

Editor: Amy Quinn

## Welcome to August's Newsletter

Ciarán Carroll



Welcome to the August edition of our monthly newsletter. After last month's drop pig prices recovered some bit during the month and with a strong European price the expectation is for further increases in the weeks ahead. The harvest has reported good yields for winter and spring crops which is promising for pig feed prices.

August has been a busy month for the PDD. The new Lean project is well underway with the PDD Specialist Advisors meeting with the consultants and farmers to finalise the overall farm plans. The Pig Farm Managers course has come to a successful end with 20 students completing the course. We now look to rolling out the QQI Level 5 Pig Production course so if you have staff interested in participating please contact Amy Quinn or your PDD Specialist Pig Advisor (further details later in this newsletter).

PDD staff attended the Energy in Agriculture open day at Gurteen Agricultural College, the International Society of Applied Ethology (ISAE)

congress in Norway, the European Federation of Animal Science (EAAP) in Ghent and The European Conference on Precision Livestock Farming (ECPLF) in Cork, Ireland. A report from some of these meetings will follow in subsequent newsletters.

The National Ploughing Championships take place from 17<sup>th</sup> to 19<sup>th</sup> September at Fenagh, Co. Carlow. As usual the PDD will be well represented in the Teagasc marquee so make sure to call into us when you visit.

Finally, our annual Pig Farmers' Conference is only around the corner (22<sup>nd</sup> October at Horse & Jockey and 23<sup>rd</sup> October at a new venue, the Kilmore Hotel, Cavan) so put the date in your diary now.

### In this issue:

- Mycotoxin Overview
- The 11<sup>th</sup> European Symposium of Porcine Health Management (ESPHM)
- The ExcludeMRSA Project

## Mycotoxin Overview

Louise Clarke



### Why is mycotoxin contamination important in pig feed?

Mycotoxins are highly toxic secondary metabolites produced by fungi on most agricultural commodities worldwide. Various factors are known to influence the incidence of mycotoxins. Their production can start in the field throughout the crop growing stage and continue during harvesting, drying, processing, and storage steps, depending on various environmental conditions. According to the FAO (Food and Agriculture Organization) 25% of the world's crop harvests are contaminated with mycotoxins which can result in major economic losses. There are certain feed ingredients that nutritionally are very good for pigs but at certain times may have a higher risk of mycotoxins (e.g. soya hulls, maize, pollard, etc) therefore it is important to understand the consequences of mycotoxins on pigs. In comparison to ruminants, pigs are extremely sensitive to mycotoxicosis as

mycotoxins undergo a degree of degradation in the rumen which is not possible in pigs.

### At what stage of production can mycotoxins affect pigs?

When mycotoxins are consumed, even at low levels (guidance mycotoxin limit in feed provided in table 1) they can have various negative effects on all groups of pigs with breeding and young animals being most susceptible. Although within a herd there can be great variability in response to a mycotoxin there are several factors which can influence the level of impact mycotoxins have on the animal including:

- the age of the animal
- stage of production
- sex of the animal
- health status of the animal
- type and concentration of mycotoxin consumed
- duration of exposure
- farm management

Table 1. The guidance mycotoxin limit in feed legislation for pigs (2006/576/EC).

Mycotoxin	Material	Limit (ppb)
Aflatoxin*	Complimentary and complete feeds	20
Deoxynivalenol	Complimentary and complete feeds	900
Zearalenone	Complimentary and complete feeds	100
Ochratoxin	Complimentary and complete feeds	50

\*Maximum content under Directive 2002/32/EC

### Which mycotoxins are relevant and what effect do they have on the pig?

Various mycotoxins cause significant health and performance issues in pigs and currently there are around 400 mycotoxins identified. There are six major classes of mycotoxins that frequently occur: aflatoxins, trichothecenes, fumonisins, zearalenone, ochratoxin and ergot alkaloids. Mycotoxins differ in their structure, which helps explain the great variation of symptoms.

The gastrointestinal tract of pigs is the first organ in the body to come into contact with mycotoxins and at a greater potency in comparison to any other organs. Here, mycotoxins may be absorbed and transferred into the rest of the body having the potential to affect immune system functioning, increase diseases, reduce weight gain, cause a series of reproductive issues and can even result in death when consumed by animals. What's more, irreversible tissue damage can occur that will compromise performance long after mycotoxins have been removed from the feed. In table 2 a list of the most relevant

mycotoxins to pigs and poultry feed are shown and the negative impacts associated with each of them. In addition to individual mycotoxins, contamination of multiple mycotoxins is not uncommon. Evidently, multi-contamination poses a bigger challenge for animals because simultaneous exposure may potentially lead to synergistic interactions.

