

Editor: Amy Quinn

Welcome to January's Newsletter

Ciarán Carroll



Happy new year to you all! Welcome to the January edition of our monthly newsletter. It's the time of year for new resolutions. What ones have you made for your farm this year? It's a good time to carry out a review of farm performance and to prepare a business plan for the year ahead. Analysis of accurate herd records is essential for this. Farms using the Teagasc ePM PigSys herd performance monitor perform better than those that don't. If you're not already on ePM PigSys, make this your new year's resolution. If you are, then use the information to benchmark your farm against others and prepare a Business Plan for 2018. Contact your Specialist Pig Advisor to arrange this for you.

The European network project, EU PIG, continues and Edgar Garcia Manzanilla and I attended the second annual meeting at Reggio Emilia, Italy. This network was developed to improve the pig industry and will look at health management, precision production, animal welfare and meat quality. This year, as part of the Best Practice awards we are looking for submissions on

alternatives to Zinc Oxide in pig diets, optimal vaccination strategies, precision production to improve gilt and sow performance, easy methods to identify pigs for slaughter, what's working in loose farrowing and environmental enrichment? If you would like to submit a Best Practice contact us soon as the closing date is February 21st.

Finally, good news on the education/training front. QQI have approved the modules that Teagasc PDD submitted for the Pig Managers course. PDD are working on rolling out the course so make sure you contact us to register your interest.

In this issue:

- New Nitrate Regulations
- PDD Research Update & Outlook 2018
- Netting Precision with the Net Energy System

New Nitrate Regulations

Gerard McCutcheon

The EU Good Agricultural Practice for Protection of Waters Regulations (often referred to as the “nitrate” regulations) have been reviewed and updated giving some benefits to farmers using pig slurry. The new Statutory Instrument (SI 605 of 2017) came into effect on 20th of December 2017. The main changes are discussed below.

Limit of 170 kg Organic N per hectare

The limit of 170 kg of organic N per hectare still applies to all farms that import organic fertilisers such as pig manure. Article 20(1) now states “that where imported livestock manure is to be applied in any year to the land on the holding calculations shall be based on the previous calendar year’s stocking rate.” This is a welcome change which should allow farmers that use pig manure greater certainty in their calculations in the future. It should also allow these farmers do their calculations earlier in the year. If there were sheep or horses (or other non-bovine animals on the holding) they should be factored into the calculation to determine the organic N on the farm.

Simplification of Calculation

The calculation to determine the phosphorus (P) requirement for a farm has been simplified by removing the calculation of the P contained in the slurry/manure (produced over the winter period) of the grazing animals.

Soils with a P Index of 1 or 2

The availability of P in organic manures such as pig slurry is deemed to be 100% available at soil P Index of 3 or 4. If a soil is Index 1 or 2 (see Table 1 below) the availability of the P from organic fertilisers is 50%. The farmer can verify that the soil is Index 1 or 2 by soil sampling his farm. If the farmer does not soil test the land they can still assume Index 3 soil P levels as in previous versions of the regulations.

Table 1: Phosphorus Index system remains as follows:

| Soil P Index | Soil Phosphorus Ranges (mg/l) | |
|--------------|-------------------------------|-------------|
| | Grassland – Mineral Soils | Other Crops |
| 1 | 0.0 – 3.0 | 0.0 – 3.0 |
| 2 | 3.1 – 5.0 | 3.1 – 6.0 |
| 3 | 5.1 – 8.0 | 6.1 – 10.0 |
| 4 | > 8.0 | > 10.0 |

***Reference SI 605 of 2017**

It would be wrong for pig farmers to ever soil sample another farmers “holding”. The “duties of the occupier of a holding” in relation to nutrient management” are clearly set out in Article 16 of SI 605 of 2017. These duties do not oblige pig farmers to produce nutrient management plans for other “holdings”.

In the new regulations a soil sample must be taken per 5 hectares (max. area) and every 4 years (In the previous regulation this was a sample per 8 hectare (max) every 5 years).

There is a new calculation that uses Table 13B if farmers are soil testing and are above a stocking rate of 130kg of organic N /ha which allow for extra P allowances once the farmer is compliant with the requirements as outlined in Article 16(5) of the regulations.

Transitional Provision

There is a new allowance to exceed the P allowances by 3, 2, 1 and 0 kg in 2018, 2019, 2020 and 2021 respectively if the excess P arises from the application of pig manure.

