

Questions and answers: find out everything about PG 600®

PG 600® is the key to optimal farm organisation because it improves the fertility of sows and gilts¹.

Why does PG 600® contain both PMSG and HCG?

In layman's terms, PMSG stimulates ovarian follicle growth and HCG favours ovulation and the formation of corpora lutea.

In the first hours after weaning, natural secretion of FSH and LH is stimulated. These two gonadotropins act together to regulate follicular development, leading to ovulation.

Thus, the synergistic effect of these two molecules (PMSG and HCG) is **combined** in the same product, with the benefit of favouring the development of fertile oestrous at lower doses than would otherwise be required if they were administered separately.

Furthermore, both PMSG and HCG have a long half-life, thus allowing them to be administered at the same time².



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What are the advantages of inducing cyclicity in replacement sows with PG 600®?

There are several technical and economic advantages³⁻⁵

- Better organisation and planning of replacement sows, including the possibility of a reduction in their number.
- Grouping sows according to the timing of their heat, in order to optimise the detection of their first oestrus and, more importantly, their second and third oestrus (when they will be covered or inseminated).
- The management of problematic replacement sows to minimise the extra rearing costs involved.
- Reduction in the number of non-productive days in future sows.
- In regions with warmer climates (such as southern Europe, Asia, and Latin America), PG 600® helps



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sows to come into heat at higher rates than untreated females.

Some economic studies carried out in the United States (Martin, 2002) indicate a gross profit margin of \$15.26 per gilt treated with this product.

What are the risks of administering PG 600® to reared gilts if they are already cycling?

The main risk of giving PG 600® to a reared gilt during the luteal phase of the oestrous cycle is that this drug will be **ineffective**: low doses of gonadotropins will not be able to exceed the level of progesterone naturally present during this phase.

Controversy exists about the increased risk of cysts after using PG 600® in these sows at this time, although several publications have reported that the incidence is not higher than in control groups^{6,7}.

Nonetheless, the administration of PG 600® early during follicle maturation can favourably affect the beginning of oestrus.

PG 600® is best used in suitably aged prepubertal sows with anestrus in which studies have shown that successful induction of the first oestrus can be expected in 95% of cases (Martinat-Botté, 2006).

The procedure can be optimised by evaluating the physiological state of the sow before injecting PG 600® using ultrasound or by determining progesterone levels.



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How should PG 600® be used in reared gilts that have not yet come into heat during quarantine?

A replacement sow is said to be in anestrus if it has not gone through its first cycle in the weeks following its arrival at the farm, despite attempts to help prevent this status such as management to reduce stress related to transportation and new accommodation, contact with boars, adequate lighting conditions, and the provision of fortified feed, etc.

In this case, one solution is the administration of PG 600® when the sow is transferred to the covering pen, that is, **after spending 50–60 days on the farm**; in this way its effect adds to the stress from the transfer or external sources.

Depending on the quarantine conditions and restrictions, PG 600® can be administered sooner, but only after performing an ultrasound or hormonal determination to ensure that the sow is in true anestrus.



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Can PG 600® be combined with a progesterone treatment for heat synchronisation in replacement sows?

American studies^{8,9} have shown that the combination of PMSG and HCG with an oral progestin (altrenogest) **can enhance oestrus control** in reared gilts.

This combination synchronises not only their heats, but also the timing of their ovulation.

For this purpose, PG 600® should be administered 12 to 14 hours after the final dose of altrenogest (i.e. number 18). In modern replacement-flow programs, the combination of both products can improve the efficiency of the use of the replacement sow *pool*. It is also useful to consider these programs when installing or expanding farm populations.



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Should the PG 600® be systematically used in primiparas at weaning?

Some research has shown that less than 60% of primiparas come into heat within 8 days after weaning¹⁰. Furthermore, another well-recognised phenomenon is the reduction in prolificacy in the second farrowing.

A lot of evidence in the field of breeding management has shown the benefits of the systematic treatment of primiparous sows with PG 600® to encourage them to go more easily into heat and at an earlier stage (with 88–95% of the primiparous sows going into heat within one week).

Although there are more reproduction problems in primiparas in summer, there are proven benefits to the constant use of PG 600®.



