CHAPTER 1 Statistics for Manitoba Pig Industry

Contributors:

Derek Brewin, PhD (corresponding author)
Department of Agribusiness and Agricultural Economics, University of Manitoba

Janet Honey,
Independent Consultant

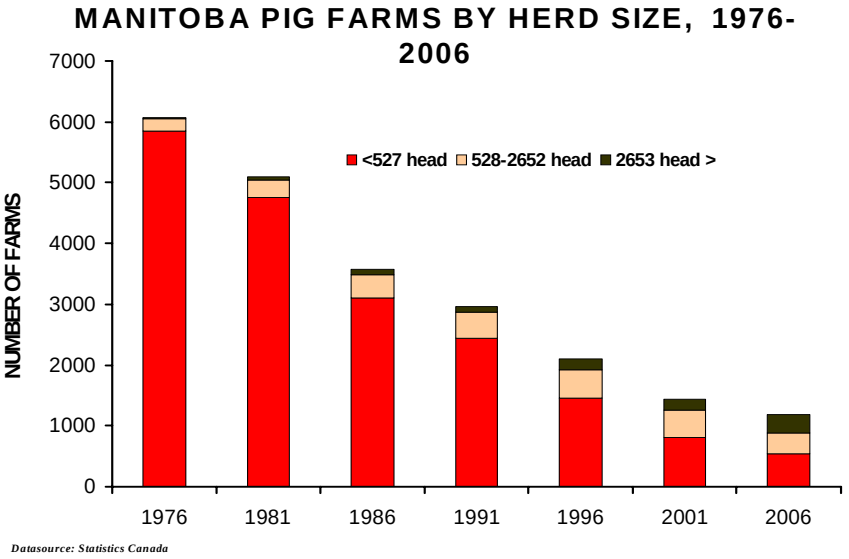
James Young, MSc student
Department of Agribusiness and Agricultural Economics, University of Manitoba

1.1 Farm statistics

1.1.1 Current pig/livestock farm numbers

Statistics Canada's *2006 Census of Agriculture* shows that there were 1,188 Manitoba farms with pigs in May 2006, of which only 768 were classified by the North American Industrial Classification System (NAICS) as "hog and pig farms". Only 6.2% of all Manitoba farms had pigs in 2006, and of all Canadian farms with pigs, 10.3% were in Manitoba. According to the census five years earlier, there were 1,668 farms with pigs in 2001 (7.9% of all Manitoba farms) and 995 "hog and pig farms" using the NAICS (Statistics Canada, 2007).

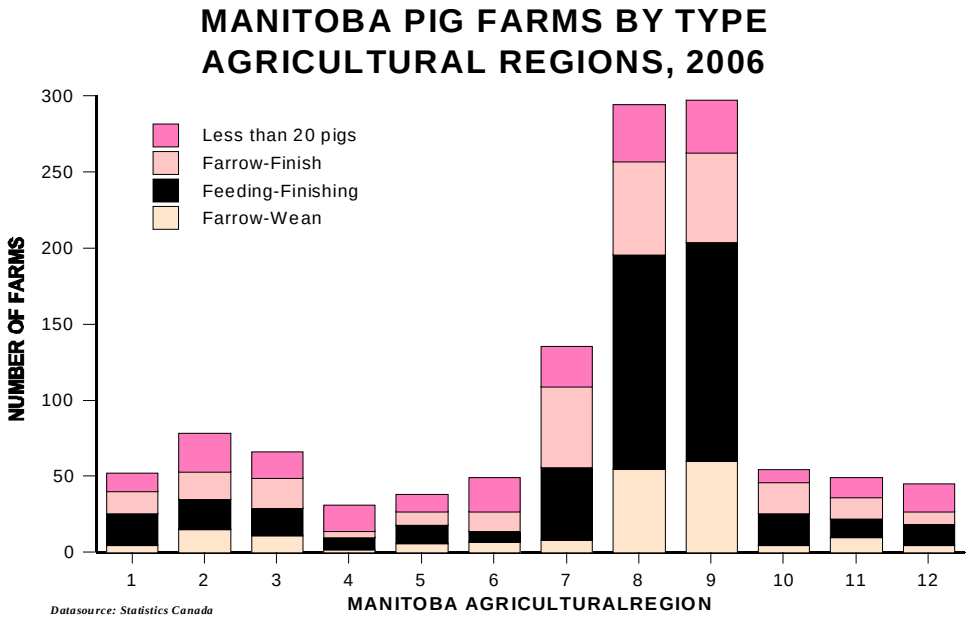
Of the 1,188 Manitoba farms with pigs in 2006, 240 or 20.2% had fewer than 20 pigs on the farm, 189 or 15.9% produced weanlings only, 293 or 24.7% were farrow-to-finish and 466 or 39.2% were feeder operations. The Manitoba swine industry has a much higher percentage of farms which produce only weanling pigs (those under 23 kg) than do other provinces.



