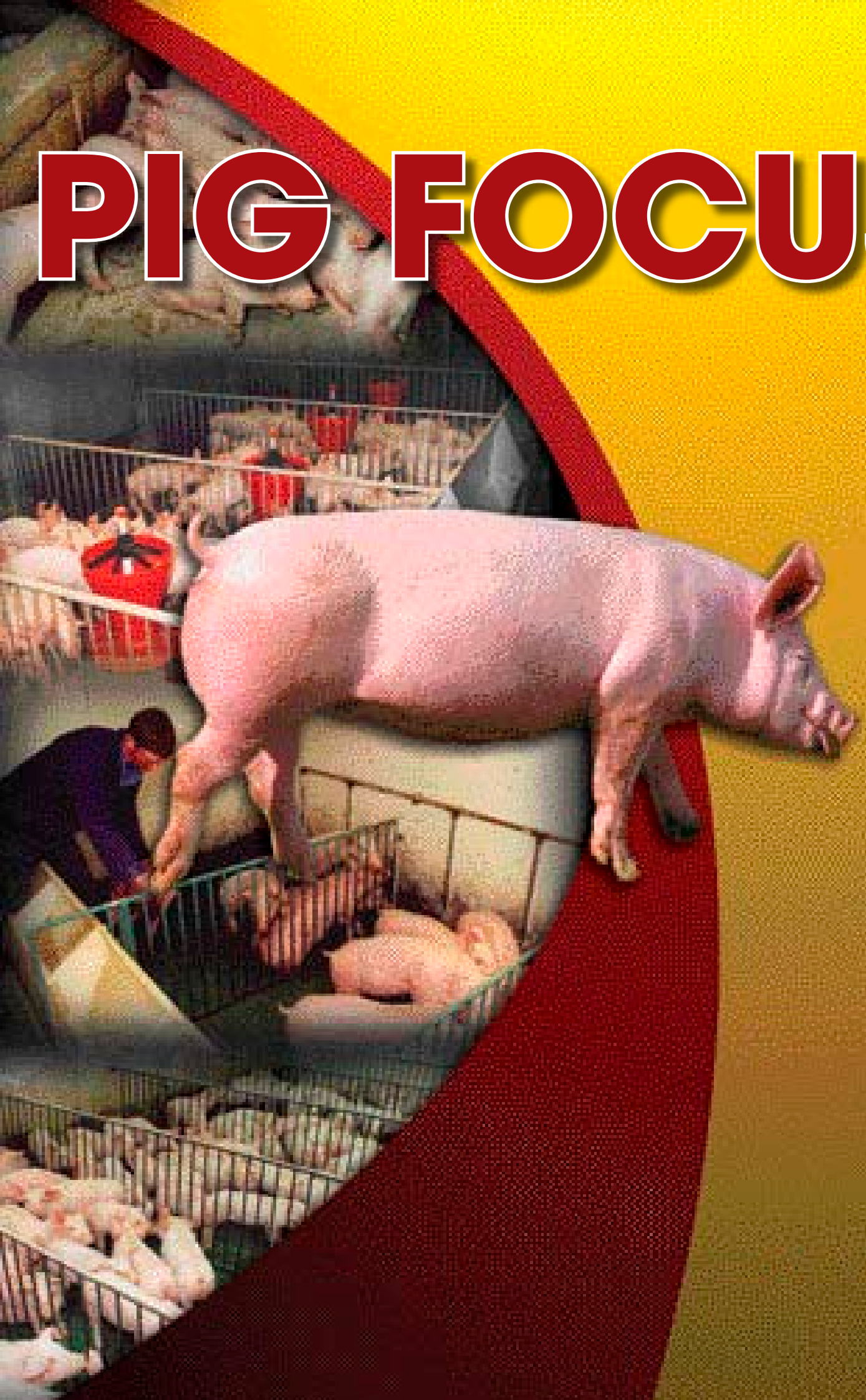
PIG FOCUS



Global pigmeat production – how good are our competitors?

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At the national level, over the last decade we have seen industries in decline that arguably were once world leaders, such as that of the UK, and new major industries have emerged in non-traditional areas, such as in Brazil. At the more local level, regions that have been major producers of pigs, such as the Midwest of the US, are experiencing problems maintaining competitiveness; it is a startling realization that having access to cheap feedstuffs for pigs is no longer a panacea for a prosperous industry.

It is very difficult for an existing industry or for any established producer within that industry to remain competitive in the longer term. The rapid speed of change in technology development and in business models is such that existing approaches are quickly outdated and replaced with more efficient technologies and systems. Producers must be continually updating facilities and equipment and production practices to remain competitive. This is often difficult in a sector where profitability and return on investment is historically relatively low.

In Illinois over the last decade or so we have seen some sobering examples of the dynamic nature of this industry. A substantial number of our relatively large producers that a decade ago would have been considered among the best in the state have gone out of business. In their place, new larger systems of production have emerged that have adopted business models and production systems that have allowed them to develop low cost, very competitive businesses. One of the major reasons why these systems have been able to grow quickly is their extensive reliance on contract finishing. Contracting with another farmer to rear the pigs from weaning to slaughter has many potential advantages the major one of which is that it reduces the capital (in the form of buildings and land) that is needed to expand production.