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What are the advantages of systematically treating the entire breeding population with PG 600® at weaning?

The systematic use of primiparas is completely justified from the technical and economic points of view.

The beneficial effects in terms of heat synchronisation and prolificacy in untreated sows are less marked in multiparous sows compared to primiparous females.

This product makes it easier to organise the treatment of all the breeders at the farm level, especially on larger farms. Synchronising oestrus over 3 days with the use of PG 600® at weaning **guarantees insemination or coverage of an entire group 5–6 days after weaning**.

The use of PG 600® in the whole sow population is recommended, at least between June and October, to help

avoid the reproductive problems that commonly appear during summer¹¹.



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Why is it better to administer PG 600® on the day of weaning?

First, there are physiological reasons for this:

- There are spikes in FSH and LH in the 24 h post-weaning; the extent of LH secretion immediately after weaning and the speed of the onset of oestrus are closely correlated.
- For an early onset of oestrus, the ovarian follicles must be active and secreting hormones less than 20 h after weaning. The resumption of follicular maturation is linked to the level of gonadotropin secretion directly after weaning.

Second, there is also zootechnical evidence for this:

- Preliminary trials at INRA (France) and a recent comparison in the UK recommend the use of PG 600® 6–12 h after weaning.

However, injection the day after weaning (usually for practical reasons), has shown equally good results in the field (Kirkwood, 1998).

The extent of LH secretion immediately after weaning and the speed of the onset of oestrus are closely correlated.



How should PG 600® be used in a sow that does not go into heat 8 days after weaning?

If the sow has not returned to heat (real oestrus), an injection of PG 600® will effectively restart her cycle. However, **there is always a risk that heat was not properly detected**. In this case, the injection of PG 600® will be ineffective because it would have been injected during the luteal phase and the sow will not come into heat.

- In the case of **three-week programs**, there is no certainty about the effectiveness of heat detection. The best option is to wait for the next cycle and put the sow in the next group: PG 600® can then be injected 20–21 days after weaning. If a urogenital problem is suspected, this prostaglandin can be injected at the beginning of the week, that is, 24–72 h before weaning, with PG 600® administration on the day of weaning.
- When there is no certainty in **one or two-week programs** this prostaglandin can be injected 8 days after weaning, which will help in cases of persistent corpora lutea or luteal cysts. Alternatively, PG 600® can be injected 20–21 days after weaning.
- If heat detection efficiency is not in doubt and oestrus is not present (due to stress), PG 600® can be injected 8–10 days after weaning.



How should PG 600® be used when a sow is diagnosed as not pregnant?

Theoretically, the sow can be treated **the same day** it is diagnosed as not pregnant, that is, at around four weeks after mating or artificial insemination. This will reduce the number of non-productive days between two pregnancies. In a classic three-week program, the sow must be reintroduced into the group after a negative diagnosis. In this case, prostaglandin can be given at the beginning of the week, followed by PG 600® on the day of weaning, as described above.



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Does long-term or repeated use of PG 600® have any negative effects on the reproductive lives of sows?

Some studies have failed to demonstrate medium or long-term negative effects after treating adult sows or reared gilts with PG 600®:

- Replacement sows: induction of cyclic activity does not affect subsequent performance; a gilt that does not respond to the first injection of PG 600® can receive a second dose 8 days later and respond in the expected way.
- Primiparas: their reproductive life is not affected.

Recent studies in Germany and Argentina have shown that there was still a significant improvement in the weaning-to-oestrus interval (WEI) after several years of PMSG use on monitored farms¹². Furthermore, recent studies confirm that the induction of immunity (antibodies) to gonadotropins does not have any zootechnical impact on sows.

PG 600® is used worldwide, including in France for over 30 years. Studies of the history of farms where it has been consistently used for many years provide good evidence for the absence of any long-term negative effects.



