

THE INCIDENCE OF POST WEANING ANESTRUS IN PRIMIPAROUS SOWS AND THEIR RESPONSE TO TREATMENT WITH GONADOTROPINS

G. W. BEVIER, G. D. DIAL, J. E. HIXON, B. K. GUSTAFSSON

UNIVERSITY OF ILLINOIS
COLLEGE OF VETERINARY MEDICINE
URBANA, ILLINOIS, U.S.A.

Post weaning anestrus in primiparous sows represents a significant loss of productivity in swine confinement herds throughout the midwestern U.S.A. Hurtgen has reported seasonality changes in the reproductive performance of sows. BeVier has reported similar findings in large confined herds. In order to determine the etiology, pathogenesis and treatment of post weaning anestrus in primiparous sows, the status of their hypothalamic-hypophyseal-ovarian axis was examined in a series of studies. Study I is presented in this text.

The incidence of return to estrus following weaning in primiparous sows in large confined herds was 61.2% during the first 14 days and 38.8% from day 15-90 (n=345). This suggests that sows failing to return to estrus during the first 2 weeks post weaning will either return to estrus at variable times (days 15-90) or be culled as "non-breeders" (Fig. 1).

With the incidence of post weaning anestrus established, 30 primiparous crossbred sows of SPF origin were bled once daily for 14 days. Estrus (E) was checked twice daily on each sow with several different boars. Plasma progesterone (P) was determined and compared with the E observations. Fourteen sows failed to show P increases of greater than 1 ng/ml (P-) and failed to show behavioral estrus (E-); 12 sows were P+, E+; 1 sow was P-, E+; 3 sows were P+, E-. These data suggest that during the first 2 weeks post weaning the majority of sows which failed to exhibit estrus also do not ovulate (Fig. 2).

Since post weaning anestrus sows are probably anovulatory by day 14, it was of interest to see if their ovaries could respond to gonadotrophic stimulation. Pregnant Mare's Serum Gonadotropin (PMSG), Human Chorionic Gonadotropin (HCG) or saline (Sal) were injected into 28 anestrus primiparous sows, E was observed and plasma (P) was determined following treatment (T). Of 8 PMSG-treated anestrus sows, 6 had P+ and E occurred 4.8 ± 0.3 days following T; of 10 HCG-treated anestrus sows, 10 had P+ and E occurred 3.4 ± 0.2 days following T; of 10 Sal-treated anestrus sows 0 had P+ and E was not detected following T. These data suggest that post weaning anestrus sows have ovaries capable of responding to exogenous gonadotrophins.

Since the majority of sows (61.8%) return to E during the first 2 weeks post weaning and the remaining sows (39.2%) return to E at variable times (up to 90 days later), day 14 post weaning was chosen as a suitable time for the prophylaxis of post lactational anestrus. HCG was chosen as the gonadotropin because of its efficacy in previous studies and its availability in the U.S.A. Thirty-two sows which had not shown E by day 14 post weaning were treated subcutaneously with either 1000 iu HCG or Sal. Of 21 HCG-treated sows, 14 returned to E at day 21.7 ± 0.4 ; of the remaining sows, 4 came in E approximately day 76 post T and 3 were culled at day 85 as "non-breeders". Of 11 Sal treated sows, 10 returned to E at 46.3 ± 16.4 days post T and one was culled at day 90 as a "non-breeder". These data suggest that if a 14 day post weaning anestrus sow is treated with HCG, 66% of the time she will return to E on her next cycle. HCG may induce ovulation of follicles in a high percent of animals but E fails to accompany this ovulation.

The final step of Study I was to determine if HCG induced ovulation could result in reasonable farrowing rates if insemination occurred. Since E fails to occur following a single injection of HCG, estradiol cyclopropionate (ECP) was used to elicit psychic manifestations of E so natural breeding could occur. A single injection of ECP (1 mg) at day 14 post weaning was administered to each anestrus sow followed by HCG (1000 iu) in 24 hours. E observations were made on each sow by several different boars twice daily after this T. Of 20 treated sows, 18 (90%) were in E $3.18 \pm$

0.3 days following ECP T. All 18 sows were mated twice and 11 of the sows (61%) farrowed litters (9.27 avg. total born piglets) 114.4 days later. Two of the 18 sows were rebred 21 days later and farrowed 3 and 12 piglets respectively from that mating. Five of the 18 sows were not pregnant by day 60 of gestation according to ultrasound pregnancy detection.

In conclusion, approximately 40% of first litter gilts do not show estrus by day 14 post weaning. These animals are anestrus and anovulatory. Their ovaries can respond to PMSG or HCG challenge after long periods of anestrus post weaning (>30 days) or to HCG at 14 days post weaning. By pretreating post weaning anestrus sows with ECP on day 14 followed by HCG on day 15, approximately 90% of the animals will show estrus and breed with a resultant farrowing rate of 61% and litter size of 9.27.

Fig. 1

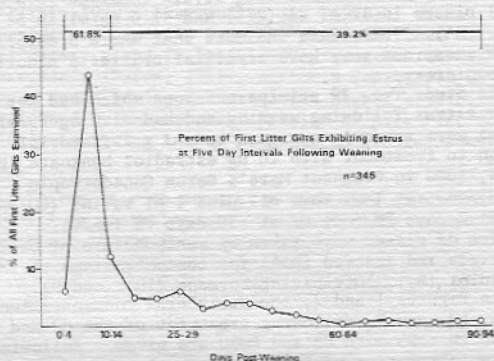
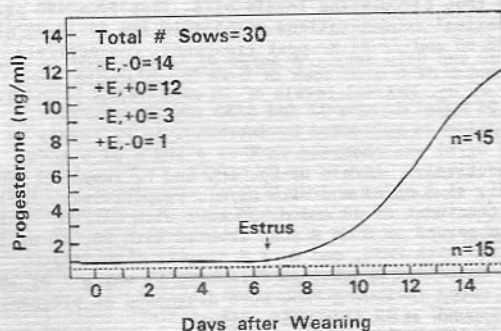


Fig. 2



Selected References:

- Hurtgen, J.P. and A.D. Leman. Seasonal Influence on Fertility of Sows and Gilts. JAVMA 177(7): 631(1980)
- BeVier, G.W. and L. Backstrom. Seasonal Fertility Patterns on 22 Confined Swine Herds in the Midwestern U.S.A. IPVS 1980, Copenhagen, Denmark.