In the US, and increasingly elsewhere, we have seen major restructuring within the industry with, particularly, the emergence of large-scale production companies. Many of these are vertically integrated, controlling all aspects of production through to slaughter and meat processing. Currently, the largest producer in the US controls more than 20 per cent of US production and nearly 40 per cent of the pigs are produced by just 10 production companies. Many of these companies are expanding into other countries and regions of the world.

On the face of it, there are

Country	Production costs ($US/Kg live weight)			Market Price ($US/Kg live weight)
	Feed	Non-feed	Total	
Japan	0.88	1.29	2.17	2.23
United Kingdom	0.62	1.16	1.78	1.77
South Korea	0.87	0.74	1.61	2.23
Ireland	0.69	0.80	1.49	1.65
Denmark	0.52	0.65	1.17	1.48
Spain	0.65	0.51	1.16	1.21
Poland	0.80	0.33	1.13	1.78
Canada	0.32	0.82	1.14	1.50
Mexico	0.63	0.44	1.07	1.38
China	0.59	0.30	0.89	0.89
Chile	0.40	0.44	0.84	1.21
USA	0. 39	0.38	0.77	0.96
Brazil	0. 44	0.31	0.75	0.98
Argentina	0. 32	0.31	0.63	0.96

Table 1: Production costs and market price in selected countries February 2006 (PIC, unpublished)

many reasons to be pessimistic about the future of swine production, particularly for smaller independent producers. However, not all is doom and gloom and there will be many of opportunities for those that remain committed to the industry and are able to adapt quickly to the rapid changes that we will undoubtedly see in all aspects of our industry and in the political, economic, and social environment that it has to operate in.

Future prospects

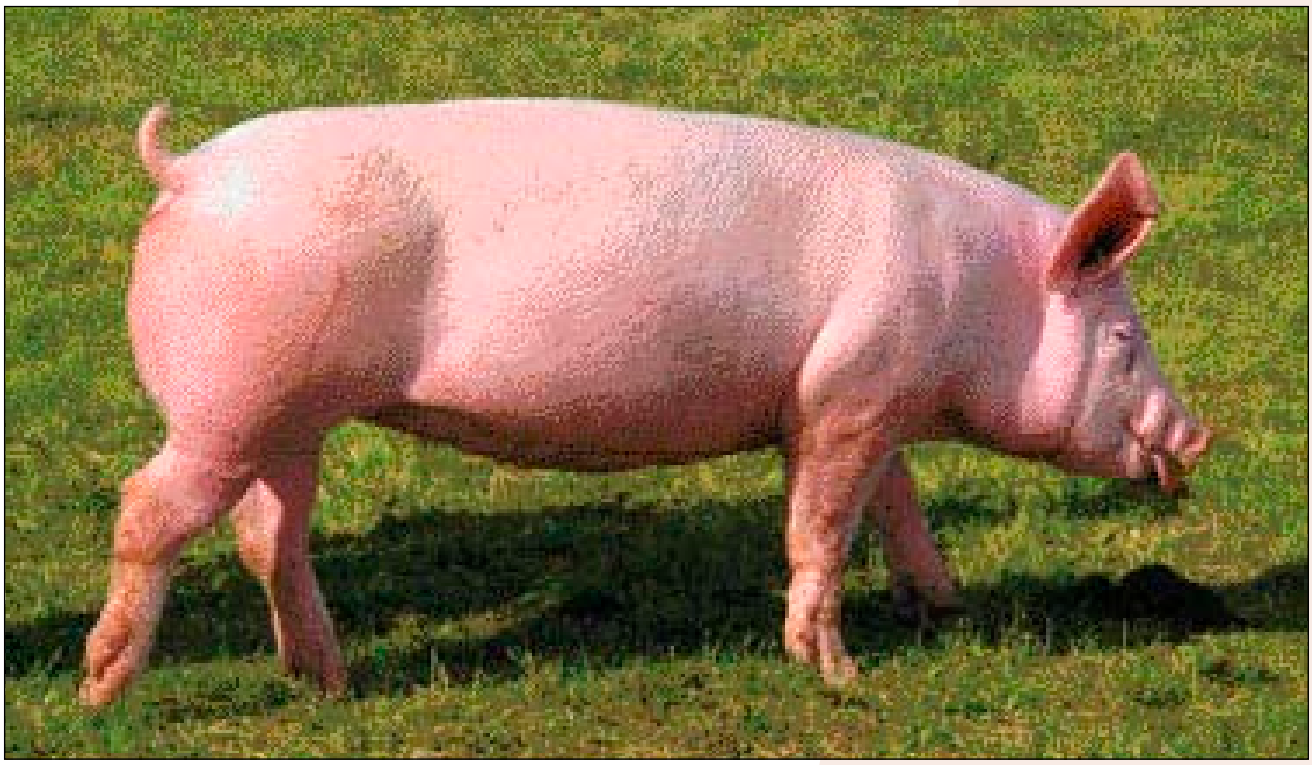
Globally, the demand for pork is increasing and this trend is predicted to continue for the foreseeable future. Projections indicate that by the year 2020 on a world basis the consumption of pork will increase by as much as 3kg/person per year. Given the projected increase in the size of the world population over the same time period, this increase in demand, if it does occur, will result in a substantial increase in the numbers of pigs needed to supply this extra pork. Interestingly, most of the extra demand for pork will occur in the developing world, largely in Asia and Central and South America, where improving living standards will result in a concomitant increase in meat consumption. In developed countries, such as those in Western Europe and the US, pork consumption levels per capita are expected to be relatively static. Although there will be some population increase in these area leading to increased demand for pork, this will be relatively modest. Thus, the major opportunity for expansion for swine industries in the developed world is directly related to their ability to export pork.

