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David Brown

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Ruth Cronje, and Jan Swanson;

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Efficiency of pork production: A USA, Canada, and Ireland comparison

M. Young

Gowans Feed Consulting, Wainwright, AB, Canada

Introduction

Winston Churchill was once asked “How is your wife?” to which he replied “Compared to what?” When looking at efficiency of pork production we can do this within farm on a regular basis and monitor how we are doing compared to some set targets. We can also use our records to compare on-farm production levels with those of other farms with similar geographical conditions and production challenges. Or we can compare data on a national basis. Because of changes in agricultural policies and liberalization of trade worldwide, global trade in pork has increased significantly. Pork is a relatively standardized commodity, traded on the basis of price, quality and reliability of supply¹. For the USA, Canada and Ireland an export trade is plays a very significant role in maintaining product price and profit margins. Therefore, it has become essential to be competitive in the global market. To be competitive in this market will require:

- Low cost of production (not a guarantee for survival)
- Efficient production
- Quality and safety of product
- Reliability of supply

To satisfy these requirements will obviously require that our primary production sector is competitive with that of other exporting countries. However, all segments of the industry must work together as a value chain to compete successfully on the international market. A pig producing country that can compete successfully on the export mar-

ket will contribute significantly to the profitability of its primary producers.

This paper will focus on the efficiency of pork production in the USA, Canada and Ireland.

USA

Any comparison of the swine industries of different countries should consider the population base and pork consumption levels of those populations (**Table 1**).

As can be seen, the USA with a population of 275 million has a large domestic market for pork. Per capita consumption of pork is currently at 31.6 kg but has been static since about 1955. It is expected that the USA population will increase by about 1% per year. It is more difficult to predict trends in pork consumption but it is expected to increase by about 1.5% per year. However, it is expected that pork production will increase by about 3% per year from the current 9.34 million metric tons per year. This increase in pig meat production will be achieved through a slight increase in herd size and in slaughter weight and increased production efficiency. Exports of pig meat have increased by 60% since 2000 to a current level of 10.4% of production. It is expected that exports will continue to increase and will play a very significant part in influencing pig price.

The USA has several major advantages that allow it to compete competitively in the global market:

- Large grain and soybean production

Table 1: Comparative human and pig population data for the USA, Canada, and Ireland (2004).

	USA	Canada	Ireland
Population, million	275	32.5	3.9
Per capita consumption kg	31.6	32.2	38.2
Landmass, km ² /million	9.63	9.97	0.07
Pig population, million	60.5	14.6	1.76
Pigs/km ² , million	6.3	1.5	25.1
No. slaughtered/year, million	103.7	22.6	2.9
Pork production, million tones	9.34	1.96	0.25
Percent pork exported	10.4	50.0	63.0
Breeding herd, million	5.94	1.62	0.15

- Economy of production through size of units; nearly 60% of production is from units marketing more than 50,000 pigs per year
- Availability and adoption of new technologies, information and products
- Access to capital, low interest rates
- Industry leadership
- Low hourly wages
- Low building costs
- The declining value of the dollar should also increase US competitiveness on the export market

Not surprisingly, therefore, a survey by J. Rasmusen of the Danish Bacon and Meat Council¹ showed that the USA has relatively low cost of production (Figure 1). Roppa²

also compared US production costs per kg liveweight with those of several countries (Table 2).

However, number of pigs born alive is lower in the USA than in many other countries (Figure 2). In addition, pig mortality rates in the US are high (Figure 3) with the overall result that number of pigs per sow per year sold for slaughter is only 18 compared to 19.5 in Canada and 21.9 in Ireland. A more local comparison of 2004 USA and Canadian reproductive efficiency data and data from a recent Irish survey data is shown in Table 3.