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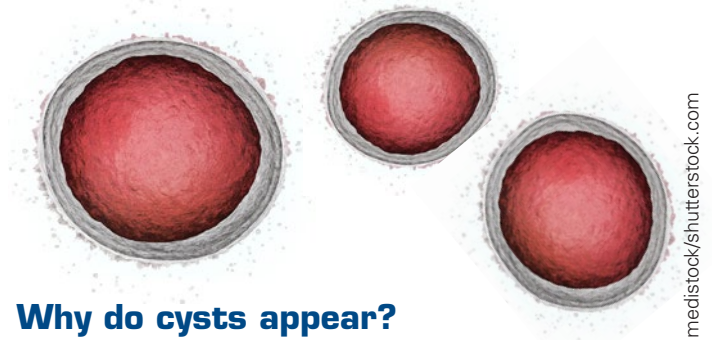
12 Does PG 600® increase the risk of ovarian cysts?

Theoretically, there is a possibility that ovarian cysts could form after administration of PMSG and HCG at the time of ovulation or at the start of the luteal phase. However, this problem has been detected in cases where high doses of PMSG or HCG (over 1,000 IU) were used, which far exceeds the recommended dose for PG 600®.

The main consequence of injecting PG 600® during the luteal phase is its ineffectiveness and the possibility of slight prolongation of the progestin period.

After analysing many gilts and adult sows in slaughterhouses in the United States and Germany, a higher incidence of ovarian cysts was not detected in sow farms or batches that had used PG 600® compared to those that had not used it.

If cysts are found by ultrasound after injection of PG 600®, a pre-existing but previously undetected genital infection should be considered. It should be noted that the PG 600® is not a solution for infectious reproductive problems.



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Why do cysts appear?

- As an ovulation defect caused by stress which stimulates the adrenal cortex and increases the release of cortisol, which in turn, inhibits LH secretion.
- Because of an endometrial alteration, for example metritis or endometritis. Studies in abattoirs carried out by the Ploufragan branch of the AFSSA (the French Agency for Food Health and Safety) have established a clear relationship between the presence of follicular cysts and the existence of urogenital infections in pigs. The probable cause is an alteration in the hormonal relationship between the uterus and the ovary which leads to insufficient LH secretion.

Can the administration of PG 600® alone optimise the appearance of heat in adult sows and in replacement gilts?

In this case, it may be important to change handling protocols when administering PG 600® in order to optimise not only the appearance and synchronisation of oestrus, but also fertility and prolificacy.

Special attention should be paid to:

- Light levels (to an average of 14 hours per day).
- Ambient temperature (which should be below 20°C).
- The quality of the feed given (in terms of its energy, amino acid, mineral, vitamin, etc. content).
- The amount of feed given (especially during lactation).
- Body condition at weaning.
- The boar: his age and the frequency and way in which he is allowed into contact with the sows.
- Infection control (checking for mycotoxins, genital infections, etc.).
- The way in which replacement sows are introduced.

For example, when inducing cyclic activity in gilts, the use of PG 600® must be associated with the stress of transport or another modification in their habitat or environment.

Its combination with other factors is not necessarily advantageous. For example, in reared gilts, there were no additional benefits to the injection of supplemental vitamins alongside treatment with PG 600® compared to the use of PG 600® alone.

Finally, the effects or mechanisms of action of endocrine products such as PG 600® cannot be compared to those of feed additives.

The effects of PG 600® are normally immediate, reproducible, and repeatable. The activity of feed additives is less immediate and depends on the nutritional status of the animal. It is never a problem of choosing between the two.

14 What should I be aware of when over- or underdosing PG 600®?

Moreover, **dose-effect studies** (Intervet, Webel) have been carried out in the context of heat induction in gilts;

- of all the criteria measured, the combination of 400 IU of PMSG and 200 IU of HCG (together in a single dose) was determined as optimal. Significant reductions were seen when half these doses were used (29% reduction in WEIs of less than 10 days and a 1.2 day increase in the WEI), and these results were even poorer when a quarter of these doses were given (53% reduction and an increase of 1.9 days, respectively). When double these doses were given, the results were better than when half was used, but were poorer than the results from the standard dose.

Other Baker studies also showed that the standard dose of PG 600® corresponded to optimal ovulation and fertility rates. These criteria decreased significantly when only half the dose was used.

Underdosing decreases efficacy at the group level and increases variability in the response to PG 600®. In this sense, overdosing with a double dose does not provide any extra benefits. Additional dose increases (up to more than 1,000 IU of PMSG or HCG) carry a risk of inducing cysts and may have a negative effect on fertility and prolificacy.



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