

PIGS

August 2021

Edited by Amy Quinn



Welcome to the August edition of our monthly newsletter. This month saw another drop in pig price following on from July; this along with increasing grain prices and continued labour shortages affecting slaughter plant capacity, makes for a very concerning period for Irish producers. Farmers are having to take stock and see where efficiencies can be improved on to claw back some of this deficit.

The episode of the Pig Edge is definitely worth a listen as I chat to Roy Gallie; Pig Producer, Tillage Farmer and Chair of the IFA pigs committee. Roy explains to us the history of his farm in Kildare and its current set up. He then goes through where he sees genetic improvement going, the biggest challenges facing the pig industry and his top pieces of advice for producers.

Our latest Teagasc Pig Research Facility monthly update is available in the coming days. Tomas Ryan, farm manager, welcomes our latest recruit; Kieran Keane who has taken up his role in the Teagasc Pig Research Facility mill and discuss an upcoming trial that will be using our new

supplementary milk feeding system. We look forward to updates on this project in the future.

This month was very busy for several members of the PDD team, who were involved in hosting and presenting at the recent 8th International Conference on the Assessment of Animal Welfare at Farm and Group Level. The conference had its highest ever attendance on record with delegates attending from 32 different countries. The event featured 210 scientific papers, with many being pig based.

Finally we would like to reiterate our thanks to the farmers who featured in our Farm Safety Week 2021 campaign. The response from farmers and industry personnel throughout this month has been resoundingly positive.

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Removing therapeutic Zinc Oxide and preventive antibiotics from pig diets, less than a year to go

Edgar Garcia Manzanilla, Juan Manuel Ortiz & Daniel Ekhlās

The management of health in pig farms will change dramatically next year when the new EU veterinary medicine regulation is implemented (January 2022) and zinc oxide (ZnO) is banned at therapeutic doses (June 2022). In the Teagasc PDD, we are trying to understand what will happen on commercial farms once preventive antibiotics and ZnO are not available anymore (Project ZincO), and we are investing much resources in to find solutions with 6 projects ongoing (Projects PigNutriStrat, MonoGutHelath, Proswine, Milkobiome, BM-Farm, AMU-Farm) and more than 1.5 million in funding over the next 3 years.

In project ZincO, the first thing we did is to compare 5 farms that have removed ZnO and antibiotics from the feed and were successful with 5 farms that tried to remove ZnO and antibiotics and failed. Unfortunately, there is not one approach that works for all the farms. The farms that were successful in removing preventive antibiotics and ZnO all had to go through a process of re-adjusting their management that took more than a year and required investment in nutrition, cleaning equipment or facilities. However, it is encouraging that all of them ended in a much better situation than they started with, better production indexes and less health issues. All of them agree that they would not go back to antibiotics and ZnO.

Now, in the second phase of project ZincO, we are helping those farms that failed previously with the removal of antibiotics and ZnO. So far, we have followed 5 farms with very similar results. What we are doing in each farm is to test in parallel:

- A control diet with no ZnO or antibiotics.
- The same diet with ZnO.
- The same diet with the antibiotic that they are using

In each farm we are also testing new diets or solutions proposed by the nutritionist, the PVP or the farmer to learn how effective they are. The idea is to test these in 2 batches per farm. We have run one batch for each of the 5 farms so far with 150-200 piglets per treatment. In all of the farms the results are similar. The pigs without ZnO in the diet show diarrhoea earlier than those with ZnO and they reduce intake for a couple of days. These are two things that are easy to measure, and they tell you how well your pigs are doing when removing ZnO. To monitor intake, we number the bags of creep (Figure 1) and follow the intake for 2 weeks.



Figure 1. Example of Labelled creep bags on each farm.

If you have a scales, it is also worth getting the weights of the pigs at weaning, 2 weeks after and, if possible, at transfer. In all the farms pigs are showing reductions in daily intake of 40 to 70g per day and reductions in growth of 20 to 40g per day. That would be expected and all those that removed ZnO and antibiotics from their feeds suffered with these decreases in growth at some point. Some increase in mortality may happen too (+1%) although it can easily be controlled by injecting sick pigs.

