Medicines used in reproduction – management tools

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The majority of medicines used in pig reproduction are involved in getting gilts and sows into heat or the induction of farrowing, so that the timing of service and sow throughput in batches can be optimized and farrowing supervised. As such they are very valuable management tools.

Very simply the brain controls reproductive function and the anterior pituitary, at its base, releases hormones, which control the activity of the ovary. When the pituitary secretes follicle stimulating hormone (FSH) this causes the egg producing follicles in the ovary to develop and grow and oestrogen is produced, which causes the signs of oestrus or heat, such as a reddened and swollen vulva, standing to back pressure and a willingness to be mated. The follicles finally burst, releasing the eggs via the oviducts into the uterus, where the sperm can fertilize them. The follicles change into corpora lutea and if the mating is successful and the embryos implant into the uterus, they will be maintained for the duration of pregnancy. They secrete progesterone, which feeds back to the pituitary, which in turn produces luteinising hormone (LH) to suppress further heat cycles. If the sow is not pregnant then the corpora lutea regress and the cycle starts again.

A number of medicines have been developed to control various functions and are summarised in table 1.

Table 1. Reproductive medicines used in the pig

Product	Company	Active	Dose	Effect	WDP (Days)
Regumate porcine	Janssen AH	altrenogest	Gilts-5ml on food for 18 days Sows-3 days	Oestrus 5-7 days	15
PG 600	Intervet	FSH 400iu LH 200iu	5mls I/M anoestrus gilts and sows	Oestrus 5 days	0
Folligon	Intervet	FSH 1000iu	1000iu S/C or I/M 40days post partum	Oestrus 3-7 days	0
PMSG-Intervet	Intervet	FSH 5000iu	1000iu S/C or I/M 40days post partum	Oestrus 3-7 days	0
Lutalyse	Pfizer	Dinoprost	2ml I/M upto 3days before farrowing	Farrowing 24-36 hours	1
Planate	Schering-Plough	Cloprostenol	2ml I/M 2days before farrowing	95% farrowing in 36 hours	4
Prostapar	Intervet	Luprostiol	2ml I/M 2days before farrowing	Farrowing 24-36 hours	1

Oxytocin S	Intervet	Oxytocin	0.2-1ml/sow	Assist uterine contractions at farrowing and milk release (MMA)	0

Regumate is a synthetic progestagen (like progesterone) and suppresses cycling; it is used most frequently in gilts to synchronize their oestrus and service, to allow them to join into the production system in a planned way. It is given for 18 days and 5-7 days after removal the gilts will come into heat and can be served and put with the sow groups. It has become very popular for use in batch farrowing. The response can be 90% as long as the gilts nutrition is good and they are exposed to boar stimulation. The product is squirted onto food daily. The container should not be shaken; otherwise bubbles will form in the doser and deliver a smaller dose. It is important to administer the full dose as under-dosing may cause cystic follicles to develop (follicles which do not burst and lead to infertility problems). It may be given to sows at weaning time for 3 days to co-ordinate oestrus and service. This has been very useful especially in first litter sows. It is almost impossible to administer in wet feeding systems and it is difficult in outdoor herds. The use of a slice of bread as a carrier 'the Regumate sandwich' has proven very effective. Care must be taken to avoid contact with the product and impervious gloves and suitable protective overalls should be worn. Women of childbearing age should not handle the product.

PG 600, a combination of FSH and LH, has been used for many years to stimulate the onset of oestrus in non-cycling gilts and sows. Oestrus usually starts 5 days later. If the gilts are already cycling, PG 600 will not break the cycle and induce heat. It is basically used to stimulate inactive ovaries into action. As such, it is useful to bring mature gilts into heat, which have been kept quiescent and away from boar stimulation. It has been shown to be highly effective in first litter sows at weaning to boost oestrus where litter sizes have been increased by over 15%. It has also been used in older sows, which have not shown heat. Inject, check 5 days later and if not showing signs then repeat 10 days after the first injection.

