

Edited by Amy Quinn



Welcome to the May edition of our monthly newsletter.

This month the Teagasc Pig Development Department (PDD) held the 2024 Pig Open Day in two locations, the Teagasc Animal and Grassland Research & Innovation Centre, Moorepark, Fermoy, Co. Cork on May 22nd, and Ballyhaise Agricultural College, Co. Cavan on May 24th.

We were delighted to welcome such big numbers to this year's event and we would like to take the opportunity to thank all those who attended and took the opportunity to engage with our researchers, technical staff and students. This type of engagement and feedback benefits both the attendees and ourselves, strengthens our programme and ensures our future research continues to be both applicable and of high quality.

The feedback from both days has been positive while also providing us with more ideas and improvements for next year.

The research on show at the event can be found in the [event booklet \(PDF\)](#).

The "Teagasc Pig Herd Performance Report 2023" is currently being finalised and will be released shortly. A copy of the report and a summary infographic will be posted out to all clients. Specialised Advisor Gerard McCutcheon will discuss all the latest trends and developments on our next episode of "The Pig Edge" podcast.

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Using pig slurry to reduce fertiliser costs and inputs

Gerard McCutcheon, John Mahon & Mark Plunkett



Miriam and Mattie Moore have two pig units: a 1,600-sow pig unit, rearing pigs up to 18kg liveweight, in Co. Offaly; and a finishing unit in Co. Wicklow.

“Finishers consume 70% of our meal each year, so the Wicklow unit was the logical location when we built a feed mill in 2009. We bring meal from the mill back to Offaly for the sows.”

To achieve even greater integration and efficiency, the Moores grow an increasing proportion of the pigs’ diets - using home-produced manure to fertilise their winter barley, wheat and rye crops. Mattie, a pig farmer at heart, and his staff are equally at home at field work, farrowing or feeding finishers. Miriam looks after the administration of this complex operation.

From an environmental perspective, there are a number of features on this Signpost farm that are important. On the pig farm, LED energy-efficient lights are used in the pig houses. The heating system is a wood pellet boiler, eliminating the need for fossil fuels. Solar panels will soon be generating 50% of the electricity required on the sow farm.

“These investments improve the economic viability of the business and boost our sustainability credentials,” said Mattie.

The Moores have three years’ experience using an umbilical system with a band spreader to apply pig slurry to their crops. On this, Mattie said: “Compared to using a tractor and slurry tanker, we have less soil compaction and we can apply pig slurry in growing crops at the optimum time for

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nitrogen (N), phosphorus (P) and potassium (K) uptake.” Spring application enables the organic fertiliser to deliver a greater portion of the crops’ N requirements, reducing the need for expensive bagged nitrogen. In addition, the system has the capacity to cover large areas of ground before the application windows close.

Winter rye, a new crop on the farm, will help spread the tillage workload and may replace some of the winter wheat in the future. “We are looking forward to seeing how this grain performs in the pig diets,” Mattie commented. Teagasc research suggests that it can be included at up to 60% in finisher diets.

Using pig slurry to reduce fertiliser costs and inputs

This farm was selected as a Signpost farm, as it uses organic fertiliser (pig slurry) to grow some of the feed requirements for its overall pig production enterprise. Slurry from the sows eliminates the need to purchase chemical phosphorus (P) and potassium (K) for the Offaly farm’s 95ha of cereals. The slurry is also a valuable source of some of the other nutrients that crops require such as manganese, copper, zinc, sulphur and magnesium.

The nutrient content of pig slurry is closely related to the dry matter content. The dry matter percentage depends mainly on the amount of water added either in the feeding and watering of the pigs or from sources such as washing of houses, leaks, spills or from roofs, open tanks or dirty yards.

Good manure management will ensure minimal dilution with water. The need for storage is reduced and transport costs are lower if the manure is sold off-farm. Pig manure that contains 4.3% dry matter is considered reasonable quality. A minimum of 5% solids is preferable. The fertiliser value of pig manure at 4.3% solids is €7.14/m³ when there is a requirement for N, P and K (see Table 1).

Table 1: Nitrogen (N), Phosphorous (P) and Potassium (K) content and value of pig slurry (4.3% solids)

Column 1	N	P	K
Nutrient content kg/m ³	4.2	0.8	2.2
Nutrient availability %	50	100	100
Available nutrients	2.1	0.8	2.2
*Fertiliser cost per kg €	1.26	2.73	1.05
Value € of each nutrient	2.65	2.18	2.31

Note: 1m³ equals 220 gallons. *Based upon chemical fertiliser prices January 2024. The dry matter (DM) and nutrient content of the pig slurry can be assessed quickly using a slurry hydrometer.

