IMPACTS ON FURTHER GROWTH OF THE NORTH AMERICAN PORK INDUSTRY

John Lawrence, PhD
Extension Livestock Economist and Professor, Economics Department
468 Heady Hall, Iowa State University, Ames, Iowa, 50011-1070
E-mail: jdlaw@iastate.edu

ABSTRACT

The world in which North American pork producers operate has fundamentally changed. Business models based on low priced oil, grain, and fertilizer face a new world where none of these exist. Higher feed costs will eventually reduce production of animal proteins leading to a new equilibrium with higher pork prices at smaller supplies than would have occurred otherwise. While the new equilibrium is expected to provide a return on investment sufficient to sustain the down-sized sector, the transition will be stressful. Packing capacity that was a significant concern in 1998 appears to have weathered the storm in 2007. Unless there is a herd reduction during 2008 packing capacity will be challenged in the fourth quarter. At the other extreme, a smaller production sector due to higher feed costs will result in mothballing packer capacity in the long run. Besides the obvious and immediate challenge of higher feed costs and low hog prices, there are additional challenges to growth. Finally, constraints on production practices, or at least documentation of practices, are increasingly important and market access is replacing governmental regulations on issues of environment, animal care, and pharmaceuticals. Market access and the documentation needed to assure market access may restrict growth by increasing cost of production.

INTRODUCTION

Until ethanol came along, the pork industry was the most rapidly changing, most exciting sector of agriculture. For a variety of reasons the pork sector has lost its shine and risks being drowned out by the current biofuel binge. Up until six month ago the hog production sector was defying economic gravity. The combined US and Canada hog inventories posted 16 consecutive quarters of slow growth and US producers enjoyed the longest stretch of profits in at least 35 years. It appeared that producers had found that nirvana where increasing supply was just below the growth in demand. Reality arrived in the fall of 2007 when large supplies pressured hog prices lower and feed prices headed higher. Losses in late 2007 and early 2008 were estimated to exceed $25/head for Iowa farrow-to-finish operations. Regions with higher feed cost or higher freight costs experienced losses sooner and larger.

The extended period of profitability has been credited to disease pressures in 2006. Specifically, circovirus that swept through North American herds in 2006 increased death loss and culls in the finisher and reduced the number of hogs that lived until they died. An effective vaccine was widely adopted by summer of 2007 and a surge of hogs hit the market in the fourth quarter. The percent of hogs reach slaughter in the fourth quarter increased

dramatically between the 2006 and 2007 (Figure 1). Second, third and fourth quarter values in 2006 had lagged the five year average quantifying what everyone suspected, circovirus had significantly reduced supplies. If the higher livability continues at the fourth quarter pace, supplies will remain large.

Besides healthier pigs, where did the current record production come from and what are the prospects for continued growth of the industry. The North American breeding herd has increased modestly since January[1] 2000 and with the exception of 2001 the two countries have moved in opposite directions (Figure 2). Since 2005 Canada has decreased and the US has increased sow numbers.

Figure 1. U.S. barrow and gilt slaughter as percent of U.S. pig crop two quarters earlier adjusted for Canadian imports.

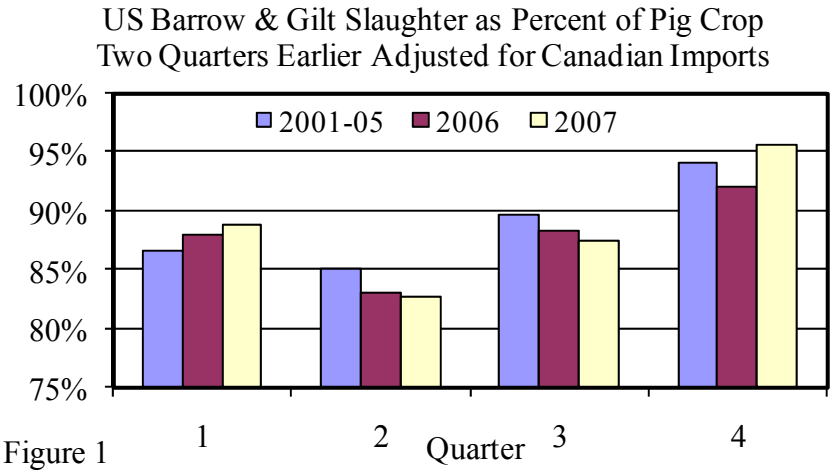

Figure 1

Figure 2. Change in breeding herd inventory versus 2000 (1000 head).