Relative competitiveness

In a very general sense, it is possible to identify the major strengths and weaknesses of swine industries in various countries. However, there a few published studies that have attempted to detail the relative economic performance of these industries. Recently, PIC has carried out a comparison of production costs and prices for pigs in the major swine producing countries across the world and the results of this comparison for selected countries is presented in Table 1. Obvious caution is needed when interpreting this type of information and one is reminded of the saying "lies, damn lies, and statistics'. Comparisons such as this one are fraught with problems, particularly in relation to the exchange rates used to convert from the local currency to US dollars. Rates of exchange can fluctuate widely and can have a major impact on such cost comparisons across countries. However, this type of information can be used in a general sense to assess an industries economic strengths and weaknesses.
The countries presented in Table 1 were chosen to represent the range in terms of production costs and this range is considerable; there was a three-fold difference between the countries with the lowest (Argentina) and the highest production costs (Japan). There was also a threefold difference in feed costs between the lowest and the highest and, perhaps surprisingly, a four-fold difference in non-feed costs.
Broadly speaking, these countries could be divided into high, medium, and low cost industries. The highest cost industries (total cost > ~$1.50) include Japan, United Kingdom, South Korea, and Ireland, the medium cost industries (total costs ~$1 to $1.20) include Denmark, Spain, Poland, Canada, and Mexico, and the lowest cost industries (total costs <$1) include China, Chile, USA, Brazil, and Argentina. Unfortunately, Ireland appears to be in the higher cost bracket!
One country that will have a huge influence on global swine production, both directly and indirectly, is China. Over half the pigs produced in the world are in China and the numbers are increasing. Living standards are increasing dramatically and with that there is an increase in meat consumption, including pork. China is obviously a huge market and there will be opportunities for other industries to export pork to that country. The Chinese are committed to producing as much of the pork they need within China. They will need to import an increasing quantity of feed ingredients, particularly corn and soybeans, for the extra production and that will influence world prices for ingredients.

Future prospects

Given that the numbers of pigs produced worldwide will need to increase to meet the increased demand for pork in the developing world, the obvious critical questions include where will these extra pigs be produced, who is going to produce them, and what technologies will be used? Historically pigs were produced and slaughtered and processed close to the centers of population and to a large extent that is still the case today. However, the export trade in pork has increased dramatically in recent years and distribution networks have developed that allow large quantities of product to be shipped around the world relatively cheaply. For example, the major multinational supermarkets, such as Wallmart, and the international fast food chains, such as McDonalds,



commonly source their materials from the lowest-cost sources wherever in the world that might be. These changes will favor an expansion of production in areas that are low cost, such as Brazil, Argentina, and the countries of Eastern Europe, with product being shipped globally from these centers. As an aside, it is interesting that swine production in Argentina has not increased over recent years to the same extent that it has in Brazil. On the face of it, both countries have similar potential to increase production, having vast areas of fertile land on which to grow cereals and oilseeds. However, pork consumption in Argentina is relatively low and it is difficult to develop a large swine industry based solely on exports without a significant domestic market to absorb the product that doesn't meet the requirements for the export market.

Future competitiveness

Political and social climate A colleague of mine is very fond of saying that pigs will be produced wherever the people want them to be produced and there is a significant element of truth in this statement. Successful pork production depends to a large extent on a favorable political and social environment in which to operate. Unfortunately, the political influence of agriculture including the swine industry is declining in many countries, including the US, and the social acceptance of the industry is on the wane.

Barriers to free trade in pork

Many domestic industries have been protected from outside competition by, for example, tariffs on cheaper imports. As long as these barriers remain in place, high-cost domestic producers can survive. Globally, however, there is an increase in free-trade agreements which will result in tariffs on agricultural goods being reduced or even eliminated. Swine producers in many countries will need to produce pork at a price that will be competitive with other industries globally. One barrier to free trade in pork that will continue to protect some industries is that relating to disease. There are many areas of the world were some critical diseases are endemic which will eliminate any potential for such areas to export pork.

Production efficiency and cost

Swine industries lose sight of the need to continually improve production efficiency and reduce costs at their peril. A classic example of where this happened would be in the UK industry. Arguably, in the period from the 1960s through to the 1980s, the UK industry was the leader of developments in swine science and swine technology. It was also one of the lowest cost producers during this period. Today, as illustrated in Table 1, it is now one of the highest cost producers and the industry is substantially smaller than it was 30 years ago. Although there were many factors involved in this demise, the major one undoubtedly was that the industry stopped focusing on reducing production costs and got hung up on other issues.

Technology development and application The rapid development, evaluation, and application of new technologies are essential to maintaining production efficiency.

Research and education systems

A well-organized, appropriately-funded research and education system is essential for the development of successful industries. Historically, research and education in agriculture was largely funded by governments. However, in recent times government funding of agricultural research has been dramatically reduced, particularly in the applied areas related to improving production efficiency. In the future, funding of applied research will need to come from industry and its important that strong partnerships are formed between industry and the research and academic communities to organize and facilitate technology development and educational programs.

