Introduction

The aim of this study tour was to look at how the Irish pig industry has developed over the last twenty years and, in particular, how producers have coped with loose housing of sows since the sow stall ban (1 January 2013). Further objectives were to look at wet feed systems and novel systems of ventilation.

From 12-15 October 2014, BPEX and John Chambers (consultant and ventilation expert) took a group of producers over to Ireland to visit a range of organisations and pig units.

Summary

Overall, the visit gave the group a better understanding of some of the key issues within the Irish Pig Industry and has encouraged producers to consider adopting some of the ideas and technology in their buildings in the future.

Key messages, day 1:

- Irish producers are looking to reinvest in their businesses despite high feed prices and lower pig prices compared to the UK
- Producers are looking at reinvesting in specific areas/parts/technologies of buildings, eg new ways of medicating animals and the use of more efficient and user-friendly materials and systems

Key messages, day 2:

- Under-passage ventilation
- Gilt management is key to performance success
- Automatically controlled ridges on natural ventilation systems

Key messages, day 3:

- The group saw what reinvestment the Irish pig industry is undertaking and the impact of investment on the quality of standards and working welfare for both staff and stock
- The group also got an understanding of the scale of reinvestment for the business visited

Background to the Irish pig industry

The pig sector represents the third most important agricultural enterprise, with approximately 149,000 sows making up the herd. It produces 3.5 million pigs a year and employs 8,000 people (directly and indirectly) with an average herd size of 540 sows. A 500-sow unit would cost approximately 3m Euros, ie 6,000 Euros/sow place.

The industry exports about €525 million worth of pig meat with the current price being around 1.55/kg (Euros).
Day 1

Visit to IDS (Irish Dairy Services), a company which installs a range of ventilation systems and fixtures and fittings. The company was founded in 1976 to support the Dairy industry. However, significant changes to milk quotas in the early 80s meant that new opportunities had to be explored so IDS branched out into pigs and poultry. They also became agents for Big Dutchman pig and poultry equipment.

1990 saw the development of “Piggy Parlour” – designed to cater for the piglet’s post-weaning needs. In 1995, they became an agent for SKOV Ventilation and developed their workshop in Portlaoise. A management buyout by the current team took place in 2006 and they currently employ 33 people and have 30-40 subcontractors.

Overall, the message was very much about customer care. “Variability and adaptability at IDS is crucial for the customer. If we were merely a conduit for Big Dutchman, we wouldn’t survive as a business.”

Other aspects of IDS’ work include a range of fixtures and fittings as follows:

- Targeted medicated feed line
- Use of stainless steel throughout
- Tipping drinking troughs (for easy cleaning)

In addition to looking at various examples of innovation within the development of fixtures and fittings for pig buildings, staff at IDS also gave a presentation on a new unit in Lincolnshire, which has recently been built. It is anticipated that the running cost of this shed of 3,500 pigs is <5 euros/day.

Among the new technologies included in the design is ‘Hydro Air’ – a day one pig feeder used in first stage weaning. The principle behind this system is that it mixes 20kg of feed and delivers a minimum of 2kg at a time. This is achieved through a 25mm pipe 16 times a day. The system self-cleans after use so the feed is always fresh. By having the freshest feed fed in a targeted way, an immediate increase of feed intake of 50g/day has been achieved. This feed system is also suitable for the farrowing house.

Photo 1: Hydro Air system
The Hydro Air system takes pigs to the second stage at 18kg and, to date, no check in growth has been seen. One of the possible reasons for this is due to the water medication mixing system. Typically, in most systems, all the pigs would need to be medicated either via the feed or water. However, this system allows targeted medication through a simple valve and 15ml pipe. By identifying which pen requires medication and, therefore, which valve is relevant, it is possible to medicate a small number of pigs as opposed to the full herd. In addition to saving money on medication and medicated food, it is possible to target the pigs as soon as signs of illness are seen.

Photo 2: Medicated feed system

Photo 3: Water medication system

Another area of innovation in the new unit involved the heat pads in the farrowing crates. These have one-push automated canopies over them which offer extra warmth and comfort for the piglets. In addition, the farrowing crates are placed head to head which means the sows have a shared feed trough, where the sows can be fed between three and seven times a day. The idea is that competition between sows for food helps to increase intake and reduces feed wastage. However, it
is important to get the sizing of the sows right when putting them into the crates, ie don’t put a gilt opposite a large sow.

