



THE UNIVERSITY of EDINBURGH  
The Royal (Dick) School  
of Veterinary Studies

The Jeanne Marchig International Centre  
for Animal Welfare Education

## What you will learn: The welfare impacts of nutritional management for pigs

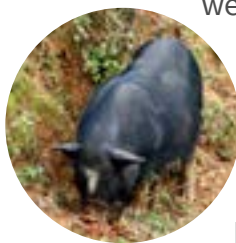
The differences in the life cycle of wild pigs in nature and pigs in commercial farms.

How most commercial farms for pigs are structured and managed.

Main welfare issues to look for in the pig industry and opportunities to promote positive animal welfare.

## Outdoor pigs

In scavenging production systems (Type A), pigs can find food on the street, garbage dumps, land and forests around villages. They may be fed swill (feeding of food scraps), although this practice is banned in many countries due to the risk of disease transmission such as Classical and African Swine Fever, and Foot and Mouth Disease (FMD). Nutritional welfare risks in these systems may be high because the variable amount of food available means nutritional needs can go unmet, particularly seasonally. Water may also be variable in volume and quality, potentially negatively impacting both pig health and feelings of thirst.



When pigs are kept in pasture areas (Type E systems), feed of higher qualities are usually provided. Due to the outdoor nature of the environment, there is greater diversity of feed available, and so this variety can create positive welfare opportunities. Feeding risks in these systems include pigs coming into contact with/ consuming human food waste without supervision. Fencing, signs and protocols for visitors are important to reduce risks of subsequent health and biosecurity risks.

Pigs may increase their feed intakes during winter, since cold-stressed pigs spend more time feeding. The opposite also occurs, when pigs' feed intake decreases in summer. Since it is more difficult to control temperature changes in outdoor systems, it is important to adjust the feed offered depending on the season to avoid hunger.

# Breeding stock

## Sow feed restriction and hunger

Over decades, pigs have been selected for production traits, such as rapid growth of finisher pigs. They are bred to grow more efficiently and put on muscle mass very quickly. Consequently, the size of adult pigs, their growth potential and appetite have increased dramatically.

To reduce the issues associated with fast growth (see **Health**), pregnant, or “dry” sows are typically fed a restricted diet, which is around 50% of what they would eat if given the choice or an ad libitum diet. Sows are generally also given concentrated feed only once a day, which can be consumed within about 20 minutes. This restricted diet will cause feelings of hunger and frustration and lead to expression of abnormal behaviours (see **Behaviour and HAR**).

To minimise these effects, diets can be altered to increase the fermentable fibre content and make the grain size larger. This can increase feeding time and gut fill, which helps the animals feel fuller. Providing the animals with substrate, such as straw, also allows them to forage and consume, which can supplement their concentrate feed to get a feeling of fullness. Straw can also help to protect the pigs against developing gastric ulcers, which is an increasingly common health condition for pigs.

Providing fibre in dry sow diets, while still restricting energy intake, can contribute to a more normal expression of eating and foraging behaviour. Sows with higher fibre diets display less redirected oral behaviours (stereotypic behaviour). Fibre, soluble fermentable fibre, or resistant starch has beneficial effects on short-term satiety due to its physical properties in the gut, and because hindgut fermentation of fibre into short-chain fatty acids (SCFAs) which results in prolonged energy supply. Fibre-fed sows spend longer eating, have reduced activity post-meal, and show more stable blood glucose and insulin concentrations.

However, fibre does not completely satisfy energy-restricted dry sows: if additional food is offered, high-fibre-fed sows will ‘work’ as hard (or almost as hard) as low-fibre-fed sows in operant tasks to access more feed. This indicates they are still hungry.



## Feeder access

Good feeding management practices allow all the sows to feed at the same time or to feed individually in a protected way. This is important to reduce aggressive interactions. For example, electronic sow feeders or full-length voluntary feeding stalls allow pigs to get their individual ration without competition. Electronic sow feeders also have the added advantage of giving options of when sows want to eat.

# Piglets



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## Colostrum feeding

Pigs are born with very little energy reserves and are vulnerable to chilling. Therefore, the energy supplied from colostrum promotes piglet survival, reducing hunger and weakness, until the transient milk is secreted 34 h postpartum. Colostrum is vital for piglet thermoregulation and provides the piglet with passive immunity after birth, playing an essential role in survival and growth and contributes to reducing neonatal diarrhoea. It is recommended that piglets receive at least 250 g of colostrum within the first 24 h to survive. However, colostrum production is estimated to vary between 2.5 and 5.0 kg over 24 h for a litter of 8–12 piglets, and is highly variable between sows.

Due to the extreme importance of colostrum for piglets' welfare and survival, supplementation of colostrum to piglets is an extended practice in pig production specifically to support low bodyweight piglets.

There are some strategies that can facilitate the access to colostrum and increase intake:

- Piglets can be placed manually close to the udder shortly after birth, helping them to find a teat more promptly.
- Weaker piglets can be supplemented with colostrum recently milked from sows from the same herd (higher immunoglobulin levels).
- “Split suckling or split nursing” (withdrawing the larger piglets or those that have already taken colostrum for a short period of time) can guarantee colostrum intake of less vital piglets.
- Administration of artificial colostrum replacers available in the market.

## Milk access

Breeding programmes have focused on large litter production over the years (see **Life cycle of pigs in typical commercial production: Parents/ grandparents stock**). High producing sows can have 14-18 piglets per litter, whereas the average number of functional teats is between 14-16. Teats might also vary in quality, and so it is common for sows not to easily support beyond 12-14 piglets. This poses a greater risk of hunger for their piglets. Starvation is one of the main causes of piglet mortality, along with stillbirth, crushing by the sow, hypothermia and disease. Many of these causes interact. For example, a piglet might become chilled, fail to drink enough colostrum and become too weak to move away from the sow as she changes posture leading to crushing (see **Behaviour and HAR**).



Artificial rearing systems, which involve the removal of piglets from their mother at two to 14 days of age and moving them to enclosures in a separate room or above the sow's farrowing crate, can be an alternative to rescue piglets that cannot be reared by the sow. They provide piglets with warmth, milk replacer and solid food to complement their nutritional requirements. However, artificial rearing may allow a piglet to survive but it can impact negatively on a piglet's physical and social development, affecting the rest of their productive lives.

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