,000	312,000
	BC TOTAL	4,000	208,000	6,000	312,000
Alberta					
Red Deer	Olymel (formerly Fletchers)	25,000	1,300,000	40,000	2,080,000
Edmonton	Maple Leaf (Closed 1997)	20,000	1,040,000	0	0
Lethbridge	Maple Leaf	0	0	6,500	338,000
Trochu	Trochu Meats	3,000	156,000	3,000	156,000
Warburg	J&M Meats International	3,000	156,000	3,000	156,000
	ALBERTA TOTAL	51,000	2,652,000	52,500	2,730,000
Saskatchewan					0
Saskatoon	Mitchell's	20,000	1,040,000	20,000	1,040,000
Moose Jaw	Worldwide Pork	5,000	260,000	5,000	260,000
	SASKATCHEWAN TOTAL	25,000	1,300,000	25,000	1,300,000
Manitoba					
Winnipeg	Maple Leaf (formerly Burns)	14,000	728,000	0	0
Winnipeg	Maple Leaf (formerly Schneider)	17,500	910,000	17,500	910,000
Neepawa	Springhill Farms	12,500	650,000	20,000	1,040,000
Winnipeg	Best Brand (formerly Forgan)	4,000	208,000	8,000	416,000
Brandon	Maple Leaf			45,000	2,340,000
	MANITOBA TOTAL	48,000	2,496,000	90,500	4,706,000
	WESTERN CANADA TOTAL	128,000	6,656,000	174,000	9,048,000

Impacts of US Country of Origin Labeling on US Hog Producers

(November, 2001) ESTIMATED CANADIAN SLAUGHTERING CAPACITY, CURRENT & PLANNED (EASTERN CANADA)

Province/Plant	Company Name	1996	1996	2002/2003	2002/2003
		WEEKLY	ANNUAL	WEEKLY	ANNUAL
Ontario					
Burlington	Maple Leaf	32,000	1,664,000	45,000	2,340,000
Toronto	Quality Meat Packers	25,000	1,300,000	30,000	1,560,000
Breslau	Conestoga	2,000	104,000	12,500	650,000
Mitchell	West Perth	0	0	5,000	260,000
Other provincial				5,900	306,800
	ONTARIO TOTAL	59,000	3,068,000	98,400	5,116,800
Quebec					
Vallée-Jonction	Olymel	27,000	1,404,000	33,000	1,716,000
St-Valerien	Olymel	21,000	1,092,000	28,000	1,456,000
Princelville	Olymel	13,000	676,000	12,000	624,000
St-Henri	Brochu	20,000	1,040,000	22,000	1,144,000
Notre-Dame-du-Lac	Du Breton	11,000	572,000	15,000	780,000
Yamachiche	Trahan	6,000	312,000	7,000	364,000
Yamachiche	Lucyporc	0	0	3,250	169,000
St. Alexandre	Abattoir St-Alexandre	5,500	286,000	14,000	728,000
St-Esprit	Brochu	5,000	260,000	15,000	780,000
St-Blaise	Agromex	5,000	260,000	7,000	364,000
St-Jacques-de-Montcalm	Jolibec	3,500	182,000	0	0
	QUEBEC TOTAL	117,000	6,084,000	156,250	8,125,000
Altantic					
Charlottetown	Maple Leaf	5,000	260,000	5,000	260,000
Moncton	Maple Leaf	5,000	260,000	6,000	312,000
Berwick	Larsen	5,000	260,000	8,000	416,000
Antigonish	Antigonish Abattoir	300	15,600	300	15,600
	ATLANTIC TOTAL	15,300	795,600	19,300	1,003,600
	EASTERN CANADA TOTAL	191,300	9,947,600	273,950	14,245,400
TOTAL CANADIAN CAPACITY		319,300	16,603,600	447,950	23,293,400

