



## Basic Pig Husbandry - The Litter

By Graeme Taylor and Greg Roese, Livestock Officers Pigs, Intensive Industries Development, Tamworth - This Primefact is one of five articles providing an overview of basic pig husbandry, covering boars, gilts and sows, the litter, weaners and grower herds.

### At birth

As the piglets are born, clear any mucous from the mouth and nostrils. If time permits, the navel cord can be dipped and, if required, needle teeth clipped before they are confined to the creep area or placed in a heated crib to dry off. An alternative is to allow the larger piglets to suckle for an hour and then put them away for 2 hours. Large piglets can consume in excess of 100 mL of colostrum in the first hour, so they are unlikely to be disadvantaged by being withheld for a short time.

The weak or smaller pigs can remain. They can be physically held to the sow and allowed to suckle from several teats before being placed in the heated creep area. The main cause of piglet death is starvation. In other words, apart from stillbirths, the biggest single problem is that piglets fail to suckle because of low viability or low birth weight and thus die.

Birth weights are a critical factor in piglet survival. While an overall pre-weaning mortality of 8-10% is common, some 40% of these losses still occur in piglets weighing less than 1.0 kg at birth. These smaller piglets are the ones at most risk. Because there is very little transfer of antibodies across the placenta prior to birth, it is essential that the piglets get the passive immunity provided in the colostrum.

In order to survive, piglets must be born into a warm environment in which they can conserve their meagre energy reserves, quickly gain access to the sow, and suckle in safety.

### Providing warmth

Up to 20% of piglets born will die within the first week of life, and the majority of these losses are due to chilling and crushing. The newborn pig is extremely susceptible to cold, damp conditions. It has little fat and hair, a thin skin and a small mass in relation to its body surface area. Its ability to regulate its body temperature is poor and it is not until the piglet is 3 weeks old that its regulatory system is fully developed.

Pigs have a normal temperature range of 38°C to 40°C. Immediately after birth, a piglet's temperature can drop by 1°C or more within the first half-hour, depending on environmental conditions. Under favourable conditions, this drop in temperature is regained in about 24–48 hours.

Also, piglets are born with a limited supply of readily available energy and must suckle shortly after birth to maintain their blood sugar levels. If the levels are not maintained, piglets can lapse into a coma, and die. Cold conditions force piglets to use up these reserves very quickly, and, when weakened, the piglet has less chance of survival.

The lower critical temperature for piglets weighing 5 kg or less is considered to be 29°C. As the piglet grows, it needs less warmth - a pig weighing 10 kg has a lower critical temperature of 24°C. (Temperatures stated are those associated with low air movements.) Temperatures suitable for newly born piglets are considered uncomfortable for sows. To ensure that piglets are born into a desirable environment, the farrowing room is usually heated to around 18°C to 20°C. The extra warmth for the piglets is provided in an area away from the sow, in the creep area.

### Supplementary heating

Because the newborn piglet requires quite a different environment from the sow, heated creep or straw areas are essential. Nurtinger style kennels are becoming popular in farrowing pens. They are well

insulated kennels with a heater and a double layer of plastic curtain, providing excellent temperature control.

The temperature is slowly dropped 1 °C per day from the 40 °C on day one down to about 29 °C to 30 °C on day 10 after birth. Very small or weak piglets (including those with severe splayleg) will benefit from being placed in a crib. This consists of a dry box using a thermostatically controlled heater lamp. Here, they receive the warmth they need and are protected from being overlain or trodden upon by the sow.

They can be bottle fed or stomach tubed, and, when recovered, placed back on the sow. At lower than adequate temperature ranges, the pigs use a greater proportion of feed intake merely to keep warm, so that piglets given adequate warmth use less feed and grow more efficiently.

### Assisting weak piglets

Even under good conditions piglets may be born weak. This is usually associated with a delayed farrowing or light birth weight. These piglets have difficulty moving and are at great risk as they could easily die or be crushed before they reach the udder. Even when they reach the udder, they may be so weak as to have difficulty suckling, especially when competing with their littermates for a teat.

Allow small piglets to suckle from five or more teats for a short period. It is essential they receive at least 50–60 mL of colostrum within an hour of birth. The piglet can then be held to a teat and allowed to suckle. It is amazing how quickly the majority of piglets will revive when given warmth and a good feed.

### Bottle feeding and stomach tubing

To ensure weak or deprived piglets receive adequate quantities of colostrum they can be bottle fed with colostrum collected from the sow while she is farrowing. Only about 100–250 mL need be collected from the sow when she has passed one or two pigs. The colostrum is stripped from most teats and collected in a wide-mouth container.