To monitor diarrhoea, we would recommend checking the same area of the pen every day. It is useful to take pictures of that area. This is to try and make the process a bit less biased. It is easy to think that diarrhoea is worse than it actually is if you don't have pictures. We recommend using the wall instead of the floor because diarrhoea will disappear through the slats, but you can really see diarrhoea problems on the wall like in Figure 2.



Figure 2. Pen wall images day 7 after weaning from a pen without ZnO (left) and one with ZnO (right).

In pigs fed ZnO, faeces tend to be yellowish, and the presence of diarrhoea is less or appears later. This is the key moment to successfully remove antibiotics and ZnO. Yes, there is diarrhoea, and yes, the animals are growing less. However, the situation is not out of control, and we should not

go back to ZnO or antibiotics. We just have to keep an eye on the piglets and as long as they keep eating and the faeces do not become completely liquid, they should recover in 2-3 days. Then it's time to implement solutions; new diets, different cleaning, changes in environment or electrolytes.

In Figure 3 you can see the evolution of feed intake on one of the farms. You can see how around day 5 the animals with no ZnO had a drop in intake and then they went back to their normal intake by day 7. If the drop in intake is longer than that you may want to intervene with medication. In this case, the growth of the pigs was 259g per day for those animals with ZnO and 234 for those without ZnO. The FCR was similar in both groups (1.3 and 1.2). That would be the starting point for this farm. The objective is to increase growth to 300g without ZnO or antibiotics in a year time.

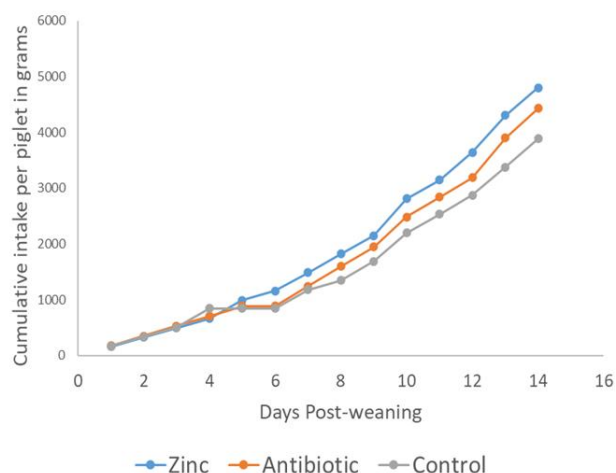


Figure 3. Piglet feed intake post weaning.

If you have not tried to remove ZnO from your creep it may be the time to check the results and start working on it. Try to start trials with animals that have weaning weights above 6kg and then move to the smallest ones. In many cases, pigs that are above 6kg do not suffer without ZnO but

below that weight you will need to follow the piglet closely. It is also worth trying it for 4-5 batches in a row. Not all the batches are the same and it is good to see how consistent the response is over time. Chances are that you will have a bad batch out of 4 or 5 and then you can learn the worst-case scenario and be prepared.

We are following the pigs on the different trials until they move to the finisher stage, and we are seeing that the pigs with no ZnO do catch up a bit although they do not recover completely. We will

publish the summary of the data once the pigs in all the farms reach finisher stage. From previous experiences we know pigs with no ZnO and antibiotics normally reach slaughter age at 3-4 kg less than those with ZnO and antibiotics. These differences should be gone with time. As always, if you have any questions on this area contact your Teagasc pig advisor and we can discuss the data in more detail and let us know if we can help in any way.

How much do pigs cough?

Joana Pessoa & Laura Boyle

Pigs cough for two main reasons, because dust or fumes irritate their airways or because they have a respiratory infection. The latter is a major cause of economic losses in the Irish pig industry. Coughing is a useful and easily measured clinical symptom indicating underlying problems for the pig. The following article will summarise some of the main findings from the PLFpigCarc project.

Is the SOMO capturing cough sounds?