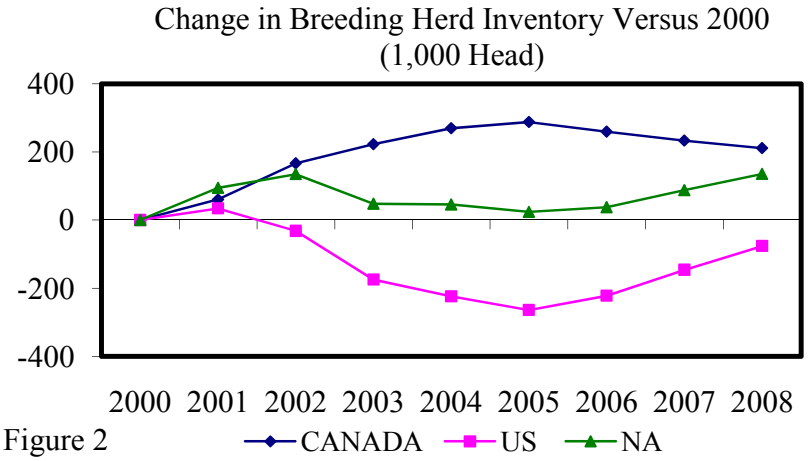

Figure 2

[1] The US Inventory is measured in December, one month earlier

Another source of hog supply is increased productivity. North American producers have made significant progress in breeding herd productivity in recent years (Figure 3). Compared to 2000 the number of pigs per animal in the breeding herd has increased. The two countries measure the statistic differently as Canada reports pigs born and the US reports pigs weaned, but both have increased. Canada's reported pigs per breeding animal has leveled off since 2004 while the US continues to increase. While it is difficult to compare, in 2007 Canada reported 22.3 pigs born versus 18.0 weaned in the US. It is doubtful that there is 24% pre-weaning mortality in Canada to make these two numbers equal.

Figure 3. Change in pigs per breeding herd versus 2000.

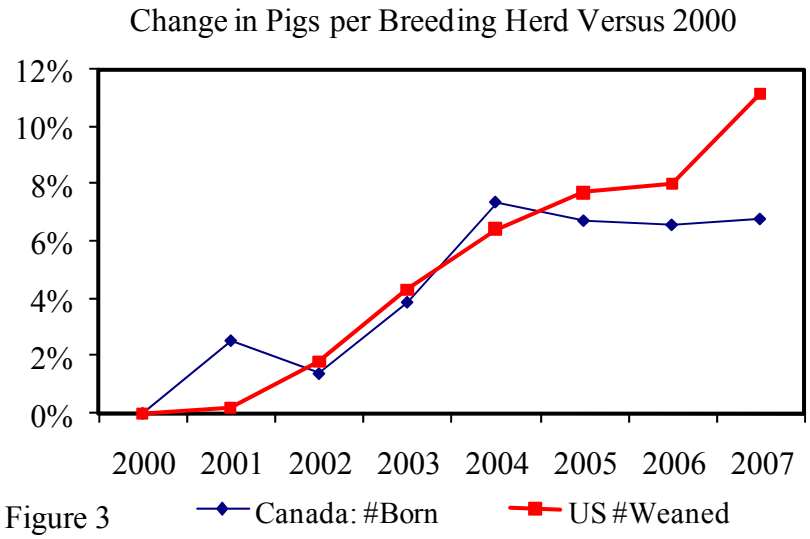

Figure 3

The North American pig crop has increased over 12% or near 16 million head since 2000 (Figure 4). Canada posted a higher percentage increase and until 2007 added more total pigs to the supply than did the US.

Figure 4. Change in pig crop versus 2000 (1000 head).

