Basic pig husbandry — gilts and sows

Greg Roese and Graeme Taylor
Livestock Officers Pigs
Intensive Industries Development, Tamworth

Introduction
One of the greatest effects on profitability is the number of piglets reared per sow per year. As well as possessing the genetic potential to improve the production characteristics of her progeny, the sow must have the ability to rear large, healthy litters.

Selection

Production performance
As with boar selection, gilts should be selected on performance, namely growth rate and lean and fat composition.

Various selection indices are available which take into consideration the prolificacy of sow lines and their ability to wean large numbers of heavy, healthy piglets. Replacement gilts are then drawn from these superior lines.

Small herds are faced with the alternative of buying in gilts from breeding companies or selecting gilts from their own herd. If you intend to purchase gilts, it is unwise to simply go to a herd which has a high average performance in a particular trait and purchase one at random. It is important to select animals that are proven superior to their contemporaries.

If gilts are not managed properly when they arrive, wastage can be high, which can be expensive and disrupt breeding programs.

The entry of stock always poses a disease risk, but where gilts are bought from a known healthy source and adequate quarantine measures are employed, the risk can be kept to a minimum.

Conformation and physical soundness

Teating
Teating is perhaps the obvious character on which to base gilt selection but, unfortunately, the number, size, shape and placement of teats receives little attention. Gilts should possess at least seven evenly spaced teats on either side. They should start well forward and be in a straight line. Often the last three to four teat pairs tend to splay out, and when this occurs they tend to be hidden under the sows flank when she lies down, thus out of reach of the piglets.

Avoid selecting gilts with blind teats. This is an inherited defect and means that the particular mammary gland cannot supply milk to the piglet. An equally serious problem is physical damage to the teats. When establishing their teat order and when young piglets suckle, there is vigorous activity prior to milk let-down. Young piglets can damage their front teats, especially if the floor surface is rough and abrasive.

Inverted teats are also a cause for concern. Small, inverted teats often recover but the long inverted teats rarely become functional. If at all in doubt, cull the gilt.
Short, thick teats are less desirable than longer thinner teats. Piglets have difficulty suckling short teats and as the sow matures the teats increase in size and the problem is magnified.

Gilts should be physically examined for these disorders. This means actually restraining her while an examination can take place.

**Vulva**

While the exact incidence of defects in reproductive organs is unknown, a wide variety of abnormalities do occur.

With visual selection the only reliable feature that can be accounted for is the shape, size and placement of the vulva. It should be large, without sign of infantilism, and free of the ‘fish hook’ appearance found in hermaphrodites.

**Legs, feet and general conformation**

Gilts must possess sound legs and feet without any sign of weakness. Pasterns should be strong, sloping to toes of even size. Gilts should be wide through the hindquarters with depth and squareness in the body cavity; ribs should be well sprung.

If the physical soundness of the gilt is in doubt she should not be kept as a breeder. Breakdown later in her breeding life can cause piglet losses, hardship and loss of productivity.

**Temperament**

Gilts should be quiet but alert and active. If there is any tendency to be flighty or overly aggressive, they should be disregarded as future breeders.

While management plays an important part in the development of certain behaviours, many problems at farrowing time could be averted by careful selection of gilt replacements.

**Care of gilts**

Selected gilts should be housed in groups in the breeder shed to allow time for them to build up immunities to organisms present in the breeding herd before gilts are mated. It is particularly important to quarantine and acclimatise purchased gilts on-farm for 6–7 weeks.

Vaccination for diseases like *E. coli*, erysipelas, leptospirosis, mycoplasma and parvovirus should be undertaken before the gilt is mated. Consult your veterinary practitioner about a suitable herd health and quarantine program.

Selected gilts should be exposed to a mature boar for 20 minutes daily (under supervision) to stimulate them to cycle earlier. An alternative is to use vasectomised boars, or to move weaned sows into the gilt pool as their urine contains oestrogen which acts as a stimulus.

**Feeding program**

Gilts today are leaner, mature earlier and start their breeding lives with less body reserves. The aim should be to have gilts ready to mate, weighing 120–130 kg liveweight at around 28 weeks of age, with a backfat reading of at least 18–20 mm. They should be in good condition but not overfat.

