Waterford Institute *of* Technology
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE

Realising our Future

Sow feed additive to increase progeny carcass weight

Background

In commercial pig production, feed contributes up to 70% of total production costs. Such costs can be further compounded by poor feed conversion caused by sub-optimal nutrition, infection, stress and sub-optimal weight gain. This very often necessitates costly dietary supplementation on a per animal basis. Furthermore, the EU prohibition of routine in-feed antibiotic use and supplementation with pharmacological levels of zinc oxide necessitates the development of alternative sustainable treatments and strategies to support development of a healthy piglet intestinal microbiota and optimal gut health. The availability of a clean-label sow feed additive that promotes robust and durable piglet growth would mean a significant increase in the output and value of saleable meat for commercial pig producers.

Technology Description

Research undertaken by Waterford Institute of Technology (WIT) and Teagasc, Moorepark in Ireland has demonstrated that a microbial strain, which when fed to transition and lactating sows, significantly increased offspring carcass weight.

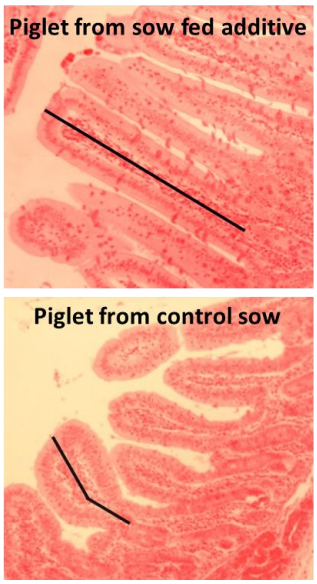

Fig.1 Duodenal histology

A feed supplementation trial involving 24 pregnant sows and 144 of their offspring compared the effects of this microbial feed additive on progeny growth when administered daily to the sow over a 6-week period (last 14 days of gestation and the 28 days of lactation) against a control treatment (standard lactation/gestation diet without the additive). Sows and offspring from both groups were continuously monitored, with faecal, blood, colostrum and milk samples collected from sows, and faecal, gut digesta, gut tissue and blood samples collected from offspring at intervals from birth to slaughter. It was found that supplemented sows produced colostrum with a higher protein content. Piglets born to sows fed the microbial additive demonstrated faecal shedding of the strain while suckling, thereby demonstrating transfer of the microbial additive from sow to offspring. Offspring from supplemented sows also exhibited the following benefits:

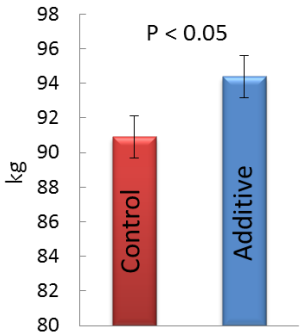

Fig.2 Carcass weight

- Increased villous height in the small intestine at day 7-8 post-weaning (P<0.05; **Fig. 1**)
- Better feed conversion ratio (FCR) for the first 14 days post-weaning (P<0.001).
- Increased pig live-weight at day 105 and 127 post-weaning (P<0.05).
- A numerical reduction in pre-weaning mortality (from 15.6 to 10.1%).

Most notably, the improvement in live-weight at the end of the finishing period resulted in an increased carcass weight, with offspring from supplemented sows being 3.5 kg heavier than offspring from untreated sows (P<0.05; **Fig 2**).

WIT technology transfer office

Opportunity

Sow treatment with this feed additive improved FCR of offspring by 0. 17 of an FCR unit during the first 14 days post-weaning. This is a good indicator of improved gut health at this critical period that has been shown to correlate with increased lifetime growth. The 3.5 kg heavier carcass weight, at the same slaughter age, achieved by pigs from the maternally supplemented sows represents a financial gain of €5.39 per pig using a 5-year average pig meat price of €1.54/kg carcass. Based on the fact that a sow produces an average of 26.9 piglets/year this amounts to €144.99 increase in the output value per sow per year. For a typical 500 sow unit, this equates to an economic benefit of €72,495 a year.

Commercial Opportunity

These data suggest that considerable savings can be made when this microbial strain is fed to sows for 6 weeks (2 weeks prior to farrowing and 4 weeks post-farrowing). Competing products are supplemented to sows for the full reproductive cycle. Based on the cost of competing products if adopting a 6 week administration period, for every €1 spent on the supplement, a farmer could expect a return of between €53 and €177 and if fed for the full reproductive cycle, the return would be €21 to €69 for each €1 spent on the supplement.

Further Work

These data provide sound evidence of an improved FCR in the early post-weaning period and increased carcass weight at target slaughter age in offspring from sows fed this microbial supplement. Possible mechanisms of action are improved colostrum quality in sows and increased small intestinal absorptive capacity/gut health in offspring early post-weaning. The second stage of this development program involves determination of mechanism of action and product development. The third stage will necessarily focus on commercial scale efficacy evaluation and scale-up of the manufacturing process coupled with product stability and shelf-life studies in line with market, business and regulatory requirements. It is desirable that such development work be conducted in conjunction with a commercial partner. To this end, expressions of interest from commercial feed additive producers are invited at this stage.

IP Status

The intellectual property outlined above is the subject of a patent application (filing no. EP20162860.9) filed on 12/03/2020. Further prosecution of this patent or alternative IP protection strategies will be considered in the context of commercial licensee requirements.

Contact

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