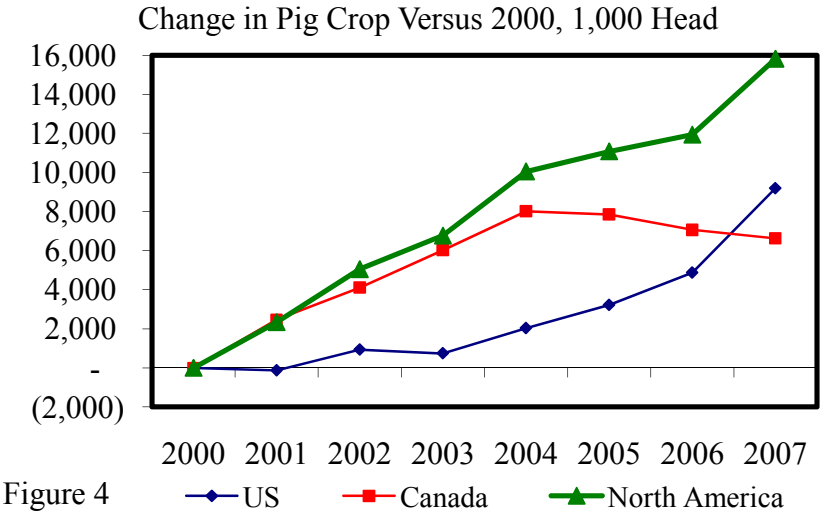

Figure 4

Much of the increased production has gone to exports from both countries as domestic pork consumption has been flat in the US and declined in Canada (Figure 5). Exports have increased in both countries and on a percentage basis much faster in the US (Figure 6). In Canada, export growth exceeded the increase in pork production by 50%. In the US, exports fell 20% short of meeting the increased production.

Both countries will depend heavily on continued export growth if they wish to increase pork production. Population growth in the US and Canada is approximately 0.9% a year. The potential to grow demand lies in tapping new markets as global income increases. This strategy does have risk in the form of higher transportation costs, the strength of the global economy, exchange rate risk, and WTO negotiations.

Figure 5. Change in domestic pork consumption and net exports versus 2000.

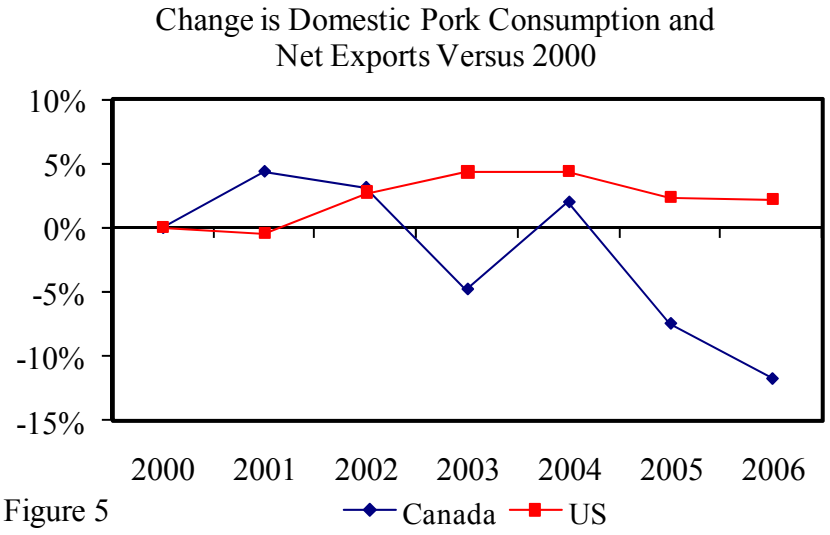

Figure 5

Figure 6. Pork net export (1000 metric tons).

