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SERUM CONCENTRATIONS OF PITUITARY AND ADRENAL HORMONES IN FEMALE PIGS EXPOSED TO TWO PHOTOPERIODS[1]

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Summary

Serum concentrations of pituitary and adrenal hormones were determined in lactating sows and ovariectomized (OVX) gilts exposed to 8 h (8L:16D) or 16 h of light (16L:8D). In addition serum prolactin (PRL) concentrations were determined after a thyrotropin releasing hormone (TRH) challenge. At 103 ± 2 d of gestation or 3 wk after ovariectomy of nulliparous gilts on d 7 to 9 of the estrous cycle (d −10), blood samples were collected from jugular vein cannulae at 30-min intervals for 8 h beginning at 0800 h. Immediately after the last sample, 13 sows and five OVX gilts were assigned to 8L:16D and 14 sows and five OVX gilts were assigned to 16L:8D/d and placed in two identical chambers in the farrowing house. Blood sampling was repeated on d 7, 14 and 21 of lactation in the sows and on d 7, 14, 21 and 28 in the OVX gilts. In Exp. 1, serum cortisol (C) concentrations were similar for sows exposed to 8L:16D (n = 7) and 16L:8D (n = 6) treatments, whereas in Exp. 2, serum C concentrations for sows exposed to 8L:16D (n = 6) were lower than those exposed to 16L:8D (n = 6) on d 7, 14 and 21. Photoperiod failed to influence serum concentrations of PRL, luteinizing hormone (LH) and growth hormone in the lactating sows or PRL in the OVX gilts. Photoperiod also failed to affect mean basal serum concentrations, peak height and peak frequency for PRL and LH in the lactating sows or for PRL in the OVX gilts. However, PRL release in response to the TRH challenge was significantly greater in OVX gilts exposed to 8L:16D than those exposed to 16L:8D.

(Key Words: Photoperiod, Prolactin, Luteinizing Hormone, Growth Hormone, Cortisol, Sow.)

Introduction

Photoperiod affects production traits and concentrations of hormones in blood of several species. In sheep, photoperiod influenced secretion of prolactin (PRL), growth hormone (GH), insulin, thyroxine and adrenal hormones, wool and horn growth, feed efficiency and average daily gain (Forbes et al., 1979a,b; Pelletier, 1973; Schanbacher and Crouse, 1980). In cattle, photoperiod increased serum PRL concentrations as well as weight gains and milk yields, but failed to influence serum GH concentrations (Bourne and Tucker, 1975; Peters and Tucker, 1978; Peters et al., 1978, 1980; Leining et al., 1980).

The effect of photoperiod on production traits and reproduction in swine is not well defined. Prepuberal gilts exposed to either 18 h

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of light, 9 to 10.8 h of light (natural photoperiod) or complete darkness had similar average daily gains, feed conversions, subsequent ovulation and fertilization rates, pineal gland weights and plasma luteinizing hormone (LH) concentrations (Ntunde et al., 1979). However, gilts exposed to complete darkness were heavier and older at puberty than those exposed to either 18 h of light or natural photoperiod. In contrast, Surmuhin et al. (1970) and Hacker et al. (1974) reported that long photoperiod accelerated puberty and improved conception rates in gilts. Recent research indicates that supplemental lighting given during periods of increasing daylength failed to alter serum PRL concentrations in the boar (Hoagland et al., 1981) or to hasten puberty, increase growth or influence serum LH concentrations in prepuberal gilts (Diekman and Hoagland, 1981). Mabry et al. (1982b) demonstrated that increased photoperiod increased milk volume of sows used in this study, increased baby pig survival and tended to increase 21-d litter weights. The purpose of this research was to investigate the effects of photoperiod on serum PRL, GH, cortisol (C) and LH concentrations in lactating sows. In addition, the effect of photoperiod on serum PRL concentrations in the ovariectomized (OVX) gilt was examined to determine if photoperiod alone would alter PRL secretion in the absence of the suckling stimulus.

