
PIG FOCUS

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TRENDS IN PIG HEALTH: ANTIBIOTICS AND VACCINES

While there is a general acceptance of animal husbandry among policy makers, surveys of society's concerns in the EU indicate many individual concerns on the topic

Some of the concerns highlighted centre on the use of genetically modified products; eating food from animals treated with antibiotics; the consequent likelihood of people suffering from or developing resistant bacteria; worries about residues of veterinary medicines in food from treated animals; and, the risks of catching zoonotic diseases from vaccinated animals.

If we focus mainly on the eating of food from animals treated with antibiotics, and the likelihood of anyone suffering from the development of resistance to those antibiotics, it leads to the question: what quantity of antibiotics does the average person consume in a year? Data is presented on the total outpatient antibiotic consumption in the EU – people in Ireland are in the middle of the league table in terms of annual antibiotic consumption levels.

Risks

With this background of normal people consuming levels of antibiotics directly, it is fair to ask what proportion of clinical antibiotic resistance problems are due to animal use? Risk estimation involves estimating the chances of any food-related human illness requiring antibiotics, the chances of clinical failure in these cases, and the proportion of clinical failures due to farm use of antibiotics. What is this proportion and what is an appropriate response?

Pressure groups with a vested interest can find it easy to simply link antibiotic usage in livestock to a failure of clinical medicine usage in humans. This pressure has led to many useful antibiotics being banned and restricted in animals. This has had a serious impact on innovation, in terms of the number of new antimicrobials authorised in Europe for food animals in the past eight years, with no new classes being added. Similarly, the applications for setting residue limits for new food animal medicines received at EMEA in 2005 were only three. These outcomes have had a serious impact on animal health, welfare and production, with a vast increase in the cases of diarrhoea among post-weaning pigs requiring therapeutic and vaccine responses.

There are several current animal-human antibiotic resistance issues in the EU, namely: products for VTEC-EHEC in cattle; the use of cephalosporins in pigs, poultry and cattle; campylobacter in poultry treated with fluoroquinolones or macrolides; salmonella in poultry and pork consisting of multiresistant strains e.g. DT 104; and, multi-resistant staphylococcus aureus (MRSA) in pigs.

Salmonella

EU studies on the sources of human cases of salmonella indicate that the majority are acquired from overseas travel or from imported food products (51 per cent), with a further 25 per cent unknown, but probably from similar sources. In some surveys, cases acquired from EU-derived pork products form only around 20 per cent of the cases derived from eggs.

This therefore raises the question of whether a large programme attempting to reduce salmonella in pig farms will have any real benefit to the treatment of humans with salmonella. Previous EU programmes in this area have been hampered by the use of an inappropriate tool for measuring salmonella levels in pig farms, namely the meat juice ELISA, originally promoted by the Danish industry. This test will pick up any exposure to salmonella during a pig's life, but not whether it has a current infection at the time of slaughter. It therefore greatly over-estimates the actual danger of salmonella occurring in a slaughtered animal and transferring to the edible portions of a carcase. The results of these tests have been used to then go back to pig farms and impose hygiene measures aimed at reducing salmonella infections. An analysis of the costs and benefits of 10-years worth of the salmonella reduction farm scheme was conducted in Denmark. This indicated that the costs of the considerable on-farm efforts leading to the suggested reductions in human clinical cases, due to cleaner pork, consumption cost around €15,000 per human case saved. To add to the confusion, pig contact with organic matter (bedding, soil etc.) likely to contain lots of salmonella is often now encouraged by other groups focused on notions of animal welfare.

Actual reductions in human salmonella cases due to contaminated pork are most likely to be achieved via carcase decontamination methods in the abattoir, with farm improvements a very distant second. In terms of finding pig farms with poor levels of salmonella control, a switch to simple carcase cultures would be of more benefit to the industry and food safety.

MRSA

A further issue has arisen with MRSA in pigs in the Netherlands. Globally, susceptible strains (MSSA) are carried in the nose of 30 per cent of animals, including pigs and humans, and MRSA are carried in the nose of one per cent of animals. However, in Holland, 10 – 30 per cent of pigs and farmers were found to have MRSA strain ST398 some years ago. Further study indicated that this strain is not related to MRSA in human cases and no human death has been attributed to this strain. While it remains an issue for Dutch pig farmers who wish to enter hospital for surgery etc., it is not an issue for the wider community. There is no specific food safety issue with MRSA, both MSSA and MRSA can be directly applied to food by consumers and food handlers and standard food hygiene applies. However, the import of Dutch pigs is probably not a wise choice at the moment.