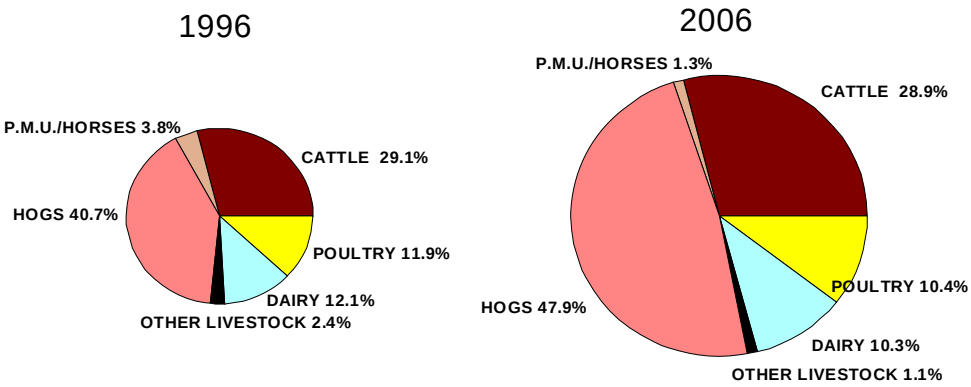
The 2006 Census showed that about 29.6% of Manitoba's pig farms are located in the Eastern Region (9 and 10 in MB Pig by Type and Region chart), about 36.1% in the

Central Region (7 and 8 in chart) about 16.5% in the Southwest Region (1, 2 and 3 in chart), about 9.9% in the Northwest Region (4, 5 and 6 in chart) and about 7.9% in the Interlake Region (11 and 12 in chart).

Further analysis using Statistics Canada's Census data showed that more than half of the pig farms in Manitoba in 2006 had no sows. These 629 units had an average of 1,505 pigs per farm and 32.3% of the total number of pigs in Manitoba. There were 559 Manitoba pig farms, or 47.1% of the total number of operations, with sows and, of these, 227 or 40.6% had fewer than 100 sows. These smallest farrowing units had only 1.6% of the total number of sows in Manitoba. On the other end of the scale, there were 111 pig production units (compared to 75 in 2001) with more than 1,000 sows per unit. These large units averaged about 2,396 sows per unit and, in total, comprised 72.4% of all sows and 40.0% of total pigs in the province. Another 70 units had 600-999 sows, averaging 744 sows per unit, with a total of 14.2% of all sows and 14.9% of total pigs in the province. There were 61 units in the 300-599 sow category, which had 7.5% of all sows and averaged 451 sows per unit. The 90 pig farms with 100-299 sows had 4.3% of all sows and 4.0% of all pigs.

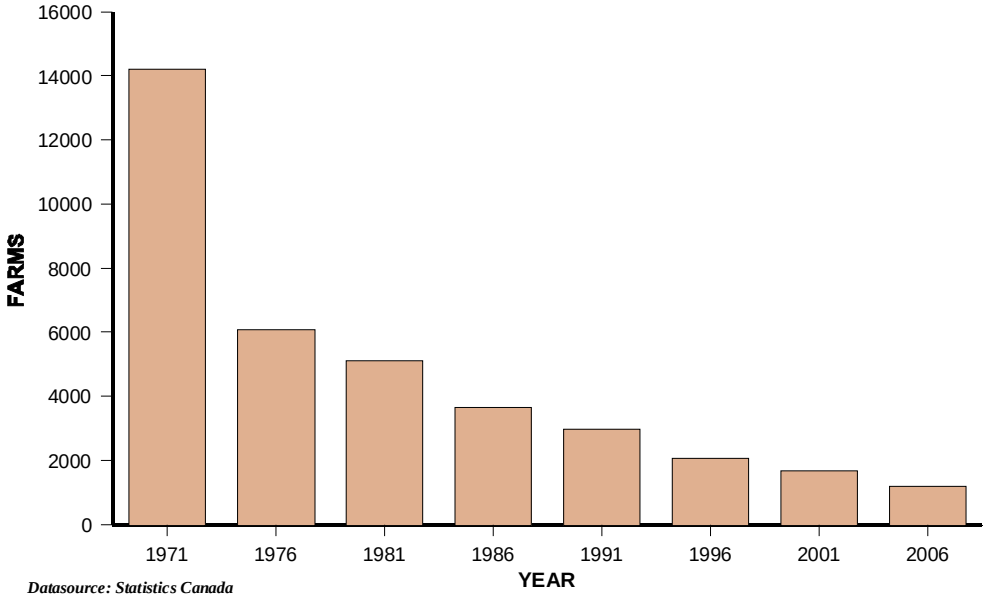


MANITOBA LIVESTOCK TYPE: PERCENT OF TOTAL PRODUCTION VALUE, 1996 and 2006



***Datasource:MAFRI**, author's estimate for 2006*

NUMBER OF MANITOBA PIG FARMS 1971- 2006



Datasource: Statistics Canada

1.1.2 Change in farm numbers and farm size

According to Statistics Canada, the number of farms with pigs in Manitoba decreased from 14,200 in 1971 to 1,668 in 2001. By 2006, there were 1,188 pig farms in the province.