Table 2: Mycotoxins of relevance in Pig/Poultry feeds (Innovotec, Mycotoxin Prevalence Report November, 2016).

Mycotoxin	Negative Impacts
<b>Trichothecenes family:</b> Deoxynivalenol (DON) T2 Toxin HT 2 Toxin	<ul style="list-style-type: none"> <li>Reduced feed intake</li> <li>Epithelial lesions in the oesophageal region</li> <li>Decreases blood serum haematocrit &amp; haemoglobin</li> <li>Reduced antibody response</li> </ul>
Zearalenone (ZEA)	<ul style="list-style-type: none"> <li>Uterine enlargement, ovarian atrophy and vaginal prolapse</li> <li>Reduced fertility in sows and boars, smaller litters, abortion, foetal mummification, abnormal return to oestrus</li> </ul>
Ochratoxin A	<ul style="list-style-type: none"> <li>Reduced feed intake</li> <li>Increases susceptibility to salmonellosis</li> <li>Increases water consumption- more manure</li> <li>Kidney damage</li> </ul>

### How do you manage mycotoxin risk?

Practical guidelines should be put in place in order to reduce animal exposure to mycotoxins

1. Always be on the lookout - seek up to date information on mycotoxin prevalence on a

quarterly basis but especially at the start of the key raw material season (September and January). Information is available online from websites such as Feed Navigator or Neogen and always seek information from your supplier.

2. When purchasing grain/feed make sure it is from quality assured suppliers only.
3. Where possible install a pre-unloading, quick-test procedure using a certified test kit making sure that a representative sample is tested. From these results implement effective management responses, such as rejection or segregation of suspect materials. If testing of a grain/feed sample is not a viable option on your farm collect any suspected contaminated grain/feed and send away for immediate analysis.
4. Operate an effective bin hygiene plan including running bins down to empty at least

once a month, dust with a mould inhibitor every 6 months (Spring and Autumn) and pressure wash bins, allow to dry and disinfect and fumigate to eradicate mites and insects on an annual basis while continuously being on the lookout for leaks or condensation that create hang ups in bins.

5. Take control action early - if mycotoxin contamination is detected take immediate action to prevent the exposure of pigs to mycotoxin contaminated feed by stopping the use of the contaminated material (which is often not a possible answer), diluting the problem, or by using a broad spectrum mycotoxin binder and mould inhibitor. Also minimizing the usage of suspect ingredients in diets for young pigs and sows will help. As a result of the broad range of effects that mycotoxins can have on pigs, preventative measures are certainly warranted.

## The 11<sup>th</sup> European Symposium of Porcine Health Management (ESPHM)

Jen-Yun Chou & Maria Costa

From the 22<sup>nd</sup> to the 24<sup>th</sup> of May, the 11<sup>th</sup> European Symposium of Porcine Health Management (ESPHM) was held in Utrecht, the Netherlands. With almost 1600 delegates (veterinarians and researchers) from all over the world, the symposium focused on the latest developments in porcine health (from diagnostics to economics), management (biosecurity and good practices to reproduction) and welfare. Jen-Yun Chou, PhD Walsh Fellow, and Maria Costa, Postdoctoral Researcher, were there representing the PDD.

### The Dutch pig industry

The conference started with an overview of the pig sector in the host country, presented by Prof. Anton Pijpers from Utrecht University. Pijpers guided us through the ups and downs of Dutch pig production throughout recent decades, highlighting the impact that the 1997-1998 massive breakdown of Classical Swine Fever had on the sector. This outbreak had an overall cost of ≈ 1.5 billion euro. More than 80% of Dutch pig farms closed (20,000 pig farms) and the industry lost about of 25% of the pig herd (approx. 4

million pigs). It took many years for the sector to recover, but the restructuring of the industry, supported by the government and Rabobank, brought producers together to implement good practices, improve facilities and enforce effective pig health monitoring systems. Nowadays, the spine of this industry is disease prevention and biosecurity coupled with monitoring and surveillance, in which the Dutch invest greatly. At the same time, Pijper also discussed the current challenges, which are to transform pig production into a sustainable activity and to attract professionals to the area, while addressing social acceptance and concerns, especially regarding animal welfare.

