The demedication challenge in modern swine production

Weaning can be a very challenging period for piglets, and one of the most stressful events in a pig's life. Piglets have to quickly adapt to many changes creating possible high levels of stress and consequently affecting the immune status and gut microflora of the animals.

Antibiotics and zinc oxide are still commonly used for this problem but regulations are becoming more and more restrictive.

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Weaning is well known as the critical period for piglets where they are facing multi-factorial stresses and challenges in a short time:

- Adaptation to the feed intake. The longer the time without eating at weaning, the higher the risk of diarrhoea will be. Effectively, that drop in feed intake is likely to cause difficulties in meeting nutritional requirements (for maintenance and growth), due to reduction of the villi height, thus nutrient absorption area.
- Adaptation to the feed distribution – from milk to a solid feed.
- Feed composition changes – from milk containing lactose to a pre-starter feed containing mainly or exclusively plant-based raw-materials (with new nutrients, for example starch).
- Adaptation to a new environment – separation from the sow to the litter, from farrowing crate to post-weaning pen, with possible variations in the microbiota present in the environment.

The intestine constitutes the largest interface between the animal and its environment. An intact intestinal barrier is thus essential in maintaining gut health and preventing tissue injury and several diseases.

The use of antibiotics and zinc oxide at a pharmaceutical dosage are common during the weaning period to contribute to a better digestive process and consequently ensure optimal pig performance.

Widely used in the post-weaning phase to prevent digestive disorders and other pathologies, their reduction is currently the first key challenge in the swine industry, indeed zinc oxide will be banned in the EU in 2022. The key challenge is to manage this critical period with no or less antibiotics and with restrictions on zinc oxide levels.

Development of a global approach

Only a multifactorial strategy can answer the challenge of demedication; it is one in which product solutions alone will not be sufficient to obtain concrete results.

Three main axes have been identified to develop a global medication reduction programme.

- **Nutrition strategy**

It is primordial to first work on precise nutrition to exactly meet the requirements of the piglets. A strong knowledge of the requirements of the different piglet stages and a good expertise on formulation and ingredient analysis are the key to this approach. Feed formulation, and also its instructions for use, are essential to ensure an efficient nutritional itinerary and positive results.

- **Farm management**

A strong pillar for a successful demedication programme is improving farm management. Wisium have developed a very specific audit to evaluate the breeding conditions in order to prepare or improve the demedication strategy. This audit allows them to propose and monitor improvements for farmers.

- **Product solutions**

There are several additives that are alternative solutions to antibiotics but their use alone without a specific nutritional approach is limited. Wisium have developed a nutritional approach, combined with audits and a specific mix of additives (Wisium Pack MAX) illustrated by the following field results.

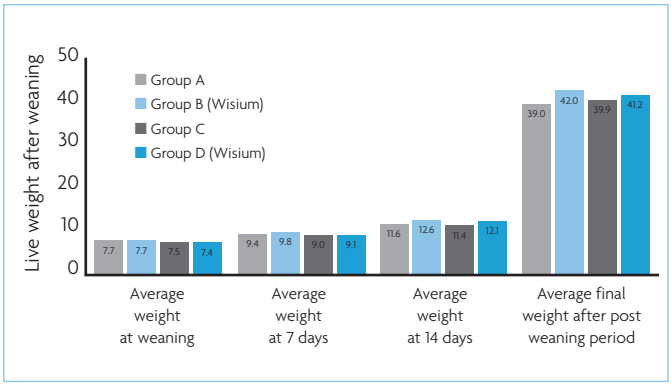

Fig. 1. Live weight after receiving the different piglet feeds.

Results in the field

In order to illustrate the positive results that can be obtained with a global demedication approach strategy, a trial was conducted on a French farm with 220 sows. This farm has received support from Wisium for many years, including regular farm audits, regular analysis of water quality and a specific peri-weaning feed. This piglet feed, without any antibiotics and zinc oxide, contains a combination of specific ingredients including a Medium Chain Fatty Acid (MCFA) mix, prebiotics and plant extracts.