Competitive slaughter sector

Maintaining an efficient, low-cost slaughter and meat processing sector is central to future competitiveness for any industry. Arguably, one of the competitive advantages of the US industry is its large-scale, volume-throughput packing plants which have very low costs for slaughter and meat processing.

Sustainable production systems

'Sustainable' is an often misused word that has commonly been associated with extensive, low-input systems of production. However, it is my view that intensive systems can be (and often are) sustainable. The issues associated with intensive, housed livestock production are environmental sustainability, particularly manure disposal, and emissions of dusts and gases from the facilities. In the case of the former, areas that can use manure to fertilize growing crops will have a competitive advantage. There is a large amount of research currently underway to develop cost-effective approaches to minimizing emission from swine facilities.

Available markets for pork

Here I would like to draw the distinction between 'commodity' and 'niche' markets. The former demands large volumes of low cost products whilst the later requires small volumes of products with some special attribute(s). Advocates for niche marketing view it as an absolute alternative to producing for the commodity market. They propose that producing for niche markets is the best way for small producers to remain competitive and in business. The argument that is often put forward to support this view is that niche markets pay higher prices; smaller producers with a high-cost structure can stay in business because the higher returns will compensate for their higher costs. I do not subscribe to such an argument. Certainly there will be opportunities at the local level for some producers to capture niche markets, however, it is my view that they will still need to be lowest cost producers to stay competitive in the long term. One factor that is often overlooked is that niche markets actually depend on having a strong local commodity market to sell the products that don't fit into the "niche". The successful production systems of the future will need to produce at a low enough cost to be able to survive with commodity market prices whilst remaining flexible in their approach to exploit other marketing opportunities. There are many examples worldwide of highly successful systems that have adopted such an approach. There is a very competitive and sizeable swine industry in the middle of the desert in Sonora in northern Mexico that exports a substantial volume of its product to the highpriced Japanese market and sells a lot of product into the commodity market in Mexico.

Size and scale

For as long as anyone can remember, structural changes in agriculture have resulted in fewer, larger farms. In the US swine industry, this change has been taken to the extreme with one company currently producing over 20 per cent of the 100 million pigs produced annually. Many industries are still based on small independent producers and there is a great debate over the future for these operations. In the absence of any legislation limiting the size of companies, there is no doubt that economic forces will continue to drive the increase in size of pig production companies. So what of the smaller producer? I believe that there is a major central role for the smaller producer in the modern swine industry but not as an independent but rather as a part of a larger system. In fact, all of the larger systems are based on a very large number of relatively small producers, often working on contract to the larger operation. The small producer losses some independence but gains all of the benefits of being associated with a large company, a major one of which is a substantial reduction in financial risk. Generally speaking, contract producers supply buildings and labor, and land for manure disposal and in return get a guaranteed payment for their services which is independent of any fluctuation in market prices.

Young people

The life blood of any industry is a steady supply of talented, well-educated young people that can move the industry forward into the next era. Unfortunately, the supply of such people that want to work in the swine industry is declining dramatically in many countries. In large part this is due to a reduction in the number of people working in agriculture and, consequently, a reduction in the number of sons and daughters from farming backgrounds that want to work in the industry. In addition, there are many alternative careers available to young people today. Attracting young people of the appropriate caliber into any swine industry will be a big factor determining its future competitiveness.

Using feed efficiently for growing pigs

Feed accounts for 65 per cent of production costs, therefore it is in your best interest to ensure it is utilized as efficiently as possible, according to Karen O'Connell, Tegasc Moorepark.

Without adequate nutrient intake (determined by feed intake) growth is restricted, throughput is suboptimal and unit productivity, and hence profit are reduced, she says. "Selection of pigs for improved feed efficiency and leanness has inadvertently selected for reduced voluntary DFI (Webb, 1989). Consequently, DFI is now generally recognized as a factor limiting production."

Feed intake versus feed disappearance

She says it is important to distinguish between feed intake and feed disappearance. The difference between the two is waste. If intake of a nutritionally balanced diet is high and growth rate is disappointing then waste is the only explanation.

Factors which influence changes in voluntary feed intake

Daily feed intake is affected by:

- Genetics
- Environment (temperature)
- Diet (energy density, protein/amino acid content, ingredient choice)
- Housing (group size, space allowance)
- Feeding system (wet v dry, hopper, feeder design).

Genotype

Potential for gain and voluntary DFI varies with genotype, according to O'Connell, who says certain breeds of pigs, particularly Duroc, have a higher capacity for ad libitum DFI than others. "In a study in Moorepark, pigs born from seven different sirelines had differences in DFI during weaner stages 1 and 2, which ranged from 742 to 818 g/d, reported that Duroc sired pigs had greater DFI than either Pietrain or Large White from 75 to 120kg." She says that recently many Irish producers have used Pietrain sires because of perceived resistance to PMWS, however, a study of feeding behaviour of different pig breeds from 30kg to slaughter indicated that Pietrains had lower ADG and DFI than Large White or Landrace pigs and took longer to reach slaughter weight (Table 2).

