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## Genetics and Breeding

# Synchronization of estrous in gilts with Altrenogest

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**Abstract.** The aim of this study was to evaluate the effect of Altrenogest (trade name ALTRESYN<sup>®</sup>) as a method for synchronization of estrous in gilts. The synthetic progesterone Altrenogest was fed daily to 123 nrs. gilts at 20 mg/gilts for 18 days. Gilts were checked for oestrus twice daily and were artificially inseminated. One hundred and seven gilts came in estrous between 3 and 7 days ( $5,22 \pm 1,42$ ) after withdrawal of Altrenogest. The farrowing rate was 74,92 % and average litter size was 12,06. The piglet index was 903,53. Altrenogest, the active ingredient in ALTRESYN<sup>®</sup> is effective for regulating the estrous of cycling gilts in commercial pig farms.

**Keywords:** gilts, altrenogest, estrous, synchronization

## Introduction

An effective method of synchronizing estrus in swine would provide producers with a useful management tool by reducing the labor required to detect estrus, facilitating the use of artificial insemination and assisting in batch farrowing.

The administration of progestogens has proven to be highly effective in synchronization of estrus in cyclic sows and gilts (Gerrits and Johnson, 1965; Polge et al., 1968). New orally active progestogens have reportedly controlled the time of estrus in swine without reducing of the fertility (Davis et al., 1976; Knight et al., 1976; Webel, 1978; Webel and Scheid, 1980). The studies of some authors (Stevenson and Davis, 1982; Horsley et al., 2005; Kaeoket, 2008; Stancic et al., 2009) established that the estrous synchronization of puberty gilts with the synthetic progestins resulted in a high degree of oestrous reaction within the first 5-7 days after treatment (80 % and more), high farrowing rate (73-79,2%), as well as in a normal average number of live-born piglets (8,73-9,7) per litter.

The aim of this study was to evaluate the effect of *Altrenogest* (trade name ALTRESYN<sup>®</sup>) as a method for synchronization of estrous in gilts.

## Material and methods

The experiment was begun in October 2008 to September 2009 in commercial pig farm, and involved 123 gilts (Topigs genotype) 210 to 220 days of age. All gilts were housed in individual gestation crates and were fed once daily. The animals were each given at 20 mg Altrenogest (trade name ALTRESYN<sup>®</sup>, Ceva Sante Animale, France) in the feed daily for 18 consecutive days. Gilts weighed mean 120 kg at the beginning of the treatment. The animals were checked for estrous with mature boar twice daily after cessation of progesterone treatment. Three boars Pietren with good fertilizing

ability were used. Semen was collected twice per week and volume, motility and agglutination were evaluated. The concentration was determined by Karras densitometer. The semen was diluted in BTS diluent, packaged in 100 ml bottles with  $3.0 \times 10^9$  spermatozoa. Diluted semen was stored at 17 C and was used within 24 h.

Gilts received first artificial insemination (AI) 12 hours after estrous was detected and second AI 24 hours after estrous detection. Pregnancy rate was determined at 18-22 days after insemination by mature boar with combination with synthetic pheromones BoarMate.

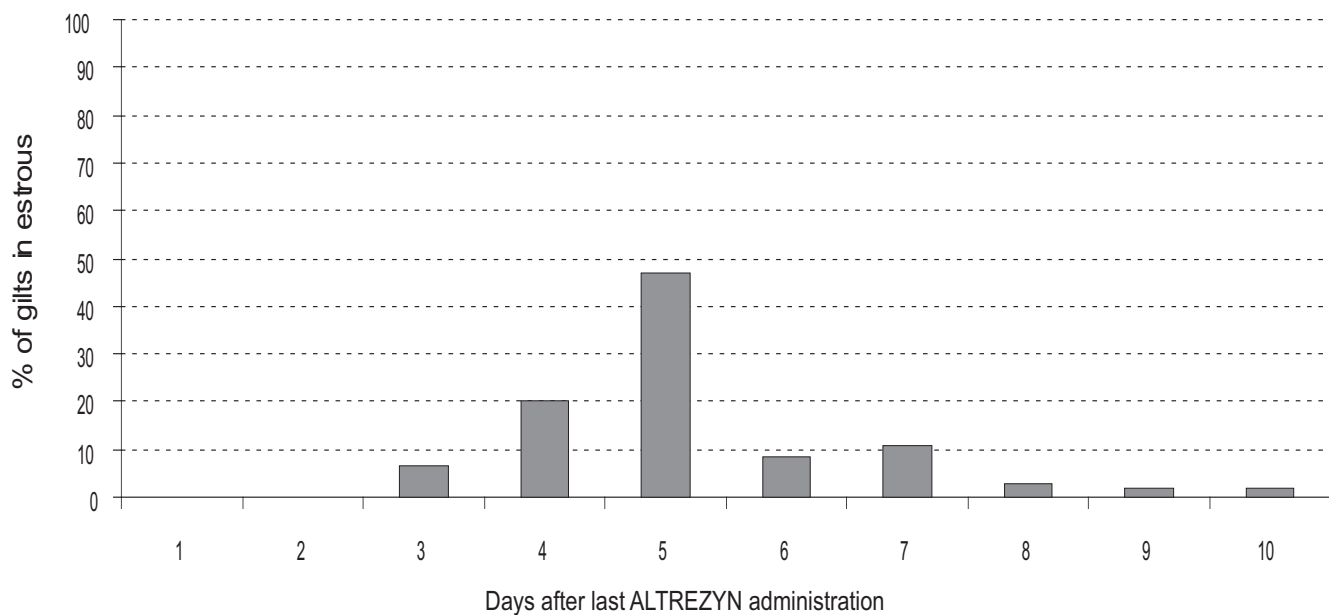
The following parameters were recorded: days of cessation of progesterone treatment to estrous signs, percentage of farrowing rate, total piglets born per litter, piglets index for total piglets born per litter/100 inseminations.

