USING REGUMATE TO CONTROL ESTRUS IN SWINE

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Summary

Altrenogest, marketed for use in horses as Regumate, is a synthetic progestin that is marketed for use in pigs as MATRIX. It effectively regulates the occurrence of estrus in randomly cycling gilts if it is provided for 14 or more days at a daily dose of 15 mg/day. It is important to assure that each gilt receives her full dose; otherwise problems of cystic follicles and reduced fertility may be observed.

(Key Words: Pigs, Estrous Synchronization, Altrenogest.)

Introduction

It has long been recognized that gilts constitute a challenge for swine breeding herds. Gilts are expensive, they occupy valuable space, and the occurrence of estrus in gilts may not fit the production schedule. Production managers often view gilts with skepticism, and most would opt for eliminating the first pregnancy cycle and going right to the second parity if there was a method to do it.

Gilts are unavoidable, however, and make up 20 to 50% of breeding herds. The gilt pool provides a management system to minimize problems with gilt breedings, but the unpredictable occurrence of estrus in gilts creates additional labor and housing costs. Many production units opt for one or both of the following strategies: 1) house excess gilts to make up for shortages on some weeks, 2) check estrus but not breed at first detected estrus, thus allowing service to occur at a second or later postpubertal estrus, and providing some ability to predict future occurrence of estrus and plan for excesses and shortfalls in the availability of gilts in a particular week.

Researchers began attempting to regulate the estrous cycle of pigs at least 50 years ago. The development of prostaglandin $F_2\alpha$ products provided a method to regulate the estrous cycle of several species of farm animals, but not pigs. The mechanism of prostaglandin products is to regress the corpora lutea (CL), thus causing an early entry into proestrus, but the pig CL are resistant to the effects of prostaglandin $F_2\alpha$ until very late in their cycle and a practical method to use them has not been forthcoming. Some have inseminated gilts, then used prostaglandin $F_2\alpha$ to induce abortion followed by a fertile heat, but this is too cumbersome for routine use.

Soon after synthetic progestins became available, there were many attempts to administer these to pigs as a part of the daily feed for the purpose of estrous synchronization. To be useful, the progestins should group the estruses of gilts at a reliable interval after the end of progestin treatment, and provide fertility equal to untreated controls. Experiments with these initial products revealed two things:

1) with the progestins tested, a relatively low dose would suppress estrus, but often resulted in follicular cysts, rather than the growth of normal follicles and ovulation.

2) doses high enough to suppress the formation of follicular cysts led to poor synchronization of estrus and even lack of estrus. Faulty sperm transport was also a problem.

Among the initial progestins tested was melengesterol acetate (MGA), a product used to suppress estrus in feedlot heifers and as a part of some synchronization protocols in cattle. Results of the earlier trials clearly indicate that MGA will not be useful for synchronizing estrus in pigs.

In the middle 1970s, the first experiments were conducted at Abbott Laboratories with a progestin that proved unique in its ability to synchronize estruses in gilts. The progestin has been identified by several names, including allyl trenbolone and altrenogest, and has been marketed for use in horses as Regumate for some time. Recently, Intervet, Inc. has secured approval to market the formulation long used in horses for use in pigs. The product, MATRIX, is supplied as a solution containing 0.22% (2.2 mg/mL) altrenogest. The label indicates a treatment administering 6.8 mL (15 mg altrenogest) per gilt once daily for 14 consecutive days.

Gilts should be treated on an individual-animal basis by top-dressing MATRIX on a portion of each gilt's daily feed allowance. The rest of this paper will describe the research leading to this recommendation and will explain the mechanism of action of altrenogest for regulating estrous cycles in gilts.

Effectiveness of Altrenogest

When post-pubertal (cycling) gilts are treated with altrenogest for 14 or 18 days, followed by cessation of altrenogest treatment, there is a grouping of estruses between 4 and 10 days after the last altrenogest treatment. The peak in occurrence of first estrus is generally from 5 to 7 days after last treatment. The data in Figure 1 illustrate the estrous response in cycling control gilts and those treated with altrenogest. This response has proven to be repeatable, and the estruses of 85% or more of cycling gilts can be scheduled to a 5-day interval, with the majority of estruses occurring in a 2- to 3-day interval.