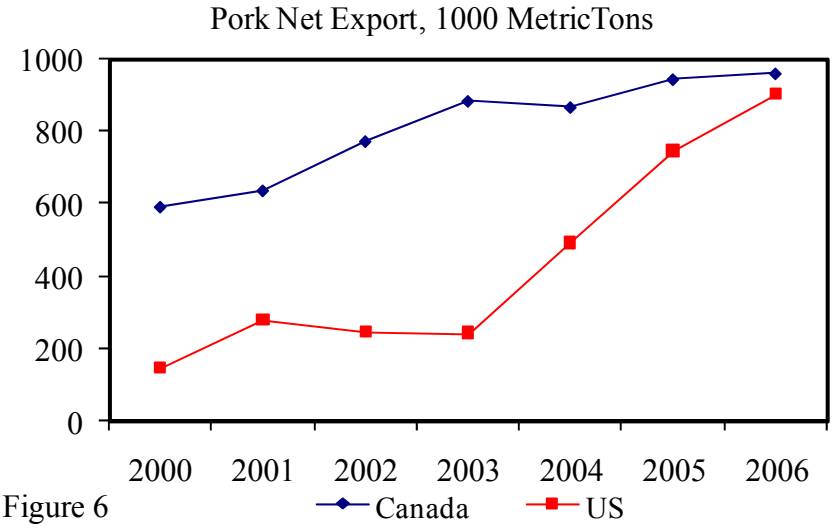

Figure 6

Domestic and export customers are demanding more of their food. These demands are not about wholesomeness, safety from food borne illness, or humane treatment of animals. Those requirements are a given. Demands on food and food producers today are not coming from additional regulations, but rather from customers that have a brand to protect. Organizations with a mission have found that they have a greater impact by attacking the brand than they do by going through legislative channels. Agriculture still has an effective voice in politics and regulation development, but they have less influence with an individual company that chooses to implement standards in order to protect its brand or stock value.

These expectations often deal with animal care, environmental quality, sustainability, fair trade, labor practices and origin. These things have little to do with the science or economics of producing hogs, and everything to do with ethics, trust, and documentation. A good example is country of origin labeling. What started as a protectionist movement by some producer organizations now has taken on new meaning after pets were poisoned by melamine from China. The production sector has traditionally justified its practices based on science and economics. The organizations and individuals pressuring retailers do not care about your economics and may not trust science. Agriculture's defense is often that these additional requirements will drive up the food costs. In the US consumers spend on average less than 10% of their disposable income on food and meat is a fraction of that amount. The vast majority of consumers wouldn't recognize the higher pork prices, and a growing number of consumers are willing to pay a higher price if it fits their preference. The other reality is that some retailers expect the change and expect that they do not have to pay the difference. They see it as a cost of business. As countries try to protect markets for domestic producers and consumers either fear or favor particular characteristics market access will continue to be a critical issue for North American pork producers.

ETHANOL AND CO-PRODUCTS

The 800 pound gorilla in North American agriculture is ethanol. Ethanol and biofuel production is a worldwide phenomena and it is reshaping US agriculture. This new competition for grain and acres has impacted feed prices, feed availability, crop production, and crop input costs.

Ethanol in the US grew out of a perfect storm. Corn growers have supported ethanol production policy for more than 20 years. However, higher world oil prices (nearly a five-fold increase from January 2002 to December 2007), a drive toward energy security following September 11, 2001 and a growing "green" wave pushed ethanol production into high gear. Ethanol has grown up and has its own organization(s) and lobbyists, and the emphasis has shifted to cellulosic ethanol production. US farmers are now more interested in the Energy Bill than the Farm Bill. The 2007 Energy Bill contained a renewable fuels standard of 36 billion gallons by 2022, but "only" 15 billion gallons carved out for grain based ethanol.

A private sector analyst prepared a list of ethanol plants at various stages of production-planning as of August 2007. The industry is dynamic with plans changing with economic conditions in real time, but these figures provide a snapshot of what that sector may look like

in the near future (Table 1). The plants that are producing and expanding last August produced 6.7 billion gallons per year (BGY) and used an estimated 2.4 billion bushels of corn (BBu). The estimated output of distillers dried grains and solubles (DDGS) is 20.6 million tons (MTon). By January the US was producing at a 7.3 BGY pace. When the plants under construction, meaning that they had poured concrete, are included production increases the 11.6 BGY. Adding in those that have broken ground, but had not yet pour concrete, the total was 14.3 BGY. Once these plants are on line it is estimated that approximately 5.1 BBu of corn will be processed into ethanol and over 43 MTons of DDGS will be produced. Plant efficiencies processes may change the corn to ethanol yield and DDGS production, but the ball park will be similar.

Table 1. US ethanol production August 2007: Current and planned.

	BGY	BBu	MTon
Operation-Expansion	6.7	2.4	20.6
Operation-Construction	11.6	4.1	35.1
Operation-Broke Ground	14.3	5.1	43.3
Operation-Planned	36.2	??	??

Note that last summer there were "plans", meaning announcements in the press or discussions within the industry for plants to total 36 BGY. That is the size of the RFS for 2022 in the Energy Bill and there were plans for that much production three months before it was signed by the President. Also note that there is no estimate of the amount of corn used or DDGS produced to achieve this amount of ethanol. It is currently possible to produce ethanol from cellulose in the lab, but it is not at a commercial scale yet.