This translates into €32 per 1,000 gallons. A reasonable rule of thumb is that a thousand gallons of pig slurry is equivalent to a 50kg bag of 19:7:20. The DM% and nutrient content of the pig slurry should be known, as this will determine the required application rate for the field. Also, make sure that the slurry is well agitated before it is applied to land to get a more homogenous/consistent fertiliser application of N, P and K.

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Table 2: Typical N, P and K value of pig slurry (available units per 1,000 gallons)

Dry matter %	N	P	K
2	11	4	11
4	19	7	20*
8	25	14	21

*Teagasc Green Book & McCutcheon, 1997; Tunney, 1987

Table 3: Organic manures, types and carbon supply

Manure type	%DM	Application rate	Carbon (t/ha)
Pig slurry	4	25m ³ /ha	0.4
Cattle slurry	6	25m ³ /ha	0.6
Layers manure	55	5t/ha	1.1
FYM	25	25t/ha	2.5
Mushroom compost	32	20t/ha	2.6

Tillage Signpost farms

Nitrogen accounts for approximately 80% of the greenhouse gas (GHG) emissions from crops. The tillage sector is the lowest emitter of GHGs. Beef farms have three and dairy farms seven times higher emissions per hectare than a tillage farm. The pig sector is a small component of our national emissions at about 4%, because the sector is relatively small (about 140,000 sows plus progeny in Ireland) by comparison to other more intensive countries.

In the tillage sector, there are 12 goals to reduce gaseous emissions. The first three relate to correct soil pH, optimum soil P and K levels and increasing the N usage efficiency.

The investment in an umbilical system has allowed the Moores to apply slurry on to growing crops. "The umbilical system together with the GPS

system have given us confidence in getting a more even spread of slurry and a better utilisation of the nutrients in it," said Mattie.

Pig manure has been applied to growing winter cereals on the farm over the last two years. Previously all land received 33m³/ha (3,000 gallon/ac) of pig slurry (about 4% dry matter) incorporated in the autumn time at planting. All of the P and K in the pig slurry is available, but only 10% of the available N is taken up by the growing crop (when using autumn application). If this slurry goes out in springtime on to a growing cereal crop, the fertiliser N value is 10 times greater because the crop is actively growing and has a large demand for N. This reduces the crop's N requirements by almost 70kg/ha (57units N/ac).

"Our aim is to increase our slurry storage capacity from six to seven months currently up to 12 months, which will allow pig slurry to go out in the spring, eliminating autumn application."

Soil carbon

An additional benefit from using organic manures is the boost to soil organic matter/carbon. This brings other benefits to continuous tillage soils such as – feeding soil microflora and improving soil structure. Building soil carbon is a slow process. "We are in it for the long term (they have two young sons) and we will take whatever steps contribute to the overall sustainability of the business," concluded Mattie and Miriam.

This article first appeared in [Today's Farm](#). For more information on the Signpost Programme, click [here](#).

Insights from meetings with European animal breeders and a visit to the Van Asten pig farm in The Netherlands

Paul Venner, Operation Manager, Van Asten, NL & Laura Boyle, Teagasc

In early May, I spent a busy 48 hours in the Netherlands hosted by Dr. Egbert Knoll from Topigs Norsvin and Ana Granados from The European Forum of Farm Animal Breeders which is the association that represents the animal breeding and reproduction organisations and companies in Europe. Our first visit was to the spacious new offices of the Dutch division of Topigs (Topigs Norsvin Nederland and Varkens KI Nederland) located in Den Bosch which is in the south of the country in the province of North Brabant.

I met Chiara Lipori a PhD student funded by Topigs Norsvin and studying with Wageningen University who told me about her work investigating maternal traits in loose farrowing systems to improve piglet survival. Her goal is to identify desired maternal behaviours around parturition and during lactation, and relate these to piglet survival and weight gain. She is also interested in how pain and stress during farrowing affect maternal behaviour during lactation. Topigs Norsvin use an estimated breeding value for mothering ability (EBV_MAB), for sows housed under restrictive conditions, i.e. in farrowing crates. Clearly this is unlikely to reliably predict mothering abilities in free farrowing and lactation systems. Hence, Chiara validated the EBV_MAB for maternal care in these alternative systems. Unsurprisingly, she found that free farrowing sows had higher piglet mortality (12.0%) due to crushing compared to sows farrowing in crates (1.2%).