After selection at 80–90 kg liveweight, the gilt may require a special feeding program to build up her fat cover to the desired level. If this is not achieved, her fat cover becomes depleted over subsequent pregnancies, resulting in the ‘thin sow syndrome’ and her subsequent breakdown.

Low specification dry sow diets are usually unsuitable, as a gilt diet should be at least 13.2 megajoules (MJ) of digestible energy (DE) per kilogram and 0.5 grams of available lysine per MJ DE. Try to achieve a daily intake of around 35 MJ DE.

**Flushing**

It is important that the gilt has at least two true heat periods before mating, to gain the increase in ovulation rate. For gilts, the ovulation rate can be further increased by a high energy intake for 10–14 days prior to service. This should be reduced for the first 3 days after mating. Increased feeding levels may then be made to ensure adequate energy intakes, but prevent high energy intakes between days 70 and 105 of gestation.

**Signs of approaching oestrus**

The length of the oestrus cycle is normally 21 days and occurs regularly until the sow or gilt becomes pregnant. Gilts tend to have a shorter cycle of 18–20 days.

**Gilts**

When oestrus is approaching, there is increased activity, and also swelling and reddening of the vulva. A small amount of mucous appears, but the gilt may not stand for the boar at this stage. Twelve to twenty-four hours later, the vulva will have diminished in size, the mucous becomes the consistency of light oil, and the gilt will respond to the back pressure test.

Only 50% of gilts will show the standing reflex or back pressure response in the absence of the boar. For this reason a gilt should be checked by a mature boar to determine whether she is on heat.

The actual duration of the heat cycle is shorter in gilts and therefore her period of receptiveness is shorter. *Staff should be alerted to this fact.*
Sows

Oestrus can be pinpointed more easily than in the gilt. Normally a sow is in oestrus 3–10 days after the litter has been weaned.

The sow becomes restless and frequently sniffs the genitals of her pen mates. She will attempt to mount other sows or be mounted.

There may be some swelling of the vulva, although only 75% of sows may exhibit this. There is, however, a clear vaginal discharge at this time. As in the gilt, the sow may not stand to the boar or the back pressure test at this stage. This usually occurs 12–24 hours later and the mucous changes from being thin and watery to becoming the consistency of light oil.

Sows will normally accept the boar for some 50 hours during the heat period. It is of interest that the individual duration of heat in sows is highly repeatable.

It is important when conducting oestrus checks that gilts or sows are taken close to a mature boar so that the important stimuli of smell and sound are most intense.

Mating period

After weaning a litter, the sow normally returns to oestrus 3–10 days later and, if not successfully mated, will cycle every 21 days, although it may vary to between 18 and 24 days. Placing the gilt or sow in close proximity (i.e. within sight, sound and smell of the boar) will induce and aid in the detection of oestrus. This is particularly important during cold weather as the transmission of the pheromones or boar odour is affected. It is also a very good argument for providing adequate warmth in the boar pen and mating areas.

Best results appear to occur when sows or gilts are separated from the boar by a 1 m wide corridor. When penned next to a boar they will apparently become conditioned by continuous and intense stimulation.

It is normal to ‘batch farrow’ sows so that groups of sows will be weaned and come on heat together. Grouping sows or gilts opposite to the boar pens will also aid in the detection of those on heat.

Timing of mating

Ovulation occurs between 38 and 42 hours after the onset of oestrus, and takes about 4 hours. As the sperm cells can survive longer than the ova or eggs, the optimum time for service is prior to ovulation.

Unfortunately it is not possible to predict this with any accuracy, so to overcome the problem the sow is mated at least twice during the standing heat period. The first service should take place soon after the sow or gilt will stand.

Mate gilts when standing heat is first detected, and again 24 hours later. If detection is carried out twice daily, you can delay the first mating 12 hours, with the second mating occurring 24 hours later.

With sows, if detection is carried out once daily, mate at first detection and again 24 hours later, or wait 12 hours and remate 24 hours later. If detection is done twice daily you can delay the first mating 12–24 hours, with the second mating 24 hours later. If herd litter size is low, a third mating 12 hours after the second should be considered.