Appropriate Responses

There are two main approaches that can be taken against the resistance. Pig carcasses can be decontaminated or one can make changes in their antibiotic usage.

The decontamination of finishers from infected herds with water, at a temperature of 80ºC for 15 seconds, will reduce the number of surface bacteria on the carcasses quite effectively.

You can also use new vaccine products instead of excess antibiotics. Current vaccines for production pigs in the EU include mycoplasma, ileitis, PCV 2, CSF, PRV, and PRRS and for breeder pigs include PRRS, E. coli, erysipelas, parvovirus, and SIV. The ileitis and mycoplasma vaccines are widely used in Europe and America and are credited with reducing the need for medications in the finisher stages on most farms. PCV circovirus vaccines for piglets and sows have also been widely used and are very effective at stopping wasting problems requiring antibiotics through the grower and finisher stages. Unfortunately, current PRRS vaccines are probably inadequate for full control of this disease. Luckily, in the EU, we only have mild strains. Many US and EU farmers are not vaccinating production pigs for PRRS, but use management techniques to control PRRS, starting by isolating breeding pigs.

Besides the vaccines listed, there is some research activity in bacterial disease vaccine development, with many projects looking at candidate vaccines for glasser's disease, strep suis meningitis and actinobacillus pleuropneumonia (APP). All these bacterial infections colonise the upper respiratory tract and are still associated with high morbidity and mortality on many pig units.

These developments point to vaccine company R&D responses to future-gazers predictions that pigs will suffer major restrictions in antibiotic usage, with vaccines expected to fill the gap in health. US style multi-site operations, with 50km between each of the three farm phases, are often touted as a good way to reduce farm infections, but the suggestion ignores the reality of obtaining the necessary capital in Europe.

The restriction of antibiotic usage in animals to those not used in humans has been a trend for some years and may continue. Many vested interests point to the levels of antibiotics placed in feed and water for food animals as being intrinsically bad. In this debate, a schism can open up between those caring for companion animals and commercial farmers caring for food animals.

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NUTRITIONAL REQUIREMENTS AND RESPONSES OF MODERN PIG GENOTYPES

Many factors influence the performance of the grower and finisher pig, but the key factor influencing the efficiency and cost of production is nutrition

In many countries the cost of feed may represent 65-70 per cent of the total cost of production.
Indeed, the grow-finish period is the most costly, accounting for two-thirds of the total feed costs. So, how can productivity be increased in this period and costs reduced? Despite the considerable improvement in pig production, the performance of the grower and finisher pigs on many farms is well below their genetic capacity.
The modern pig has a potential maximum protein gain of 200-240g/day and this equates to a growth potential of 1.2-1.3kg/day. Yet on many farms, the growth rate is often below 0.8kg/day. Thus, the actual performance may only be 50-60 per cent of the animal's true genetic potential.
The first step in improving and optimising production is therefore to 'take stock', to establish the actual level of performance as achieved on-farm and to set targets (Table 1). A nutritional program and feeding strategy to meet these new target levels of performance can then be devised and implemented.

Table 1: Target levels of performance for the modern growing-finishing pig

Age (days)	Body weight (kg)	Feed intake (kg/day)	Graowth rate (kg/day)	Feed : gain (kg/kg)
55 – 83	20 – 40	1.40	0.70	1.85
83 – 106	40 – 60	1.90	0.85	2.20
106 – 128	60 – 80	2.40	0.92	2.55
128 – 148	80 – 100	2.80	1.0	2.80
148 – 169	100 – 120	3.00	0.85	3.50
Overall	20 – 120	2.25	0.85	2.65

To be that precise, however, necessitates weighing pigs throughout the grow-finish period, as well as recording their feed intake. Thus, during both summer and winter, selected pens of pigs should be weighed every two weeks throughout the grow-finish phase in order to calculate their growth rates at the different ages/body weights. These should then be compared with target growth rates and corrections made, if necessary.
If the actual growth rate is below expectation, then extra feed will be required and the time taken to reach slaughter weight is longer.