If all the colostrum is not required that day, it can be frozen then reheated to body temperature when needed. Small ice cube trays are ideal for this purpose. Artificial colostrum products (e.g. Resus®) can be purchased commercially. Small piglets will need 20–30 mL every 2 hours or so until they are mobile. Usually they can be bottle fed but sometimes they will need to be fed by stomach tube if they have not yet developed a good swallowing reflex or receive a 10 mL intra-peritoneal injection of a 20% solution of glucose.

If sow colostrum is unobtainable, colostrum replacements or cow colostrum can be used and given by syringe and stomach tube. It can be stored in the freezer and reheated and used as required.

### Fostering

Fostering piglets was previously regarded as a technique for overcoming difficulties where:

- a sow had died soon after farrowing, or was too sick to nurse a litter;
- a sow had a large litter of healthy pigs and not enough functional teats to go around;
- a sow had a large number of, or uneven-sized, pigs.

Today, with the trend towards larger units and the use of batch farrowing, fostering or 'cross fostering' as it is termed, can be undertaken as a routine practice. It is common to find a sow having difficulty rearing a large litter, while nearby another sow is suckling only a few pigs. If this occurs, the litters can be balanced by taking a few pigs from the large litter and placing them on the sow with the small litter. However, it is even more common to have a variation of birth weights within a litter, and cross fostering is a useful technique to even up litters.

Piglets of low birth weight have a low chance of survival when their littermates are much larger. But these

small piglets have a good chance to survive and grow rapidly when their littermates are of similar size. Where cross fostering is to be carried out as a routine practice, sows should have farrowed within 6–8 hours of each other.

If producers do not wish to undertake 'cross fostering' as a routine practice, it can still be used in an emergency situation as long as the following points are adhered to:

- Allow 4–6 hours for colostrum intake, and foster a competitive piglet — not one that is weak or lighter than the foster sow's litter.
- Do not transfer newly born pigs to sows that have farrowed more than 48 hours previously — the ideal is within 24 hours.
- Do not transfer pigs more than 48 hours old to sows that have just farrowed.
- The best chance of success is when both sows have farrowed more or less together and the suckers to be transferred can be almost immediately rubbed in the gleanings or urine of the sow to which they are to be transferred.
- Where this is not possible, remove the suckers to be transferred and the litter they are to be matched with, and place them together in a box under a heat lamp before placing them with the sow.
- Some success can be obtained by spraying all the suckers concerned with various substances like neat's-foot oil, vanilla essence, or cod liver oil to mask body odour. However, there is a risk that the sow will not accept any of the piglets.

The opportunity of synchronising farrowings is available by using prostaglandins, so cross fostering then becomes an extremely valuable husbandry technique.

### Artificial rearing

Artificial rearing of piglets from birth or up to 1–2 weeks of age could be necessary because of:

- surplus piglets
- orphan piglets
- slow growers.

### Surplus piglets

Even after attempts to foster piglets have been made, there may be extra piglets that cannot be successfully suckled by sows and will have to be raised artificially. A piglet's chances of survival are enhanced if it has suckled colostrum prior to its move to the rearing quarters. It is extremely important that these quarters be hygienic, warm, free of draughts and comfortable. Commercial rearing units offer automatic liquid feeding, thermostatic control in the sleeping quarters and meshed dunging area. Where piglets are fed automatically, they receive about 20–30 mL of feed at 60–90 minute intervals. When hand fed, they can be fed 40–50 mL four to six times per day, building up to 80–100 mL per feed.

Sow-milk substitutes are available, but cow colostrum or artificial colostrums have proved very useful. When piglets are around 3 kg liveweight, they can be transferred to milk-based solid feed. There are a number of reasons why this should be attempted:

- While piglets stay on liquid diets, they are more susceptible to scouring.
- Feeding a solid diet allows the diets to be changed slowly and the digestive system to mature earlier.
- It is far easier to overfeed on liquid diets and cause digestive upsets than when the piglets are on solid diets.

Temperatures should be kept at 35°C and then progressively reduced until the temperature is 29°C at 5 kg bodyweight.