The Energy Bill identified a target of 15 BGY from grain with the idea that cellulosic ethanol will be a commercial reality soon and make up the bulk of the renewable fuel production is the US. The 15 BGY and 5 BBu are part of the National Corn Growers 15x15x15 policy. Their goal is to produce 15 billion bushels of corn and 15 billion gallons of ethanol by 2015. They assume that advances in corn yields and ethanol plant yields will leave 10 billion bushels for feed and exports. I see two major challenges. First, the numbers may be right for 2015, but we can build ethanol plants faster than we can change corn genetics in the commercial fields to improve yields. Second, while the incentive structure has shifted to encourage cellulosic ethanol, I am not sure there are dis-incentives for producing more than 15 BGY from grain. Obviously, the price of corn relative to the price of ethanol will act as a governor on the speed of grain based ethanol, but that is little solace to livestock farmers.

The increased demand for corn and resulting higher prices is bringing more land into corn production. In 2007, the US planted its largest corn crop since 1944 at over 93 million acres. But, like pushing on a balloon at one place, something changes elsewhere. Soybean and cotton acres decreased dramatically in 2007. Now the battle is on for acres in 2008 and it is expected that corn acreage may decline from the 2007 level. Reputable climatologists have also placed a 70% chance of a drought in the US Cornbelt in 2008 as well. Bottom line is that corn prices will be higher and more volatile than before, and I include 2007 in the "before" category.

Corn and SBM prices have increased significantly from 2005 and early 2006 level (Figure 7). In January 2006 corn and SBM averaged $1.88/bu and $181/ton; in 2008 their prices were $4.53 and $336. In January 2006 estimated total cost of production for Iowa farrow to finish operations was $53.60/cwt carcass. It increased to $74.70/cwt carcass in January 2008. Table 2 is a simple matrix of estimated cost of production at different corn and SBM prices. Current futures prices adjusted for Iowa basis are predicting costs in the mid to upper $70s.

Figure 7. Omaha corn and Decatur soybean meal.

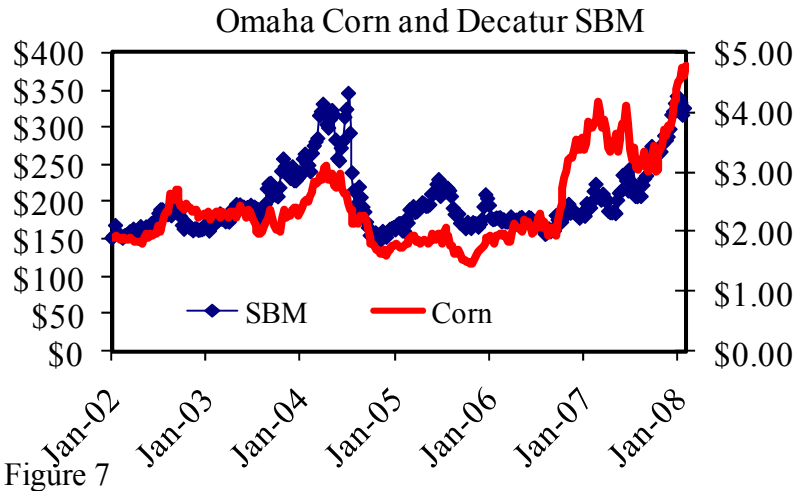

Figure 7

Table 2. Estimated total cost of production for Iowa farrow to finish operations per cwt carcass by corn and SBM price.

SBM/Corn	3.50	3.75	4.00	4.25	4.50	4.75	5.00	5.25
250	65.59	67.06	68.53	70.01	71.48	72.95	74.43	75.90
275	66.47	67.95	69.42	70.89	72.36	73.84	75.31	76.78
300	67.36	68.83	70.30	71.78	73.25	74.72	76.20	77.67
325	68.24	69.72	71.19	72.66	74.13	75.61	77.08	78.55
350	69.13	70.60	72.07	73.55	75.02	76.49	77.96	79.44
375	70.01	71.48	72.96	74.43	75.90	77.38	78.85	80.32
400	70.90	72.37	73.84	75.31	76.79	78.26	79.73	81.21
425	71.78	73.25	74.73	76.20	77.67	79.15	80.62	82.09
450	72.67	74.14	75.61	77.08	78.56	80.03	81.50	82.98
475	73.55	75.02	76.50	77.97	79.44	80.91	82.39	83.86
500	74.43	75.91	77.38	78.85	80.33	81.80	83.27	84.74

The co-product of ethanol production, distillers dried grains and solubles (DDGS) is an increasingly available feedstuff. However, hogs and poultry cannot use them as effectively as can cattle. The current type of DDGS is readily used in hog diets at 10-15% of the ration and

can replace both corn and SBM. There is evidence that higher levels, particularly beyond 20% of the ration negatively impacts hog performance (Table 3) and fat quality.