Energy and Amino Acids

Once the target levels of performance at the different ages and body weights of the animals have been established, the nutrient and dietary requirements can be calculated. The requirements change as the animal grows and develops and, therefore, feeding only one or two diets during the growing and finishing period is unlikely to meet these changing requirements: at times there will be periods of under- or over-supply of nutrients. During periods of under-supply, the animal cannot meet its potential for lean tissue growth, whereas during periods of over-supply there is excretion of expensive nutrients, which is not only wasteful and results in poor feed conversion efficiency, but also increases environmental pollution. Thus, the more diets that can be fed, the better.
In terms of amino acid balance, lysine is the most critical amino acid for growth and, therefore, the most essential. However, the other essential amino acids need to be considered.
There may be some change in the balance of amino acids relative to lysine at different body weights and growth rates because of the changing proportion of each amino acid needed for maintenance and the rate of protein gain. However, with the exception of a few amino acids, such as arginine, the sulphur amino acids and threonine, these are small and hence for simplicity a constant proportion relative to lysine may be used, regardless of body weight.
The requirement for some amino acids, for example threonine and tryptophan, may be higher under certain stress and disease situations, but the exact requirement has not yet been established.
Interestingly, leaner genotypes require higher dietary specifications than more conventional breeds, but utilise the diets more efficiently, since a greater proportion of growth is lean (1g protein + 3.34g water) which is deposited more efficiently than fat.

Minerals and Vitamins

Minerals and vitamins are involved in many endocrine, physiological and metabolic processes in the body, as well as providing structural components, and are essential for optimum growth and development.
In terms of minerals, there is increasing interest in the form

of the mineral and its availability to the animal. Generally, organic minerals are more available than inorganic minerals and can be used at lower rates of inclusion, thereby reducing mineral excretion levels. This has recently been demonstrated in studies by Hernandez *et al.*(2009), when different levels of inorganic and organic (proteinate amino acid chelate) copper and zinc were fed to grow-finish pigs between 27kg and 107kg body weight. Irrespective of the level of Cu and Zn, there was no significant effect ($p>0.05$) on growth rate, although feed conversion ratio was improved ($p<0.05$) by the inclusion of proteinate amino acid chelates. Cu and Zn content in faeces were in direct proportion to their inclusion level in the diet. Reducing Cu and Zn in grow-finish diets from 50 to 0 mg/kg Cu and from 80 to 40 mg/kg Zn, reduced faecal Cu and Zn by 90 per cent and 40 per cent, respectively, without compromising growth. However, when Cu supplementation was 0 mg/kg, Cu in the liver approached marginal levels, suggesting that some dietary Cu needs to be added in grow-finish diets, especially for pigs reared in commercial conditions when the animals are stressed and challenged by disease, environment and inappropriate stocking density. In the European Union the total level of Cu allowable in the diet for pigs from 10 weeks of age is 25mg/kg: for zinc the level is 150mg/kg.

Nutrition and Disease

In addition to causing mortality, disease influences the immune response of pigs and hence performance. Following a disease challenge, a series of metabolic events occurs which results in an increase of acute phase protein production in the liver. Acute phase proteins serve different physiological functions of the immune system and are a useful indicator of inflammation, oxidative stress or other immune responses; the higher the immune challenge or level of stress, the higher the level of acute-phase protein production. However, they are nutritionally demanding, resulting in less nutrients available for protein synthesis and hence growth. In addition, appetite is also reduced. Williams *et al.* (1997) have shown that grow-finish pigs of low health status (high immune system activation) have lower levels of performance than pigs of high health status (low immune system activation).

Feed intake reduced from	2.70-2.45kg/day
Growth rate reduced from	0.93-0.76kg/day
Feed : Gain increased from	2.90-3.25kg/kg
10th rib depth increased from	2.79-3.11cm

A number of procedures may be used to improve health and immune status, including an appropriate vaccination programme, better hygiene and sanitation on farm; as well as dietary intervention strategies, such as the inclusion of specific amino acids, special dietary ingredients, minerals, vitamins, fatty acids, neutraceuticals and mannan-oligosaccharides in the diet.

One procedure to assess their effectiveness is to measure the concentration of haptoglobulin in blood, as it indicates the level of acute phase protein production: the higher the concentration, the higher the challenge. In this respect, Gymnich and Petersen (2004), have investigated haptoglobin as a screening parameter in health management systems. They found that the level of haptoglobin was related to the hygiene and health status on farm and, as a consequence, the lower the daily growth rate, the higher the level of serum haptoglobin concentration (0.89mg/ml at growth rates >350g/day, compared with 1.19mg/ml at growth rates <350g/day). Pigs with veterinary treatment costs above €1.50 in the rearing period had significantly higher haptoglobin levels (0.50mg/ml) compared with pigs which had lower veterinary costs (0.33mg/ml). Similar responses have been reported by Le Floc'h et al. (2009). This procedure therefore offers the possibility to assess health and hygiene status on farm and to develop appropriate nutritional strategies to improve health and performance.