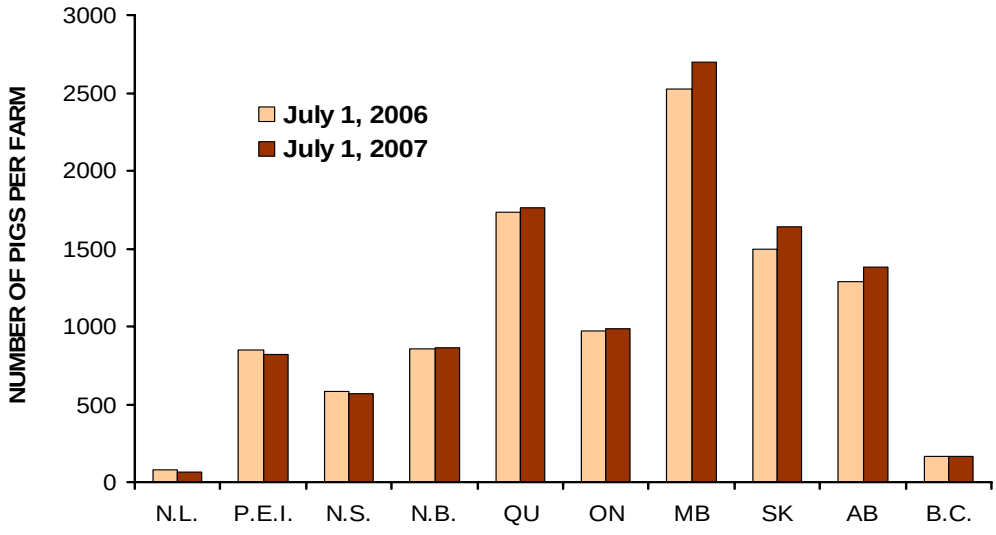
Manitoba has the largest average number of pigs per farm of any province. From 1,495 pigs per farm in 2001 the number rose to 2,695 pigs per farm in mid-2007, well above the next province, Quebec, which had 1,761 pigs per farm in mid-2007.

1.2 Animal Statistics

1.2.1 Animal Categories

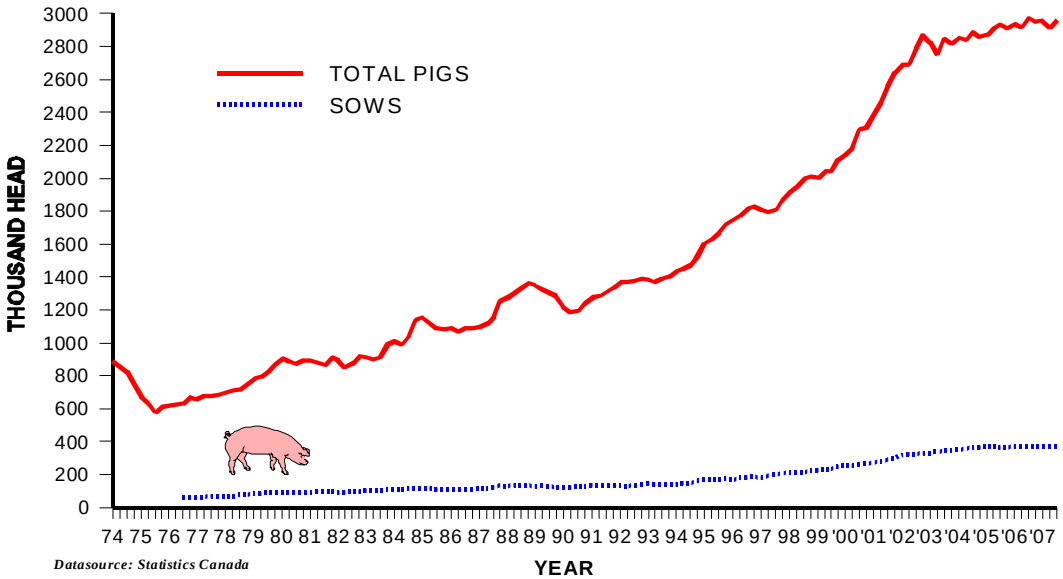
According to Statistics Canada data, only 31.2% of all Manitoba farms with more than 300 animal units (AU) were pig farms in 2006, while 881 Manitoba pig farms had 300 (AU) or less comprising 4.9% of all Manitoba farms in this category. Of all farms with sows, 208 or 37.2% had more than 300 AU in 2006.