	Target intake range
Week 1-2, post weaning	250-300
Week 3-4, post weaning	600-800
Weaner stage (4-10 weeks)	800-1,000
Finisher	1,750-1,900
Weaning sale	1,350-1,500

Table 1: Target feed intake values for pigs in different stages of growth

Effect of gender

Female pigs tend to eat more than entire males. However, they have lower ADG and poorer FCR. Consider separate diets for females, which have lower requirements for protein and amino acids at heavier weights. Table 3 shows the difference between DFI, ADG and FCR of groups of male and female pigs in difference weight ranges.

Temperature

Animals perform well within a certain temperature range, the thermal neutral zone (or comfort zone, TNZ), which for newly weaned pigs is in the range 28 to 30oC, falling to 18 to 20oC as they approach slaughter weight. Higher temperatures decrease DFI and ADG, while FCR may be unchanged. The effect on DFI is more pronounced in heavier pigs. Pigs on a high level of feed have a lower optimum temperature range. Pigs with low DFI (e.g. newly weaned or ill pigs) have a higher optimum. During the summer months DFI is reduced.

	Large White	Landrace	Pietrain
Daily grain, g	869	854	714
Daily feed intake, g	2,214	2,277	1,704
Feed conversion ratio	2.57	2.68	2.40
Days	88	90	99

Table 2: Effect of breed on performance traits (Baumung et al., 2006)

Table 3: Effect of gender on DFI, ADG and FCR at different weights.

	DFI		ADG			FCR		
	M	F	M	F	sig	M	F	sig
40-60 kg	1,868	1,953	801	814	ns	2.34	2.45	*
40-100 kg	2,494	2,509	882	750	***	2.92	3.30	***

Re-grouping

Re-grouping, e.g. at weaning or transfer to fattening, affects DFI and ADG for a period, according to O'Connell and for younger pigs (e.g. 8 weeks old), the effects of re-grouping are overcome with time, without long-term effects on production. However, re-grouping is not recommended in the finishing facility, due to increased aggression, and less time to overcome the effect. When some pigs are removed from the pen there is disruption to feeding as a new 'pecking order' is established. By removing 1/3 or 1/4 of a pen to slaughter (one to two weeks before the rest), DFI of remaining pigs increased from 1,833 to 2,245g/d (remove 1/3 of pigs) and from 1,829 to 2,098g/d (remove 1/4 of pigs; O'Connell et al., 2005a). However, the pigs remaining had the poorest overall carcass ADG and carcass FCR. While this is probably because those were the slower growing, less efficient pigs, increased wastage as the pigs compete to establish the social order may also be a factor. DeDecker et al., (2005) found that over a 19-day period post removal of 25 or 50% of pigs from a pen, DFI and ADG was greater in the remaining pigs when compared to a control where no pigs were removed. They attributed this partly to increased feeder space. Scroggs et al., (2002) found that removal of 50% of the heaviest pigs one week before their pen-mates lead to increased DFI and poorer FCR post removal compared with pens where no pigs were removed.

Increasing DFI post-weaning

Most piglets will find the source of feed and water within 36 hours of weaning, but it is up to you to identify those that have not. Weaning age is extremely important for maturity of the digestive system. A piglet weaned at three weeks weighing 6kg is not as physiologically mature as a four-week-old piglet at the same weight. This is very important where split-weaning is practiced or where heavier pigs are weaned ahead of their litter mates. A study in Moorepark showed 16 per cent less feed intake, 25 per cent lower ADG and 30 per cent poorer FCR when pigs of the same weight were weaned at 21 days rather than 28 days Weaning heavier pigs at the same age as lighter pigs will result in increased DFI, and ADG, and this advantage will continue to slaughter.

Energy density

Dietary energy content affects DFI but has less effect on daily energy intake. Pigs that have access to a nutritionally-adequate diet in a thermo-comfortable zone adjust their DFI to meet their energy demand. Within a range of energy density diets pigs adjust voluntary DFI so there is little change in energy intake. However, DFI may be limited by the physical nature of the diet, gut fill or the passage rate so that energy intake is reduced on low density diets. This is rare in commercial pig production. A reduced intake of high energy diets means that the expected benefit in increased growth rate may not be achieved.

Feed ingredients and palatability

Some ingredients may become unpalatable if included in high amounts. E.g. canola may contain sinapine (a bitter tasting compound) that may reduce palatability at high inclusion levels (Thacker, 1990). A reduction in performance (due to reduced DFI) of weaned pigs has been found when canola meal in the diet exceeded 9 per cent (McIntosh et al., 1986). Given a choice of a diet containing soybean meal or canola meal, pigs prefer the soyabean.

Water supply

A 60kg pig fed ad libitum will consume approximately 2kg of feed per day. This feed contains about 14 per cent moisture, giving a water intake of 0.28 litres/day. In a wet feed system, water to feed ratios range from 2.5 to 3.5:1. Thus, the pig receiving 2kg dry matter would receive between five and seven litres of water. Newly weaned pigs dehydrate rapidly and must have ready access to drinking water. A supplementary water source may help e.g. turkey or cube drinker. The water must be fresh. Make sure that the correct type of water devices are installed, that piglets can reach and operate them without difficulty. All pigs over two-weeks of age must (by law) have access to fresh water (even if using a wet feeding system). Willingness to drink water will be influenced by water quality and water flow rates. Water must be clean.