Clinical examination and *post mortem* examinations of dead or euthanized animals during farm visits combined with routine slaughter checks help diagnose respiratory disease in pigs. Additionally we need to identify the pathogen to get a definitive diagnosis. This approach is costly and, being time consuming and retrospective, delays the implementation of intervention strategies crucial to minimising negative impacts on pig performance and welfare. Thus, alternative

ways to detect and monitor respiratory disease are needed.

The Pig Respiratory Distress Package by SoundTalks® (SOMO) performs continuous and automated measurements of coughing by analysing the sounds collected in a pig house using a microphone. This tool was developed to give farmers an objective measure of coughing frequency in finisher pigs (>25kg).

We know that detailed inspections of lung lesions at slaughter provide a comprehensive picture of a pig farm's respiratory health status. However, due to their ability to heal with no scarring, lung lesions at slaughter do not reflect pig respiratory health in the early production stages. Combining lung inspections with coughing measurements can fill significant knowledge gaps regarding the onset of respiratory disease at different stages of the production cycle.

What did we do?

Our first study took place on a commercial farm. The farm was positive for Mhyo, PRRSv, Influenza and APP and vaccinated for Mhyo, PRRSv and IAV. Productive performance figures for the first six months of 2018 included average daily gain (885 g/day), feed conversion ratio (2.52; FCR) and finisher mortality (3.9%).

A total of 1573 pigs of approximately 12 weeks of age and weighing ~25kg were housed in eight rooms and were individually identified with ear-tags such that they could be monitored individually for 13 weeks, until reaching the targeted slaughter weight of 110 kg.

Manual coughing assessments

For each of the 48 pens, the number of coughs were counted over a 5-minute period once per week, for ten consecutive weeks starting when the animals were aged 13 weeks until 22 weeks of age.

Automatic coughing assessments

SOMO performs continuous and automated measurements of cough sounds, issuing a Respiratory Distress Index, which corresponds to the average number of coughs per pig per twenty-four hours. It also generates an automated warning. One SOMO box was installed in each room.

Slaughterhouse checks

Pigs went to the slaughterhouse in eight groups. There, pigs were individually identified in order to attribute lungs to the corresponding pen/room. For each pig, individual lungs were examined for pneumonia lesions, scars, dorsocaudal and cranial pleurisy.

What did we find?

In general, both the manual coughing and the SOMO captured higher levels of coughing at the beginning of finisher stage. Coughing levels decreased thereafter and remained somewhat constant until the last three weeks, when coughing levels were high again. Pens and rooms with higher levels of coughing at the end of the finisher stage showed higher prevalence of lung lesions. However, this was not true when looking at the pens and rooms that had higher levels of coughing at the beginning of finisher stage. Indeed, we actually found that higher levels of coughing at that time were associated with lower prevalence of cranial pleurisy. Although the levels of coughing varied throughout finisher stage, they never reached very high values. One study suggests that when pigs cough 10 times over a period of 24h, this means that they are sick. We only got values above 10 coughs/24h once!

What does it all mean?

First, we found that the SOMO captured similar trends of coughing levels as our manual coughing counts. This agreement shows that both assessments are useful to measure coughing frequency on-farm. However, manually assessing coughing on-farm overtime has logistical disadvantages. In this study, it took over 40 hours to assess coughing for 10 weeks in 48 pens (containing approximately 1600 pigs). The possibility that less frequent direct assessments could also yield useful information requires further investigation. However, it would be difficult to surpass the effectiveness of the SOMO in terms of time-effectiveness/labour saving.

The fact that higher coughing levels at the end of finisher stage were associated with higher

prevalence of pneumonia lesions is consistent with the knowledge that pigs' age is associated with increased pneumonia lesions at slaughter. Interestingly, scar lesions were associated with coughing levels on week 17. As these lesions indicate that infection occurred at an earlier stage, associations with higher coughing levels at that time are coherent. The fact that the higher levels of coughing at the beginning of finisher stage were not associated with a higher prevalence of pneumonia at slaughter indicates that these lung lesions in younger animals heal and leave no scar tissue. Which means that pneumonia lesions at slaughter have no value for assessing respiratory health in younger pigs, and that measuring coughing levels can be employed for that purpose.