Where possible, matings should be made before feeding and in the cool of the day in summer months.

Assistance at first mating

It is advisable to supervise and assist if necessary. Boars of similar weight and age should be used, but if this is not possible, a service crate should be used. Rough handling by a vigorous boar may make a gilt nervous about later matings, but it is important not to interfere unless necessary.

Supervision

With supervised or hand matings, it is important to take the sow or gilt to the boar’s pen or mating pen. She normally assumes the major role in searching out the male and this initial contact is important in replacing the social contact behaviour with the sexual behaviour sequence. However, don’t leave them together unsupervised. If the sow is not on standing heat the boar may become particularly aggressive and frustrated, and injure himself or the sow.

Check that vaginal entry takes place and the boar does not serve into the rectum.

Care after mating

After mating, the sow or gilt should be returned to a pen or stall on her own, and then remated 12–18 hours later and the service date recorded. If the sow or gilt has to be returned to a group of sows, she should be washed or held until she has gone off heat, and then returned.

A check on the sow should be made 18–23 days after mating to see if there are any signs of her returning to oestrus.

Gestation period

The first month after mating is critical, and any form of stress must be avoided.

Implantation of embryos occurs between day 11 and day 18. Incorrect nutrition or stress can have an adverse effect on embryo survival. Conception rates can also be affected when mated sows are
returned to a group of sows. Placing sows in individual pens or stalls has many advantages.

**Feeding regimens**

While a pregnant sow uses feed more efficiently than a dry sow, the actual feeding program employed not only affects her performance in that particular pregnancy, but, more importantly, it affects her future performance as a breeder. Feeding rates are determined by body weight, sow condition, stage of pregnancy, housing and temperature.

| Table 1. Guide to feeding levels for gilts and sows (13.2 MJ DE/kg) |
|------------------|------------------|------------------|
| Weeks            | Gilts            | Sows             |
| 1–4              | 1.8–2.3 kg       | 2.0–2.5 kg       |
| 5–13             | 1.8–2.3 kg       | 2.0 kg           |
| 14–16            | 2.0–4.5 kg       | 2.2–2.5 kg       |

**Gilts**

Even though the gilt is still growing, a high feeding level in the first month of pregnancy can increase embryo mortality. As a guide, 1.8–2.3 kg/day is ample for most gilts to obtain the desired backfat reading of 25 mm by farrowing time, and a 15 kg body weight increase after weaning.

Litter growth can be supported by increasing the feed level by about 1–1.5 kg over the last 2 weeks of gestation. At no stage should the gilt be overfed. Besides being wasteful, it results in difficulties at farrowing time and tremendous weight loss during lactation with subsequent breeding and management difficulties.

**NB. Feeding heavily late in the pregnancy depresses appetite during lactation.**

**Second and third litters**

During lactation, the sow should receive an energy-dense diet. Where a lactating sow ration is used, it should provide a minimum 100 MJ DE, 700 g crude protein and 50 g lysine per day. If a special lactating-sow ration is not available, then try feeding a grower ration.

It is advisable to continue feeding at generous rates after weaning and up to 2–3 days after mating. Thereafter, feed 2.0–2.5 kg of a 12.5–13.0 MJ DE diet with 0.4 g available lysine/MJ DE. Where considerable weight loss has occurred, higher than average feed levels for the first month after mating may be necessary.

The aim should be to have sows gain 10–15 kg liveweight after each cycle, with a backfat reading of at least 15 mm at weaning time.

**Fourth and subsequent litters**

By this time, the sow has reached her mature body size and thereafter a large increase in body weight is undesirable. The sow becomes heavy and clumsy, and more feed is required for her maintenance. Bodyweight gain should stabilise, or at most a 5 kg liveweight gain is allowed between cycles and she is fed according to her body condition.

While the above practices are ideal, not all small producers have access to weigh crates for sows or backfat testers. A system of condition scoring can be used with success, as can ‘liveweight bands’ to determine weight gains in the vital first few pregnancies.

Nutrient requirements are influenced a great deal by environmental conditions, therefore feeding programs should be determined for individual piggeries.