How much feed in the tray?

Ensure feeders are closed before adding feed. Then open the slide/gate so that a small amount is visible in the trough. Adding feed with the slide open makes it difficult to adjust correctly. If there is too much feed in the tray, pigs sort through it, causing a build up of fines and a blockage. Smith et al., (2002) suggest that the optimal feeder gap size (opening) for weaned pigs is achieved when 40 per cent of the trough is covered with feed (60 per cent of trough base is visible). If the opening is too small, pigs spend more time at the feeder, but intake is reduced. For grower-finisher pigs adjust the feeders so that at least 70 per cent of the feeder tray is visible and not covered with feed (i.e. approx 25 per cent feed coverage, DeRouchey et al., 2003; See, 2000).

Feed waste

It is generally assumed that if there is spilt feed visible around the feeder, there is 10 per cent wastage, and although the greatest amount is consumed in the finisher stage, do not overlook weaners,

as the diet is more expensive. It is better that only one person checks the feeders in each house preventing accidental closing or opening of feeders.

What can you do on site to improve feed efficiency?

- Check your DFI recorded in PIGSYS over the last number of quarters.
- Can wastage be reduced?
- Keep thermometers in all rooms and observe your pigs for signs of thermal comfort.
- Do not wean younger, lighter pigs.
- Ensure ALL weaned pigs are eating and drinking.
- Have drinkers working optimally – flow rate, accessibility, cleanliness.
- Provide additional water at weaning.
- Check feeders – not too much feed nor too little, adjust and clean.
- Make sure pigs can eat and drink comfortably.
- Multispace feeders are best for weaned pigs.
- Add feed a little (weaned pigs) and often and adjust feeders regularly (all pigs).
- Consider separate-sex feeding.
- Post-weaning 40-50 per cent feed coverage; Grower-finishers 25 per cent feed coverage.
- Replace old, worn, wasteful feeders.
- Keep pictures of properly adjusted feeders.
- Assess your selling strategy, is it working?
- Check that the nutrients in the diet are supplied in the correct amounts for your DFI.

Pig production, health and genetic potential

Marc Cox
PIC Europe

The pig industry in Europe has changed enormously in the last forty years and is likely to change at least as radically in the next ten years. Average herd size has steadily increased and the number of herds decreased.
Scientic advances in genetics and performance, production methods, nutrition and disease control along with improvements in welfare, food safety and marketing have been widely applied and will continue to be applied.
Nevertheless the current pig production has to cope with a number of developments affecting its future, like an increase of costs of labour, farm buildings, energy, environmental costs, welfare, etc and at the same time at the very best a constant but more likely decreasing level of prices for meat or piglets (EC 2006). Those two facts together mean a continuous pressure on cost of production (per piglet and/or per kilogram carcass produced) and on total farm revenue. Therefore, improvement of technical results is required to control cost of production and to increase total revenue; health management is a very important aspect to achieve that.
All over the world the larger producers are focused on the health status of their herds because the economical impact of diseases in both acute and chronic stages is enormous. In different US market surveys between the larger producers, health is in almost all cases considered as the most important factor influencing the financial result of the production herds (see Figure 1).

In most markets the health status of pig production farms has gone down due to increasing farm sizes, more intensive production methods and introduction of new pathogens. For the countries in the Benelux, we estimate that over the last 25 years, the increasing health problems in pig production have negatively influenced the profitability with €10,– to €12, per finishing pig due to increasing vaccination, medication, veterinary costs and lower production results..
For these countries it is estimated by the industry that the difference between conventional and high health production would be 7 – 10% in cost of production per finishing pig.

The importance of health for pig breeding companies

Health assurance and health control are crucial for breeding companies and health therefore is always one of the key drivers for the business of breeding companies.
First of all, breeding companies are the beginning of the Pork Chain and logistically very often the top of almost every production pyramid.
The direct contact between animals is the biggest transmitter of pathogens. Therefore the top of a production pyramid has to be as free of diseases as possible because of the high risk that almost all diseases at the top may be transmitted to the lower parts of the pyramid resulting in a less efficient and less economical production. To protect the companies breeding and multiplication pyramid and the customers production pyramid, the breeding company has to establish and maintain the highest health status possible at the top of its breeding pyramid.
The importance of health in breeding companies is for example reflected in the objective of the PIC Health Assurance Program; To improve and protect the health of PIC and customer herds so they can realise their genetic potential and maximise production and profitability.
As an example for a health assurance program, this is the PIC program which consists of four overall principles:

1. Start-up: All breeding herds should be established in safe locations with the healthiest pigs available.
2. Protect: All breeding herds must be protected against the introduction of infectious diseases. This is known as biosecurity for which there are very strict rules.
3. Monitor: Because biosecurity will never be perfect, herds will occasionally break down with serious infections. In order to minimise the spread of these infections to customers' herds, all breeding herds must be regularly monitored for infection. In most countries PIC for example uses a combination of routine herd clinical inspections primarily by a regional veterinarian, slaughter house inspections and laboratory follow-up if a disease is suspected.
4. React: When a new serious infection is detected, PIC has mechanisms in place for rapid action to prevent its spread to customers' herds. It is essential that a breeding company has mechanisms to quickly and accurately identify the pathogen and to take rapid action. Herds may be shut temporarily and at a later stage reopened, or permanently closed depending on the disease diagnosed.

