Correct gilt management, key to achieving productive objectives

This article reviews the key points to keep in mind to achieve good rearing performance throughout the productive life of sows.

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Good management of gilts is often overlooked as a critical factor in the productive half-life of sows; the best way to improve this ratio is to increase the retention of P0 and P1 females.

Pig rearing is the foundation of good production and will drive the success of the farm now and in the future.

The management of gilts begins at birth. To achieve a successful result, we must identify a program to follow and chose the piglets that will grow into sows with the best productive lives.

Management of gilts from birth

The quality of future breeders must be confirmed at birth; they should have more than 14 teats, have good health and growth rates, come from a healthy originating litter with a good phenotype and lactation management, etc.).

Individual weight at birth is one of the main risk factors.

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Individual birth weight

Piglets with a low birth weight (< 1.1 kg) will have compromised survival and growth rates which will lead to poorer productive results and less longevity[1,2], as demonstrated by Patterson[3] in a study that concluded that the preselection retention ratio at around 170 days of life (according to the individual weight at birth) was:

61% in piglets weighing > 1.6 kg.

38% for those weighing < 1.18 kg.

Part of the variation in performance between, and even within, farms can be attributed to the quantity and quality of the reared gilts in their first farrowing. It is clear that in order to achieve the conditions associated with high performance in the first farrowing (which varies depending on the genetic line used), such as lifetime yield and optimised production cost, we must follow:

- Appropriate management practices (housing, feeding, boar exposure, heat detection, etc.).
- Certain requirements regarding weight, average daily growth, age, immune level, etc.

First manifestation from oestrus to puberty

Once the gilt is ready and selected, it moves from the pre-pubertal to pubertal stage and begins its productive cycle at the time of its first heat. In general, we could say that a standard replacement sow would be 225 days old, 145 kg, and in her second heat[4].

In most cases, producers receive piglets at a peripuberal stage of their sexual development. If these animals are an adequate age and body weight, their first oestrus should occur within one month of their arrival on the farm.

Piglets normally reach puberty at about 200–210 days; however, this will be influenced by many intrinsic and extrinsic factors such as genotype, the environment, contact with the boar, and transport.

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Transport

Onset of oestrus often coincides with the transportation of animals to the destination farm: if the age of the gilts at the time of transport is close to the time they would normally start puberty, approximately 25–35% of them will show signs of heat in the week following their transportation[5].

The importance of contact with a boar

Contact with a boar is the main factor required for the induction of their first heat.

Although the age of the gilt is very important for boars to be an efficient stimulus of puberty. This is an important point that can cause the most common problem related to delayed puberty in replacement sows: due to their age upon arrival at the production farm, contact with boars may start too late to stimulate puberty.

Age of the gilt

If contact with the boar begins when the gilts are only 4 months old, their pubertal response will be minimal and they can become habituated to the stimulus.

Conversely, when the introduction of the boar is delayed until the time near puberty (at 6 months or older), their response will also be limited.

In addition to producing good heat synchronisation, the interval between the first boar contact at puberty and the gilt age at puberty is minimised if boar stimulation occurs at around 150–160 days of life.

How can we achieve heat in gilts when they are at the right age?

There are several strategies to increase the percentage of young gilts that come into heat at the appropriate age, depending on the cause of the delayed puberty:

Anestrus at hot times of the year

- Ventilation control.
- Availability of fresh water.
- Heat detection during the cool hours of the day.
- Improve feed consumption (provide more access to food, keep the feeders clean, check the pen density, etc.).

Heat stimulation and detection

- Sufficient number of boars.
- Boars do not work for more than one hour each.
- Change the boars between groups of gilts.
- Check that the staff performing heat detection are sufficiently experienced and spend enough time on screening.

Health status

- If the gilts become ill during this period, there may be a delay in them coming into heat.
- Avoid vaccinations three weeks before the first mating[6].

Hormonal induction of puberty

If, after implementing the above strategies, the desired results are not obtained, we can use a hormonal treatment to induce puberty.

Puberty induction

For example, in a study presented by Martinat-Botte[7] which included two groups of 6-month-old pubertal piglets (n = 94), one was treated with PG600 and the other was left without treatment as a control:

100% of the treated sows showed oestrus versus only 65% of the control group.

The appearance of puberty was shorter in treated sows (3.3 days) compared to untreated sows (4.7 days).