So, why were higher levels of coughing associated with a lower prevalence of cranial pleurisy at the beginning of finisher stage? Well, we found that the percentage of removed pigs was highest at that time. Removing pigs showing clinical signs of respiratory disease likely explains why coughing levels declined on the subsequent weeks. Moreover, the timing of antibiotic treatments could also be an important factor influencing both the reduction in coughing frequency over time and the healing of lung lesions at the time of slaughter. Further research is needed to understand variations of coughing levels, mortality, and antimicrobial use.

Our findings call into question the validity of values of coughing/24h above 10 indicating the

presence of respiratory disease on-farm. Despite the high prevalence of lesions recorded at slaughter, we only recorded levels of coughing/24h higher than 10 once. To better calibrate the SOMO's warning system we need to clarify differences in levels of coughing in different environmental conditions (e.g. high concentrations of ammonia and dust), and to verify the baseline coughing frequency in healthy pigs.

It is yet not possible to acquire pen-specific information with the SOMO, as it records coughing sounds at room level. This information could be useful for diagnostic purposes. For example, our data from the manual coughing assessments indicate that coughing was largely pen-specific, as were the corresponding lung lesions. These findings fit the disease presentation of Mhyo.

Overall, measurements of coughing frequency can be useful to detect and manage respiratory disease. By providing farmers and their veterinarians with objective information, adjustments to vaccination and treatment protocols can be made, and ultimately the effect of those changes can be assessed.

In next month's newsletter we will look at the results from our follow on study that aimed to; classify patterns of coughing according to environmental risk factors, and verify the baseline coughing levels in healthy pigs.

Teagasc & UCC host large international animal welfare science conference

Keelin O'Driscoll



In late August Teagasc and University College Cork (UCC) hosted the 8th International Conference on the Assessment of Animal Welfare at Farm and Group Level (WAFL), which is the first international animal welfare conference to be held in Ireland. The organising committee was made up of Keelin O'Driscoll, Amy Quinn, and Laura Boyle from the Teagasc PDD, as well as Dr. Fidelma Butler from UCC. The conference was 4 years in the planning and had been scheduled to take place in UCC August 2020, but due to COVID restrictions, it was postponed until this year, and run on a virtual platform. Nevertheless, it was the largest WAFL conference to date, with over 360 delegates from 32 countries attending.

WAFL is highly regarded internationally, and was officially opened by Professor Gerry Boyle, Teagasc Director, Professor Sarah Culloty Head of College, Science, Engineering and Food Science (UCC) and Professor John O'Halloran, President of University College Cork (UCC). The Minister for Agriculture, Charlie McConalogue, also provided a closing address, where he highlighted the importance of considering animal welfare when

we think about sustainability, and mentioned the launch of the new Irish animal welfare strategy.

Over 210 scientific papers were presented at the conference, the majority of which were related to farm animal welfare, with several contributed by past and present staff and students from the PDD. It also featured a workshop on the topic of tail biting, which we will hold again for stakeholders in the Irish pig industry in the coming months. Besides practical papers to do with animal management, there were a lot of social science type papers, many of which focused on how to address the disconnect between what scientists say, what policy can dictate, and what producers and stakeholders in industry feel themselves. These studies indicate how to best share research findings with industry stakeholders, and how to improve communication and understanding.

Many of the papers have direct relevance for stakeholders in the Irish pig industry. We heard from Hans Spoolder, who is the coordinator of the EU Reference Centre for Animal Welfare: 'EURCAW-Pigs'. Hans explained how this group

offers assistance to competent authorities (in our case DAFM) across the EU by meeting inspectors in different regions of Europe, and addressing questions about how to achieve and maintain legally required welfare standards. We also heard from Jan Tind Sorenson, who was the founder of the WAFL conference in 1999 in Copenhagen. He addressed the question of whether welfare label schemes help to solve welfare problems in European pig production. Several large pig producing countries such as Germany, Denmark and The Netherlands already have pig welfare labels. Because of consumer pressure, outdoor access, straw, and duration of suckling period, labels often focus on these aspects. However, pig welfare labels rarely address more severe welfare issues often seen in practice; examples include piglet mortality and weaner diarrhoea. Inclusion of animal based measures may be an approach to harmonize animal welfare labels across the EU.

