

Improving piglet survival: a nutritional approach from the sow to piglet

Dr. Ruth Wonfor: IBERS, Aberystwyth University

Take home messages:

- We can improve the nutrition of the sow before and after farrowing to improve piglet survival.
- It is essential that piglets receive enough good quality colostrum in the first 24 hours after farrowing for their health and vitality.
- Creep feeding before weaning should be considered to better prepare piglets for weaning.

After farrowing piglets are energy deficient. This is enhanced in large litters due to competition for space at the teat and decreased birth weight, for which both factors result in a reduction in piglets' ability to ingest colostrum. The energy requirements of a new born piglet, needed for movement and maintenance of body temperature, are in excess of the reserves that they are born with. Therefore, the [required energy needed in piglets' early life](#) must come from the limited supply of stored energy they are born with or through feed from the mother. Within the first three days, piglets will receive two types of milk from their mother. Firstly, colostrum, which is produced by the sow before farrowing and secreted up to 12-24 hours after farrowing. Colostrum contains an essential supply of passive immunity and energy that is critical to the piglet in the first 24 hours of its life, both for short and long term survival. Second, transient milk, which is rich in fat and produced by the sow in the intermediary period between colostrum and mature milk, up to 4 days after farrowing. As the newborn piglet is reliant on nutritional and energy input from the sow, the nutrition of the sow during gestation has received considerable interest as a way to improve piglet viability and ultimately survival.

Sow nutrition to improve piglet birth weight

Good nutrition for the pregnant sow is essential throughout gestation. Both energy, which is positively associated with piglet birth weight, and protein intake, which is imperative for foetal development and birth weight, should be appropriately managed through a balanced gestational diet. In fact, [protein availability to the sow throughout pregnancy](#) is more important than energy availability in terms of piglet development in the womb and subsequent birth weight. The arginine family of amino acids (which are the building blocks of proteins) are especially important for piglet growth whilst in the womb. If sows are supplemented with these amino acids and their derivatives (such as L-carnitine or L-arginine) piglet birth weight increases and suckling behaviour is improved, resulting in improved daily growth rates. Therefore, although the amino acid profile of a diet should be balanced, it is clear that at points of gestation, supplementation of certain

functional amino acids can be beneficial. Small scale units often utilise one mid-range nutrient supply feed for both gestation and lactation. However, the advantages to feeding two different sow diets for each period which are mixed specifically for the sow's needs during that time should be considered.

Sow nutrition to improve piglet energy reserves

Piglets are born with small energy reserves of glycogen, which are deposited in the liver and muscle in the final month of gestation and utilised quickly in the first few days following birth. Therefore, research has investigated whether improved sow nutrition can work to increase the deposition of these energy reserves during gestation, in an attempt to improve short term survivability of piglets. However, results have been mixed and it is now presumed that usual management of sow nutrition in late gestation is adequate and that there is another piglet related limiting factor for limitation of the build-up of energy reserves that cannot be controlled through nutrition.

Sow nutrition to improve colostrum yield, composition and ultimately piglet intake

The immune content of colostrum begins to decrease after the beginning of farrowing, with the biggest deterioration occurring between 4 and 12 hours. Therefore, it is essential that all piglets within the litter suckle as quickly as possible. However, increased time to first suckle and total colostrum intake are influenced by several factors including rectal temperature, birth weight, litter size and piglet vitality. This supports the need to provide heat to piglets in the first few hours of their life to encourage as many as possible to ingest colostrum, as explained in our [previous article on piglet survival](#). Higher temperatures through underfloor heating or heating pads, also leads to fewer piglets dying without ingesting colostrum.

It is imperative that sows produce as much colostrum as possible, yet yield is [highly variable between sows](#) and influenced by a number of factors such as breed, cleanliness, parity and nutrition. At least [200g of colostrum ingestion](#) considerably reduces rate of death in piglets. Nevertheless, colostrum production by the sow is not dependent on litter number. With increasing litter sizes, one third of sows do not provide enough colostrum to supply the litter with sufficient amounts to give them the best start in life. Therefore, attempts should be made to improve the yield and composition of colostrum to support piglet survival, both in the short and long term.

Suggestions have been made that sows should also be selectively bred for colostrum yield so that they can adequately provide for all of the piglets born in a litter, thus helping to improve piglet survival. However, it is also possible to improve colostrum yield through sow nutrition during gestation, whilst the mother is producing colostrum. Ideally, the fat content of colostrum should be increased in addition to the yield. Piglets may intake less colostrum if the fat level is high but the extra provision of energy through the increased fat accounts for this.

In theory, the best time to target the sow's nutrition is during late gestation when colostrum is being produced. It should be noted that both over and underfeeding during the late pregnancy period is detrimental to production of colostrum and mammary development. However, a correctly balanced diet can be effective in improving piglet survival. Addition of extra dietary fat and fibre have been investigated to improve colostrum yield, composition and uptake by piglets.



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Dietary fat is a common additive for lactation diets to improve the yield and fat content of milk. However, for colostrum production, care should be taken on the type of fat added. For example, conjugated linoleic acid in the late gestation diet showed a tendency to reduce colostrum yield in some scientific studies, but improved fat content in others. Yet, the use of β -hydroxy β -methyl butyrate increased colostrum production through increased piglet weight gain and piglet survival, but made no difference in the composition of colostrum.

The use of late gestation diets high in certain fibres, such as sugar beet pulp or pectin residue, have not been directly demonstrated to increase colostrum yield, but do increase piglet intake and bodyweight gain in the first week. A high fibre diet (23% fibre) fed from 92d of pregnancy, containing sugar beet pulp amongst other fibre sources, increased colostrum intake in low birth weight piglets by 60% which contributed to a significant reduction in piglet mortality. Furthermore, utilisation of fibre also improves the fat content in the colostrum.

Creep feed provision during suckling

In order to reach growth and efficiency potential, of even traditional breeds, you should really work out how best to support the nutrient supply to the piglet from the sow's milk production. Milk replacers can be provided to piglets whilst they are still suckling, although intake is variable before piglets are weaned. Creep feeding at an early stage often gives piglets an extra enhancement in growth rate, especially in larger litter sizes. The creep feed also helps to [better prepare the piglet for weaning](#) by making the gut adapt to a different feed source, which better equips them to digest the feed given at weaning. However, it must be noted that although this will better prepare piglets for the weaning period, the management strategy has minimal effects on piglet survival, and does not benefit piglet mortality in the first 3 days after birth. Therefore, creep feeding is something to be considered before weaning to ease the transition. The use of creep feed is also likely to have a benefit on the sow's body condition through a reduction in piglet dependence on the mother's milk and also eating of her food. An elongated reliance on the sow without the use of a creep feed will manifest on further production traits of the mother related to getting the sow pregnant again soon.

To find out more information on management strategies for improving piglet survival that are not related to nutrition, read our previous Farming Connect article on this subject, entitled: '[Improving piglet survival: a management approach from breeding to farrowing](#)'.



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