## 1. Wheat-based dry meal

Wheat	40%
Skim milk powder	40%
Meat meal	4%
Fish meal	6%
Soybean meal	6%
Sugar	4%
Plus antibiotics and minerals/vitamins	

### Dry meal mixtures (cereal based)

Specialised meals can be purchased for early weaning, but the wheat-based or rolled oat diets in the following tables can also be used. It is important that they have access to fresh, clean water at all times. By 28 days of age, the ration is slowly changed so that they are on conventional weaner rations.

### Orphan piglets

## 2. Rolled-oat-based dry meal

Breakfast (rolled) oats	38%
Spray-dried skim milk	45%
Maize oil	10%
Glucose	5%
Dicalcium phosphate	1%
Salt	1%
Plus antibiotics and minerals/vitamins	

When a sow or gilt dies or dries-off and there is no chance of fostering piglets, an attempt can be made to raise them artificially. If piglets are orphaned at an early age (1–2 days) they can be treated as surplus piglets and raised accordingly. If orphaned at 1 week old or later, they can be placed on liquid diets for the first few days and then switched to dry meals (milk based). Colostrum diets are of limited value at this age and less sophisticated mixtures can be fed.

### Orphan mixtures

These particular mixtures can be made up and then stored under refrigeration. At feeding time, the amount required can be warmed to blood heat. Piglets are fed as much as they can consume in about 3–5

minutes. A guide is start off at 10–20 mL per piglet and increase to 80–100 mL per piglet per feed (three to four times per day). The important thing is not to overfeed, as this will increase their susceptibility to scouring.

The mixtures are fed:

- every 4 hours for the first and second days, i.e. six times per day;
- every 6 hours for the third and fourth days, i.e. four times daily;
- every 8 hours, i.e. three times daily, until 10–14 days of age — at this stage, they should be handling dry feed which can entirely replace the milk mixture.

### Slow growers ('nutritionally deprived')

Even when all the husbandry techniques of fostering have been undertaken, it is not uncommon to see piglets falling behind their littermates. This is particularly noticeable at around 7–10 days of age, especially in large litters. By the time they are weaned, they are well behind their littermates and fail to thrive, or even die. The main cause is malnutrition, with either the teat drying up or the piglet having difficulty suckling because of the large litter and/or more aggressive littermates.

These 'deprived' piglets can be gathered together and reared artificially or can be fostered onto a newly weaned sow. The latter alternative can prove difficult at that age and the effect of an extended lactation on the sow must be considered. Sows destined to be culled may also be used. Whichever alternative is decided upon, it should be done promptly before piglets lose condition.

### Piglet anaemia

### 1. Spray-dried-milk orphan mixture

Spray-dried milk	100 g
1 fresh egg yolk (beaten)	
Water	400 mL
Cod liver oil	3 mL
Citric acid	2.5 mL

When a piglet is born, it has sufficient iron to last for only 3–7 days and so must obtain sufficient iron from elsewhere. Under natural conditions, baby pigs may obtain sufficient iron from the soil, but most pigs today are farrowed and reared indoors and thus have no access to soil. However, some soils contain very little iron, or iron in a form that is chemically bound and not available to the pigs.

### 2. Cow's-milk orphan mixture

Cow's milk	500 mL
Water	500 mL
1 fresh egg yolk (beaten)	
Cod liver oil	5 mL
Citric acid	2.5 mL

If a piglet is reared on concrete, it is not very long before symptoms become evident. Piglets affected have heavy, jerky breathing and general weakness. The mucous membranes of the eyes and mouth become white in colour and the skin loses its bright pink colour. As the condition progresses, they pass a white, pasty scour.

### 3. Reduced-milk orphan mixture

Reduced milk	375 mL
Water	280 mL
Cod liver oil	3 mL
Citric acid	2.5 mL

Without iron, the piglet cannot form haemoglobin for the transport of oxygen, which in turn limits tissue growth and activity. They receive some iron in the sow's milk (1 mg/day), but the milk does not contain sufficient iron to provide the minimum needs for normal healthy growth (7–8 mg/day). Unless iron is obtained from another source, the pigs will die.

#### Provision of iron

- A shovelful of clean earth given daily and sprinkled with iron sulfate. Alternatively, ashes can be used and sprinkled with a copper–iron solution.
- Various oral mixtures can be used and are placed on the back of the tongue; these are best given within 36 hours of birth to be effective. Iron can also be provided in piglets' drinking

water, with a dispenser placed in the creep area.

- Iron sulfate paste can be painted onto the sows teats every 2–3 days.
- Use of iron licks or blocks.
- Injections - specialised compounds are available for injection with a syringe direct into the tissues. This is the most certain way of providing iron over the critical period, as iron is slowly absorbed into the bloodstream. The best site for injection is in the neck.