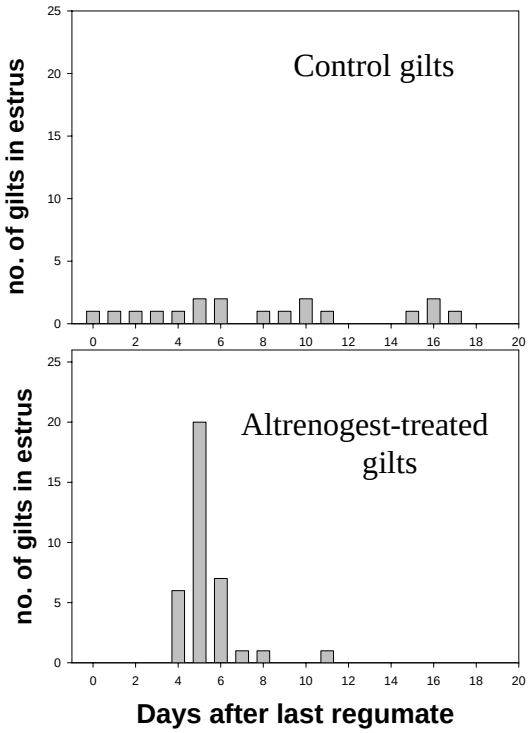

Figure 1. Occurrence of Estrus in Cycling Gilts Not Treated (control) or Treated with Altrenogest (15 mg/day) for 18 Days. Day 0 is the last day of altrenogest treatment.

Required Dose to Regulate Estrous

A well designed, two-stage study was conducted at five locations in the United States to identify the daily dose of altrenogest required to synchronize estrus. Gilts that were known to be having regular estrous cycles were treated with increasing doses of altrenogest daily for 18 consecutive days. The data indicated that daily doses less than 12.5 mg/day result in increased incidence of cystic follicles. Many gilts with cysts at the lower daily doses had multiple cysts and experienced failures to conceive.

These studies resulted in the recommendation that 15 mg/day be provided to each gilt to provide a small margin of safety. Reliably administering this dose requires treatment of

individual gilts. Attempts to feed altrenogest to groups of gilts have met with poor synchrony of estrus, reduced numbers of gilts exhibiting estrus, and with reduced fertility.

Recommended Duration of Treatment

The initial studies evaluated gilts provided altrenogest for 18 days. In theory, however, 14 days should be adequate because the CL of gilts regress on days 14 to 16 of their estrous cycles. Comparison of 14- and 18-day durations of treatment is presented in Figure 2.

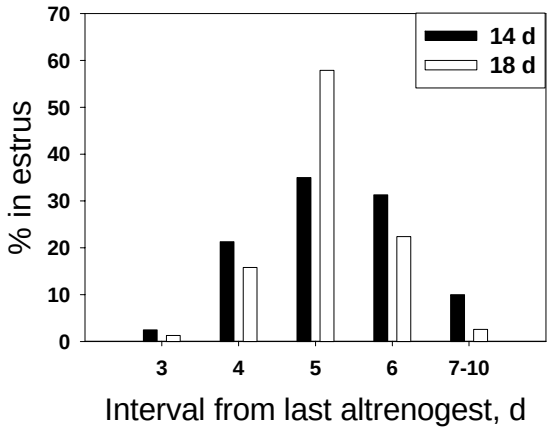

Figure 2. Effect on the Onset of Estrus of Treating Gilts with Altrenogest (15 mg/day) for 14 or 18 Days. The last day of altrenogest treatment is day 0. (Drawn from data in Stevenson and Davis, J. Anim. Sci. 55:119-123, 1982).

The onset of estrus may be somewhat more synchronous with the 18-day treatment but for practical applications 14 days is adequate.

Fertility After Altrenogest Treatment

Numerous trials have evaluated the conception rate, farrowing rate, and litter size after treating gilts with altrenogest. The results indicate no effects of altrenogest on these traits. In some experiments there is a slight improvement in litter size for altrenogest-treated gilts. This may result from the more predictable time of estrus onset, and thus more ideal timing of insemination. In some experiments ovulation rate is increased by altrenogest treatment but this has not been consistently observed.

Conclusions

Altrenogest, the active ingredient in MATRIX, has been adequately evaluated in controlled experiments and field observation and, if administered in a way that provides 15 mg daily for 14 days, it is effective for regulating the estruses of cycling gilts such that 85% or more will express estrus 4 to 10 days after last treatment with altrenogest.