These data support the conclusion that breeding herd efficiency is lower in the USA than in Canada or Ireland. However, the production data shown in Table 3 are based on small numbers of herds and only represent herds keeping Pig Champ records. Therefore, these production levels probably flatter the US and Canadian production systems. The Irish national data base system provides more

Figure 1: Production costs per kg of carcass 2002.¹

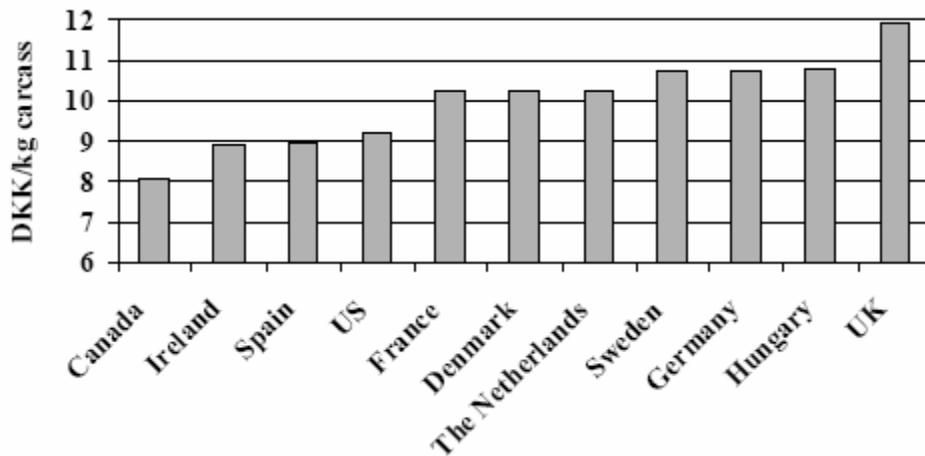


Table 2: Pig production costs per kg live weight.¹

	USA	EU-15	Canada	Brazil	Ireland ³
\$/kg LW	0.75-0.85	1.00-1.20	0.75-0.85	0.55-0.65	1.00-1.10

Figure 2: Number of piglets born live per litter.¹

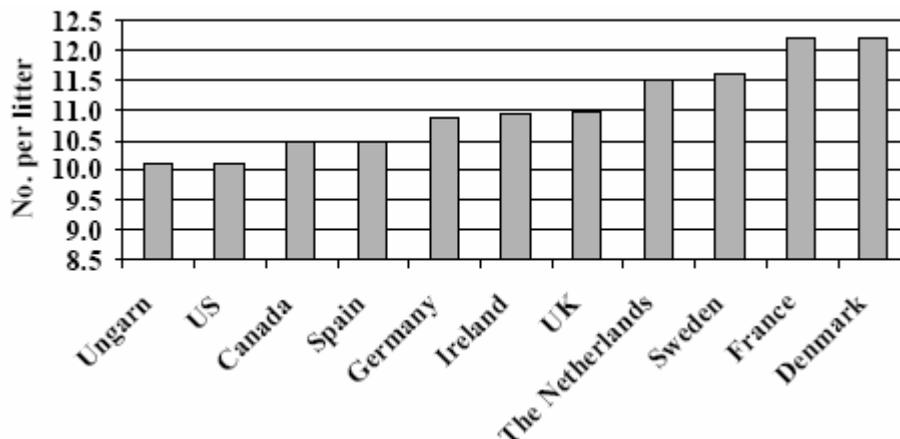


Figure 3: Mortality by stage and country.¹

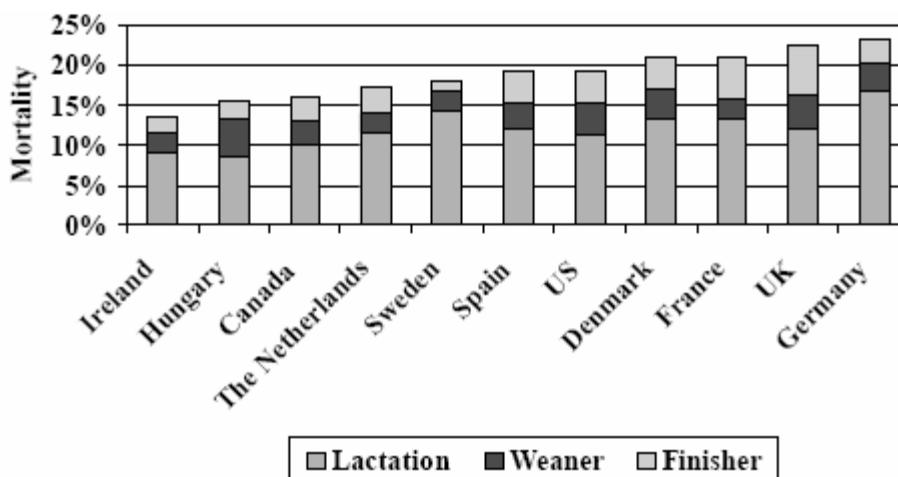


Table 3: Reproductive efficiency levels for sow herds (2004).⁴

Country	USA	Canada	Ireland
Number born alive	10.4	10.9	11.2
No. pigs weaned/sow/year	20.8	22.4	23.2
Pigs/sow/lifetime	35	40	NA
NPD	59	51	48
Replacement rate, %	60	52	48