The most common combination of exogenous hormones is equine chorionic gonadotropin (eCG, formerly called pregnant mare serum gonadotropin or PMSG) and human chorionic gonadotropin (hCG). The commercial combination of these hormones is called PG600 and contains 400 IU of PMSG and 200 IU of hCG:

- Gilts usually show signs of oestrus 3–6 days after treatment and
- their ovulation time is approximately 110–120 hours.
- The conception and farrowing rates and the litter size of treated animals are comparable to those with natural cycles.

However, gonadotropins are not effective in the presence of corpora lutea. Thus, workers should be aware of the approximate age at which gilts reach puberty and when ovarian cyclicity begins. Treatment failures occur when natural ooestrus has been missed by farm staff and the gilt is thought to still be prepubertal.

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Heat synchronisation

Once the gilts are pubescent, they must be organised into batches in order to achieve our objectives for matings and, consequently, our farrowing objectives. Thus, we will become more efficient in our use of the gestation and, especially, the farrowing facilities.

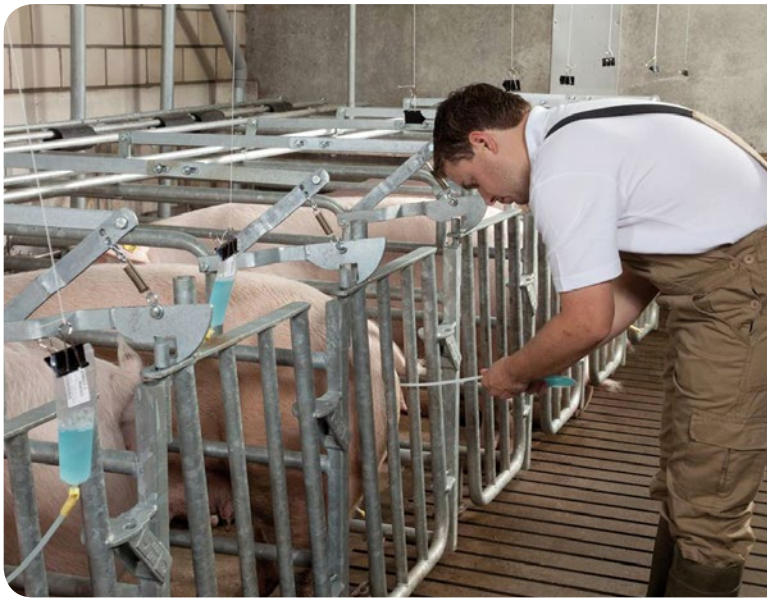
Altrenogest

The gilts will naturally present scattered heats and this will complicate our desired programming schedule. However, we have tools such as altrenogest (Regumate) to help us with this problem. Altrenogest is a synthetic progestin administered orally that blocks gilts from coming into heat by inhibiting GnRH production, and should be administered at 20 mg/day for 18 days.

Studies with altrenogest have concluded that 96% of gilts will come into heat 7 days after the withdrawal of this drug[8]. Altrenogest also improves the productivity of gilts to increase their ovulation rate, resulting in larger litter sizes and a higher farrowing rate[9,10].

To ensure the correct result after using this product, we must:

- Confirm that the gilts have previously cycled (that is, they are already pubescent).
- Ensure that the animals have received a dose of altrenogest every day during the treatment schedule (*figure 1*).



Tools to assess reproductive status

Some tools are available to help us to know if we are using altrenogest correctly, or to diagnose the cause of a poor outcome (not enough gilts going into heat) once the normal age of puberty is reached.

One of these tools is the progesterone (P4) kit (*figure 2*): a semiquantitative competitive ELISA which produces colorimetric results. In other words, the intensity of the colour is inversely correlated with the concentration of P4.