However, free farrowing sows with a higher EBV_MAB had lower piglet crushing rates compared to free farrowing sows with a low EBV_MAB (5.9% vs. 16.0%). This means that there is promise in selection of sows for good maternal ability (and therefore low crushing rates) in free farrowing systems. Additionally, Chiara found behavioural differences between high and low crushing sows irrespective of the farrowing environment. For example, high crushing sows seemed to show more sternal lying pre-and post-farrowing compared to low crushing sows.

At the visit I also learned about Topigs Norsvin's new nucleus farm in Manitoba, Canada, called "Innova" where Chiara will conduct some of her postgraduate research on free lactation using the Pro Dromi Liberté temporary crating system. This farm represents one of the first in Canada to completely opt out of conventional farrowing crates and sows are housed in groups during gestation which is also relatively novel in Canada. This also means the genetic lines produced at Innova will be bred for these types of housing systems. Innova was built with future animal welfare legislation in mind but when it comes to sustainability and biosecurity the farm is also setting standards. It runs entirely on electricity and materials that need to enter the barn are disinfected with UV in the case of smaller items or fumigated for 48 hours and stored in a dry storage area in the cases of larger items.

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The following day, Ana, Egbert and I, along with several other European pig breeders, visited a farm of the Van Asten Group in Sterksel, north Brabant. The Van Asten Group is a Dutch family company. They started the company in 1974 and since then it grew up to be one of the leading pig farming companies in the Netherlands. In 1997 the company became international with the purchase of the first German company. In 2012 the founders of the company passed it on to their children. Now the Van Asten Group has pigs in four locations in the Netherlands and another five in Germany employing 220 people over all locations. Paul Venner, Director, showed us around the 13 year old, 4000 sow, farrow to wean farm which produces 25kg piglets for the German market. Paul told me how he used to work on his father's pig farm before joining the Van Asten group. His father voluntarily stopped pig farming due to pressures arising from farming in an environmentally sensitive area. He now grows cash crops including carrots and beans. The farm at Sterksel operates the HyCare method (<https://hycare.eu/pig-farming/>) and it was indeed immaculate with strict showering protocols and different coloured boots, clothes and handling material used in the different sections. They also had fantastic canteen and working facilities for their staff who work with the LEAN Principles concept and therefore follow fixed protocols every day.

Electricity is produced through biogas plants and solar panels at several locations. Biogas is produced from manure and residual, circular products obtained from the feed industry and horticulture. Paul said the farm has almost zero ammonia emissions and is feeding circular products through its liquid feeding systems which

allows them to use residual products from the food industry (e.g. potatoes and beer) since 1982. Sows produce 17.2 liveborn piglets in conventional but spacious, farrowing pens with 12% mortality which Paul is trying to reduce. Indeed they are committed to ensuring the survival of piglets with round the clock supervision during farrowing. The farm weans 35 piglets per sow per year. Many sows have 16 teats – some of our group noticed a few sows with super-nummary teats on their hindquarters! The uniformity of piglet size in the newborn litters was impressive which Paul attributed to careful gestation feeding regimes. They practice minimal cross fostering, instead selecting some good milking sows in each house to feed additional piglets and whose litters were allowed to come in. All suckling piglets had access to liquid feed (Nutrix+) from day 8, no dry creep feed was provided and the pigs had the same liquid creep for the first few days post-weaning. The farm also applied split suckling whereby a piece of chicken wire was used to enclose the earliest born piglets after their first feed of colostrum to ensure the later born piglets also got their fill.

During gestation sows were housed in small groups in back-to-back free-access stalls with a fully slatted floor between – sows were fed once per day and cooled by a system that pumped air from beneath the slats. The houses felt very comfortable considering it was over 25 degrees outside. Old age is by far the main reason for sow culling with sows selected for culling (voluntary culling) after 8 litters. The low rate of involuntary culling reflects how well the farm looked after the sows. Selection for more teats means sows are getting longer and they certainly looked a little cramped in the farrowing crates. The farm was