Other Factors

Other factors that can influence nutritional requirement and availability are feed form and quality, the application of exogenous enzymes, availability of water, the extent of feed wastage, appetite, mycotoxins, environment and housing conditions, as well as overall management and stockmanship.

Suggestions for optimising performance of the grow-finish pig (Close and Turnley, 2004)

1. What is the growth rate of your pigs? Monitor performance regularly.
2. Target growth rate (20-120kg bodyweight): 850g/day and FCR of 2.65:1.
3. Poor growth costs money: each 100g/day reduction in growth (20-100kg) costs €6/pig.
4. Optimise lean tissue growth: higher growth rate, better FCR, reduced P2 = higher carcass value.
5. Overall herd FCR Target: 2.80kg/kg live weight; 3.50kg/kg carcass weight. How do your values compare?
6. Good quality diets are essential; minimal changes of ingredients and low anti-nutritional factors (ANFs).
7. Avoid excessive feed wastage. It is expensive and should not be >5 per cent.
8. Good bin hygiene is essential to reduce moulds and mycotoxins: consider mycotoxin binders.
9. Wet feeding or wet and dry feeders give better FCR values and growth rates than dry feeding.

New Age Ingredients in Pig Nutrition

An interesting development in the formulation of diets for the grow-finish pig has been the availability of novel feed ingredients. These include lupins, peas, field beans, dried distillers grain and solubles (DDGS), glycerol, sorghum, rye, triticale; as well as the traditional ingredients, such as cereal products and by-products, soya bean meal, rape seed meal, sunflower meal and fish meal.

In terms of the 'new ingredients', perhaps the most interesting is DDGS as a consequence of the rapid expansion of the ethanol and bio-fuel industry in many parts of the world, including Europe. Of specific interest is the use of cereal grains including corn, wheat, barley, rye and sorghum. Corn and wheat have been the major grains of choice in the USA and Canada and a plant producing 350,000t of DDGS from 1m tonnes of wheat will soon start production in the UK.

The crude protein and fat content of wheat DDGS is higher than that of corn DDGS while the total lysine content is similar. The fat content in wheat DDGS is lower and the crude fibre content is higher, resulting in lower ME and NE content compared to corn DDGS.

The available phosphorus content of wheat DDGS is higher than many sources of cereals, but is lower than that of corn DDGS: the fermentation process removes a lot of phytic acid.

The digestibility of amino acids in DDGS may be reduced during processing and drying and may be quite variable between samples. With the exception of lysine, the digestible amino acid content is similar to rape seed meal.

A number of other features also need to be considered when using DDGS:

- DDGS, if not dried properly, is a potential source of mycotoxins. It is therefore recommended, as a security, that a mycotoxin binder be added.
- The amino acid content needs to be checked, as this may vary; the digestibility of the amino acids may be reduced during processing and drying of the product.
- One consequence of feeding too high a level of DDGS may be the quality of fat, with soft carcass fat.

How much can be used? Recommendations are to a maximum of 10-15 per cent in grower diets and 20-25 per cent in finisher diets. However, in a recent review Stein and Shurson (2009) suggested that 30 per cent DDGS could be fed to grow-finish pigs without any impact on growth performance. The normal ingredients to replace would be soya bean, wheat feed and some cereal. However, it is important to maintain both energy and amino acid content and synthetic amino acids may need to be used. It is also important to formulate the diets based on NE and digestible AA content. Indeed, when these principles were followed, there was no negative effect on performance up to 20 per cent DDGS inclusion level (Stein and deLange, 2007).

Overall Conclusions

The modern pig has considerable genetic potential to grow and to convert feed most efficiently. However, unless all elements of the system are favourable, this cannot happen and growth rate is reduced and the conversion ratio (FCR) increases. Nutrition plays a key role in efficient production and it is important that the diets not only are designed to meet the changing needs of the animals, but are also formulated to optimise appetite, to enhance the immune status of the pig and to ensure the highest quality.

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DO YOU COMPETE ON COSTS?

International comparisons provide a further insight into the differences between countries for production costs and for the efficiency of producers

Money made the headlines when an international group of pig-industry economists reported recently on their latest comparison of production costs between countries. However, an equally practical aspect from a producer viewpoint may have been that they also compared efficiency in terms of herd-level measures such as labour utilisation and feed conversion rates.