When it came to papers that had direct practical applications, many of the oral presentations were very relevant to pigs. Megan Hayes from the University of Melbourne showed that even just 3 minutes of positive interaction per day (scratching/petting) during the first 3 days of life reduced piglet stress during routine processing procedures. Jacinta Bus, from Wageningen University, showed evidence that feeding patterns could be used to monitor pig welfare (this is something that we are working on with regard to our ESF feeders in Moorepark). Roger Vidal, from IRTA in Spain, carried out work on commercial farms and found lower numbers of tail lesions in pigs receiving more manipulative enrichments compared to pigs which received less manipulative enrichment. However the work concluded that one of the key strategies to

prevent tail biting would be the development of tailored strategies which are farm specific. Melanie McAuliffe from AFBI in NI told us about how a small reduction in dietary protein (from 15.5% to 13.5%) resulted in more harmful behaviours being performed, and the occurrence of an abrupt diet change caused more standing and restlessness. Keelin O'Driscoll then presented results which were generated by the Moorepark pig production model, which showed that if a farm has a prevalence of 0.86% of severe tail lesions (visible from the side of the pen), average daily gain is reduced by 4.8% resulting in the pigs spending an extra 7 days in the finisher stage. The consequence of this was that farm profitability is reduced by 15.1%.

Finally, the winner of the student oral presentation award, Alice Scaillierez, again from Wageningen, spoke on the topic of lighting provision for pigs - 'Can artificial light enlighten pig welfare? This is an often overlooked topic when it comes to pig welfare. Although the duration of light provision has been linked to health and reproduction in pigs, light intensity and spectrum have been studied less. Invisible (ultraviolet) light affects vitamin D synthesis in the skin for both pigs and humans. Vitamin D is essential to bone health, various physiological processes in the body and can affect mood and depression in humans, but its effect on pigs is unknown. Improved use of light, such as use of novel light technology, could thus offer opportunities to simulate 'natural light regimes' and provide a mechanism to improve pig welfare.

We would like to thank our sponsors: DAFM, Bushranger Ingelheim, Bord Bia, Carbery, Fota Wildlife Park, AFB NI, Teagasc, UCC and UCD.

New PDD Technician

The PDD would like to welcome new Pig Research Technician Kieran Keane to Moorepark. Kieran comes to us with almost 20 years' experience working in the Irish pig sector. He brings with him a wealth of knowledge having previously held positions with Makeway in planning and process automation and with Hermitage Pigs. Kieran's primary role at Teagasc Moorepark is management and operation of the feed mill attached to the pig research facility. We'd like to wish him all the best in his future with Teagasc.



Welcome Apeh



The PDD are also delighted to welcome Dr. Apeh Omede joined the team this month. Apeh is a Marie Curie Post-doctoral researcher working on the Milkobiome project. He will study the composition of sow milk to develop new

ingredients that can be used in piglet nutrition once preventive antibiotics and zinc oxide are gone. Apeh is a native of Nigeria and has carried out much research in Australia in recent years.

Welfare Workshop

The PDD are currently seeking interest from people looking to complete the Bord Bia required Teagasc certified pig welfare workshop. If you are interested in the workshop please contact your Teagasc Pig Advisor or email amy.quinn@teagasc.ie.



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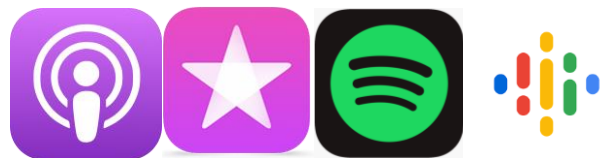
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