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warily experimenting with long tailed pigs. The fact that they sell weaners into the German market where long tails are not wanted poses complications. Paul was experimenting with gilts destined for breeding first. He told me that Dutch pig producers face a 2000 euro fine if they send pigs to the factories with a tail lesion, or indeed any lesion. He lamented the uncertainty associated with the variation between inspectors in terms of what constitutes a finable lesion. All the purebred males are finished on the farm but I didn't get to see these animals. Paul told us there is almost no difference in growth rates between these and the terminal line pigs (they have Topigs Norsvin genetics). They stopped castrating for a while but the castrates proved too lean (they receive a premium for fat) and so they switched back to producing barrows. The farm uses cough monitors to stay on top of respiratory disease. Their protocol is to feed non-steroidal anti-inflammatories (NSAIDS) for two days following the first warning and to administer antibiotics thereafter on an individual basis if needed. Paul told me they generally don't need to resort to antibiotics and that the NSAIDS usually cure the pigs.

After the farm visit we were treated to Dutch apple tart and coffee and discussed the future for pig breeding in Europe with the group. Paul stated that the farm does not need larger litters and the pig breeders questioned what should the focus of a breeding programme be for such a farm in the future. The farm was top of its class in terms of hygiene, management, labour and housing and hence was fully able to exploit their sows high genetic potential for prolificacy. On farms with lower production standards there is likely a

considerable amount of 'wasted' genetic potential and such farms likely make up the majority. Such a mismatch likely has detrimental implications for sow health, welfare performance and indeed longevity. Indeed Topigs Norsvin personnel suggested that this mismatch is responsible for the high rate of rectal prolapses in North America where gestation and lactation diets are sometimes poorly formulated. We discussed the need to develop animals for a wider variety of production systems. For example there are already a wide variety of hens available for different egg production systems (aviary, cage, free range etc.) but apparently this is much more expensive to do with pigs. Nevertheless, such issues must be considered if pig production is to be future proofed.

I finished the visit to the Netherlands at the Breed4Food seminar at CRV international, a Dutch dairy genetics company, in their new head office in Arnhem. In line with CRV's 150 years anniversary, the Breed4Food community and invitees were invited to reflect on the past, present and future of animal breeding at the seminar. With a focus on the dairy industry, the participants were walked through some of CRV's recent achievements, there were also opportunities for the other Breed4Food partners - Hendrix Genetics, Topigs Norsvin and Wageningen University and Research - to reflect on the challenges and opportunities in other species and what the farming systems of the future might look like. It is clear that we need to maintain closer links between geneticists and animal scientists, especially animal welfare scientists, in decision making for the pig industry of the future.

The potential for Precision Livestock Farming (PLF) to improve pig health and welfare

Florence Viard & Keelin O'Driscoll

On April 16th this year the Teagasc PDD ran a workshop as part of the TailBiteAdvice project: An ICT-based real-time advisory tool to minimise tail biting in fattening pigs. This project is funded by Ireland's Department of Agriculture, Food and the Marine (DAFM) (project no: 2020EN505), and is aligned with the EU funded ICT-Agri-Food network (ERA-NET Cofund). It involves researchers from Ireland, Denmark and Belgium aiming to investigate and improve health and welfare in commercially farmed pigs, using a vision based precision livestock tool. Precision Livestock Farming refers to using electronic tools and methods to manage livestock. It generally involves automated monitoring of the animals or environment, and can be targeted to monitor of performance, health, welfare etc. In this project, we are developing a tool that should be able to identify when pigs are at risk of tail biting. However, we also want to find out what are the views of people working in the pig industry.

The workshop was held before the IPHS Symposium, at the Curragh racecourse in a large room overlooking the track. For this workshop we issued invites to people who represented various stakeholder groups, because we wanted to obtain a balanced number of views from across the industry. The final participant composition was; 4 farmers, 3 vets, 3 DAFM animal welfare inspectors, 3 pig advisors, 4 pig researchers, including the head of the Teagasc PDD and 2 persons from certification organisations (Bord Bia and Animal Health Ireland)

To kick off the workshop, we had a guest speaker on PLF, Prof. Ilan Halachmi, who is on sabbatical at Teagasc Moorepark for a year. Ilan provided an overview of PLF in general, along with examples of how it can be practically used on farm, for a range of species. Following this Dr. Laura Boyle presented an overview of the subject of tail biting, including our own research in Teagasc, and Dr. Keelin O'Driscoll presented the TailBiteAdvice project.



