



Nutritional aspects affecting sow performance during gestation and lactation

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Over the years, the optimal feeding of sows has become a refined science to maximise the number of piglets born alive and piglets weaned. Quantity and quality of feeds should receive the same amount of attention to ensure sufficient nutrient supply and satiety. In this article, we examine important nutritional and management aspects with a major impact on sow performance according to production phase.

The gestation period

The optimal feeding of sows during gestation is important to reduce farrowing length, still-birth rate, and to improve piglet vitality at birth. A good average body condition is preferred to prevent complications during farrowing associated with overfat sows and, on the other hand, to prevent a prolonged post-weaning oestrus interval when sows are too lean during transition. Some research indicates three main phases to target gestation-specific diets, being

early gestation (days 1 to 28), mid-gestation (days 29 to 84), and late gestation (days 85 to 115). However, this does come with practical management challenges and on-farm factors should be considered. The age of the sow should also be taken into account, since pregnant gilts need additional nutrients for body growth to maturity.

During late gestation, the sow requires a substantial quantity of nutrients for foetal growth, mammary growth, colostrum production, and sow maintenance. Foetal growth rate increases during pregnancy and nearly a third of foetal weight gain occurs during the last 10 days before parturition. This high growth rate brings about an increased demand for protein and amino acids.

Transition: Gestation to lactation

The transition period is defined as the last 10 days of gestation through to the first 10 days

of lactation. During this period, many important biological and physiological processes occur, which are affected by sow nutrition. The major losses of piglets occur during farrowing (stillborn piglets), and until three days post-partum, with insufficient energy being one of the main causes, while a lack of immunity may also play a role.

Constipation may also be reduced by including higher levels of dietary fibre, which, in turn, may reduce farrowing time and increase piglet survival. Thus, sows may benefit from being fed a transition diet with intermediate levels of crude protein and fibre compared to gestation and lactation diets.

Colostrum provides the piglet with energy for thermoregulation, passive immunity, and weight gain. Sufficient intake of colostrum by piglets is crucial to avoid neonatal death. Diets high in fibre during late gestation may be beneficial for colostrum production, depending on the fibre source. Studies have shown that fat supplement-

ation during gestation can increase the immunoglobulin concentration in colostrum.

Basically, all the colostrum is produced before parturition and secreted from the birth of the first piglet until approximately 24 hours later. According to research, an average intake of 250 g colostrum per piglet is recommended to achieve good body weight gains after birth. Colostrum intake is positively related to birth weight and negatively related to litter size. Small piglets may, thus, be less vigorous and less able to compete for teat access, resulting in poorer growth and higher mortality.

The onset of milk production starts about 25 to 30 hours postpartum and has a great impact on sow physiology due to the drastic increase in milk production.

At peak milk production (around day 18 after farrowing), approximately 50% of the nutrients from the sows' feed are transferred to the piglets through the milk.



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The lactation period

Various studies concluded that a high-energy diet during lactation resulted in better average daily gain and, thus, improved weaning weight of a litter. Higher protein levels can also improve litter performance. Several research papers established that lysine is the primary limiting amino acid in sow nutrition. Higher lysine levels during gestation resulted in higher birth weight of piglets, better survival of piglets, and improved weight gain. It is very important to balance the other amino acids in the correct ratios to lysine.

Lactating sows with large litter sizes must reach *ad libitum* feed intake as soon as possible (between three and five days after farrowing) to meet the drastic increase in nutrient demand for milk production. Feed intake during lactation is often not high enough to sustain the milk production level needed for the litter. To compensate for these high nutrient requirements, the sow mobilises body fat and protein to meet the needs for lactation. An alternative to increased feed intake during lactation is to have a more nutrient-dense lactation feed to avoid excessive condition loss.

Numerous factors can influence the appetite of sows during lactation, especially environmental temperature. Research indicates that feed intake decreases by up to 40% when the temperature is raised from 18 °C to 28 °C. Temperatures of between 15 °C and 20 °C are considered the upper comfort level for sows, while piglets need temperatures as high as 30 °C. There are various practical applications to accommodate both the temperature requirements of sows and piglets in the farrowing room.

Apart from temperature control, the following will also help to improve feed intake:

- Twice-a-day feeding instead of one feeding per day will encourage intake. Switching from two to three times per day can further increase feed intake by between 10% and 15%.



- The more frequent feeding of small amounts is especially beneficial during the summer months due to the smaller effect of modest amounts on increased body temperature and the consequent negative effect on intake.
- Clean feeding troughs are important; mouldy feed will depress intake.
- Water intake drives feed consumption with a lactating sow being able to drink more than 40 l per day. Ensure a sufficient supply of cool and clean drinking water at the appropriate pressure.

Body condition, feed intake is key

Strive to maintain the correct body condition during gestation to prevent complications during transition, birth, and lactation. Apart from the nutritional challenges during the transition period, sufficient feed intake during lactation is important to maintain body condition and milk production, which will maximise piglet growth rates. Complying with the nutritional demand for these production phases will have a definite positive effect on the sow's subsequent reproductive performance.