Pigs are what they eat and the fat in corn oil in DDGS is more unsaturated than other fat sources and the pig's fat becomes more unsaturated and softer. While there is little fat on the lean pork of today, softer fat is a problem for many bacon slicers.

Table 3. Impact on hog performance and carcass lean of feeding DDGS.

DDGS %	DDGS 0	DDGS 10	DDGS 20	DDGS 30
ADG, lbs	1.90[a]	1.89[a]	1.82[bc]	1.78[bd]
Feed:Gain	2.78[a]	2.78[a]	2.78[a]	2.94[b]
Final BW	257.2[a]	258.7[a]	250.6[b]	246.2[b]
No. of days	103.5	103.5	103.5	103.5
Dressing, %	73.4[c]	72.8[c]	72.1[d]	71.9[d]
Lean, %	52.6	52.0	52.6	52.5

a,b Means within row with unlike superscripts differ ($P < 0.05$).
c,d Means within row with unlike superscripts differ ($P < 0.10$).
Source: Whitney, Shurson, Johnston, Wulf, and Shanks, JAS, July 2006.

Producers will trade off some performance if it is economical to do so. However, pork fat quality is a complicated issue. Unlike feed efficiency and average daily gain that belong to the individual producer, pork fat quality belongs to all producers. Packers and processors are raising the biggest concern about fat quality because it disrupts the efficiency and yield of their business. They are finding ways to measure and penalize soft fat. However, if consumers are dissatisfied with pork, they will buy something else. Even if you did not use DDGS, a decrease in pork demand impacts all producers. Unless packers can find a way to effectively identify and signal producers about the appropriate DDGS use, the incentive for individual is to use more than is optimal for the industry.

Corn processing technology to make ethanol is evolving and as it does the co-products will change. There will be improvements in co-products that will allow a larger inclusion rate in hog diets. For example, reducing oil will allow higher inclusion before impacting fat quality. Other technologies are striving to make a corn substitute. Regardless of the changes to DDGS, the markets are efficient and co-products will be priced at what they are worth to somebody. They will be priced at their highest value until that market is filled, then they will be priced at their next highest value, etc. Initially, DDGS were priced for their protein value. Once we had enough protein, their value fell to their corn replacement value. Now that SBM has increased in price so has DDGS value. The bottom line is to not look to corn co-products to be cheap enough to make up for the higher corn price.

Along the theme of priced at their highest value it is important to recognize that once the starch is removed from corn to make ethanol the plant is left with a pile of cellulose with some additional protein and minerals in the form of DDGS. Once researchers crack the cellulosic code, DDGS may be an important feedstock for ethanol production. At a minimum, the ethanol price will put a floor under the price of DDGS.

OTHER OBSTACLES

Higher oil prices that have supported a growing ethanol industry have also led to higher transportation costs of grain and hogs that has implications for some regions more than others. It has also led to higher fertilizer prices and in turn higher values for manure in cropping systems. Production systems and business models that were build on a foundation of cheap oil, cheap corn, and cheap fertilizer are at risk now that these three do not exist. Likewise, production systems in grain surplus regions may not have fully captured these opportunities. Whether it is reducing the carbon footprint to satisfy a retail customer's goal to go green or simple farm level economics, capturing manure value and reducing energy use will be important.

Baby boomers have impacted every facet of society that they pass through. Now that they are reaching retirement the largest segment of our population will be eating less meat. The other demographic shift, at least in the US is the growing Latino population. A recent USDA study found that older people and Latino's consume a below average amount of pork. The demographics are working against pork demand in the US.

Partly related to the demographics above is a pending labor shortage, particularly in the US Midwest. There is evidence that Canada is facing similar challenges. A reduced workforce, at a minimum, leads to higher labor costs. If quality labor isn't available the higher labor cost may come from reduced productivity. Management systems are needed to streamline production practices, provide ongoing professional development for workers, and motivate, retain and grow an effective production team.