#### **Porcine health management 4.0: or the way from “no data” to “big data”, and finally to “smart data”**

More recently, the routine collection of vast amounts of data (aka big data) in pig production is helping producers and veterinarians to detect and manage health and welfare constraints earlier and even to identify their causes (i.e. biosecurity breach). Precision Livestock Farming (PLF) involves using technology to collect information on individual animals (e.g. an ear tag that can detect when a sow feeds in the ESF etc.). This information then can be combined to provide a picture of what is going on in the whole batch or herd. There has been a vast body of research on how to use PLF in recent years to improve farming systems. Prof Daniel Berckmans, a respected figure in PLF, and based at KU Leuven, spoke about how to use PLF to monitor farm animals for health and welfare outcomes. It's not just about “BIG data” but about “SMART data,” selecting the measurements that relate to

the health and welfare of the animals, instead of collecting an excessive amount of data without having a clear aim. Real-time monitors for pigs are currently in development and there are also real-time video recordings combining thermography cameras to enable detection of aggressive encounters. A few other examples of PLF are coughing monitors (i.e. Soundtalks, already being researched in Irish farms by Laura Boyle and Joana Pessoa), water consumption to detect diseased pigs, and weight estimation based on video footage (see some examples at <http://www.eu-plf.eu/>). Collaborations between industry, researchers, farmers and stakeholders are the key to implementing PLF, and use it most effectively.

#### **Antimicrobial use and resistance**

On the second day the focus turned to the hottest topics/challenges now in pig production, and so Antimicrobial usage (AMU) and Antimicrobial resistance (AMR) took centre stage. These are challenges, and sometimes not enough focus is put on them, since AMR reduction in animals does not necessarily reduce AMR in humans - the links still need to be established. In last month's newsletter, Laura Boyle discussed this issue (see Teagasc Pig Newsletter for June). Further challenges in the control of AMU in low-middle-income countries, which usually lack knowledge and awareness, surveillance, regulation, biosecurity and proper veterinary advice, need to be considered as well since AMR is a global issue. For farmers, it is important to think about the benefits of improving animal health in general, not just for reducing AMR. Actions, such as optimising vaccinations, strengthening animals' immune system, or (even better) just going back to the very basics: improve biosecurity, facilities and adopt good practices

that promote disease prevention (e.g. lower stocking density, proper cleaning and disinfection) can be put into place.

### “Long tails” - the future

The next topic discussed was tail docking and tail biting. The senior administrator at the European Commission (EC) Directorate-General for Health and Food Safety (DG SANTE), Desmond Maguire, spoke about the current progress of the EU Member States (MS) in complying with the Council Directive 2008/120/EC; this states that producers must not routinely use tail docking to control tail biting. During the past 2 years, the EU has put in place a compliance project, which has included several meetings and which require the MS to propose clear action plans to help producers comply with the directive. These plans were then audited, and guidance and feedback provided to the individual countries. Desmond reiterated the position of EC in the enforcement of the policy and the important role private vet practitioners can play to help producers in taking actions. Although many producers in the EU are now able to rear pigs with intact tails, there is no silver bullet for an easy solution. One barrier to change is that vets and producers are not used to rearing long-tailed pigs, so training, learning and support is needed to gradually change the practices. It is important to stay optimistic and as a vet delegate said, a little bit of "just do it!" spirit is needed.

Dr. Nicole Kemper from Hanover University also spoke on long tails. In her experience, moving from stage to stage is a critical period for tail biting, and she states the three factors of ‘water-rooting-air’ to be the most important ones when controlling tail biting. At the same time, it is

important that farm staff learn to identify “hanging tails” for early warning.

### ASF: insights from field veterinarians

Last but not least, African swine fever (ASF) was the theme on the last day of the symposium. Two Belgian delegates presented detailed work on how they tackle the issue first hand. Although currently the origin of the outbreak in Belgium is still under investigation, it is possible to contain the disease without further outbreaks in domestic pigs by having stringent biosecurity, a thorough surveillance network, frequent veterinary visits and good reporting, and a wider engagement of other stakeholders (e.g. the tourist sector, hunters, and the public). Currently the battle is still on-going, and as ASF becomes a global issue, international collaborations are needed to ensure the continuity of disease prevention across borders.