Increased genetic potential requires a better environment

Another important driver for breeding companies to focus on health assurance and health control is to ensure that the genetic improvement they establish can be utilised by their customers. Over the last decades the breeding companies have made impressive genetic improvement both on individual traits and on the total economical merit of all the trades combined.
High health environments give pigs the possibility to express their full genetic potential for fast and efficient lean growth and high prolificacy. A genetic better pig will even under lower environmental conditions in average perform better then

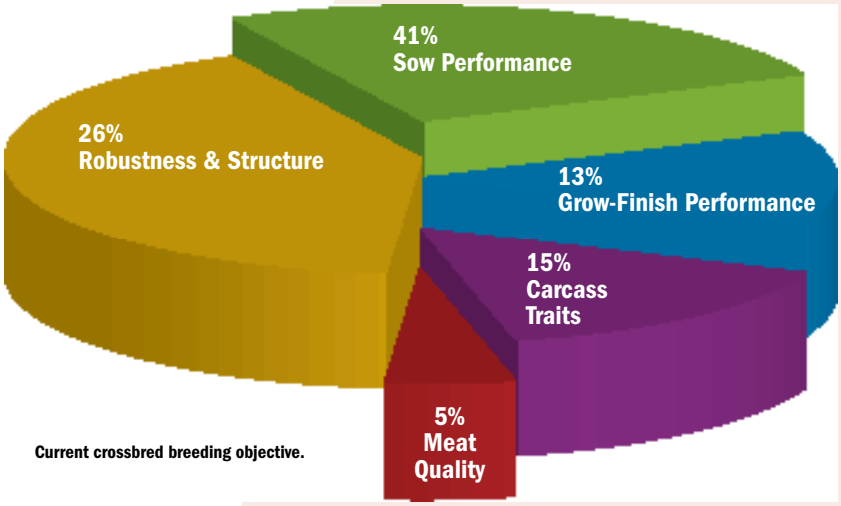
Clean Water For Healthier Pigs

Water is the most important ingredient in the diet of a pig. Because the farmer or farm staff are drinking the water does not mean that the water is of a suitable high quality and potability. The weaner section is the area of the pig unit that is most likely to react to poor quality water. Piglets post weaning require high quality water, free from taints and faecal contamination. It is essential that water quality post weaning remains high so that intake of ration can be maximised and so that growth rates can be maintained.

Water to pig units is sourced from wells, mains or from water courses directly. Of the three possible sources the mains water probably is the safest but is also the most expensive, especially for large piggeries. Shallow wells are more liable to surface water contamination than deep wells. Well water should be tested at least once per year to ensure that it has not become contaminated. Direct sourcing of water from water courses is fraught with danger since most of the water courses in the country would harbour some contamination be it from domestic waste or from other farming activities. Advances in filtration and decontamination techniques as well as ultra violet chlorination can render otherwise poor water into potable water but at a significant cost. There have also been advances in proportioning equipment that allow for chlorine to be added as a proportion of the drinking water.

Mixing tanks, header tanks and feed and water lines should be included in the routine hygiene programme and washed out frequently. Properly fitting covers should be placed over all water and feed tanks to prevent external contamination from birds, insects and dust. Poultry producers are already obliged to go to these extremes after each batch of broilers produced. It may not be long before the same standard will be applied to the pig industry!

Veterinary Ireland's Herd Health Planning Programme is supported by Pfizer Animal Health.



Current crossbred breeding objective.

a genetic inferior pig. But the higher the genetic potential of the pig is, the more it can benefit from a better environment. Differences between the genetically different pigs which might be economically relatively small (€2 – 3,-) under low environmental circumstances can become much higher (up to €15,- per finishing pig) under high health circumstances.
Another important factor to realise is that the decades of genetic improvement have also come with a trade off. We have improved our pigs and other production animals like broilers, dairy cattle intensively on the economically relevant traits. But we also know there is interaction between the genetic potential of animals and the susceptibility to their environment. Broilers were highly selected for heavy body weights and confronted with big problems in legs sound-ness and increased mortality. And although the broilers were confronted with these fitness constrains much earlier then the pig sector, also the pig sector is experiencing the negative effect of years of intensive selection. Years of intensive on single trait selection on litter size has de-creased the vitality of the piglets and increased mortality.
Frank et al. (1997) (Figure 5) showed that the mortality rate was higher in pigs which are challenged with a high infection level when compared with pigs with a low infection level.
Furthermore, they demonstrated that the mortality rate in pigs with a high lean tissue growth capacity plus a high infection level was much higher in comparison to pigs with low lean tissue growth capacity or a low infection level.

Health as a breeding objective

Looking over the past 20 years, breeding objectives have evolved considerably. From relatively simple breeding objectives taking into account only finishing and carcass traits in the 80's, through breeding objectives with more attention for fertility and meat quality in the 90's, to the current breeding objectives taking into account also robustness and survivability traits. Due to the availability of more powerful computers, better software, improved data collection and databases and of course application of marker technology, breeding objectives are not only taking into account more traits, but also generate a higher total genetic merit (as an economic value). Today's PIC breeding objective contains traits connected to health, vitality and robustness like: leg scoring, sow mortality, grower and finisher mortality, pre weaning survival and more (Figure 6). Depending on the lines used, these traits can together form over 30 per cent of the breeding objective on final product level.