AVERAGE NUMBER OF PIGS PER FARM, BY PROVINCE, 2006 - 2007



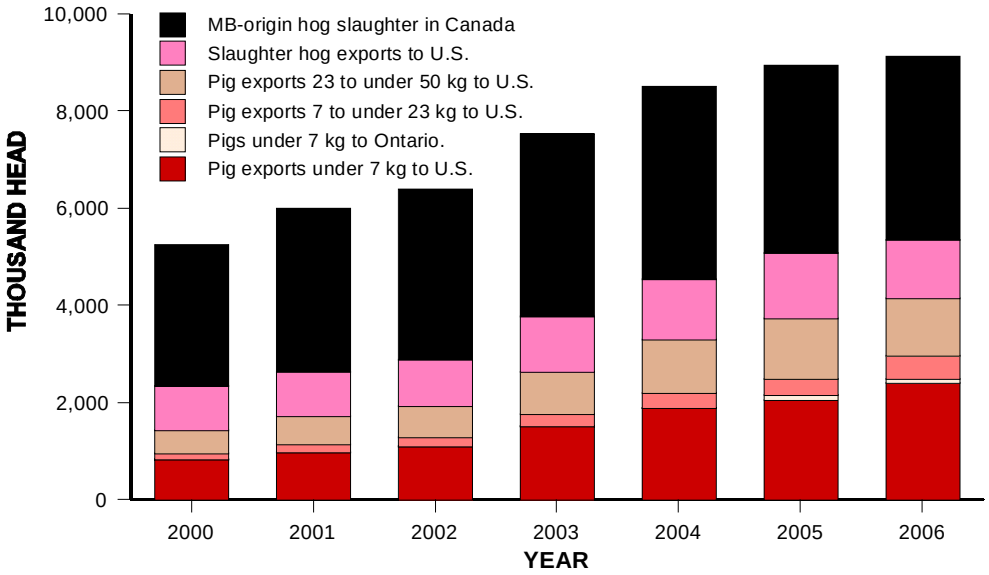
Datasource: Statistics Canada

PIGS ON MANITOBA FARMS BY QUARTER 1974- 2007



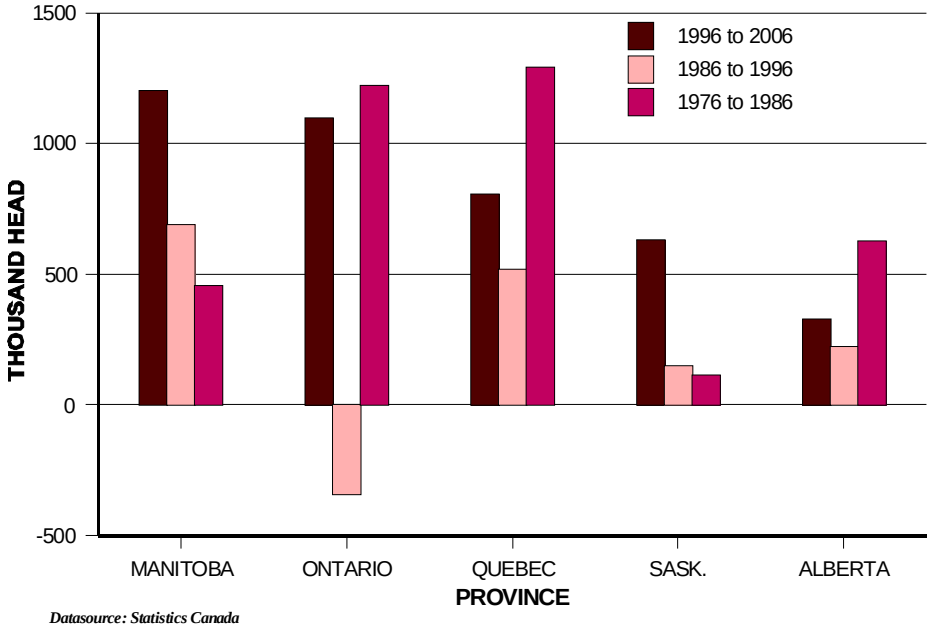
Datasource: Statistics Canada

MANITOBA PIG SALES BY TYPE
2000 - 2006



Datasource: Statistics Canada, AAFC, author's estimate

CHANGE IN TOTAL PIG HERDS BY PROVINCE
TEN-YEAR INTERVALS, 1976 TO 2006



Datasource: Statistics Canada

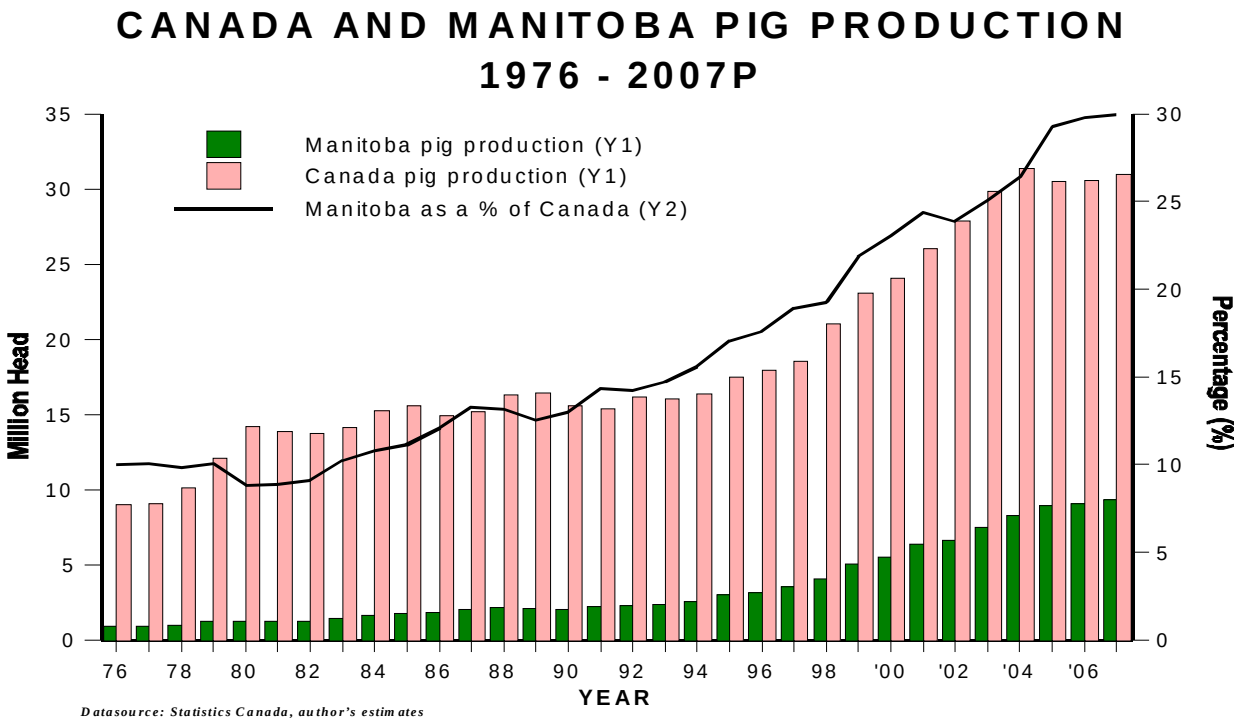
1.2.2 Current pig numbers

Interpretation of media and other reports often lead to an incorrect conclusion that Manitoba's total annual pig production (9.1 million pigs in 2006) reflects the number of animals on Manitoba farms at any given point in time. In fact, the total number of pigs on Manitoba farms at any given point in time would consist of the breeding herd of sows and boars, which are on farm all year, and fewer that 30% of the pigs destined for market annually. Sows produce approximately 2.2 litters annually. A large percentage of Manitoba's piglets are exported at 18 to 50 days of age. The remainder remain in Manitoba barns until they reach slaughter weight of 115 kg.

According to Statistic Canada estimates, there were a record 370,500 sows on Manitoba farms on July 1, 2007, an increase of 0.7% from a year earlier. The total number of pigs on farms at that time was 2,965,000 head, slightly below the July 1, 2006 record of 2,980,000 head.

January 1, 2007 statistics indicate that 38% (989,000 head) of the 2,586,000 pigs destined for market from Manitoba farms were either newborn or weanling pigs weighing less than 20 kg. More than half of these were targeted for export, most weighing less than 7 kg. The amount of feed consumed and manure produced by these animals during their time in Manitoba is small. Approximately one-third of the 799,000 of the pigs on farms in January weighing 20 to 60 kg were targeted for export with an average export weight of less than 50 kg. Total feed consumed and manure produced by this category of animal is significantly lower that for a slaughter pig. Finally, there were 789,000 head in the over 60 kg category, all of which were being fed to slaughter weight of about 115 kg.

1.2.3 Change in pig numbers



Manitoba is the largest pig-producing and pig-exporting province in Canada with close to 30% of national pig production in 2006. The quality of Manitoba pigs is among the best in Canada. Manitoba sows are also the most efficient producers of pork in Canada, producing an annual average of over 2.29 tonnes per sow in 2006 compared to the Canadian average of almost 1.72 tonnes of pork per sow.