By the time the piglets are eating creep feed, they are getting sufficient iron to meet their requirements. Pigs allowed to develop with insufficient iron will be slow growers, and susceptible to sickness. Losses amongst affected pigs can be high and those which survive may take a long time to reach market weight, and this will reduce the profit margin per pig produced.

#### Tooth clipping

Piglets are born with eight sharp needle or juvenile teeth and they may need to be clipped. They are extremely sharp and piglets can lacerate the sow's udder and themselves when fighting. The wounds may allow secondary infections to occur and this is often blamed for sows savaging piglets.

This procedure should not be routinely required. However, if there are ongoing problems in a herd, this procedure should be carried out within 3 days of birth.

The teeth can be removed using a strong pair of nail clippers. Clippers should be disinfected, and, where possible, only the tips (top quarter) of the teeth should be clipped using sharp, clean clippers, without cracking the tooth or leaving sharp edges. Note that cutting a tooth flush with the gum provides another site for infection.

#### Tail docking

This involves removal of part of the piglet's tail at 1–2 days of age to prevent tail biting. The cause of tail biting is largely unknown but stress factors are blamed. Overcrowding and poor environment are two such factors, but severe restriction of feed, poorly balanced rations and a high incidence of external parasites have all been implicated. Where tail biting is a problem, all aspects should be investigated so that remedial action can be taken.

The loss of the pig's tail is of no commercial significance, but if it becomes infected through biting, complications can arise. It can seriously affect growth rates and result in the death of pigs or condemnations of affected pigs at the abattoir. If tail docking is then required as a preventive measure, it should be carried out before pigs are 7 days of age. Removal of the pig's tail at 1–2 days of age is perhaps the best approach. At least 2 cm of the tail from its base should be left after docking at this age. Tail docking of pigs over 7 days of age should be performed only in an emergency.

The operation is best done in clean surroundings, using a scalpel, emasculators, surgical clippers or a cauterising cutter. It is best not to apply antiseptics or dressings before the operation, but where bacterial infections are common, a disinfectant can be applied on the tail stub. Where tail biting occurs, it is an indication that something is wrong and the problem can usually be solved by a thorough review of housing and management.

### **Castration**

After slaughter, large entire males can have a distinctive odour in the carcase which becomes more pronounced when the meat is heated during cooking. For this reason, some butchers and processors tend to refuse to handle boars, or they pay a much lower rate for them. If surgical castration is considered necessary for market and consumer requirements it should be performed by a trained and competent operator. Non-surgical methods are preferable.

Surgical castration requires that the animal be adequately restrained and the testes removed by use of a sterile sharp implement such as a knife or surgical scalpel.

It is recommended that piglets be castrated after 2 days of age, when they have established their suckling order, and before 7 days of age. When pigs older than 7 days of age are castrated, appropriate and effective restraint should be used. Surgical castration should be avoided; however, the following details are presented for those producers who are required to surgically castrate.

### **Preparation**

The main requirement is a high degree of cleanliness, particularly the pen into which the pigs will be placed after the operation. If possible, select a cool dry day and avoid exciting the pigs any more than necessary.

### **Equipment**

An extremely sharp knife (a scalpel is superior), wash cloths, disinfectant and containers are required. A castration crate can be used if an assistant is not available. Where tetanus has been a problem on the farm, it is a wise precaution to inject each pig with a tetanus anti-toxin, which will give immunity for about 3 weeks.

### **Procedure**

1. Catch the pig and hold securely, with its belly up. Hold the hind legs apart, enough to allow ample room to move but not too far to hinder grasping the testicles. Wash the scrotum and surrounding area with disinfectant solution, and wipe dry.
2. Grasp the testicle between the thumb and forefinger and move it slightly away from the midline. Only minimum pressure is required to cut through the skin readily.

3. Make a cut about 15 mm long, deep enough to cut into the testicle itself. Incisions should be low enough to allow adequate drainage. Draw the testicle free from the opening and the thin membrane (tunica vaginalis). Sever the white-coloured cord (vas deferens) and allow it to retract. Then sever the other spermatic vessels by scraping the scalpel up and down — this reduces the risk of excessive bleeding that would otherwise occur if the spermatic vessels were severed in one clean cut.
4. Remove the second testicle in a similar manner through another cut — not through the septum (tunica dartos) that separates the two testicles.