The group is called InterPig and it was reporting on a Pig Cost of Production comparison for the year 2007, covering the member states of the European Union and the transatlantic competition from Brazil, Canada and the US. By the assessment of these economists, the average cost of producing pigs in the EU countries in 2007 showed an annual increase of 12 per cent. Virtually all the extra cost was down to record-high prices for feed ingredients, of course. Even so, the total cost rise was found to have varied quite widely from one European country to the next. At the top there had been annual increases of 19 per cent for Belgium, 16 per cent for the Netherlands and 12 per cent each for Britain and France. Lower down the scale, costs were up by 11 per cent in Spain and Sweden, 9 per cent in Germany, 8 per cent in Ireland and 5 per cent in Austria.

A commentary on these findings by Tony Fowler of AHDB Meat Services in the UK has pointed to higher rises in the USA (over 12 per cent in dollar terms), Canada (over 22 per cent) and Brazil (18 per cent), while including a reminder that the total cost per kilogram of carcase weight in each of these countries was still lower than in the European Union. He also repeated an earlier caution about comparing Italy's costs with those for the rest of Europe because of the significantly higher Italian slaughter weight associated with prosciutto ham production.

How Countries Compare

By Fowler's analysis, the members of the European Union in the high-cost category remain Italy, Britain, Sweden and Austria. Relatively low British carcase weights contribute to apparently higher national costs, he adds, as the total cost per pig is divided by fewer kilograms.

The medium-cost category for EU members comprises Germany, Ireland and Spain, he continues. But they differ in cost components. For example, whereas Ireland and Spain have some of the highest feed costs in the European Union, Germany's feed costs rate second-lowest of all member states.

The low-cost countries in Europe are France, Belgium and the Netherlands. He says countries in this cost band are characterised by a combination of superior technical performance and low feed prices.

His analysis makes clear that feed costs rose in 2007 at rates ranging from 10 per cent for the USA to 44 per cent for Canada. Across the European Union the average uplift was 21 per cent. Brazil's feed cost rose by 17 per cent during the year, according to this calculation.

More Productive Labour

Labour inputs receive a detailed commentary in his report. The average for EU members in 2007 as in 2006 was 0.99 hours per finished pig produced, he explains. Improved labour productivity for most of them over the past five years is attributed largely to the fact of more pigs per sow/year leading to a decline in hours/year. A 2 per cent improvement in the number of pigs finished per sow helped the EU average labour cost per pig fall by 1 per cent from 2006 to 2007.

Brazil's labour costs per hour were the lowest of any country in the InterPig survey. They therefore continued to give the lowest cost of labour per kg produced, despite the Brazilian number of hours per finished pig being over three times the EU average.

A closer look at production cost developments in the Netherlands has been undertaken by Dutch economics institute LEI on behalf of the national Ministry of Agriculture, Nature and Food Quality and the Product Boards for Livestock, Meat and Eggs (PVE). With LEI economist Robert Hoste being a prominent member of InterPig, the assessment overlaps what the group had to say about the cost comparison between countries for 2007.

A new report co-authored by Mr Hoste with Linda Puister has been issued with the Dutch-language title of Productiekosten van Varkens: een internationale vergelijking (for details, see www.lei.dlo.nl/publicaties). It adds to the InterPig comparison an assessment of the cost increase per country until the year 2013 resulting from social societal demands on production.

In 2007, producing each kg of slaughter weight on a Dutch pig unit was reckoned to have cost €1.40 (up to €1.47 when adding value-added tax) and 52 per cent was due to feed expenses. However, some pig producers nationally might be able to cut their cost by improving labour productivity. The report says this factor explains part of the considerable variation in production costs between farms in the Netherlands. There is a close relationship between labour productivity and production costs in both sow herds and finishing units.

Moreover, Dutch units that wanted to expand would need to have so-called production rights costing the equivalent of €0.05/kg of pig produced. When InterPig compared European countries for their 2007 pig-producing costs the result was shown excluding value-added tax and production rights. On that basis, the Netherlands and Denmark were the cheapest pig producers. But the LEI investigation has concluded that adding the costs of production rights would show the Dutch industry to be at a cost disadvantage compared with the Danes.

Since 2007, say the authors, there has been a clear increase in production costs in the Netherlands, illustrated by a 56 per cent rise in price for the average pig feed between July 2006 and June 2008. A cost per kilogram calculation for Dutch pork at mid-2008 feed prices would be €1.58 or around 25 per cent more than calculated for 2006.

The investigators contend that the rise in production costs caused by the increased feed price was generally higher in other countries than in the Netherlands, because Dutch units had a better feed conversion rate for grow-finish pigs.