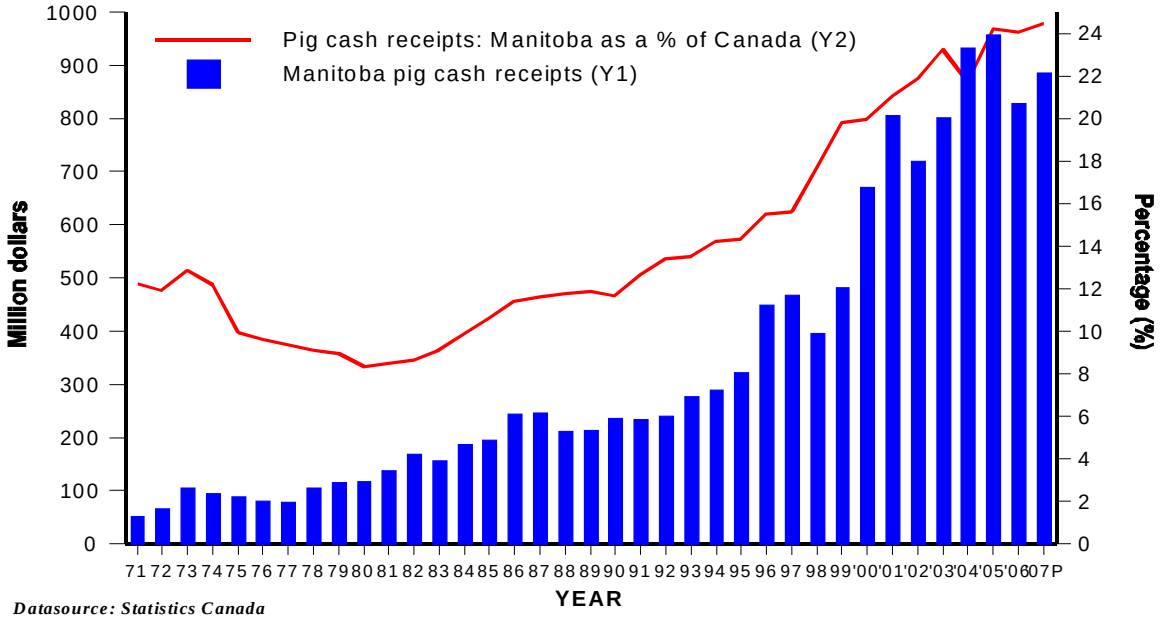
Manitoba's swine industry grew significantly from the mid 1990s to the early 2000s, but growth began to slow after 2003. The average annual rate of growth in production from 1995 to 2004 was 12.6% compared to an average increase of 4.6% for the previous decade. Annual production growth fell from 12.8% in 2003 to less than 2% in 2006.

Pig sales in the province totalled 9.1 million head in 2006, of which about 5.3 million head or 58 percent were sold out of the province, with 2.4 million or 26% of total sales as baby pigs under 7 kg. Total pig production in 2006 was up by 43% from the 6.35 million pigs produced five years earlier and ten times the pig production in 1976.

Pig producers and brokers exported over 1.2 million slaughter hogs and more than 4 million weanlings/feeder pigs directly to the U.S. Close to 0.1 million weanling/feeder pigs were sold to Ontario in 2006, well below the level ten years earlier, when many more pigs were shipped east and fewer to the U.S. Reduced demand for hogs by Manitoba slaughter plants led to 3.8 million Manitoba hogs being killed in federal and provincial plants in 2006, down by 2 percent from 2005.

The swine industry is the largest source of farm cash receipts of any single agricultural commodity sold in the province. Pig sales produced about 27% of Manitoba's farm cash receipts from the marketplace (excluding direct program payments) in 2006. Increased pig sales and slightly higher prices for slaughter hogs and iso-wean pigs are expected to raise cash receipts from pig sales by about 7% in 2007.

PIG CASH RECEIPTS: MANITOBA AND AS A % OF CANADA, 1971- 2007P



Datasource: Statistics Canada

1.3 Economic Impact of the Industry

The cash income from pigs in Manitoba was estimated for 2006 by Statistics Canada at $834 million, the largest income from any single commodity in the province. In their study on the regional impacts MacMillan et al. (2004) estimated a dollar of output in pig production in the Pembina Valley can mean $2.66 in output the rest of the supply chain in the province. Manitoba has a significant pork processing plant in Brandon, MB owned by Maple Leaf. At current single shift capacity it can slaughter 45,000 pigs per week. Grier and Kohl (2003) argue that they would need to move to double shifts to be competitive with U.S. plants.

The pig sector is also a huge user of feed. Kraft and Rude (2002) showed that nearly 2 million tonnes of feed grains go to pig feed each year, contributing to a feed grain deficit and the need for feed imports to supply Manitoba's livestock sector. Kraft and Rude showed an average 174,000 tonnes of corn were imported into Manitoba each year to supplement feed supplies. This is of great concern if the prices in the U.S. rise due to new ethanol demand. The price for corn in Chicago has stayed above $3/bu. for more than six months now which is a 50% increase over the long term floor price of $2. Increased grain demand is resulting in similar price increases for wheat and corn in Canada, and the increasing value of the Canadian dollar has reduced US importer demand for pigs and causing a decline in pig prices.