PDD Research Update & Outlook 2018

Keelin O'Driscoll

Last year was a busy year for research carried out in the Pig Development Department (PDD). The new unit facilitated huge progress in a number of our larger projects, and in fact during the year every single batch of pigs was used in research. As well as our own researchers and students, we also hosted 23 visiting students from universities around the world, several of whom carried out their own small research projects.

Starters and Leavers

The **PROSWINE** project, headed by Peadar Lawlor and run in collaboration with WIT, started up in the summer of 2017. This project is investigating the feasibility of a novel probiotic which was identified in previous work by Peadar, and Gillian Gardener in WIT. Carmen Villodre joined the department as a postdoctoral researcher for 4 months and completed one of the experiments for the project, with several more planned for the coming year. Shilpi Misra started her PhD on water foot-printing and water use reduction in Irish pig farms (**Waterworks**). She has already started the process of developing a survey and identifying farms for water monitoring. Lorcan O'Neill also began his PhD on antimicrobial use and resistance in animal production (**AMURAP**). Lorcan has been collecting data on antimicrobial use and management on pig farms. We said

goodbye to Ursula McCormack in the autumn, who was working on the **ECO-FCE** (A whole systems approach to optimising feed efficiency and reducing the ecological footprint of monogastrics) project. She submitted and defended her thesis in the autumn and has taken up a research role in AFBI. Oliver Clear finished his contract on the **OPTIPIG** project, and moved over to working with Laura Boyle on a new project she is leading (**PLFPigCarc**). The project involves setting up hardware and software in both commercial units and slaughterhouses to monitor respiratory disease on farm, and facilitate more standardised collection of lung pathology data on the slaughter-line. As well as Oliver, a new PhD student will be taken on board during 2018, in collaboration with UCD. Finally, the **GREEN FARM** project, investigating anaerobic digestion of pig manure and food waste, finished at the end of 2017, with Yan Jiang and Conor Dennehy submitting their PhD theses and hosting the end-of-project dissemination day in Grange in March 2017.

Ongoing projects

The **PigSurvPath** project, investigating respiratory pathology, risk factors and relationships with other pathologies, has continued, and some new long scales studies started up in late 2017. There

has been a lot of progress with the **OPTIPIG** project in 2017; a project investigating supplementation of sows with carnitine during gestation and/or lactation is ongoing, and a study investigating the use of various energy supplements for small piglets finished in August. The **Entail** project is also still going well; during the year we managed to successfully rear pig with intact tails in Moorepark. This is timely, bearing in mind the renewed focus of the European Commission on enforcing a ban on tail docking. The PhD student on the project investigated whether the amount and the variety of enrichment could prevent biting outbreaks. She is using her data to plan a new project which will hopefully identify some more 'producer friendly' methods to prevent biting without docking.

As well as this on-going work, several newer projects really got going during the past year. Three more experimental batches of pigs were put through our liquid-feed facility, with data on both pig performance and the microbes present being collected (**Wet-Feed**). Three experiments for the **GiltLife** project (management of replacement gilts) have been completed; the gilts were reared to service age, 80 were served and monitored throughout gestation, and their offspring have had a variety of health and stress checks carried out. The student working on the **NetEnergy** project, led by Edgar, completed four experiments during the year; she investigated the timing of phase feed changes and high and low crude protein levels at 2 energy levels. John Moriarty carried out a series of Focus groups as part of the **DigiPig** project, as well as developing educational and training videos, and is compiling his final report. The experimental work for the **PigZyme** and **WelPig** projects has finished, and the PhD students involved are in the process of

compiling the data for completion of their PhD's in 2018.

Good result from the Peer review

In late 2017 a peer-review exercise was carried out across all the animal research departments in Teagasc. This process happens every 5 years. A team of internationally recognised experts who are external to Teagasc are assembled, provided with a report of research activities during the previous 5 years, and then come on site to carry out a detailed programme of assessment over several days. We were delighted with the outcome of the process; the PDD scored Excellent in both 'Quality and Productivity' and 'Relevance to Stakeholders'. The peer-review panel also stated that the pig development department team are 'clearly among the best in their field for applied research as attested by publications, but also the number of projects underway'. The reviewers also stated that the department 'is one of the largest and arguably best applied pig research/extension programmes operating globally today.' The report bears testament to the success of the pig-levy and the collaborative success of the Teagasc PDD and our stakeholders in developing our research, advisory and education strategy during the past 5 years.