Appendix D

Estimated Daily Slaughter Capacity

	Company	Plant	February 1995		February 2000		Spring 2002	
			Plant	Co. Total	Plant	Co. Total	Plant	Co. Total
1	Smithfield	Tar Heel , NC	16,500	34,800	32,000	80,300	32,000	80,300
		Smithfield, VA	9,500		9,500		9,500	
		Gwaltney, VA	8,800		8,800		8,800	
	Morrell	Sioux Falls, SD	15,000	30,000	15,000	80,300	15,000	80,300
		Sioux City, IA	15,000		15,000		15,000	
2	IBP	Waterloo, IA	17,000	64,200	18,000	69,500	19,000	71,000
		Logansport, IN			13,400		14,000	
		Storm Lake, IA	13,400		13,400		14,000	
		Col. Junction, IA	13,000		10,500		9,800	
		Madison, NE	7,500		7,500		7,500	
		Council Bluffs, IA	7,300		Closed		Closed	
		Perry, IA	6,000		6,700		6,700	
3	Swift	Worthington, MN	15,700	39,400	15,700	39,400	17,000	43,000
		Marshalltown, IA	15,700		15,700		17,500	
		Louisville, KY	8,000		8,000		8,500	
4	Excel	Beardstown, IL	16,000	26,000	16,000	38,700	16,000	32,000
		Ottumwa, IA	10,000		14,500		16,000	
	Tyson Foods	Marshall, MO	11,800	11,800	8,200	38,700	Closed	32,000
5	Hormel	Austin, MN	13,000	30,000	16,000	31,600	17,000	30,500
		Fremont, NE	10,000		8,500		9,000	
		Rochelle, IL	7,000		7,100		4,500	
6	Farmland	Crete, NE	8,300	22,800	8,300	33,800	10,000	25,500
		Denison, IA	7,500		7,500		7,500	
		Monmouth, IL	7,000		7,000		8,000	
	FDL Foods	Dubuque, IA	11,000	11,000	11,000	33,800	Closed	25,500
	Thorn Apple Valley	Detroit, MI	12,000	13,500	Closed	Closed	Closed	Closed
	Hyrum, UT	1,500	Closed		Closed			
7	Seaboard	Guymon, OK			16,000	16,000	16,000	16,000
8	Prem. Std.	Milan, MO	5,000	5,000	7,000	7,000	7,100	17,100
		Clinton, NC	8,000	8,000	8,000	8,000	10,000	
9	Indiana Pack	Delphi, IN	9,000	9,000	11,000	11,000	12,000	12,000
	Dakota Pork	Huron, SD	5,850	5,850	Closed	Closed	Closed	Closed
10	Pinnacle Foods	Des Moines, IA	5,500	5,500	6,000	8,000	6,000	6,600
		Chicago (Ampac)	2,000	2,000	2,000		Closed	
		Falcon, NC					600	
11	Sara Lee	West Point, MS	6,500	7,300	6,500	9,000	6,500	9,000
		Newburn, TN	800		2,500		2,500	
12	Hatfield	Hatfield, PA	6,800	6,800	7,000	7,000	7,800	7,800
13	Clougherty	Vernon, CA	6,000	6,000	6,000	6,000	6,800	6,800

Estimated Daily Slaughter Capacity (Cont.)

	Company	Plant	February 1995		February 2000		Spring 2002	
			Plant	Co. Total	Plant	Co. Total	Plant	Co. Total
	Worth'ton Pack	Worthington, IN	4,700	4,700	Closed	Closed	Closed	Closed
	Premium Pork	Moultrie, GA	4,700	4,700	Closed	Closed	Closed	Closed
15	J.H. Routh	Sandusky, OH	3,700	3,700	3,700	3,700	4,200	4,200
	Fisher	Louisville, KY	3,000	3,000	Closed	Closed	Closed	Closed
16	Greenwood	Greenwood, SC	3,000	3,000	3,000	3,000	3,000	3,000
17	Sioux-Preme	Sioux Center, IA	2,650	2,650	2,650	2,650	2,900	2,900
	Southside Pork	Hazleton, PA Shamokin, PA			Closed Closed	Closed	Closed Closed	Closed
18	Johnsonville**	Watertown, WI Momence, IL			1,000 1,500	2,500	550 1,250	1,800
19	Pork Packers Int'l	Downs, KS	1,600	1,600	1,600	1,600	1,700	1,700
20	Bob Evans Farms	Bidwell, OH Xenia, OH Hillsdale, MI Galva, IL			1,500	1,500	150 300 500 500	1,450
	Field Packing	Owensboro, KY	1,200	1,200	Closed	Closed	Closed	Closed
21	Yosemite Meat	Modesto, CA	1,200	1,200	1,200	1,200	1,200	1,200
22	Cloverdale Foods	Minot, ND	920	920	920	920	920	920
	Ohio Packing Co.	Columbus, OH	900	900	Closed	Closed	Closed	Closed
23	Leidy's	Souderton, PA	800	800	800	800	800	800
24	Owens Sausage	Richardson, TX			800	800	800	800
25	Odom's	Little Rock, AR			750	750	750	750
26	Abbeyland Foods	Curtiss, WI			700	700	700	700
27	Independent Mea	Twin Falls, ID	400	400	650	650	650	650
28	Brown Packing	Little Rock, AR	600	600	600	600	600	600
29	Fineberg Packing	Memphis, TN	500	500	500	500	500	500
	Reeves Packing	Ada, OK	400	400	Closed	Closed	Closed	Closed
30	Lowell Packing	Fitzgerald, GA			350	350	350	350
31	Masami Meat Co.	Klammath Falls, Or	300	300	300	300	300	300
32	Simeus Food	Forest City, NC			300	300	300	300
33	Carleton Packing	Carleton, OR			250	250	250	250
34	Metzger Foods	Paducah, KY	250	250	250	250	250	250
TOTAL CAPACITY				369,770		388,620		381,020