Another contention from the report is that costs vary from country to country in Europe because of differences in regulations (Figures 3 and 4). Within the European Union there is said to be an inequality in government measures relating to environment, animal welfare, animal health, public health and spatial planning.

According to LEI analyses the environmental costs paid by pig producers in the Netherlands are likely to rise from around €0.11/kg in 2007 to €0.13/kg in 2013 as a result of government policies on reducing ammonia emissions. In other countries of Europe the equivalent costs were only between €0-0.05/kg, but France, Germany and Denmark by 2013 can expect increases to a level of €0.05-0.06/kg.

Animal welfare measures in the Netherlands are predicted to incur costs rising from €0.02/kg in 2007 to €0.05/kg in 2013. In Germany, by contrast, these additional costs for welfare measures are forecast to rise only to €0.01/kg and in other countries they will probably stay at almost zero.

There are also costs relating to public health measures and to spatial planning that need to be taken into account. The overall figure suggested by the LEI authors for the extra costs due to policy measures in the Netherlands in 2007 was €0.20/kg. This compared with €0.08 in Denmark and Spain, around €0.07 in Germany and €0.06 in France and Poland.

"The costs of policy measures in Europe will further increase in the coming years," the Dutch report insists. In net terms, their cost in the Netherlands until 2013 will rise by €0.06 to total €0.26/kg. The predictions for Germany and Denmark are an increase to €0.12/kg and for France to rise to €0.08/kg.

It will mean the all-in production costs in the Netherlands in 2013 will move closer to €1.58/kg, says LEI, whereas France will be around €1.49/kg and Denmark €1.44/kg.

From www.pig-international.com

David Owens

PIGMEAT MARKET PROSPECTS

The prospects for the Irish pigmeat sector will depend on the supply of pigmeat in EU and global markets, currency fluctuations, the economic impact on consumer spending and our ability to export to international markets

Following a few years of both strong demand and pig prices, production in Europe peaked in 2007. This was followed by a weakening in demand in the EU and export markets, leading to an over-supply of pigmeat in the European market. This surplus situation was exacerbated by a sharp increase in the price of feed, placing massive economic challenges on producers in Europe, leading to wide scale exiting from the industry.

Despite declining production across Europe, Ireland remains approximately 107 per cent self-sufficient in pigmeat, meaning that exports to international markets are critical for the EU industry. To date this year, consumer-purchasing trends have shown a relatively robust level of activity in the pigmeat sector, however it is expected that overall demand across Europe will be affected by the current economic downturn.

Decline In Pigmeat

Results from last December's EU pig census show a sharp decline in total EU pig numbers. There was an estimated 153 million pigs in the EU last December, some 4 per cent less than a year earlier, while a drop of as much as 6 per cent was reported for the EU breeding herd. This reflects the exiting of producers from the industry over the past number of years and the only modest recovery in profitability for producers last autumn as a weakening market offset some of the gain experienced from the fall in feed costs.

In Germany, Denmark and Spain, the largest producers within the EU sow numbers fell by at least 5 per cent. A further fall of 5 per cent with in-pig gilts and up to 9 per cent for maiden gilts suggests little recovery in the EU breeding herd, particularly in the short term.

The greatest rate of decline in pig numbers was most evident in Eastern Europe, where farms are on a much smaller scale than in Western Europe and investment has been limited over the past number of years. Falls of close to 20 per cent in sow numbers were reported in Poland and the Czech Republic.

Despite the dramatic fall in the EU herd, pigmeat production across the EU fell by just 2 per cent in 2008. The decline in breeding pig numbers had little impact on production during the first half of 2008. However, finished pig supplies did tighten from the autumn onwards, resulting in production during the second half of the year falling by 3 per cent. In the final quarter of 2008, the fall in EU production was much more pronounced and was estimated to have decreased by as much as 5 per cent year-on-year.

This trend of falling production has continued into 2009, with the EU Commission at a recent forecasting meeting predicting a fall of 3 per cent for the year. EU production is forecast to fall by almost 600,000 tonnes to 22m tonnes for the year.

For Germany, the largest producer within the EU, 2008 was a record year, reaching 4.5m tonnes. The industry in Germany has not been immune to economic pressures, with a large number of producers exiting the industry.

A census carried out late last year indicated that nearly 20 per cent of mainly smaller producers had ceased production. On the continent there is a massive trade in live pigs, with the highly efficient German industry the principal destination importing pigs from neighbouring countries where environmental regulations restrict production.