Summary

Health status of pig farms has an important impact on the cost of production per kilogram of meat or per piglet produced. An important part of the industry recognizes the economical impact health can have on pork production.
As a pig breeding company, PIC is giving a very high priority to health because of the importance for its own and its customer's herds to ensure that the PIC products can realize their maximum potential in performance and profitability.
Also in the genetic improvement program, health or the ability to cope with more challenging production environments has become an essential breeding objective for future improvement, which is established through quantitative and molecular tools applied to breeding.
Today's pigs can perform far beyond the industries average obtained. A part of this gap will be closed by the breeding companies through changes in breeding objectives towards robust-ness and vitality. But another part of this gap can also be closed by controlling and improving the environment the pigs have to produce in. The whole industry can contribute to reducing the limiting factor of the environment through improvement of health, nutrition, housing and other management of pigs. That way a contributor to a better environment multiplies his own improvement by enabling genetics to perform better and more economically.

Ileitis vaccine helps control in Irish units

Experience on three commercial pig units in Ireland with Enterisol Ileitis, the new vaccine against porcine ileitis (PIA), has underlined its efficacy in controlling this economically-draining disease, according to Boehringer Ingelheim.

All three units had previously been using antibiotics to try to keep ileitis at bay, one had even been injecting pigs as well as including them in the ration.

The benefits gained by the herds from using the vaccine included an end to scour, the removal of in-feed medication, faster growth, improved feed efficiency and more uniform pigs for the processor.

One producer is now clearing his finishing pens in two weeks instead of three, and sometimes four. "It has given me more time to clean and disinfect the pens properly, and heavier, more even pigs are going for slaughter," he states.

Another producer, Mark Adams of Northern Ireland, says use of Enterisol Ileitis has also put an end to tail biting as well as ileitis in his second-stage pigs. "I was suffering pig losses from tail biting, and if I had gained no other benefit apart from curing this problem it would still be worth using the vaccine," he adds.

Mark, who has a 160-sow farrow to finish herd, found the efficacy of antibiotics in feed appeared to decline over time. This required higher amounts – and greater expense – to try to keep control.

His vet, David Stewart, of Strule Veterinary Practice, suggested use of Enterisol Ileitis, and Mark set up a trial. Newly-weaned pigs were divided into two groups as normal – light (average 7.5 kg) and heavy (average 9.7 kg), a 23 per cent weight difference.

Pigs in the lighter group were vaccinated via drinking water provided for four hours in a circular trough. The second group was not vaccinated. By 17 weeks of age the 'lighter' pigs had overtaken the unvaccinated pigs – weighing an average 67.4 kg compared with 65.9 kg. Vaccinated pigs gained an average 658g/day compared with 617g for the control group – an extra 41g/day.

"The change in the pigs is amazing," says Mark. "They have a nice bloom, finished groups are more uniform and reach slaughter weight days earlier. The absence of ileitis and tail biting makes them nicer to manage."

Mark now vaccinates his pigs individually at three weeks of age, with a small drenching gun provided free of charge by the company. "It is a little more labour intensive, but the results make the effort worth while," he says.

Roy Gallie of Co Kildare went minimal disease with his 180-sow closed multiplier unit 15 years ago. But ileitis began to affect this very high health unit, and heavy use of in-feed antibiotics throughout the first and second stages failed to control it completely. Mortality became a problem.

He tried other ways to control ileitis – acids in water, Indian herbs, changing rations – all without success.

Earlier this year Roy started vaccinating weaners with Enterisol Ileitis via their drinking water. The change in his pigs was so significant that vaccination is now part of routine unit management. "We wean pigs on a Thursday and vaccinate them on a Friday," he says.

Scour has disappeared, pigs are thriving well through all production stages, mortality is "minuscule", management is easier – "and we are selling more pigs per sow per year", he states. The removal of in-feed medication alone is saving about €.20 a pig, he says.

Veterinary surgeon Dermot Sparrow of Mossvet in Naas and Portadown says a 250-sow farrow to finish unit in Northern Ireland suffered acute ileitis after repopulating - bringing sudden deaths in grower and finisher pigs.

Symptoms of chronic ileitis followed – scour, poor growth and reduced appetite. The appetite of second-stage pigs dropped dramatically initially. Antibiotics were introduced in feed and later by injection as well. PMWS on the unit was largely overcome by changing genetics, and then attention turned to reducing the use of antibiotics.

A trial on this unit compared two groups of 250 weaners. One group was vaccinated and the other group was unvaccinated but treated with antibiotics. The vaccinated group showed an advantage of 0.1 in feed conversion efficiency and an extra 10g a day liveweight gain during finishing.

The vaccine is now also part of routine unit management and, despite increased stocking rate and hot weather, ileitis is now under control, there is no loss of appetite, and the number of days to slaughter has fallen dramatically. Again, finishing pens are emptying much more quickly.

The producer says he is saving 80p to £1 a pig by removing antibiotics, and a finishing trial shows he is saving 84p a pig in FCE.

Says Dermot Sparrow: "Good hygiene and vaccinating pigs with Enterisol Ileitis before it strikes will help to ensure units don't have to suffer the significant economic consequences of the disease."