Statistical analysis was made with statistical package StatSoft (STATISTICA, Tulsa, OK).

## Results and discussion

The dynamic of the onset of the estrous of the gilts after treatment with *Altrenogest* is given in Figure 1. The first signs of the estrous observed after the third day and continued up to the tenth day. The average interval from last day of treatment to estrous was  $5,22 \pm 1,42$  days. On days 4 and 5, a total 67,31% of treated gilts exhibited estrous. The estrous response was similar to the that reported earlier for gilts treated with similar amounts of altrenogest (Davis et al., 1976; Knight et al., 1976; Webel and Scheid, 1980). A high oestrous reaction of the gilts, within the first 4-5 days after treatment may indicate that there were more sexually mature gilts in the groups. Namely, a high degree of the synchronized occurrence of oestrus, by the method of luteal phase prolongation (treatment with progestin preparations), is possible to achieve only in gilts which, on the onset of treatment, were sexually mature i.e. which had cyclic ovarian activity.

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**Figure 1.** Effect on the onset of estrous of treating gilts with Altrenogest (20 mg/day) for 18 days

The analysis of the reproductive results was performed after the parturition of the animals (Table 1). After 18 days of progesterone treatment 86,99% of the gilts were manifested estrous signs. The average farrowing rate and litter size were 74,92% and 12,06. The best results were observed in V group (these animals were treated September 2009) and the low reproductive results were found in II group – 51,85% for farrowing (October/November 2008)

and IV group – 7,88 for average litter size (February/March 2009). The variations of the reproductive parameters between the treatment groups are probably due to errors in the management program of the farm (nutrition, technology, artificial insemination).

During of estrous cycle, corpora lutea produce progesterone for 12 to 14 days. After this, they regress or die and progesterone concentration decrease. Follicular growth is no longer stopped when

**Table 1.** Farrowing rate, total litter size and piglet index of synchronized gilts with **Altrenogest**

| Groups  | Number of treatment gilts | Number of inseminated gilts | Farrowing rate %   | Total litter size $\bar{x} \pm S \bar{x}$ | Piglet index |
|---------|---------------------------|-----------------------------|--------------------|-------------------------------------------|--------------|
| I       | 30                        | 23                          | 78,26              | 10,64±2,50 <sup>ab</sup>                  | 730,16       |
| II      | 21                        | 21                          | 51,85 <sup>a</sup> | 11,61±1,85 <sup>c</sup>                   | 622,20       |
| III     | 24                        | 23                          | 73,91              | 11,26±2,02 <sup>d</sup>                   | 854,40       |
| IV      | 25                        | 19                          | 78,94              | 7,88±4,72 <sup>acde</sup>                 | 622,84       |
| V       | 23                        | 21                          | 90,48 <sup>a</sup> | 14,42±2,36 <sup>bcd</sup>                 | 1284,42      |
| Average | 123                       | 107                         | 74,92              | 12,06±2,67                                | 903,53       |

<sup>abcde</sup> Same superscripts within columns indicate differences between means (p<0,001)

reach the medium size ranges, because the quiescent effect of progesterone on the hypothalamus has been removed. This will eventually results in the presence of large preovulatory follicles on the ovary, estrous and ovulation. Therefore, strategies for synchronization of the oestrus in the gilts need to create a situation in which the decrease or removal of progesterone occurs at the time in all animals (Flowers, 2006). The studies of Knight et al.,1976; Webel,1978; Webel and Scheid,1980 established that daily administration of 10-15 mg Regu-mate for 18 days improve the estrous 4,5-5,2 days after progesterone treatment. Of other hand, when 18 days treatment was compared with 14 days treatment, the synchronization of estrous was similar between the groups

(Stevenson and Davis, 1982). Underdosing altrenogest (< 13 mg per day) may case increased incidence of cystic follicles (Davis et al.,1979; Kraeling et al.,1981). Farrowing rates and litter sizes are similar to these of unsynchronized females in most farm. In some situation, reproductive performance is better in gilts treated with altrenogest that their unsynchronized contemporaries (Stevenson and Davis,1982; Martinat-Botte et al.,1994; Martinat-Botte et al.,1995). Reasons for this observation are not clear, but probably are related to improved insemination techniques and reduced semen ages at insemination due to better semen delivery schedules.