**General care and disease prevention**

Today, more and more sows are raised under total confinement, which makes it easier to control feed intake (and thus weight gain) and reduce injury to the sows. Regular inspections should be made to detect any signs of lameness, sore feet or injury and prompt treatment given where necessary.

Where vaccination for disease control is practised, sows are ideally vaccinated 3–4 weeks before farrowing. Similarly, control of parasites is timely at this stage. Consult your veterinarian and read the Australian Pork Limited publication *Principles of vaccination*.

**Farrowing period**

Problems with sows at farrowing time are mainly due to lack of care and attention of the sow and her farrowing quarters.

Where possible each farrowing room should operate on an all-in-all-out basis, which is possible when using a batch farrowing system.

**Farrowing pens**

When a pen/room has been vacated, it should be thoroughly cleaned and disinfected. A high-pressure hose or steam cleaner should be used to remove any dirt or dung that has collected, and then a disinfectant applied. Then pens should be dry before sows are placed in them.

Any maintenance work that is required should be carried out before the pen is again occupied. Check that farrowing rails are secure, feed troughs and watering facilities are not worn or damaged, and the floor surface is in good condition. Where heat lamps or radiators are used, their position and operation should be checked.
Where piggeries operate on a batch farrowing system and/or are large enough to have separate farrowing rooms, all the crates in the room and the room itself can be disinfected before being occupied by the next batch of sows.

**Pre-farrowing treatment**

Constipation can cause farrowing and lactation difficulties on some farms, and a sow or gilt ration can be reduced and diluted, with a bulky laxative material such as bran, 5–7 days before farrowing. Problems commonly occur when sows or gilts are allowed unlimited exercise prior to confinement and farrowing.

Check the sow’s udder for ‘lumpiness’, which will indicate the presence of mastitis.

**Booking in sows**

Everything should be in readiness long before the next farrowing. Sows should be moved into the shed at least 3–4 days before farrowing, while gilts should be allowed 5–7 days to become accustomed to their new surroundings.

Before being allowed to enter the maternity section, sows and gilts should be thoroughly scrubbed with warm and soapy water to remove any dirt and dung. Pay particular attention to the udder, feet and vulva. If external parasites are present, use a recommended insecticide according to the directions on the label. Apply a mild disinfectant on the teats and vulva, and then the sow or gilt can be moved to the farrowing pen.

If sows farrow-down in pens or yards, a small amount of clean bedding, for example straw, can be placed in them. Large quantities of bedding can be dangerous for the new suckers, increasing the risk of being overlain. Care also has to be exercised if using bedding in slatted pens to avoid pit blockage.

Make sure the sow cannot be accidentally knocked out of her shed/pen, particularly during winter and before she has farrowed.

Under no circumstances should a sow’s feed intake be increased at this late stage; in fact, a slight reduction is recommended. If constipation is still evident, an enema may have to be administered.

As farrowing time approaches, switch on heat lamps, check that they are working, and leave them on to allow the creep areas to warm up. Move a heater to near the rear and one to the side of the sow.

**Signs of approaching farrowing**

The actual signs of approaching parturition vary widely between individuals and the signs must be viewed collectively to ascertain when farrowing may take place.

As with other animals, when the vulva swells, the flank drops and there is an increase in the pulse and respiration rates prior to farrowing. However, about 48 hours prior to farrowing, a serous secretion may be expressed from the teats, followed by some milk 24 hours before farrowing, with larger quantities 6–12 hours before.

If allowed to farrow outside, the sow will make a nest 1–3 days prior to farrowing. This bed-making activity can be continued with confined sows and usually occurs within 24 hours of farrowing and more commonly 5–6 hours prior to farrowing.

Prior to farrowing, the sow will become restless and will lie down and get up constantly, and may urinate frequently. As the intensity of contractions increases, she will lie down and utter low grunts with an occasional whining sound. There may be at this time a slight discharge from the vulva.

**Parturition**

There is no standard form of presentation in pigs — they may be born with either head or tail first. Normally, the foetal sacs are ruptured at birth and thrown off by the piglets, but occasionally they may cover the snout and cause suffocation. The umbilical cord is not always broken at birth and the piglet may wander around still attached until the cord is broken.