Pig manure can be given economic value. The crop industry, important to Manitoba's economy, is the main beneficiary of pig manure nutrients. Although no single commodity generates the income of pigs, the crop sector as a whole, normally generates over $1.3 billion a year in cash income for farmers in Manitoba. The estimated annual manure production by Manitoba's pig industry is 346,000 tonnes, dry basis (calculations provided in next section of Chapter). The value of nitrogen and phosphorus supplied by this manure is in the range of $30 to $40 million and is often given away to crop producers.

The recent Census of Agriculture for 2006 identifies various types of manure management used in Manitoba. Seventy-three percent of pig farmers apply their pig manure to their own land. Despite its value in nutrients, less than 3% of pig farmers get any compensation for their manure from crop farmers. The value of the manure used by mixed farmers on their own farms is not necessarily 73% of the $30 million since large pig farms with the lion share of manure are less likely to have large tracts of crop land.

The 2006 census had some good news. Seven hundred and seventy-five farms, or 65% of all pig farms, were incorporating manure into the soil which improves its availability to plants, lowers odour generation and prevents the loss of nitrogen through volatilization. This should be expected from those farmers who can make use of the nutrients for crop production, but might not be expected by producers simply wanting to dispose of the manure as cheaply as possible.

1.4 Manure production/storage and land application statistics

1.4.1 Current estimates

The methods outlined below provide estimates of the total phosphates or phosphorus contained in pig manure produced in Manitoba in 2006. The industry has embraced new feed formulations and feeding practices in recent years which are expected to reduce manure phosphorus concentration and in some cases reduce the amount of manure produced per pig. Examples would include the use of enzymes, in particular phytase

enzyme and phase feeding. Annual estimates for total phosphorus in pig manure ranged from a high of over 7,000 tonnes with no phytase enzyme inclusion in the diet to about 6,100 tonnes with 50% adoption of phytase enzyme addition in the diet to 5,000 tonnes with 90% adoption of phytase use. Exact statistics related to level of adoption of this practice are not available, but industry and government consultation suggest that the adoption rate is high.

Pigs in Manitoba excreted approximately 22,500-24,000 tonnes of nitrogen in the form of manure in 2006. However a substantial portion of that nitrogen was lost due to volatilization of ammonia during the handling and storage of that manure.

1.4.2 Confidence of current estimates

Calculation of the total annual manure production by Manitoba's hog population can be calculated on the basis of statistics of total animal numbers within each category on Manitoba farms at a given point in time and estimates of daily manure output by each category. The values are scaled up to estimate annual manure production. Alternatively, total manure production can be estimated on the basis of total animals marketed and a calculation of manure production associated with each animal marketed.

Source of pig inventory numbers:
The number of pigs on Manitoba farms on May 16, 2006 was derived from answers to a Statistics Canada 2006 Census question, which asked Manitoba farmers if there were any pigs on the farm and if so, how many were boars, sows and gilts for breeding, nursing and weaner pigs and grower/finishing pigs. This is the most comprehensive count of the Manitoba pig inventory. Accuracy of the data depends on the willingness of pig producers to enter correct numbers on the questionnaire and on subsequent auditing and correction by Statistics Canada.

Post-censal estimates of pig inventories are conducted on a quarterly basis by Statistics Canada using the Census inventory as a base, surveying a relatively small sample of Manitoba pig producers and using hog slaughter and other production data to determine the percentage change in the pig inventory over time. In the past, Statistics Canada's estimates of the Manitoba pig inventory were carefully checked and often corrected by Manitoba Agriculture and Food staff prior to release. The quarterly inventories are adjusted by Statistics Canada back five years once new Census results are available. The inter-censal revisions for 2001-2006 and post Census corrections for 2006-2007 were released on August 16, 2007 by Statistics Canada.

Total annual pig production in Manitoba is calculated by adding (sources below)

i) the number of hogs of Manitoba origin slaughtered in Canadian federally- and provincially-inspected plants during the year to
ii) the number of all Manitoba pigs exported to the United States to
iii) the known number of weanling/feeder pigs shipped to other provinces for finishing to
iv) the January-January change in the Manitoba pig inventory.
v) Any pigs imported into Manitoba are deducted from this total.

Sources of this data are as follows:

1. Province-of-origin hog slaughter data is available from Canadian Food Inspection Agency/Agriculture and Agri-Food Canada (AAFC, 2007). (In recent

years, the improved accuracy of Manitoba Pork Council's slaughter levy data has allowed the latter to be used).

2. Manitoba pig export data is collected at the ports of exit by the United States Department of Commerce. The data is split into type and weight categories, such as breeding sows and boars, pigs <7kg (iso-wean pigs) (about 2.4 million pigs in 2006 or more than 25% of total pig production), pigs 7-23 kg, pigs 23-50 kg (almost 1.2 million in 2006 or 13% of total pig production) and pigs > 50 kg, most of which are slaughter hogs, cull sows and cull boars. Statistics Canada and AAFC compile and disseminate this data. It should be noted that about 45% of the pigs produced in Manitoba are exported as weanling or feeder pigs (AAFC,2007) .