Finally, we would like to thank all of the farmers who have contributed to our research over the past year by completing surveys, partaking in studies and allowing us to use their facilities and pigs. All in all, 2017 has been a busy and exciting time for pig research!

Updates on all the projects listed above will be provided at the Pig Research Dissemination day and are available at:

<https://www.teagasc.ie/animals/pigs/research/research-current-projects/>

Netting Precision with the Net Energy System

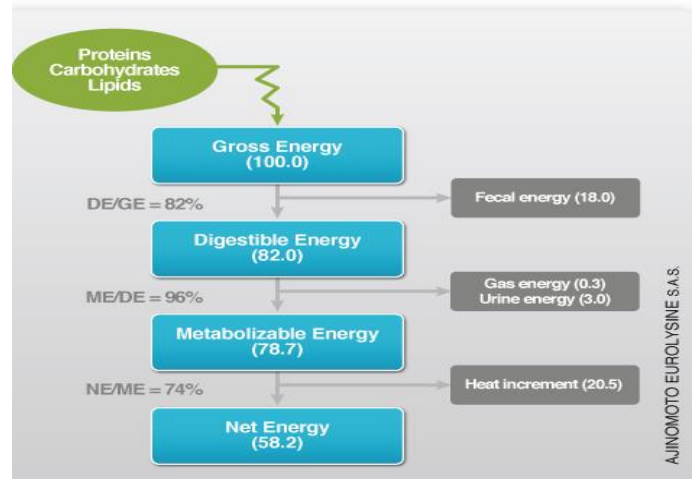
Susan Dudley

As you know high production costs are one of the biggest limitations to a profitable and sustainable pig industry in Ireland. Currently feed costs account for approximately 70% of overall costs of pig meat production, with energy representing the greatest proportion. Therefore, it is essential that changes are made in order to help reduce feed costs and make pig production a more attractive and profitable industry. This can be achieved by more precise feed formulation and by using the correct energy system when formulating diets. But, what are the differences between the energy systems available?

Firstly there is the gross energy value of an ingredient. This represents the total amount of energy present in a feed ingredient (100%). However, not all this energy is available to the animal. This is due to the fact that there are multiple pathways energy must undertake before it is made available to the animal for productive purposes.

The digestible energy (DE) system has been used in Ireland for many years as it is very easy to determine. However this system is not the most accurate system to use as it only considers the energy losses that are expelled in the faeces of the animal. Approximately 18% of the energy in an ingredient is lost in the faeces of the animal. Furthermore, there are many additional modes of energy deductions that must occur before you are left with the 'true' available energy value of an ingredient. Once you subtract the energy lost in urine (3%) and gas productions (0.3%) from

digestible energy then you are left with the metabolisable energy (ME) system.



The final system being used is the net energy (NE) system. This system considers all energy losses that occur throughout the digestive tract of an animal. The NE system is calculated as the energy lost in heat from the animal deducted from the ME value of an ingredient. Roughly there is a further 20.5% reduction in energy between the ME value and the final NE value of an ingredient. In simpler terms the NE value of an ingredient is about 70% of the DE value. So if you are formulating diets using the DE system and want to start using the NE system, the net energy values are approximately 70% of the digestible energy values. The following table is a quick estimation to use when converting diets from the DE system to the NE system.

| DE | NE |
|---------------|---------------|
| 18 MJ/kg DE | 12.6 MJ/kg NE |
| 16 MJ/kg DE | 11.2 MJ/kg NE |
| 15 MJ/kg DE | 10.5 MJ/kg NE |
| 14 MJ/kg DE | 10 MJ/kg NE |
| 13.5 MJ/kg DE | 9.5 MJ/kg NE |
| 13 MJ/kg DE | 9.1 MJ/kg NE |

The NE system is the most appropriate system to use as it provides energy values for ingredients that are similar to the energy available to the animal. Due to the fact it considers the energy lost in heat production and from the digestive processes that occur within the animal.