Figure 1. Prof Ilan Hilachmi presenting an overview of PLF

Following this the workshop participants were split into three sub-groups, with one member from each of the stakeholder groups. The head of the Teagasc Pig Department was assigned to the group that did not have representation of a certification organisation, as we felt that his role as head of the national pig research programme, which includes auditing of farms for biosecurity, feed sampling etc. could represent a similar perspective. Participants sat at three different tables, where they were guided through a discussion by a group facilitator.

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As part of the discussion, we carried out a SWOT exercise: An investigation of the 'Strengths', 'Weaknesses', 'Opportunities' and 'Threats', that the participants thought could be associated with PLF tools for pig farming. We asked them to think specifically about PLF tools that are vision based, and had potential to tackle the area of tail biting.

Strengths: All three sub-groups identified that PLF tools could act as an early warning system for tail biting. Two groups described the advantage of having recordings available for farm audits, insurance needs, and evidence of farmer's intervention. Two groups also thought that PLF could improve pig welfare. It was also identified that PLF helps detecting unusual behaviours without bias, track patterns and manages these behaviours. Finally, all three groups thought that PLF could lead to a reduction in labour, and permit the ability to monitor important numbers of pigs.

Weaknesses: All groups identified the cost of the tool, its installation and adaptation on commercial farms, the maintenance, the volume of data to analyse and its reliability, as potential weaknesses. Two groups also mentioned the need of training for the staff, including possible non-English native speakers.

Opportunities: The opportunities were mainly the efficiency that the tool has potential to allow, and the possibility of opening doors on new markets, towards higher welfare standards.

Threats: These concerns related to the use of camera-based PLF specifically, and included data hacking, the ethical aspect of recording the staff, the over-reliance on the system instead of going to

see the pigs, and the issue of applying biosecurity protocols to maintenance staff.



Figure 2: Flipchart with the strengths and weaknesses identified by one of our break out groups

Conclusion

Overall, the workshop provided highly valuable information regarding the potential positives and negative aspects of camera based PLF for pigs. As well as the SWOT analysis, a number of other questions were included in the discussion e.g. 'What innovations would participants like to see in regard to PLF?' and 'What should we stop, continue, and start doing in Ireland regarding reducing the need to tail dock?' The discussions from each sub-group were recorded, and will undergo analysis to see if we can pull out common themes and ideas, which we will be sure to share with you in upcoming issues of the newsletter!

Pig Open Day 2024



The Teagasc Pig Development Department held its Pig Open Day this month in two locations, Teagasc Animal and Grassland Research & Innovation Centre, Moorepark, Fermoy, Co. Cork on Wednesday, May 22nd, and Ballyhaise Agricultural College, Co. Cavan, May 24th.

Delegates were welcomed to the event in Cork by the Director of Teagasc, Professor Frank O'Mara. The opening session also included an overview of future research by the Head of the Teagasc Pig Development Department, Dr. Edgar Garcia Manzanilla.

Over 180 pig producers and industry stakeholders attended the event over the two days. Attendees were guided through interactive stations providing an ideal opportunity to see first-hand the results of the comprehensive research programme undertaken by Teagasc, and to meet and discuss with the researchers, postgraduate students and technical staff who carry out the work.

Much of the research on show had an emphasis on management and nutritional strategies, as well as sustainable pig production. This event provided attendees with an update on the Teagasc Pig Research Facility, our state of the art pig research

farm, where we also detailed some of the new technologies employed in the unit. This year we introduced the Pig Nutrition Feed Lab and the early results from wet chemistry analysis of feed ingredients from the Teagasc pig sector feedstuffs analysis programme.

The research on show at the event can be found in the [event booklet \(PDF\)](#).

Welcome Subin & Lianjie!



Welcome to Subin Santosh, who has joined the Teagasc PDD as part of the ValuePig project. Subin's project will focus on identifying whether we can increase the proportion of Irish pig diets that are made up of circular feed ingredients, while also optimising pig performance and welfare. He is registered with Wageningen University and Research (WUR), and co-supervised by Keelin O'Driscoll (Teagasc), Imke de Boer (WUR) and Eddie Bokkers (WUR).



We would also like to welcome Lianjie Wei to the PDD, a new student who will be working on the cost-benefits of improving biosecurity in Irish pig and poultry farms. Lianjie obtained his MSc in veterinary epidemiology from the Royal Veterinary College in London and a BSc in veterinary medicine from Zhejiang University in Hangzhou. His work will add value for the farmer to the data currently collected by AHI and Teagasc, and initiate an evidence-based decision-making process for the Irish pig and poultry sectors