accurate estimates of production levels. It is likely that the number of pigs weaned per inventoried female is more likely as shown in **Figure 4**. These data also show Canada to have higher reproductive efficiency than the USA. The good news is that the breeding efficiency continues to improve in the USA. Also, there are huge differences in breeding herd efficiency among farms in the USA (**Table 4**).

Why is reproductive efficiency lower in the USA than in Canada and Ireland?

Rasmusen¹ suggests that ‘low genetic level’ is a contributing factor to lower reproductive efficiency. He suggests that this low genetic merit is due to ‘widespread use of slaughter animals as breeding stock’. Other contributing factors might include the following:

Employment issues

Low employee wages, low status of the work and availability of alternative employment reduces the availability of a skilled, knowledgeable and motivated labor force. Management must take the major criticism for the poor herd performance. A critical first step to improve reproductive performance must be the development of appropriate SOP’s and a system that ensures that these SOP’s are understood and implemented day-in and day-out. Barn staff must appreciate the relative importance of the many factors influencing sow productivity and ensure that due attention and effort is devoted to the production issues

that would be most responsive to improved management and that will result in worthwhile improvements in production efficiency and perfectibility.

Poor gilt pool management

In most herds little effort is made to induce estrus before gilts reach market weight. Currently there is a trend to delaying breeding gilts until they are 300 lb or more in an effort to improve sow longevity. Such management systems will increase sow weight within the herd, may increase locomotion problems, will increase the amount of feed required for sow maintenance, will increase NPD within the herd and may result in some relatively infertile gilts entering the herd.

Earlier weaning age

There is a trend to move away from very early weaning of 16 days or less. Many herds are adding an additional half a weeks farrowing capacity which will increase age at weaning by about 3 days.

Larger unit size

It is likely that as unit size increases the amount of individual care each sow gets decreases. This may be critical in such activities as heat detection, service management and care of the newborn pig.