Following a 5 per cent fall in production last year and the continued decline in their herd, this year Danish production is forecast to decline by a further 5 per cent. Finished pig supplies to date this year are 13 per cent lower than in 2008, with live exports increasing strongly. Over the past four years, Danish live pig exports have trebled.

Marginal Decline In UK Production

Pig supplies in the UK market, which accounts for over 50 per cent of Irish exports, are forecast to fall by just 1 per cent this year, with a recovery for 4 per cent anticipated for 2010, assuming a turnaround in their breeding herd. To date this year, throughput has fallen in the UK by 7 per cent, however numbers in Northern Ireland have remained relatively steady.

In the UK, supplies will continue to contract throughout the second quarter of 2009, before increasing in the second half of the year. Sow throughput is back by up to 30 per cent this year, however numbers last year were boosted by producers exiting production and the backlog created the previous autumn due to the Foot and Mouth disease outbreak.

Lower Irish Pig Supplies

In last December's pig census, carried out by the CSO, the Irish breeding herd had fallen by 4 per cent year-on-year. The sharp fall in the number of replacement gilts had indicated that the fall in the breeding herd was to continue. However, on a somewhat positive note, when compared to the previous June 2008 survey, the breeding herd was unchanged, indicating some stabilisation as the market improved slightly through the autumn period.

Pig supplies at Irish export meat plants up to early May were 8 per cent or 76,000 head below the same period last year at 871,000 head. Of this total, finished pig supplies were 8 per cent lower at 842,000 head, combined with a three per cent drop in sow/boar disposals. Weekly supplies at export plants are running on average close to 45,000 head, compared to 50,000 across the same period in 2008.

Annually Ireland exports close to 500,000 live pigs to Northern Ireland for direct slaughter. To date this year, numbers are just three per cent below 2008 figures at 153,000 head. Total Irish finished pig supplies (domestic slaughtering and live exports) are 7 per cent or 80,000 head below 2008 figures at 1.08m head.

For the remainder of 2009, a drop of around 5 per cent in finished pig supplies would have been expected, due to the fall in the Irish breeding herd in 2008. However, the removal of pigs from a number of farms following the dioxin crisis will further reduce availability. It is estimated, that given the numbers of sows on these farms, finished pig supplies in 2009 could be down by as much as 10 per cent. For the year, pig supplies are expected to be less than 2.24m head.

The return to production of farms destocked in December 2008 is expected to result in an increase in finished pig supplies from early 2010.

EU Pig Prices Marginally Lower

The average EU pig reference price for the year-to-date from the EU Commission is marginally below 2008 levels at €1.38/kg dw exc. vat. Average prices have been increasing steadily since mid February, with the latest reported price of €1.43/kg, three per cent below the same week in 2008. Pig prices to date this year are lower across a number of European countries: Germany and Spain 2 per cent; the Netherlands 1 per cent; Italy 5 per cent; and, France unchanged. The average Irish pig price to date this year, of €1.31/kg, is 2 per cent below 2008. Irish prices are currently at 95 per cent of the EU average.

Bucking the general price trend is the UK, where tight supplies and a good domestic demand for pork relative to other meats has led to strong prices on the UK market. In euro terms, the UK price has averaged 5 per cent higher than last year at €151/kg. UK year-to-date pig prices are 13c/kg higher than the EU average, however current prices are 23 c/kg or 16 per cent higher.

Some pig price forecasts from the EU Commission are projecting an average EU price of €1.58/kg during the summer months, some 9 per cent below last summer's peak. The average price at the end of the year is forecast to be relatively similar to 2008.

Consumption Patterns

In the face of higher retail prices, pork consumption levels have been holding up better than beef or lamb as current pigmeat demand across Europe is reported as relatively steady.

Household purchases of pigmeat in Ireland show that over recent months, sales have performed relatively well. An increase in the number of households purchasing pigmeat has led to an increase in the volume of bacon and sausages sold at retail in Ireland for the 12-week period ending April 19, by 14 and 18 per cent respectively.

In the UK, recent data shows that the volume of household pork purchases for the 12-week period ending April 19 were up by 4 per cent, when compared to the same period in 2008. However, price inflation has led to the value of these purchases increasing by 9 per cent.

Globally pigmeat production is forecast to increase by 2 per cent this year, driven by strong expansion in China which is offsetting lower levels of production in most of the other major producing regions. China accounts for 50 per cent of World pigmeat production and consumption. This year, fuelled by ongoing government subsidies, and strong domestic demand production, it is projected to increase by almost 5 per cent.

