Use the power of nature to boost performance in your sows

An adequate feed intake by the sow during the lactation period is fundamental for high milk production and good litter performance. However, on many farms sows do not eat enough feed to cover the metabolic needs of milk production. As a result, the sow loses body weight, the quantity and quality of milk decreases, and piglet growth is compromised.

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As modern sows become leaner with less body fat reserves, the loss of body weight can be equal to the loss of muscle reserves.

After weaning, the metabolic priority of a sow is to recover from this strong catabolism period – lactation – as reproduction activity is compromised if the body's depletion is too great.

This is the reason why subsequent reproductive cycles are very often negatively affected, with an immediate increase in weaning to oestrus days, a higher unsuccessful fertility rate and a more frequent reduction in litter size and homogeneity at birth.

All valuable tools which increase the feed intake of sows are very welcome and supplementing the sows' feed with phytogenic additives is one of the most successful strategies. Nowadays, with correct management and full nutritional support, the modern sow has the potential to easily achieve the productivity of more than 30 piglets weaned per year.

However, on many farms these figures are not achieved and this is due not just to the pig, but several other factors, such as farm design, environmental conditions, health issues, animal well-being, feed quantity and nutritional quality, and staff labour quality, etc.

High ovulation rates are prepared during the previous lactation

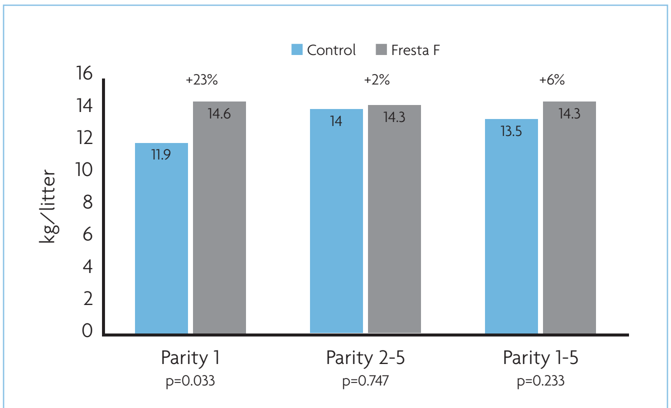
The reproductive performance of the sow is directly affected by the feeding level and the body weight loss during the previous lactation.

Low feed intake normally leads to low insulin circulating levels in the blood and to an inhibition of the direct and indirectly related ovarian functions.

An adequate lactation feed intake will result in higher insulin plasma levels that will increase IGF-I production and the LH receptor sites in the ovary, increasing the recruitment of pre-ovulatory follicles and promoting their uniform growth and maturation.

As a result, a better oocyst quality and ovulation rate will be achieved as well as an increased embryonic viability and successful uterus implantation. The aim is to allow the sow to give birth to a larger and homogeneous piglet litter.

Fig. 1. Improvement in litter weight at birth with a specific phytogenic feed additive.



An optimised sow diet means better performance of the litter

After a period of consuming body reserves (lactation), the sow enters a new reproductive cycle via successful insemination and gestation. The lactation body weight loss must be recovered during the first part of gestation allowing the sow's body to focus on some other tasks – cover daily maintenance needs, carry on normal gestation with an optimised embryonic development and foetal growth and develop the mammary glands.

It is quite relevant to remember that a young sow normally becomes an adult at the third cycle, thus until then she also has growth metabolic needs that must be covered while in gestation. These young sows usually show a low feed intake (especially during the first lactation) and quite strong lactation body weight losses.

Promoting the lactation feed intake and a correct body condition recovery for the next gestation is essential for the longevity of the herd of young sows and for achieving their piglet productivity potential, bringing profit to the farm.

However, bigger born litters are not equal to better piglet performance. A study by Quiniou et al. (2002) based on 12,041 piglets showed that the genetic prolific improvement in sows (or a higher number of piglets per litter) coincided with a reduced individual birth weight. This leads to a lower uniformity of litters and reduces the viability of the offspring.

In summary, the authors showed the following consequences of piglets' birth weight variation on subsequent performance:

- Increasing litter size from 11 to 16 piglets reduced birth weight from 1.59 to 1.26kg (on average), which corresponds to a mean decrease of 35g per each additional piglet born.
- Proportion of light piglets (<1kg) increased from 7% to 23% of total piglets born.
- 11% of these small piglets were stillborn and 17% died within the first 24 hours (in comparison to 4% and 3% respectively of piglets weighing over 1kg at birth).
- If small piglets survive, their performance in lactation is lower than heavier litter mates.

Lower uniformity is especially due to an increased number of piglets with a birth weight below 850g, which is considered the critical minimum weight for survival.

These low birthweight piglets have lower energy reserves in the form of glycogen, which leads to increased sensitivity to cold and a reduced ability to reach the best teats. Thus, first suckling is delayed and colostrum intake is limited, which compromises their future viability

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and growth potential. A lower colostrum intake, in turn, restricts their ability to acquire enough passive immunity and replenish their limited energy stores.

Since the weaning weight of piglets is strongly correlated with their subsequent growth performance, there is a clear need to take action towards the farrowing of heavier and more homogeneous litters and immediately after farrowing staff need to help light weight piglets have an adequate intake of colostrum.

