ALTRENOGEST AND FAT FOR SUMMER BREEDING OF FIRST-LITTER SOWS[1]

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Summary

Crossbred first-litter sows in a commercial swine unit were assigned to serve as controls after summer weanings or were fed altrenogest for 7 days or altrenogest for 7 days plus supplemental fat for 14 days after weaning. While similar proportions of sows came into heat after weaning, sows fed altrenogest returned to estrus about 9 days later than control sows. Incidence of anestrus was similar across sow groups (31%), while most of the sows not detected in heat could be classified by cause after examining serum progesterone concentrations at 3 wk after weaning. Nearly 69% of the sows not detected in heat had luteal function, indicating a failure to detect sows when in true estrus or failure of sows to show behavioral estrus. Farrowing traits were similar among treatments, however, there was a tendency for sows fed altrenogest to have higher farrowing rates.

Introduction

Increasing energy intake after weaning first-litter sows has decreased days to estrus and/or improved subsequent litter size in some studies. Feeding fat (high energy source) is theoretically advantageous because it increases energy density of diets and could compensate for reduced feed intake during heat stress periods of summer. Another study suggested that feeding altrenogest (Regu-mate®, experimental progestogen used for estrous synchronization) for 3 or 5 days after weaning increased the number of sows in estrus. Feeding altrenogest to first-litter sows may hold them out of heat for a few days after weaning to allow extra recuperation from lactation and thereby increase the proportion of first-litter sows coming into estrus promptly after drug withdrawal. Our objective was to determine if increasing energy supplementation (feeding fat) and delaying onset of postweaning estrus (feeding altrenogest) could increase the proportion of sows in heat and improve subsequent farrowing traits.

Procedures

Crossbred primiparous sows in a commercial unit were assigned to one of three groups after farrowing during July, August and September 1983: 1) Altrenogest (Regu-mate®), 20 mg/day for 7 days after weaning (n=76 sows); 2) same as Group 1 plus supplemental fat (Fatso®), 1.2 lb/day for 14 days after weaning (n=78); and 3) control (n=77). Sows were housed in groups of six to eight

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per pen and group fed once daily on pen floors. Altrenogest and fat were fed first and followed by the remainder of the breeding-gestation diet. Blood was collected from control sows not detected in heat by 14 and 21 days postweaning and from all altrenogest-treated sows (Groups 1 and 2) not observed in estrus by 21 days after weaning. Progesterone was measured in serum samples to determine if ovulation had occurred in the absence of detected estrus.

Results and Discussion

Characteristics of the estrous activity after weaning for sows in various treatment groups are illustrated in table 1. Overall, 80% of sows were observed in estrus after weaning. No treatment improved the proportion of sows in heat, however, occurrence of estrus was altered by feeding altrenogest. While 94% of control sows came into estrus during the first week after weaning, only 64 and 63% of sows in the altrenogest and altrenogest plus fat treatment groups were detected in heat during the first week after drug withdrawal. Average intervals to estrus were nearly 9 days shorter ($P<.01$) for control sows compared with treatment groups (table 1). Therefore, the objective of delaying estrus was accomplished by feeding altrenogest.

Serum progesterone concentrations for all sows not observed in heat during 3 wk after weaning were used to determine causes of anestrus. If serum progesterone was elevated ($\geq$1.5 ng/ml), we assumed that the sow had ovulated without estrus or with undetected estrus, whereas low progesterone (<1.5 ng/ml) indicated that the sow had not ovulated and could be truly anestrus. Over 60% of the sows not detected in heat could be classified as having a known cause of anestrus. The remaining sows could not be classified because blood samples were not collected from some sows. Nearly 69% of the former group were sows who had corpora lutea (luteal function), indicating they had either ovulated without expressing estrus or they were not observed by the herdsmen (table 1). Incidence of true anestrus was 31% and was not different among treatments.

Farrowing results for sows mated during the 3-wk postweaning period are in table 2. Farrowing rate tended to be higher ($P<.10$) for sows fed altrenogest than for control sows. Feeding fat in addition to altrenogest seemed to reverse that trend for improving farrowing rate. Average number of total and live pigs was similar across treatment groups.

Results from this study suggest that feeding fat for 2 wk after weaning and/or altrenogest for 1 wk does not increase the proportion of sows coming into heat following summer weanings, but may improve fertility for sows fed altrenogest. Summer anestrus for first-litter sows as well as for older sows may be a result of either heat detection problems and/or perhaps a lack of estrous behavior of the sow. Further work must be done to confirm these ideas. The hypothesis that delaying first estrus after weaning will improve estrous response, subsequent fertility, and litter size for first-litter sows is not supported by our results.

Table 1. Characteristics of Estrous Response for Sows Treated with Altrenogest and/or Fat After Weaning

Item	Control	Altrenogest	Altrenogest + Fat
No. sows assigned	77	76	78
No. sows in estrus[a], %	63 (82)	58 (76)	63 (81)
0 to 7 days	59	0	0
8 to 14 days	3	37	40
15 to 21 days	1	21	23
Days to estrus	5.6 ± .2	14.3 ± .3[c]	14.5 ± .2[c]
No. sows not in estrus[a], %	15 (18)	18 (24)	15 (19)
Known causes (no. sows)[b], %	9 (60)	10 (56)	10 (67)
Corpora lutea	5	9	6
No luteal function	4	1	4
Unknown causes (no. sows)[b], %	6 (40)	8 (44)	3 (33)

[a]Percent of sows assigned to treatment.

[b]Percent of sows not observed in estrus. Based on serum progesterone concentrations of sows not detected in estrus by 3 wk after weaning.

[c]Different from control (P<.01).

Table 2. Farrowing Responses of Sows Subsequent to Prebreeding Treatments with Altrenogest and/or Fat

Item	Control	Altrenogest	Altrenogest + Fat
No. sows mated	62	58	63
No. sows farrowing	29	37	33
% of mated	47	64[a]	52
No. total pigs, X ± SE	8.9 ± .5	9.4 ± .5	9.4 ± .5
No. pigs alive, X ± SE	8.4 ± .5	8.6 ± .5	8.9 ± .5

[a]Different from control (P<.01).