## Conclusion

Results showed that *Altrenogest* (active ingredient in ALTRESYN®) when fed daily for 18 days at 20 mg/gilt/day is effective for regulating the estrous cycles of cycling gilts such that 86 % will express estrus 3 to 10 days after last treatment with altrenogest.

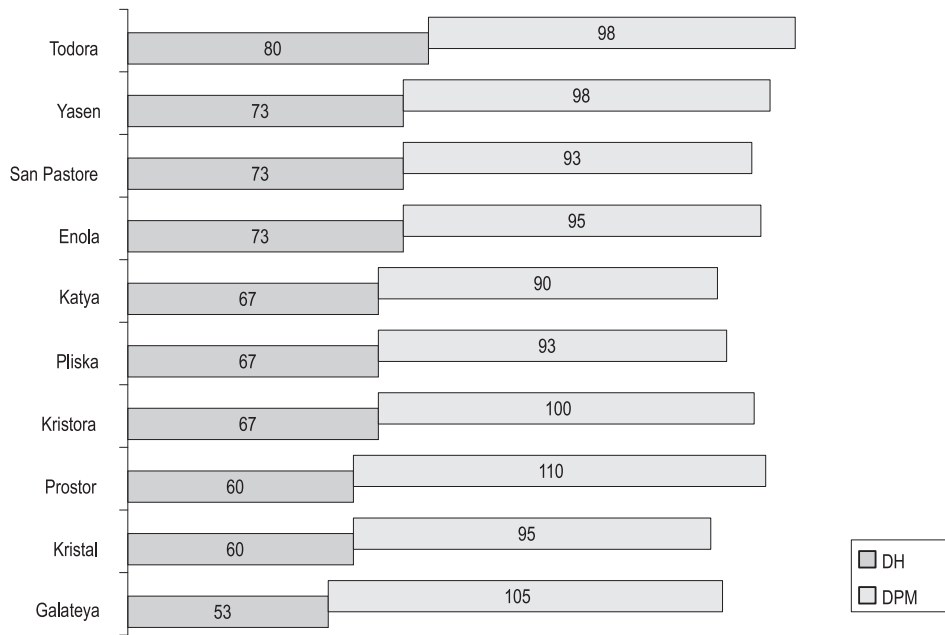
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CORRECTIONS

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Figure 4 is:



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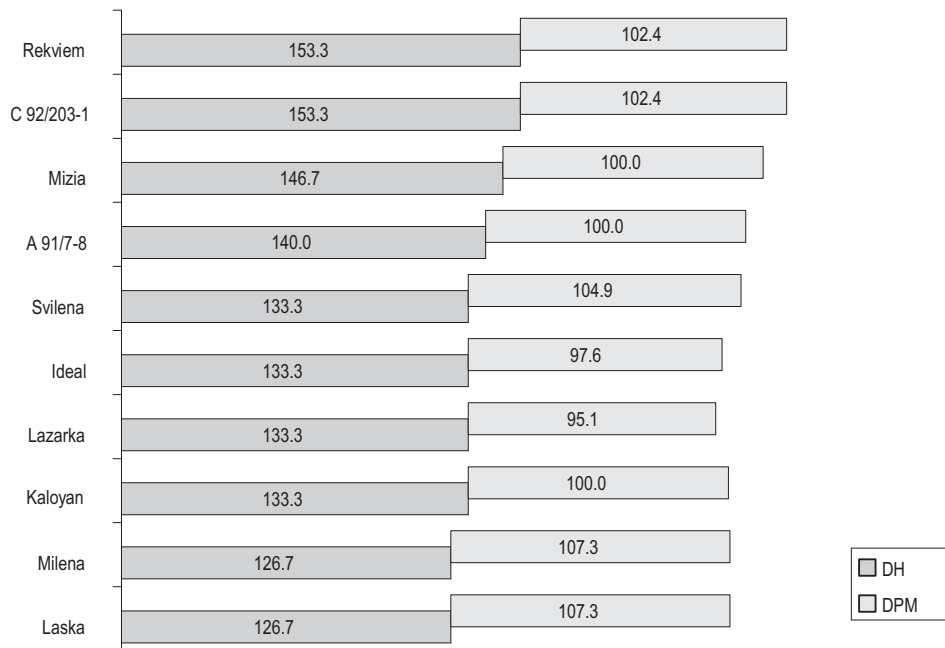


Figure 4. Duration of the period to heading and maturity in the group of late varieties expressed as relative value from the standard

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