As the NE system is the most accurate system to use for feed formulation it is clear a change needs to be made in order to utilise these added benefits. The DE system may seem like the most appropriate option to use for diet formulation as it has proven to work for many years. But in reality the DE system is actually over estimating the energy values of certain ingredients and underestimating the value of others. For example ingredients rich in protein and fibre are difficult to degrade so the animal actually uses their own energy to breakdown the nutrients and subsequently produces heat. Therefore when formulating diets using the DE system we are estimating values for diets that are not real and are in fact lower than what we think.

Likewise when using ingredients high in fat the DE system underestimates their energy value, ultimately calculating a diet that has more energy than we think available to the animal. Consequently by formulating diets using the NE system you more closely match the pig's requirements for growth, which can be more profitable. The NE system is the only system that describes the energy actually available to the pig.

Take home messages:

- The NE system considers all losses that occur throughout the animal's digestive system and it represents the 'true' energy that is available to the animal.
- Lower the CP content of your diets as protein is difficult to degrade by the animal. High CP diets cost the animal energy to breakdown and you ultimately waste energy by feeding high CP diets. Alternatively use low CP diets and substitute with synthetic amino acids to meet the requirements of the animal.
- The NE system allows for more complex diets to be used and provides more selection options for producers.
- The DE and ME systems represent 'potential energy' values of an ingredient whereas the NE system represents 'useable energy'.

Student Profile

Susan Dudley

Susan is a postgraduate student on the NET-ENERGY Project, which looks at exploring net energy (NE) and amino acid (AA) balance in Irish pig diets. Susan is supervised by Dr. Edgar Garcia Manzanilla (Teagasc), Dr. Peadar Lawlor (Teagasc) and Prof. John O'Doherty (UCD).

Location: Pig Development Department, Teagasc Moorepark

Research Interests: Animal Nutrition

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Pig Farm managers Course

The Teagasc PDD were informed in January that the QQI Level 6 pig programme has been approved by QQI meaning that we can now enrol and run the Level 6 course in Pig Farm Management. If you have not already done so please email amy.quinn@teagasc.ie if you or any staff members are interested in enrolling in the course so you will receive the course updates.

EU PiG

EU PiG is a Europe-wide network developed to improve the connection between pig producers and the latest science, husbandry techniques and technologies and is made up of a consortium of 19 organisations from 13 member states in Europe. EU PiG runs a Best Practice Grand Prix that identifies ambassadors for best practices that address eight selected challenges. Last year an Irish pig producer, Eugene Sheehan, was one of the winners under the health theme. This year the Grand Prix is addressing 8 new challenges outlined below and we intend to submit a number of Irish entries this year (closing date Feb 21st). If you or someone you know is doing something novel covering any of these challenges please contact your Specialist Pig Advisor.

| 4 Themes | 8 Challenges |
|--|---|
|  Health management |  Managing without zinc oxide  Optimal vaccination strategies |
|  Meat quality |  Reducing variation before slaughter  Producing tastier pork |
|  Animal welfare |  Loose farrowing systems  Innovative enrichment materials |
|  Precision production |  Reduce emissions  Increase sow performance |

New arrival

The PDD welcomed PhD candidate Shilpi Misra from New Delhi, India to the department. Shilpi joins Teagasc staff Keelin O'Driscoll, Amy Quinn and John Upton on the WATERWORKS Project looking at water footprinting and water use reduction in Irish pig production in collaboration with Wageningen University, Netherlands. Shilpi obtained an Erasmus Mundus International Master's degree in Environmental Technology and Engineering (IMETE) from Ghent University, Belgium, UNESCO-IHE, Netherlands and University of Chemical Technology, Czech Republic. She has more than 6 years' experience in the environmental sector with focus on climate change and its impact on agriculture and environmental conservation having worked with various national and international organizations.

Dates for your Diary

- The 2018 IPHS Symposium will take place on Tuesday April 10th at the Slieve Russell Hotel Golf and Country Club, Co. Cavan.
- The European Pig Producers (EPP) Congress 2018 'A Tail's Length Ahead' takes place from May 30th to June 1st in Lucerne, Switzerland. Registration is now open and members of the Irish EPP branch can register for an early bird special rate before February 28th. Contact EPP Ireland Chairman Colin Marry or EPP Ireland Secretary Shane McAuliffe for more information.

For More Information

This newsletter was edited by Amy Quinn, Pig Development Officer, Teagasc Moorepark, Fermoy, Co. Cork. For more information on any of the newsletter content please contact Amy at amy.quinn@teagasc.ie



Please visit our website at www.teagasc.ie/pigs/