Appendix E

Profiles of the Authors

Kevin Grier is Senior Market Analyst, George Morris Centre. The George Morris Centre is Canada's Agriculture and Food Think-Tank. It is focused on economic research into issues and challenges in the agriculture and food industry. The Centre is located in Guelph and Calgary.

Kevin Grier is involved in complex market and industry evaluations and research projects. More specifically, Kevin Grier's qualifications include:

- Writes and edits Grocery Trade Review, a monthly food industry report. Writes and edits four other industry reports: Canadian Cattle Buyer, Canadian Chicken Market Review and Canadian Pork Market Review and Canadian Commodity Review.
- Advise senior officers in the Canadian agriculture and food industries on pricing and marketing issues.
- Frequently makes presentations on market outlooks and industry issues.
- Contributes to publications such as Meat Processing magazine and Cattlemen magazine in the United States and Canada.
- Prior to joining the George Morris Centre, was a Manager in the Farm Products Marketing Commission from 1989 to 1996. FPMC is the supervisory/regulatory body of the province's 23 marketing boards.
- Attained a Masters Degree in Economics from McMaster University, Hamilton.

Recent Project Work

- Examination of potential impacts of Country of Origin Labeling in the US on behalf of Manitoba Pork.
- Evaluated the hog marketing practices in the US and Canadian prairies on behalf of a group of Quebec pork packers.
- Examined costs and pricing competitiveness of western Canadian hog production.
- Determination of the costs and the benefits of Alberta's Livestock Identification Services.
- Updated the pricing process and systems of a major Canadian meat packer.
- Examined the risks and opportunities of the beef and cattle industry in western Canada.
- Analyzed the trends, scope and challenges facing Canadian beef industry exports.

David M. Kohl is Professor, Agricultural Finance and Small Business Management, Department of Agriculture and Applied Economics, Virginia Polytechnic Institute and State University

David Kohl received his M.S. and Ph.D. degrees in Agricultural Economics from Cornell University in 1976 and 1978, respectively. He is currently Professor of Agricultural Finance and Small Business Management and Entrepreneurship in the Department of Agricultural and Applied Economics at Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, Virginia. From June 1999 through May 2000, Dave will be on special leave working on cutting-edge initiatives that will strategically position the Royal Bank of Canada in the marketplace.

Kohl has traveled over 4.3 million miles throughout his professional career! He has conducted more than 2,400 workshops and seminars for agricultural groups such as bankers, Farm Credit, Virginia Polytechnic Institute and State University 55 George Morris Centre

FmHA, and regulators, as well as producer and agribusiness groups. He has published four books and over 310 articles on financial and business-related topics in journals, extension, and other popular publications. Kohl regularly writes for Farm Journal, Top Producer, Ag Lender, the Journal of Agricultural Lending, and Soybean Digest.

He has received 11 major teaching awards and 7 major Extension and Public Service awards from Virginia Tech and Cornell University. Kohl is a two-time recipient of the prestigious American Agricultural Economics Association's Outstanding Teaching Award. Kohl is only one of five professors in the 82-year history of the Association to receive the award twice. He received the Governor's award for his distinguished service to Virginia agriculture, the youngest recipient to receive this award.

Kohl has addressed the American Bankers Agricultural Conference for 23 consecutive years, and has appeared before numerous state bankers schools and conferences throughout the U.S. and Canada.

As facilitator of the United States Farm Financial Standards Task Force and member of the Canadian Agricultural Financial Standards Task Force, Dr. Kohl was one of the leaders in establishing guidelines for the standardized reporting and analysis of agricultural producers' financial information on a national and international basis.