Visit to Moorepark Pig Research Centre

Moorepark is run by the Irish Agriculture and Food Development Authority (Teagsac). There are currently no pigs on site as the centre is going through a £3.5m redevelopment which will consist of a state-of-the-art research facility for a 200-sow herd. Planning permission has been granted and it is anticipated that it will be completed by September 2015.

Diagram 1: Plan of facility

Key projects at Moorepark include:

- **OPTIPIG**: Optimising annual output per sow by increasing the number of viable piglets born alive and minimising pre-weaning piglet mortality
- **PIG SYS**: Reporting system for herd performance. Investigating the barriers to herd recording.
- Researching various aspects of Salmonella control, including assessing and managing the risk posed by Salmonella in farm-produced pig feed
- **PIGWELFIND** ante and post-mortem meat inspection of pigs as a welfare tool
- **WELPIG**: Exploring the link between poor welfare, production diseases, antimicrobial usage and resistance on Irish pig farms
- Exploring aspects of environmental enrichment
- Development of new communications, analytical tools and methods to improve efficiency of Knowledge Transfer service delivery, including running a module on introduction to the pig industry with agricultural colleges
Day 2

The business visited consisted of 3,500 sows in total. Key information for the unit of 750 sows visited was:

- The unit was purchased in 2009 and was immediately re-stocked. Four staff are employed.
- There was an outbreak of PRRS (Porcine Reproductive and Respiratory Syndrome) in 2013 but there were no secondary outbreaks.
- 2x PRRS vaccines at day six and day 60 have kept it under control. Herd is now PRRS +ve.
- New dry sow house, and weaner/finisher house was opened in 2014.
- Nearest pigs are six miles away.
- All records are processed externally using Pig Champ recording system.
- Replacement gilts are chosen using the Hermitage Genetics BLUP (Best Linear Unbiased Predictor).
- Strict culling policy – five parities then out. If the sow/gilt returns twice they are culled.
- 28-day weaning age with weights ranging from 7-8.6kg av.
- 90% farrowing rate (33/wk).
- 2.34 litters per sow per year (LPSPY).
- 14.1 born alive (BA).
- 12.5 weaned av.
- Use 1-4 foster sows/week.
- Gilts served at 34 weeks on second heat at 150kg.
- Gilt BA is 13.4 and, as they mature into older sows, it increases by 1-1.5 more.
- Some scour at three days so gilts are fed back pre serve.
- Creep is fed from day 10 in farrowing house.
- 28.5 pigs sold/sow.
- 2015 target is to achieve 2.4t/sow.

Photo 4: In farrowing house
Management in the farrowing house

The farrowing houses were a fairly typical set-up consisting of eight sows/room, one fan and four vents. Wet feed is fed three times a day with the last feed at 8:30pm (when a night check takes place).

Photo 5: Additional water source for piglets, shared by sow

Litters are processed in typical fashion (teeth clipping, tail docking, iron, etc). Circoflex (vaccine to reduce pig wasting and reduce stress) is given at weaning.

Loose house for dry sows/service area

The dry sow house was completed in April 2014 and consisted of 32 loose-housed pens with nine sows in each pen.

Photo 6: Loose sow pen with enrichment
Ventilation

The building uses automatically controlled natural ventilation (ACNV) with a controlled ridge. This system makes the most of natural air movement until there is a need for additional ventilation. Although quite common in Ireland, the controlled ridge system is not seen in pig buildings in England. The following requirements should be noted to make sure that the system works well:

- There must be a 21 degree angle on the roof
- Ridge must be very high, ie at least 12 metres
- Ridge should be open the full length of the building with controlled outlets

Photo 7: Automatically controlled ridge

Photo 8: Temporary door to unit. Insulated, sealed doors were in the process of being fitted.
One advantage of an ACNV ventilation system is that it has an extremely low running cost but a disadvantage of such a system is that it is very difficult to correct if it is not functioning well in extreme weather conditions.
Sow management

Photo 11: Service house

The service house, also controlled by ANCV, was very light and airy. The maiden gilts are on the left and the weaned sows are on the right.

Photo 12: Showing significant levels of clean, bright lighting

With regard to sow management, no Regumate (for hormone management) is used. The gilts are heat detected and colour coded accordingly. When the colour group is due for serving they are introduced back into the serving stalls. There are 24 stalls (called baskets) per row. Sows are locked in for 28 days.