Global Trade To Be Affected

For the first time in a number of years global imports of pork are set to fall, as deterioration of the global economic situation, the stronger US dollar, restrictive trade issues and changing market conditions affect demand in major importing countries.

China has become a very important market for Irish and European exports in recent years, especially for offal type cuts. They are also expected to lower their import requirements this year as domestic production intensifies.

EU pigmeat exports in 2008 reached record levels as prices were competitive for much of the year, aided by export refunds and strong demand in international markets. However, exports are to fall by between 20-30 per cent this year as a result of tighter supplies on the EU market and deteriorating export market conditions.

Irish exports this year will decline due to our lower levels of production. Following last December's pigmeat recall, suspensions remain in place in Russia and mainland China. Bord Bia, through our offices in Moscow and Shanghai and the Department of Agriculture, Fisheries and Food officials are liaising closely with the relevant authorities in order to resume trade to these very important markets.

David Owens is Pigmeat Sector Manager, Bord Bia

VACCINATION OF PIGS

Vaccination of pigs is carried out in order to prevent, control or eradicate infectious disease. The use of vaccines is becoming more widespread for many reasons; an increased range of vaccines is available, improvements in vaccine technology, the drive to reduce antibiotic use and the increasing significance of viral diseases, against which antibiotics are not effective

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The Decision to Vaccinate

Before introducing a vaccination programme, the presence of the relevant disease on the farm should be confirmed by the farm veterinarian. The time of infection, economic cost of disease and cost benefit should be assessed.

Target Group for Vaccination

Direct vaccination of the at-risk group should be carried out several weeks prior to the anticipated time of infection, in order to provide active immunity prior to infection. A protective level of immunity is typically generated seven-to-21 days after completion of primary vaccination course.

Dead Vaccines

The infectious agent has been inactivated in dead vaccines. There is no risk of initiating even mild signs of the disease in the vaccinated pigs. The immune response stimulated is generally weaker and of shorter duration than for live vaccines. An adjuvant, something that enhances the immune response, is usually added to dead vaccines.

Live Vaccines

The infectious agent is still living in this type of vaccine, but is weakened or attenuated so that severe disease does not occur in the vaccinated pig. A stronger and longer lasting immunity develops, compared to a dead vaccine. A live vaccine can introduce the infectious agent onto the farm. The implications of this should be discussed with the herd veterinarian. For live bacterial vaccines, antibiotics active against the bacterium should not be administered to the pig around the time of vaccination, as this would result in inactivation of the vaccine.

Toxoid Vaccine

These are vaccines derived from bacterial toxins. Some E.coli and clostridial vaccines fall into this category. The toxin is converted to a toxoid in order to prevent the occurrence of severe disease.

Autogenous Vaccines

These are vaccines, generally bacterial in type, that are manufactured from a microbe harvested from a diseased pig on the farm for which the vaccine is being produced. Licensing regulations apply to the use of these vaccines in some countries. Autogenous vaccines can be useful when a commercial vaccine is either ineffective or unavailable.

Combination Vaccines

These are vaccines containing antigens of two or more different infectious agents. An example is the combined Eysipelas and Parvovirus vaccine.

Eradication Programmes and Vaccination

Most vaccines are used to control, but not to eradicate disease. Some national Aujeszky's disease eradication programmes have been built around vaccination.

Vaccination Schedule

Vaccination schedules are based on an initial primary vaccination course, generally consisting of two vaccinations with a two-to-four week interval between administrations. This is followed by periodic booster vaccinations, typically at five to six month intervals in sows. The manufacturer's recommendations are based on extensive research and should be adhered to.

Vaccination Failure

Vaccination may be ineffective in some circumstances. Reasons for this include the following:

- incorrect disease diagnosis;
- residual colostral immunity reduces vaccination response;
- sick pig unable to mount an effective immune response;
- pig previously treated with immunosuppressive drug i.e. corticosteroid;
- incorrect vaccine storage;
- poor hygiene resulting in contamination of vaccine;
- vaccination of pigs that are already incubating disease;
- incorrect injection technique; and,
- out-of-date vaccine.

Side Effects of Vaccination

Adverse effects can sometimes occur post-vaccination, although these are generally mild in nature. Live vaccines can initiate a short-lived mild episode of disease. Swelling may occur at the injection site, associated with a localised immune response.

A more generalised reaction that can occur is a temporary increase in body temperature, persisting for up to 24 hours, resulting in lethargy and appetite reduction. In pregnant animals, this could result in pregnancy loss. Anaphylactic shock, which is life threatening, occurs occasionally following vaccination.