### After-treatment and care

A clean surgical wound heals better when no dressing is applied, especially when performed correctly under clean conditions. If dressings are to be used, reliable disinfectants or antibiotic powders are preferable. Always place freshly castrated pigs into clean pens. Dusty, dirty pens, or muddy runs and paddocks with long grass and weeds, often lead to the formation of abscesses in the wounds. Note that castrates are less efficient in converting feed, carry more backfat, and are slower growing than boars. When producers are asked to provide surgical castrates, they should evaluate the cost benefit of producing these animals, especially if growing them to heavy weights.

### Creep feeding

As the name suggests, this is the practice of providing a special feed mixture inside a creep area, readily available to the suckers but beyond the reach of the sow. During lactation, a sow's milk yield reaches a peak around 3 weeks of age and slowly declines. However, a piglet's growth needs are increasing and they tend to outstrip the nutrients provided by the sow's milk, and thus need supplementing.

When the piglet is very young, its digestive system is still very immature and not developed sufficiently to handle solid foods, particularly the starches of fibrous foods. In fact, in the first 2 weeks of life, piglets can only digest satisfactorily the milk proteins (casein), milk sugar (lactose), glucose and fats. Creep feeds fed at this age are largely milk based. By the time the piglet is 2–3 weeks old, its enzyme system is developing to enable it to handle increasing quantities of starch, sugars and non-milk proteins.

The digestive system of a piglet fed a modern creep feed is actually more mature than that of a piglet receiving only its mother's milk. By introducing piglets to creep feed, the digestive system is actually being prepared for weaning.

Besides the obvious advantage of reducing weaning stress, creep feeding has further advantages:

- It minimises the effect of variation in milk supply that occurs between teats.
- It permits rapid and uninterrupted growth to weaning.
- Early gains are most efficient, and this increases weaning weights and reduces the market age of animals.
- More efficient feed utilisation allows a reduction in sow costs by giving an opportunity for earlier weaning, thus reducing the amount of feed fed during lactation.

### Procedure

Litters will vary in the time it takes for them to consume creep feed, but it is usually from 1–2 weeks of age. Pigs can be encouraged to eat by putting a few feed pellets or breakfast cereal in the creep as early as 2–3 days of age. Scattering these foods over a clean sod of earth sometimes encourages eating also.

It is not until the piglets are 2–3 weeks of age that they are consuming the creep feed in any quantity. It is important that only a small amount be put out daily and any leftovers removed. The feed can be placed on a clean patch of floor, but preferably in the hollow (frog) of a brick or into a small terracotta dish. Feed five to six times a day and as they consume more, the feed can be placed into more substantial pipe or tray feeders. However, never provide more than they can clean up in 24 hours.

As the pigs grow and their intake increases, a small self-feeder can be used. However, the feeder should only hold a few days' supply and should still be checked daily to see that the feed is not blocked or spoiled. 'Little and often' should be the rule. Keep feed fresh and palatable to maintain the piglets' interest and encourage intake. Besides access to creep feed, it is important that the pigs have access to clean, fresh water at all times.

Although creep feed is mainly used to supplement milk supply, it is often piglets on high-yielding sows that outgrow the sow's capacity and take readily to the creep feed. Producers often purchase ready-mixed creep mixtures containing cooked cereals and large amounts of milk products.

Starter diets should contain a minimum 15.0 megajoules (MJ) of digestible energy per kilogram (DE/kg) and 0.9 g available lysine/MJ DE. As mentioned, these are largely milk based, and even the follow-on diet or creep/weaner diets contain a minimum 5% milk powder. For early weaning at 14 days, the specifications are higher. The effort involved in providing creep feed and encouraging piglets to eat is more than repaid with improved piglet growth, fewer weaning difficulties, and less variability in market weight.

If weaning around 24–28 days, aim to achieve total intakes of up to 600 g of creep feed prior to weaning. If preweaning consumption is low and postweaning feed management is poor, there is the risk of an antigenic reaction to the feed. It is best to exceed 250 g of creep feed for 3 week weaning and 400 g for 4 week weaning. After weaning, the target should be 150 g/day in the first week, rising to 250–300 g/day in the second week.

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### Further information

A wide range of information sources exists for those interested in the pig industry. Australian Pork Limited (APL) is the national representative non-profit organisation for Australian pig producers. It combines marketing, export development, research, innovation and strategic policy development to help develop a viable and sustainable industry. Resources and contacts are listed on their website: <http://www.australianpork.com.au> or they can be contacted on 1800 789 099.

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