Sows are then scanned, if they are in pig they go to the loose house and, if they are not in pig, (NIP) they are held back. The unit has a first service target of 37/week (29 weaned sows and nine gilts).

(Note: Following the EU Pigs Directive 2008/120/EC, which lays down minimum standards for the protection of pigs, sow stalls were banned on 1 January 2013. The EU allows producers an 11-year phase-out period and exemptions for the first four weeks of a sow’s pregnancy, in addition to the week before farrowing).
Weaner/finisher house

Photo 13: Weaner house showing wet feeder in the middle of pen with trough containing dry pellets during transition from dry to wet feeding

Performance and management of weaners

This building currently houses second stage weaners with the pigs coming in at eight weeks old in pens of 64. The weight range was between an average of 14.31kg and 17.06kg. Feeding was in a transition stage from dry feed to wet feed so some pelleted feed was still being given in troughs to help the pigs adapt.

Although relatively new, it seemed that the system is more efficient than the old system with a performance improvement of approximately 9%.

Other production figures are as follows:
From wean to sale, the pigs would gain around 800g/day and total feed usage for an 80kg dead pig would be 285kg (including sow feed). Feed intake for finishers was approximately 2.3kg/day.

Although the buildings were washed out between batches they were not disinfected (only the farrowing houses are disinfected). This is because the owners felt that a good drying and heating process was sufficient.

Ventilation for weaners (stages 1 and 2)

The building was fitted with an under-passage ventilation system which includes two roof vents (exhausts). Slurry pits were 2m deep by 1.5m wide. There is a wall between the slurry pit and the ventilation passage. The passage contained some remnants of rainwater that had seeped in but also included used water from pressure washing the passageway.

This system works with an underfloor passage and underground air inlet on the outside of the building. The building needs to be sealed so the fans have control to extract air to give negative pressure.
Photo 14: Weaner building showing general layout

Photo 15: A closeup of the air inlet

The air enters through the inlet and is drawn up slowly through the passage by the fans in the roof. The airspeed through the channel must be at or below 3m/s. In addition, there must be a 21 degree sloping roof.

The fans have a restricting valve which helps to reduce airflow to maintain a steady air velocity. This also helps to maintain the temperature in the building.
This distribution of air encourages the pigs to dung at the front of the pen where the air is colder and, therefore, to lie at the back of the pen where it is warmer.

Benefits of under-passage ventilation

- Better control of air distribution
- Good dispersion as no side outlets, odour and ammonia go out of the roof
- Less maintenance required as no ropes, pulleys, cables or motors

Disadvantages of under-passage ventilation

- Need to design the house from day one – this system cannot be retrofitted
- More expensive to install due to either deep pit and extra wall or a bigger building to cope with the wider passage
Feeding systems

The unit was in the process of moving onto a wet feed system.

Photo 18: Feed bins

Photo 19: Wet feed tank
Photo 20: Wet feed tank

Day 3

This visit was organised to show the group outdated pig sheds which were being demolished, plus current buildings and technologies which had had several years’ usage, to tease out any issues. The group saw the end result of this improvement process which had been embedded into the new building seen the previous day. Furthermore, the general scale of reinvestment on the farm with the dug-out foundations for a new shed was also evident.

Conclusion

Although it was a short visit, it proved to be stimulating and several of the group are now looking to invest in some of the technology and ideas seen. This will help them to be more efficient and help the industry to achieve targets set by BPEX of extra 0.1 FCR and 50g/day. It will also help producers to reduce costs and emissions by being more energy efficient, thus helping the pig industry to achieve the environmental targets set out in the Roadmap published in 2011 and updated in 2013.

Feedback from the tour included:

“There is an ever-increasing need for better trained technical staff to cope with these systems and technology.” Jason Evans

“The visit to Ireland has given me a valuable insight into large-scale pig production at an intensive level. We saw excellent examples of ventilation which I could bring home with me and implement on my farm.” Kaye Davies

Next steps

- Potential visit to the new Moorepark Pig Research Unit
- Several producers are planning new sheds with some of the technology they saw
- There is potential for BPEX to report on the newly built IDS unit in Lincolnshire
- Follow up with producers in 3-6 months’ time
Photo 21: Study tour participants and hosts