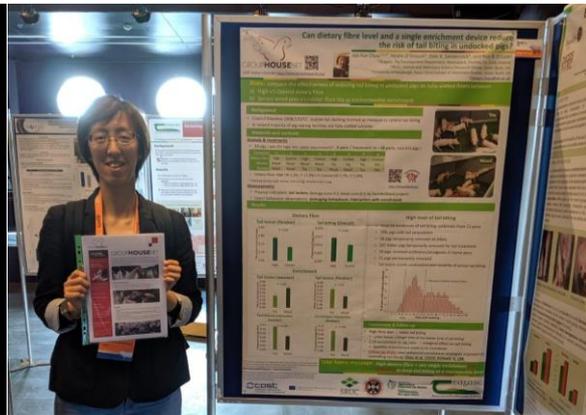
### Interesting talks

Other interesting topics brought by fellow delegates included weaners’ gastric ulcers, the effect of practices during artificial insemination on repeats, and using ropes as an easy and fast disease screening method on farm. One particularly interesting topic was about the dental diseases in sows which is rarely looked at. According to the Finnish study, about 25% of the sows euthanised or found dead on farm had certain level of dental diseases. How this may affect their performance, the association with other diseases and welfare measures is still unknown and should be further investigated. Another interesting case was a reproductive failure investigation. Apart from the normal investigation sequence to be followed in these cases (record analysis, farm audit, slaughter checks of reproductive tracts, ultrasound

examinations and further lab examinations for diagnostics), attention must also be shifted to different sow genetics on farm. In this case, the farm had two pools of sows, with genetics A taking longer to ovulate than sows from genetics B, which were a new line of hyper prolific sows. These sows had a shorter weaning-to-oestrus interval, shorter heat, and the ovulation was closer to the start of the oestrus. Thus, AI times, must be adapted to each type of genetics to prevent reproductive failure.

Jen and Maria also presented their work in this conference:

- Maria Rodrigues da Costa, Albert Rovira, Montserrat Torremorell, Rose Fitzgerald,



Josep Gasa Gasó, Helen O'Shea, Edgar Garcia Manzanilla. 2019. Modelling the effect of respiratory disease on production performance of farrow-to-finish pig herds.

- Jen-Yun Chou, Rick B. D'Eath, Dale A. Sandercock, Keelin O'Driscoll. 2019. Can dietary fibre level and a single enrichment type reduce the risk of tail biting in undocked pigs?
- Maria Rodrigues da Costa, Nienke van Staaveren, Julia Calderón Díaz, Gerard McCutcheon, Edgar Garcia Manzanilla, Laura Boyle. 2019. Modelling the effect of biosecurity practices on key pig welfare indicators.

## The ExcludeMRSA Project

**Daniel Crespo Piazuolo & Peadar Lawlor**

In 2004, the daughter of a Dutch pig farmer was the first reported case of a methicillin-resistant *Staphylococcus aureus* (MRSA) transmission from pigs to humans. This was named livestock associated MRSA (LA-MRSA). This incident highlighted that farm workers and their families are at risk for acquiring MRSA through direct contact with pigs, other humans and occupational dust exposure. The bacterium, MRSA, is now

well-known for causing difficult-to-treat infections as it is resistant to several antimicrobials. Originally, LA-MRSA infections in humans were not considered as severe as the ones spread directly from human to human. However, in 2014, four people died from LA-MRSA in Denmark. After this, concern regarding LA-MRSA spreading in humans and pigs increased in the European Union.

A pilot study performed by our Dutch colleagues at Utrecht University reported that on an MRSA-positive pig farm, piglets become MRSA-positive four days after birth. In this same study, the presence of some bacteria was found to be negatively associated with the presence of MRSA. This opened up the potential of using combinations of bacteria in an effort to reduce the carriage of MRSA. Such an approach avoids the need for antibiotic treatment which can lead to the development of new antimicrobial resistances in the bacterium.

Last year, the ExcludeMRSA project commenced. It aims to prevent/lessen the transmission of MRSA from pigs to humans through competitive exclusion. A European consortium including partners from Ireland (Teagasc and University College Cork), Germany (EW Nutrition GmbH) and The Netherlands (Utrecht University) is working on this project.