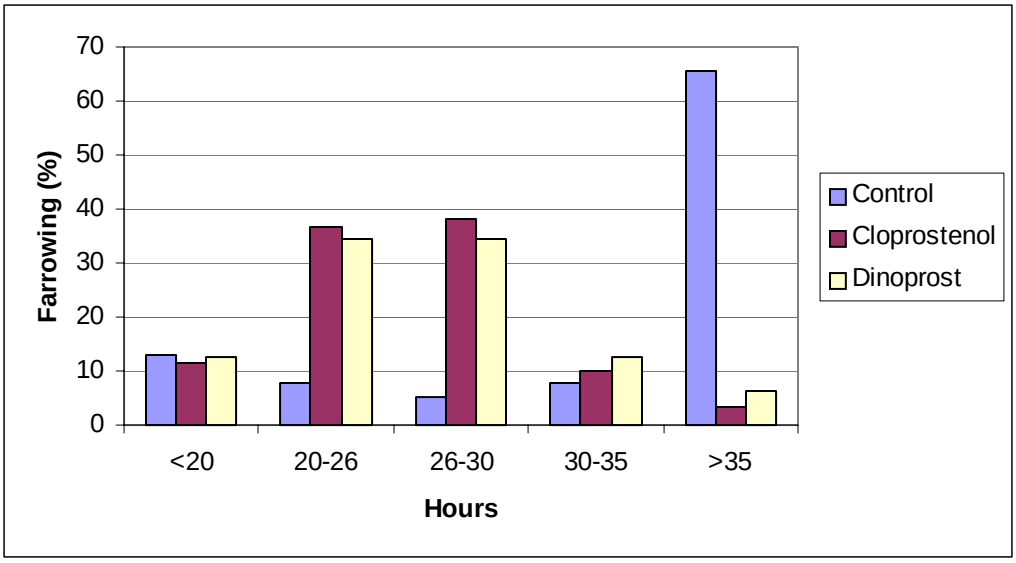
There are a number of other products containing FSH such as Folligon and PMSG Intervet, which may also be injected but PG 600 is more commonly used.

The next major group is the prostaglandins, which have been used widely for the controlled induction of farrowing. The advantages are to improve batch farrowing and to induce farrowing in the daytime (24-36 hours after injection), when labour is more readily available and farrowing can be better supervised (see Graph 1.). This enables prompt assistance to be given to a sow, which may have difficulty and ensures safer delivery of the piglets and reduces stillbirths. It also facilitates colostrum management, with supervisors ensuring piglets start to suckle. Prostaglandins act on the corpora lutea of pregnancy in the sow's ovaries and cause them to regress, signaling to the body that it is time to give birth. The injection is normally given within two days of the individual

farm's calculated average farrowing date (approximately 115 days but range 111-119 days) to avoid problems with weak piglets, which may affect viability.

In a recent study, the majority of treated sows had farrowed by 35 hours after treatment, 96.5% with cloprostenol and 93.8% with dinoprost and only 33.8% in the untreated controls. It was also noted that the sows treated with dinoprost showed various degrees of excessive nesting behaviour, whereas sows treated with cloprostenol showed minimal stress and discomfort. Luprostiol is also reported to be less stressful than dinoprost.

Graph 1. Percentage of sows farrowing by time period after treatment



(Source: Cameron and others, 2000)

Prostaglandins must be used with care and ideally should not be handled by women of child-bearing age, asthmatics and persons with bronchial or other respiratory problems, direct contact should be avoided, as they can be absorbed via the skin and miscarriage and bronchospasm may occur. Disposable plastic gloves should be worn when administering these products.

Oxytocin can be used when there is uterine inactivity following a difficult birth. Once the logjam of piglets or any other obstruction has been cleared, it is useful to get the uterus contracting again. It can also be used to assist milk let down especially when sows are suffering from MMA (metritis, mastitis, agalactia) syndrome along with the use of an antibiotic injection and possibly a corticosteroid or NSAID (non-steroidal anti-inflammatory drug) such as meloxicam, to reduce inflammation of the mammary glands. Pregnant or lactating women are advised not to handle oxytocin.

Reproductive medicines are very useful management tools to control and stimulate the onset of oestrus and the induction of farrowing. They are highly potent products and must be used with care, especially by women and only under veterinary supervision. However they can be very helpful in improving the batching of sows, supervising the production of piglets and overall improving reproduction efficiency.

References:

Cameron, R.D.A., Kieran, P.J. and Martin, I. (2000) The efficacy in inducing batch farrowing and the impact on sow behaviour of the prostaglandins cloprostenol and dinoprost. Proceedings of the 16th International Pig Veterinary Society Congress, Melbourne, Australia, p 386