Figure 4: Pigs per breeding animal in Canada and US, 1996 to 2004.⁴

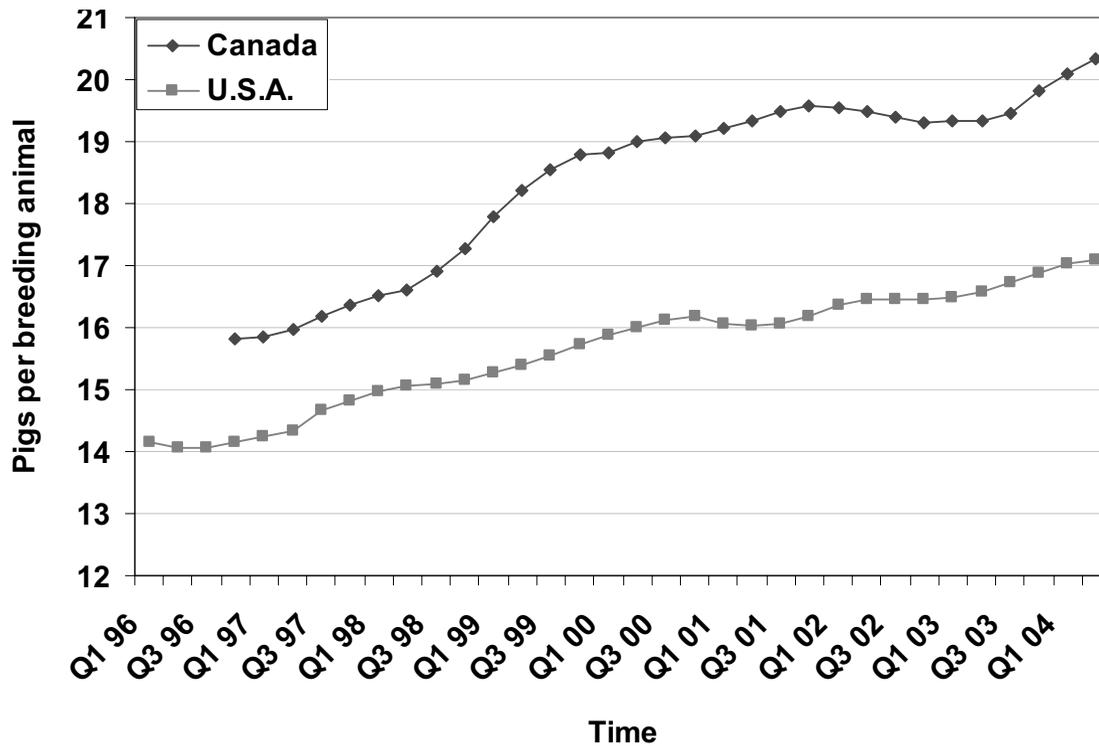


Table 4: Among-farm variation in reproductive efficiency USA.^A

	Mean	Upper 10%	Lower 10%
Replacement rate, %	60	45	75
No. born alive	10.4	11.2	9.5
No. weaned	9.0	10.0	7.9
PWSY	20.8	23.6	17.3
Pigs weaned/lifetime	35	50	22
NPD	59	38	85

^ASource: Pig Champ USA 2004

Disease levels and stocking densities
Disease levels and larger stocking densities in some hog producing areas of the USA make the prevalence of such diseases as PRRs a major concern.

Environmental temperature
High summer temperatures in some hog producing areas of the USA do contribute to a decline in sow reproductive efficiency.

How to improve breeding herd efficiency in the USA

The wide variation in production efficiency within the USA suggests that there is available to all genotypes, feeding programs, and management systems that can compete with any other country. However, many herds do not or cannot apply the current knowledge and management practices. For such herds to achieve the levels of performance of the better herds they must:

- Feel a sense of urgency that improvement is required
- Have a clear vision of the improvements needed
- Have the knowledge, skill, enthusiasm and time to bring about the improvements
- Have clear and widespread communication between management and barn staff and removal of all obstacles to the changes required
- Have continued demonstration and acknowledgement of progress made

There is little doubt that the USA will face increased international competition in the future and that labor and housing costs will increase. Added to this is the likelihood that environmental impact concerns, welfare issues and regulatory controls will increase pressure to improve efficiency of production and reduce input costs. Most costs in the breeding herd, including feed costs, are fixed costs. Therefore, increased breeding herd efficiency by increas-

ing PWSY and per lifetime, reducing NPD and sow waste will reduce overall costs of production and increase profitability. In general, there will probably be a more significant effect on profitability through increasing output then by reducing input costs. Obviously, effort must be made to do both.

Canada

Current status

Like the pork production industries in most developed countries the Canadian industry is going through a host of changes and adaptations. Among such changes are:

- Continued trend to fewer, larger and more specialized units
- Adoption of new technologies such as multi-site production, segregated early weaning, all-in/all-out production systems, parity segregation, split sex feeding, phase feeding, feed budgeting, increased use of AI, greater emphases on bio-security, use of superior genotypes and high health stock
- Increased emphasis on partnerships, alliances and contract production

Adoption of these new technologies and production systems has enabled Canada to be competitive in terms of low cost production (**Figure 1, Table 2**) However, the hog cycle continues to be a factor of the Canadian market. Two bad years are followed by two years of profit. Unfortunately since 1996 the loss per pig sustained in the bad years by the average producer is greater than the profit per pig obtained in the good years. This has made the profitability of hog production lower and less predictable in the past 10 years than it was in the previous 10 years. This has led to an attrition rate among producers of about 3.5 to 4.0% per year, and the units going out of production are no longer just the smaller ones. However, in most cases the larger units that go out of business are taken over by other larger units. Currently there are 12,400 hog production units in Canada (**Table 1**). Hog slaughter in 2004 was 22.6 million (m), an increase of 2% over 2003. Slaughter-hog exports to the US totaled 2.8 m in 2004, up from 2.4 m in 2003. Feeder pig exports to the US jumped to 5.4 m, up from 4.8 m in 2003. In 2004 Canada exported 951,000 tones of pork, over 40 % of which went to the US, and 22 % to Japan. The combination of pork exports and sale of slaughter hogs to the US accounts for nearly 70% of Canada's hog production. This large export trade in pork and live animals reflects response of the North American pig industry to competitive advantage. As shown in **Table 3**, Canada has better reproductive efficiency than the US but the US is very competitive in finishing hogs for market. The stronger American dollar relative to the Canadian dollar allows US produc-

