

# Managing the sow to improve farrowing and ensure profitability

by Dr Angela Riemensperger, technical manager, Biomin Holding.

Genetic improvements over the years has given us a highly developed sow whose reproductive performance and prolificacy has improved dramatically. Nowadays, sows are usually larger framed with less back fat and able to not only produce, but also raise, more piglets per year.

However, ensuring profitability of the sow unit by keeping numbers of piglets per sow per year as high as possible, whilst ensuring longevity of the sow, has become more difficult over the years and cull sow rates in some countries has increased with genetic improvement.

Even though it is important to meet the sow's requirements as close as possible during all stages of production, culling rates of sows are closely related to fertility problems, which are, in turn, related to several incidences which might occur around farrowing. Therefore, the event of farrowing represents a key factor in maintaining profitability of a sow herd.

Birth and weaning weight have significant influence on the subsequent growth of pigs, and thus the time to reach market weight. Thus, these parameters have significant influence on the economic output of a pig unit. The birth weight is influenced by prenatal nutrition and, therefore, the nutrition of the sow during the gestation period has a strong influence on it.

When the sow is fed according to its nutritional needs and has the ideal body condition, farrowing should go smoothly without any complications. However, there are many other factors associated with problems around farrowing apart from the sow's nutritional status.



Prolonged farrowing should be avoided by any means as a prolonged period of labour pain is associated with a slower recovery from farrowing. An exhausted sow is less reactive, which most likely leads to a reduction in post farrowing feed intake.

The main goal during suckling is to avoid severe weight loss of the sow by maintaining optimum feed intake to enable her to produce enough milk for her piglets. This is only possible if the sow has a sufficient feed intake from day one of the suckling period. A reduced feed intake of the sow during the suckling period not only has negative effects on the weight gain of the piglets, lactation feed intake also influences sow longevity.

As all these factors which may affect the sow's, and therefore the pig's, performance are linked, the producer has to pay attention throughout the whole production cycle of the sow in order to maintain the best herd performance possible and ensure economical efficiency.

## The gestation period

Prior to breeding, the sow is fed high energy levels in order to increase the number of eggs released. Gestating sows are, in general, feed restricted, as a high feed intake during gestation reduces feed intake during lactation, to minimise the risk of increased weight gain. Overweight sows ovulate fewer eggs

and additionally have a smaller litter size. However, a sow herd consists of older parity sows as well as gilts and here the balancing act starts as the sow should be fed based on body condition.

The gestation diet should be designed in order to control weight gain and provide sufficient nutrients to maintain foetal growth. A gilt still has a need to compensate for its physical protein growth need and should receive more feed.

Older sows, in parities five or higher, are usually larger framed and have a higher maintenance requirement along with a lower body fat content and may also require a higher feed intake.

The different gestation stages also have to be taken into account (Fig. 1). Early gestation is a very critical stage and an increased level of feed intake during this time should be avoided. In this stage of gestation the blastocysts attach to the uterine wall and the potential for losses in litter size due to attachment failures is extremely high.

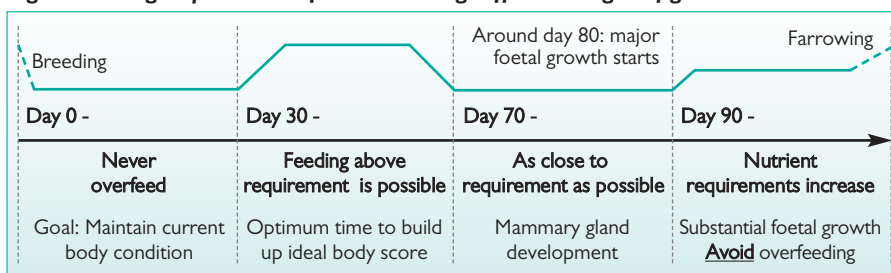
A high feed intake during this stage is associated with an increase in embryonic mortality. Therefore, in early gestation, sows should be restricted to a level at which sows maintain their current body condition.

Between day 30-70 is the optimum time to build up the ideal body score, especially in the case of under-conditioned sows as during this time the rate of body protein deposition is maximised. From day 70-90 the development of the mammary tissue takes place. During this period a high feed intake should be avoided as this would impair mammary development which might result in reduced milk production.

During late gestation (day 90-115) foetal weight gain increases markedly. Thus, the sow's nutrient requirement also increases. During this stage care should be taken not to over feed the sows as this would have detrimental effects on feed intake and reproductive performance during lactation.

*Continued on page 13*

Fig. 1. Feeding requirements for sows during different stages of gestation.



Continued from page 11

The key factor when it comes to feeding the lactating sow is to maximise feed intake. A high feed intake level as soon as possible after farrowing is the key to avoid mobilisation of sow body nutrient stores in order to fuel milk production.

## Farrowing and lactation

A high feed intake of the sow not only ensures good development of the piglets during lactation and high weaning weight, but has a positive influence on the time a pig reaches market weight, it also decreases the wean-to-oestrus interval, resulting in a higher

number of litters born per sow per year.

Furthermore, it makes the management of the gestation feeding program much simpler as differences in feeding levels to regain lost body nutrient stores will not be necessary.

Maximising feed intake of the sow is influenced by several factors such as gestation feeding management, management during lactation, ambient temperature, water and equipment. Delayed farrowing also has a negative impact on feed intake during the lactation period.

Delayed farrowing has a negative impact on the feed intake of the sow, thus the development of the piglets during lactation and during the growing-finishing period. It also increases the level of stillborn piglets (Table

Duration of farrowing (hours)	Litters	Number of stillbirths (%)
<4	376	4.0
4-6	161	5.8
>6	92	9.9

**Table 1. Occurrence of stillborn piglets (%) with differing farrowing duration.**

1) increasing economic losses. The cause of prolonged farrowing is diverse but most likely related to a lack of calcium which is needed for muscle contraction.

It is known that during late gestation the maternal calcium absorption starts increasing due to an increased foetal demand and this stage of production and lactation are associated with substantial stress on the maternal calcium homeostatic processes.

However, as calcium is essential for physiological processes, such as muscular contractions, a lack of calcium during farrowing is fatal. A lack of calcium is, amongst other factors, influenced by the acid-base balance of the feed which has a strong effect on the acid-base balance of the body. Increasing the anions in the diet results in acidic stress of the sow.

Depending on the extent of acidic stress, the sow is in a metabolic stage often referred to as metabolic acidosis. Acidic stress leads to an increase in the net-excretion of calcium from the body by increasing renal calcium excretion.

The body tries to compensate this lack via an increased mobilisation of calcium from the bones, which is the biggest calcium storage of the body. At the same time the body also tries to buffer the blood pH via increasing calcium resorption.

This process to increase the calcium blood levels is regulated by the parathyroid hormone and vitamin D. To prevent problems during farrowing due to a lack of calcium available for muscle contractions, the parathyroid hormone/vitamin D mechanism needs to fully function.

## Anionic diets

Making more calcium available can be achieved by feeding anionic diets. An effective way to increase anions in the diet is by adding a mixture of an inorganic acid, anionic substances and plant extracts to a diet (Biomim pH<sub>D</sub>, Biomim, Austria).

This increases the anions in the diet, which in turn leads to metabolic acidosis and the release of calcium resulting in a shorter farrowing time and a good start for the sow into lactation. However, good feeding management needs to be applied throughout the sow's life cycle.

Optimising the farrowing process is a key factor in influencing the economic outcome of a sow herd. When farrowing can be optimised, positive effects can also be seen up to the subsequent farrowing event. ■