The Wisium Pack MAX helps to ensure digestive comfort with a large action on Gram positive and Gram negative bacteria favouring the beneficial flora and reinforcing anti-inflammatory and immunity actions. The aim of the trial was to evaluate the effect of the peri-weaning feed including MCFA compared to a standard feed. A total of 92 litters (average of 13.0 weaned piglets per litter) were split into two batches and also split into two groups of litters (Table 1).

Different measurements were taken after weaning (weaning at 28 days old): live weight, feed intake, ADG and FCR.

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Table 1. Scheme of the trial.

Total of 92 litters	Batch 1		Batch 2	
Groups	A	B	C	D
Litters	24	23	23	22
Feed distributed from 10 days before weaning to 5 days after	Standard Peri-weaning feed	Peri-weaning feed + Wisium Pack MAX	Standard Peri-weaning feed	Peri-weaning feed + Wisium Pack MAX
Measures	At weaning, w+7 days, w+14 days, w+57 days			

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At weaning, piglets from all the groups had a similar weight, but after seven days a positive trend was observed for the groups with Wisium piglet feed which was confirmed at 14 days (Fig. 1).

Finally, at the end of the post weaning period (85 days of age), +3.0kg for group B and +1.3kg for group D was observed, so +2.0kg on average at 85 days old.

Regarding the feed intake, higher results for both groups receiving the Wisium peri-weaning feeds was observed, +82g/day (group B) and +31g/day (group D) on average for the whole period (Table 2).

Similar results were observed for the average daily gain (ADG), both groups receiving Wisium peri-weaning feed realised better performance +52g/day (group B) and +24g/day (group D) in total.

To conclude with the FCR results, the piglets receiving Wisium feed had a lower FCR during the period 0-7 days but it improved from 7-14 days, which is why there are similar results at the end of this first age period. Globally, if the FCR results from 8-30kg are standardised, an improvement of FCR with Wisium feed (-0.05 for group B and -0.08 for group D) is observed.

On average, a better live weight at the end of the post weaning period (+2kg) is observed for piglets having the same weight at weaning.

Parameters	Groups	A	B (Wisium)	C	D (Wisium)
Feed intake (g/d)	0-7d	212	292	228	253
	7-14d	400	450	366	426
	0-14d	306	371	297	340
	14-57d	1123	1212	1200	1227
	Total	**923**	**1005 (+82)**	**978**	**1009 (+31)**
ADG (g/d)	0-7d	243	300	225	236
	7-14d	314	401	339	444
	0-14d	279	351	282	340
	14-57d	638	684	663	675
	Total	**550**	**602 (+52)**	**569**	**593 (+24)**
FCR	0-7d	0.88	0.98	1.02	1.08
	7-14d	1.29	1.12	1.09	0.96
	0-14d	1.10	1.06	1.06	1.00
	14-57d	1.76	1.77	1.81	1.82
	Total	**1.68**	**1.67**	**1.72**	**1.70**
Standardised FCR	8-13kg	1.13	1.07	1.10	1.02
	13-30kg	1.57	1.53	1.61	1.59
	8-30kg	**1.48**	**1.43 (-0.05)**	**1.59**	**1.47 (-0.08)**

Table 2. Zootechnical performances after weaning.

Regarding the health aspect, the Wisium Pack MAX has had no impact on mortality control. The impact on digestive physiology is therefore measured on this farm via an improvement in growth and FCR performance.

However, depending on the health status of the farm, the improvement in digestive physiology made possible by the Pack MAX may have a positive impact on the control of mortality and digestive disorders.

Tackle the demedication challenge

Demedication is a complex challenge for livestock in general and should be tackled with a global and holistic approach. The piglet and swine production sector has been concerned by this problem for many years but still face new daily challenges to tackle, including those linked to antibiotic and zinc oxide regulations.

Wisium is addressing this challenge by offering a dedicated customised demedication programme: P4L (Partner For Life) is for livestock animals and especially for swine production, partnering to support its customers in this market move. ■