### Project outline

1. Collect nasal swabs from a sample of sows and their piglets over time to determine prevalence of MRSA
2. Identify bacterial species found in the nasal swabs taken from the piglets that compete with MRSA
3. Create a collection of commensal bacterial strains (competitors of MRSA) which can be later used in a nasal spray therapy for the control of MRSA in pigs
4. Treat pigs with nasal spray and collect nasal swabs from a sample of sows and their piglets over time to determine the effectiveness of the nasal spray in reducing the presence of MRSA in pigs

### Current status of the project and next steps

The first phase of sampling started in May 2019 in Ireland, which involved nasal sampling 11 piglets

from each of 4 sows on each of 3 pre-selected farms. Pigs were sampled on a daily basis on their first week of life, and thereafter once weekly until they were 10 weeks old. More than 2,000 duplicate samples have been collected to date.

The microbial DNA contained in these samples will be sequenced by our partners in Utrecht to discover the bacteria present and how they compete with MRSA. The ones found to compete with MRSA will be isolated, fully sequenced and screened for safety following which they will be used to make a nasal spray.

The nasal spray therapy will then be administered to new born piglets on selected commercial herds with sampling conducted to evaluate the effectiveness of the nasal spray in reducing the presence of MRSA in the nasal passages of piglets over time.

### Potential benefits of the project

- Estimation on MRSA prevalence on selected Irish pig farms. (All indications to date are that this is low in Ireland relative to other pig producing countries)
- Reduction in MRSA/*S. aureus* prevalence in pigs by using a nasal spray therapy
- Avoidance of antibiotic use which can lead to new bacterial resistances
- Reduced risk of MRSA transmission from pigs to humans

### Acknowledgements

The Irish component of the ExcludeMRSA project is funded by the Health Research Board (HRB), Grant Reference: JPIAMR-2017-1-A. We wish to thank management and staff on the three farms with which we have worked to date for their collaboration.

### ASF poster on its way to you

Teagasc with the support of Cargill and the Irish Pig Health Society have developed a poster for on farm use on how to reduce the threat of African Swine Fever. They are currently being posted out to all producers. More copies are available so please contact [amy.quinn@teagasc.ie](mailto:amy.quinn@teagasc.ie) if you require more.



### QQI Level 5 Pig Course

The Teagasc PDD is still looking for expressions of interest for the part time QQI Level 5 Certificate in Agriculture in Pigs. This course is aimed at enhancing the skills and knowledge of farm operatives. Please email [amy.quinn@teagasc.ie](mailto:amy.quinn@teagasc.ie) if you or any of your staff are interested in completing this course. It is expected that this course will be run over 2 days per month for 12 months based in one central location. On successful completion of the course students will be awarded a component award in the 5 QQI Level 5 modules.

### Teagasc Pig Farmers Conference 2019

Preparations are well under way for this years Teagasc Pig Farmers' Conference. It will take place on the 22<sup>nd</sup> of October in the Horse and Jockey Hotel, Co. Tipperary and on the 23<sup>rd</sup> of October in Hotel Kilmore, Cavan (note new venue for Cavan this year).

The theme for this years conference is "Focus on the Future". Our guest speaker is Professor John Mabry from Iowa State University, who will look at the economic impact of genetic improvement in litter size and leanness. Many of the PDD staff will take to the stage also to present a variety of topics that will spark a lot of interest. To finish off the day we will also be hosting a panel discussion to discuss the hot topics on the day. In next month's newsletter we will provide a comprehensive overview on what to expect from this years Pig Conference. We look forward to seeing you all there!

The event flyer will be sent out to producers in the coming weeks and further details will be added in due course to the event webpage at: <https://www.teagasc.ie/animals/pigs/upcoming-events/pig-farmers-conference-2019/>

### TASAH Funded Biocheck.UGent Scoring

We would like to further remind you that Animal Health Ireland (AHI) is delivering the TASAH-funded Biocheck.UGent biosecurity reviews on behalf of the Department of Agriculture, Food and the Marine (DAFM). To avail of this free service, visit the TASAH section of the AHI website:

[http://animalhealthireland.ie/?page\\_id=11040](http://animalhealthireland.ie/?page_id=11040), or contact AHI by telephone (071 9671928) to access a list of trained, participating vets and their contact details.



### For more information:

Please visit our webpage at:  
<https://www.teagasc.ie/animals/pigs/>

For any further information on newsletter content please contact the editor, Amy Quinn at: [amy.quinn@teagasc.ie](mailto:amy.quinn@teagasc.ie) or +353 87 3779015