**Sow behaviour**

There is increased activity. The sow, and particularly gilts, may stand as each of the first few piglets is born. She may twitch her tail prior to the birth of a piglet or the expulsion of fluid or meconium.

She may also try to roll as far as she can to improve access to her teats. These movements and her attempts to get up and down, place the young piglets at great risk.

The first farrowing is critical in the formation of the gilt’s subsequent farrowing and suckling behaviour, and it is wise to supervise these farrowings. Nervous sows may cause concern, and best results can be obtained by using a ‘farrowing box’. Remove the piglets as they are born, clean them, place them in a clean box with a small amount of litter, and suspend a heat lamp about 60 cm from the floor.

If the sow or gilt continues to be restless and appears to be obviously agitated, she may have to be injected with a suitable tranquilliser. Savaging can occur, especially with gilts, and a tranquilliser is usually all that is required to settle them down.

Once the last piglet has been born and the afterbirth has been expelled, the sow will usually lie quietly and allow her piglets to suckle.
Duration
Farrowing can take an average of 3–5 hours. The actual time interval between the first and last piglet is around 2½ hours. However, it is considerably shorter with gilts, usually taking about 1½ hours. Likewise, the average interval between births is only about 12–15 minutes in gilts but extends to over 20 minutes with sows.

If the interval is more than 25 minutes, the second piglet is more likely to be stillborn, and intervention should be made after delays of 25–30 minutes. If the actual farrowing time extends beyond 3 hours, stillbirths will increase.

Action at farrowing time
While sows will usually farrow without assistance, supervision is desirable if trouble is to be avoided.

As the piglets are born, check to see that their mouths are free of mucous and place them round to the side of the sow to suckle. If your presence is obviously upsetting the sow, withdraw and only intervene if a piglet is born in its foetal sac, if the piglet is being rolled on, or if the sow is in difficulty.

Record, on their card or in chalk on the pen, what time the sows started farrowing. Check progress every 15–30 minutes. If the period between the birth of piglets is considered too long (over 30 minutes) and the sow continues to strain, an internal examination is desirable. At times this can be extremely difficult, and inexperienced stockpersons should seek veterinary assistance, especially if a piglet is caught in the birth canal.

When sows have been checked they may require injections to stimulate contractions of the uterine muscles.

Some piglets, especially those removed manually, are often comatosed due to lack of oxygen. Prompt action will usually revive them:

- Clear the nose and mouth of mucous.
- Hold piglet by the hind legs and swing around at arms length; or
  Hold the piglet's mouth closed and blow gently into its nostrils.
- Check that the umbilical cord is not bleeding; tie or apply a cord clamp if required.
- Rub the piglet vigorously to dry it, and place it in or under a source of heat.
- Allow piglets to suckle as soon as possible or administer colostrum or glucose.

It is important that piglets receive colostrum, which allows the transfer of passive immunity to the piglets. Colostrum also contains a high level of nutrients.

Watch for splay-legged pigs. Taping their back legs in a ‘figure 8’ pattern with electrical tape may help support them.

Postnatal or after-farrowing care
Check to see that the afterbirth has been passed, and in the case of a difficult farrowing a course of antibiotics may be necessary. Consult your veterinarian, as further treatment, such as vaginal irrigation, may be needed.

Rectal temperatures should be taken for 24–48 hours for any sign of trouble. While a vaginal discharge is normal, excessive or purus discharge should be treated promptly.

Piglets are born with eight sharp needle or milk teeth which may lacerate the sow’s teats (and each other) while competing for available teats, and cause infection.

On some farms it is found necessary to clip the needle teeth immediately after birth. If a history of ‘naval ill’ or ‘joint ill’ is prevalent on the piggery, the umbilical cords should be dipped in tincture of iodine. Other operations that can be carried out are tail docking, administration of iron and medication.

Any sign of trouble in the sow should be treated promptly to minimise stress and loss of milk production.

Lactation period
For the first few days after farrowing, the sow should be watched for any signs of constipation. The recommendation is to slowly increase the daily ration of the sow, allowing her to build up her yield gradually and so keep pace with the increasing requirements of the suckers.