3. The number of pigs shipped to other provinces for feeding is obtained by phoning the large weanling production companies in Manitoba. This number is relatively small compared to exports to the U.S. (fewer than 100,000 pigs in 2006.)

4. Statistics Canada's January 1 inventory estimates are used to calculate the change in the Manitoba pig inventory from one year to the next.

5. The number of pigs imported into Manitoba from the U.S. is very small and is obtained from Statistics Canada or AAFC. However, there are weanlings and slaughter hogs shipped from Saskatchewan through Manitoba to the United States that may be counted by the US Dept. of Commerce as Manitoba-origin if the exporter has a Manitoba address. This number is provided by Saskatchewan Pork Development Board and is deducted from total Manitoba pig exports.

Estimating pig manure production was more complicated than expected as every source has different daily manure production data for pig types and weights.

1. One source used was the "CONCENTRATED ANIMAL FEEDING OPERATION (CAFO) AMENDED FACT SHEET", National Pollutant Discharge Elimination System (NPDES) and State Waste Discharge General Permit, June 21, 2006. (see attached table adapted from the American Society of Agricultural Engineers *(ASAE)*)

2. Another source was the Manitoba Agriculture, Food and Rural Initiatives (*MAFRI)* pre- and post phytase use manure nutrient tables 4a, 4b and 5 in http://www.gov.mb.ca/agriculture/livestock/pork/swine/pdf/bah09s04.pdf

3. The third source was from a paper by *Clarence Froese, DGH Engineering* http://www.banffpork.ca/proc/2003pdf/17cFroese.pdf

4. Also used were Prairie Agricultural Machinery Institute (*PAMI*) estimates of the percentage of P and N in stored liquid manure.

It is understood that the amount of phosphorus (organic and inorganic) in manure is highly variable and the averages used will only give a rough idea of total phosphorus content. The total amount of dry matter in the manure (Statistics Canada: 9% – this method was not used due to uncertainty of type of manure) and liquid manure (Froese/DGH: 5% and ASAE: given at 9%) were used in order to estimate both the phosphate and phosphorus content. MAFRI's estimates of nutrient content of manure, pre-and post-phytase use (50% each) were used to pro-rate phosphate production per pig type, but this data had to be applied to liquid manure estimates made by Froese/DGH because of the difficulty getting the average MAFRI manure production by farrow-finish sows/pigs to fit into the Statistics Canada inventory types.

The methods used for the N estimates were similar to those used for the P estimates. The calculation using PAMI's estimate of the organic N content of manure are much lower than the other two calculations (ASAE and MAFRI) using total N content of manure.

1.4.3 Mechanisms used to collect relevant data on animal numbers, manure production and land area receiving manure on land for the Province of Manitoba

Various ways of estimating total manure production in Manitoba were attempted using both Manitoba and U.S. reported averages of solid and liquid amounts of manure each pig type or weight group produces daily and applying these first to a breeding stock inventory on farms/total annual sales by weight of pig combination and then to Statistics Canada's 2006 Census pig inventory numbers by type of pig.

As manure produced per pig at each stage of development cannot be determined with any accuracy due to the difficulty of separating sow manure production from pre-weaned pig manure production, the breeding stock/sales by weight methods were abandoned in favour of the methods using inventory numbers by type of pig. The one fault found with the latter method was that some iso-wean pigs may be missed, but the amount of manure they produce is probably smaller than the variation in total manure production estimates.

The 2006 Census of Agriculture asked Manitoba farmers if manure was produced on the farm in 2005 and if that manure was applied to the farm operator’s own land or sold or given to another operation. Farmers were also asked if manure was purchased or received and asked about the method of manure application and areas and types of farm land on which the manure was applied.

Not all of the 1,188 Manitoba pig producers answered these questions. Only 1,114 pig operations said manure was produced on the farm and of these, 877 applied the manure to their own land, 242 sold or gave manure to other farms and 34 pig farms bought or received manure. Of all this activity, 181,200 acres were used to apply pig manure. There is no way of separating out non-pig farms, which used only pig manure, but it is assumed that most of the liquid manure applied was from pigs. Of non-pig farms, the Census shows 124,600 additional acres on which liquid manure was applied. As there are farms which did not answer the question on manure application, it is possible there could be an unknown number of acres on which pig manure was used and not reported.

The total amount of phosphorus produced in pig manure in 2006 (5,000 tonnes estimated) was divided by the minimum area of farm land on which pig manure was known to be applied in 2005 (about 120,000 hectares) to estimate the rate of phosphorus application in 2006 (42 kg/ha).

1.5 List of References

Agriculture and Agri-Food Canada (AAFC). *Hog Statistics at a Glance*. Internet Site: http://www.agr.gc.ca/redmeat/january0607englishhogsupply.pdf (Accessed September 19, 2007)

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