ers to purchase Canadian pigs at very competitive prices. The steady growth in the Canadian sow herd from 1.36 m sows in 2001 to 1.62 m in 2004, in spite of economic conditions and uncertainty led the NPPC to petition the US Department of Commerce (DOC) to initiate countervailing and antidumping duties on imports of live hogs from Canada. However, in 2005 International Trade Commission ruled that trade duties on Canadian pigs were not justified.

The future

There is considerable room for improvement in sow reproductive efficiency, especially in reducing sow waste and increasing sow productivity per lifetime. It is expected that number of production units will continue to decline but expansion or acquisition by the larger units will enable production levels to increase by about 2% per year. It is also expected that exports of pork will increase at a similar rate. The very large dependency of Canada on its export market is a cause for concern and makes the need for a high health production system especially important.

Ireland

This review will deal only with pork production in the Republic of Ireland (Eire). Eire has a population of about 4 million and a landmass of 700,000 sq. kilometers (**Table 1**).

Currently there are 510 pig farms of an average size of 490 sows. Approximately 33% of the herds have greater than 1000 sows. The breeding herd currently stands at 150,000 sows but has declined by 6% since 2000 and is expected to continue to decline. The number of hogs slaughtered in 2004 was 2.93 m with carcass weight at 73 kg. Total pork production in 2004 was 0.25 m tones approximately 50% of which was exported to the UK and 11% to Germany and 8% to Japan. The Republic also exports 466,000 live hogs per year to Northern Ireland (14% of total production). Thus, nearly 64% of the Irish pig production is exported (**Table 1**).

Production efficiency

Pig producers in Ireland have a very good reputation for achieving high levels of sow output (**Figures 1-4**). The number of pigs weaned per sow per year is estimated to be 23.2. Both NPD and replacement rates are lower than in USA or Canada (**Table 3**). Boars are not castrated and hogs are sold at light market weights of less than 100 kg. Both these factors influence average daily gain (ADG) from weaning at an average age of 28 days to slaughter. Estimates of ADG from weaning to slaughter are about 600 g, with feed conversion efficiency of 2.46. The relatively good sow reproductive efficiency and low feed conversion rate helps to off set some of the disadvantages

of high feed costs. In 2004 composite feed costs were \$277 US/T. Production cost per kg carcass was estimated to be \$1.44 US in 2004 while price paid per kg carcass was \$1.57 US, making pig production in 2004 quite profitable.

The future

Sow numbers in the Republic of Ireland are likely to decline in the future. The factors contributing to this decline may be:

- The legal requirement that sow tethers no longer be used after 2005 will require major adjustments in the housing of sows. Ireland has not restructured their sow production to loose housing (only 10-15% is loose housed) or stalls. Cost of modifying current facilities and/or difficulties in obtaining permits to refit or build new units may drive some producers out of business.
- The Nitrates Action Plan which restricts organic Nitrogen output to 67 kg per sow and her progeny per year will place extra costs on producers as they try to obtain suitable land for spreading manure.
- The introduction of Integrated Pollution Prevention and Control (IPPC) will also require licensing of units above certain thresholds. The cost and effort in preparing license applications will also encourage producers to downsize or exit the business.
- Labor shortages are becoming a major issue. Insufficient numbers of young people entering the sector as owners, managers and stockpersons at present resulting in an older age profile. Unemployment in Ireland is at an all-time low and young people are not entering the business.
- Potential to increase production through increased slaughter weight is limited by a non-castration policy and the consequent concern with “boar-taint” at heavier carcass weights, welfare issues, environmental nuisance issues, cost of money, limited and inefficient slaughter capacity are all likely to discourage expansion of the industry.

Conclusion

The USA and Canada are in a good position to compete successfully on the global market. Low cost production, availability of excellent feed ingredients at relatively low cost provides a significant advantage to US and Canadian producers. In addition the current trend to increased reproduction efficiency and improvement in lean tissue growth rate and feed conversion efficiency of grow-finish pigs will further improve their competitive advantage.

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