On the day following farrowing, it is best to feed only a light bran mash to get her bowels working, and a small amount of feed to keep her content.

Heavy feeding of the sow at this stage can cause scouring in the piglets and result in engorged, inflamed udders with the increased risk of mastitis or agalactia.
The sow can be fed lightly (say 1–1.5 kg) on the second day, and this can be increased by 0.5–1.0 kg per day until, at the end of the first week, she is receiving 2 kg for herself plus 400 g per pig suckled. However, this is only meant as a guide, as the amount fed will depend on environmental conditions, management practices used, size of the sow, and weaning age etc. The target should be 7 kg/day or ad lib feeding by 7–10 days after farrowing.

**Diets**

As already mentioned, the lactating sow should receive a minimum 65–75 MJ DE, 700 g crude protein and 30 g lysine. The actual amount fed will depend on environmental conditions and factors like size of sow and litter size.

The aim is to meet the requirements of lactation by high feeding levels and to minimise sow body weight losses and resultant breeding difficulties.

It is advisable to feed a lactating sow a ration of higher nutrient density (e.g. 13.8–14.1 MJ DE, 0.5 g/MJ available lysine) than is fed during gestation. This is particularly important with gilts or small sows that have large litters — with low-density diets, they have extreme difficulty in consuming sufficient feed to provide milk for the litter and nutrient for their own maintenance. They use their own body fat to make up any deficiency, with resultant severe bodyweight losses.

Every effort should be made to coax sows to consume sufficient feed, to the extent of adding feeds or flavourings to improve the feed's palatability, or providing it as a wet mash. Feeding two to three times per day instead of once per day can also help.

Peak milk yield is reached about the end of the third week. The piglet's growth demands outstrip the sow's milk capacity at this stage, so to maintain their growth, it is necessary to give them their own high quality feed. This creep feed can in fact be introduced as early as 4–5 days.

As the due weaning date approaches, maintain the sow's feeding rate up until after she is mated. This is particularly important for the first three to four litters, to help reduce sow weight loss, and during the ‘weaning to remating’ periods. These high feeding levels may also help increase the ovulation rate.

On the date of weaning, the sow is removed from her litter and penned out of sight, sound and smell. This pen is usually in close proximity to the boar, to help stimulate her to come on heat.

If the decision is made to sell a brood sow, wait until the udder has dried up. Do not try to fatten her unless you have access to very cheap feed.

Sows will convert feed at between 6:1 and 8:1, so the price of feed must be extremely low and backfatter prices extremely high before you would attempt to fatten sows.

When sows are no longer part of the breeding unit in the herd, it is false economy to have them holding down accommodation space meant for productive sows.

**Replacement**

Research indicates that the second to seventh (inclusive) litters are the most economically productive in a sow’s life. This would mean that they would be around 3–4 years of age at their productive peak.

Replacement gilts should be brought in on a regular basis. If this is not done, there can be fluctuations in the number of farrowings, causing management problems with overcrowding or understocking.

Having large groups of gilts coming into farrow together can cause unnecessary difficulties. At times, this may be necessary but it does require an increase in supervision at farrowing.

The actual number of gilts required can be determined reasonably accurately some months ahead by making use of farrowing and ‘expected’ mating charts. Where batch farrowing is practised, replacement numbers can be more easily calculated.

However, a decision on the percentage of sows to be culled per year has to be made so that a regular culling and replacement program can be implemented.

On occasions, a sow might become sick, lame or even die. If this occurs in the farrowing or lactation period, a replacement would have to be found at short notice.

Piggeries which are ‘self-replacing’ can operate a gilt pool from which replacements can be taken and mated to maintain the farrowing program.

**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/](http://www.australianpork.com.au/) or they can be contacted on 1800 789 099. Specific APL publications with more detailed information are as follows:

A number of pig-specific magazines and newspapers exist, including:

- **Australian Pork Newspaper**, (07) 3286 1833
- **Pig Industry News**, (08) 8372 5222
- **Pork Journal**, (02) 9798 3078
- **The Pork Producer**, (07) 4690 9253

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