Figure 1

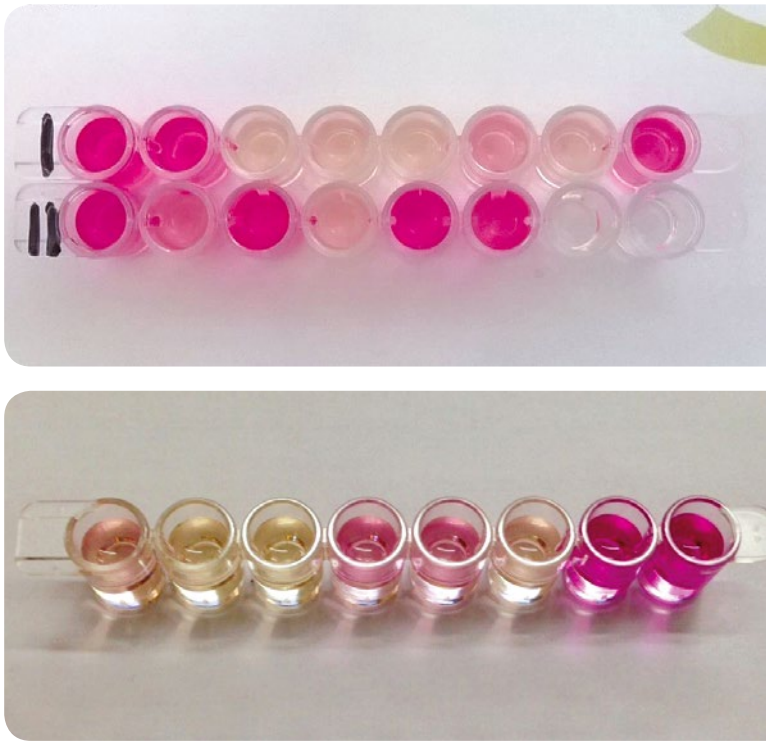


Figure 2

Regumate efficacy problems

The two most frequent possibilities related to a possible efficiency failure are:

Treat non-cyclical sows

Serum is collected from sows to check their progesterone levels before starting the treatment; if the result is negative and the gilts are not in heat, they are not cycling and the effectiveness of altrenogest will be reduced. In this case, we should induce heat in these gilts before starting the synchronisation.

Dosing failure

If the sows begin to cycle before the end of the 18 days, when the product is withdrawn the sows will be in the middle of their cycle and so they will not come into heat.

To confirm this, we would need to collect serum from these sows one day before finishing the altrenogest treatment; a positive result would be progesterone levels exceeding 5 ng/ml and indicates that the sow is cycling. This kit only detects natural progesterone and so treatment with altrenogest does not interfere with the result.

Study of the reproductive system

Another tool is the study of the reproductive apparatus collected at the slaughterhouse after having sent some gilts with reproductive problems for culling.

A study of ovarian and uterine activity will be carried out and compared to observations on the farm. This type of study can identify if the gilts are cycling (*figure 3*), in anestrus, impubertal, etc., which will help us identify the cause of the problem.

Ultrasound

The third tool is ultrasound. This equipment works at frequencies of 7.5 MHz to produce a very high-resolution image that allows us to assess the uterus and ovaries of these gilts.

There is a relationship between the transverse area of the uterine horns (in cm^2) and the weight of the uterus

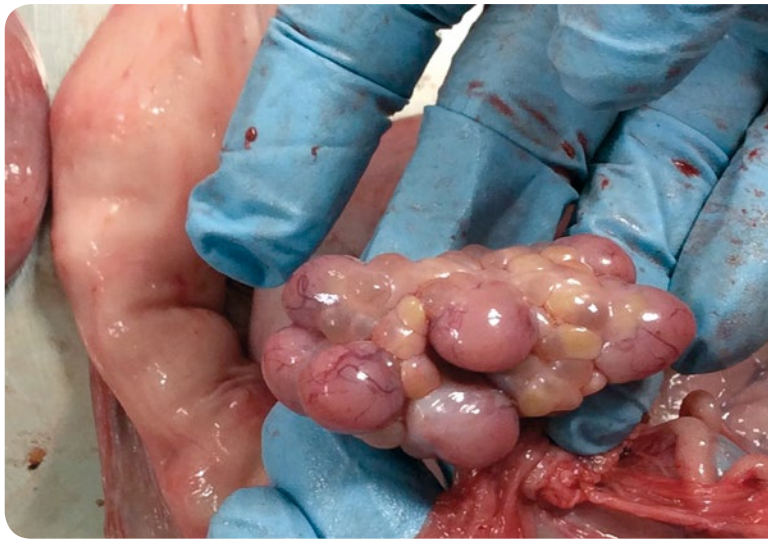


Figure 3

(in g)[11], and so, measuring the diameter of the uterine horn can tell us whether a gilt is pubertal or not.

Checking the ovaries can also show us whether the ovary has not yet cycled or if it presents corpora lutea and is cycling (*figure 4*).

Diet

Finally, we also know that replacement sows must receive a *flushing* of at least 50% of their dietary needs 2–3 weeks before they are mated.

The flushing diets generally consist of about 3.2–3.5 kg of feed per sow per day. We can take advantage of the fact that at this time the gilt will be caged and receiving altrenogest to prevent her from coming into heat, all of which will lead to better prolificacy results[4].

Figure 4

In summary

After achieving the above, our future breeder will be ready and in optimal conditions for her first insemination and will meet all the objectives for mating in order to for her to achieve an optimal productive half-life.

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