Special attention should be paid to first parity sows as they tend to wean lighter piglets than adult sows.

Colostrum as a key tool

In piglet production, most losses occur during farrowing or in the first few days of life, with colostrum being a crucial factor for survival.

An insufficient intake, or poor colostrum quality, usually has a high impact on piglet mortality. To keep this mortality low, newborn piglets should consume about 200-400g colostrum.

As the sow only produces colostrum within the first 24-48 hours and the quantity does not increase with the litter size, special attention should be paid to the colostrum intake of smaller piglets.

The nutrition of the sow influences colostrum production and composition around farrowing via the development of the mammary gland and mechanisms controlling colostrum secretion.

It has been shown that feeding special ingredients and additives, such as linseed oil and vitamin E, has positive effects on the fatty acid and vitamin content of colostrum. In addition, unique combinations of naturally derived phytogenic additives, such as plant essential oils, herbs and spices, mainly due to their antioxidant and anti-inflammatory properties, have a positive effect on colostrum composition.

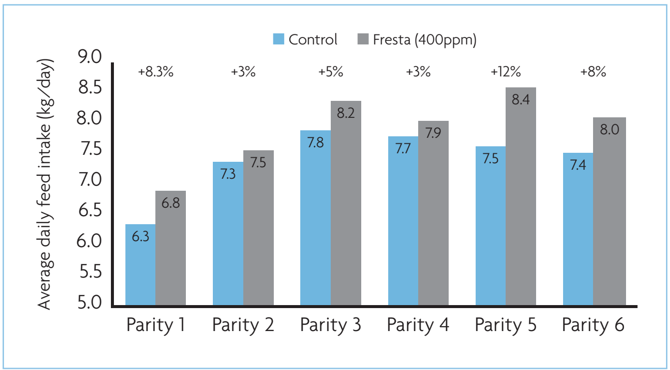

Fig. 2. Average daily feed intake by parity throughout lactation.

Colostrum and subsequent milk yield are primarily dependent on the body reserves of the sow, which are a result of nutritional management during the previous gestation.

But more is not always good, as overfeeding the sows will result in overweight sows and this will lead to an impairment of feed intake during lactation and to a lower milk yield.

The achievement of an optimal body condition and thus increased milk production of the sow, combined with an increased litter size and healthy viable piglets, seems to be one of today's challenges in pig production that has to be overcome.

It should also be noted that reduced feed intake by the sow can lead to reduced intestinal integrity and function.

Securing feed intake means securing productivity and performance

The advantages of using phytogenic feed additives in the nutrition of sows and piglets are numerous. Studies show that phytogenics not only improve feed intake and stimulate the secretion of digestive juices, which increases nutrient utilisation, but they also have a major impact on litter birth weight improvement.

A field trial was conducted in Costa Rica in 2017 on the phytogenic feed additive Fresta F (Delacon, Austria). In this trial, the effect of Fresta F supplementation during an entire gestation and lactation period on sow reproduction performance and their progeny was determined.

A total of 104 sows during gestation and 84 during lactation were used. The sows were selected based on their parity before insemination.

An equal number of primiparous and multiparous sows were used across both treatments: a control group of sows fed with a basal gestation diet in gestation and in lactation (control) and a treatment group with sows fed with a basal diet supplemented with Fresta F.

The results showed the ability of the tested phytogenic feed additive to improve litter weight at birth (Fig. 1), and the number of total born piglets by 8.3% and live born piglets by 9%.

Fresta F reduced the number of stillborn piglets by 22%; increased the frequency of medium and large litters at the expense of small litters and increased the piglet birth weight for parity 1 sows by 4% and the piglet daily gain during lactation.

Sows to which the phytogenic additive was provided had lower body weight losses from farrowing to weaning, the number of culled sows was reduced by 38%, the weaning to first service interval was shortened by 6% and the successful insemination rate was increased by 2%. Moreover, another field trial conducted in Australia, 2015 in has shown an improved average daily feed intake of sows across all parities (Fig. 2).

In this trial, 176 sows and their litters were used in the control and 178 in the Fresta F group. All sows received the same lactating basal diet; it was fed as such to the control, or with Fresta F added on top for the treated group. The diet was fed during the entire period from day 110 of gestation to weaning.

Additionally, it has been shown that sows fed Fresta F had a lower average change in body score between farrowing and weaning, relative to the control sows, and the rate of successfully remated sows was higher.

Summary

The achievement of an optimal body condition and thus increased milk production of the sow, combined with an increased litter size and healthy viable growing piglets, seems to be one of today's challenges in pig production that must be overcome.

Longevity of the sows in the herd must be a goal in itself, allowing the animals to express their improved genetic potential and to became economically viable (around the third to fourth cycle).

Natural plant-derived feed additives – phytogenics – are promising products in terms of animal welfare and productivity.

As well as the sensorial stimulation which promotes feed intake, many studies have shown additional benefits, such as an improvement in feed digestibility, antioxidant and anti-inflammatory actions as well as antibacterial properties.

By using the power of nature, we can boost performance and profit in swine farms. ■

References are available from the author on request