Materials and Methods

Exp. 1 and 2—Lactating Sows. A total of 27 sows was used in two experiments. Experiment 1 consisted of 15 Yorkshire × Landrace primiparous sows that farrowed during July and Exp. 2 consisted of 12 Yorkshire multiparous sows that farrowed in October. Sows were confined to individual pens in an open-sided finishing unit at 99 ± 2 d of gestation. At 102 ± 2 d of gestation (d −11), a cannula was placed nonsurgically into a jugular vein (Kraeling et al., 1982) and blood samples were collected at 30-min intervals for 8 h, beginning at 0800 h on d −10. All sows were assigned randomly to either 8 h (8L:16D) or 16 h (16L:8D) of white fluorescent light (400 to 500 lx at the sow's eye level) per day and placed in the farrowing house after the last sample on d −10. Seven sows from Exp. 1 and six sows from Exp. 2 were assigned randomly to the 8-h treatment group. The 16-h treatment group consisted of eight sows from Exp. 1 and six sows from Exp. 2.

The farrowing house consisted of two identical chambers, each containing 10 farrowing crates. Chamber temperature ranged from 21 to 35 C and relative humidity ranged from 60 to 70%, and were equal for both chambers at any given time. Sows were induced to farrow on d 111 and 115 of gestation by im injection of 10 mg prostaglandin $F_2\alpha$ and litters were adjusted to equal numbers across treatments on d 1 of lactation. Supplemental heat for baby pigs was provided by .30 × .91 m electrical heating pads. Maternal performance of these sows has been reported previously (Mabry et al., 1982b). On d 7, 14 and 21 of lactation, the blood sampling procedure was repeated. Sows were cannulated the day before each bleeding period. Blood was immediately placed on ice and allowed to clot at 4 C for 24 h. Serum was obtained after centrifugation at 4 C and stored at −20 C. Luteinizing hormone and PRL were quantitated in all samples by double antibody radioimmunoassays (RIA) described previously by Kraeling et al. (1982). The intraassay and interassay coefficients of variation for LH and PRL were 8.4 and 10.5% and 16.3 and 15.2%, respectively. Cortisol was quantitated in only the hourly samples by a RIA described by Fonda et al. (1982) in which the intraassay and interassay coefficients of variation were 3.2 and 9.5%. A modified RIA previously described by Marple and Aberle (1972) and validated in our laboratory was used to quantitate GH in all samples. The antiserum produced in guinea pigs against porcine GH was provided by Dr. Dennis R. Marple, Auburn University. Purified porcine GH was used for iodination (USDA-pGH-I-1) and standards (USDA-pGH-B-1). Dose response curves for pooled porcine serum and increasing concentrations of the GH standard added to a porcine serum pool were parallel ($P>.10$) to the standard curve. The GH (ranged from .2 to 10 ng) added to porcine serum was consistently recovered from 300 μl of serum (98 ± 7%). Cross-reactions of the antibody with large quantities (.1 to 1,000 ng) of adrenocorticotropic hormone (Sigma, Grade II), follicle stimulating hormone (NIH-FSH-P-2), LH (LER-778-4) and PRL (LER-2073) were not detected. Sensitivity of the assay was .1 ng GH/tube. Intraassay and interassay coefficients of variation were 8 and 14%, respectively.

Exp. 3—Ovariectomized Gilts. Crossbred gilts that had displayed two or more estrous

TABLE 1. SERUM PROLACTIN CONCENTRATIONS IN PREPARTUM AND LACTATING SOWS EXPOSED TO 8 H (8L:16D) OR 16 H OF LIGHT (16L:8D) PER DAY[a]

Treatment	No. of sows	Day of lactation			
		−10[b]	7	14	21
8L:16D	10	18.4 ± 2.3	74.7 ± 6.6	64.9 ± 3.2	58.5 ± 2.9
16L:8D	11	21.8 ± 2.2	78.4 ± 6.6	69.0 ± 5.4	53.0 ± 4.3
Combined	21	20.0 ± 1.6[c]	76.5 ± 4.6[d]	66.9 ± 3.0[e]	55.9 ± 2.6[f]

[a]Mean (ng LER-2063/ml) ± SE.

[b]Day −10 = d 10 prepartum.

[c,d,e,f]Means in a row with different superscripts differ (P<.01).

cycles of 17 to 21 d were OVX on d 7 to 9 of the estrous cycle (onset of estrus = d 0) by mid-ventral laparotomy during April. The gilts were returned to an outside dirt lot 24 h after surgery. Three weeks later, gilts were confined to individual pens in an open-sided finishing unit and cannulated by the method described previously. Blood samples were collected at 30-min intervals from 0800 to 1600 h on the day after cannulation (d −10). Immediately after the last blood sample, five gilts each were assigned randomly to the two treatments described in Exp. 1. Temperature ranged from 21 to 35 C and humidity ranged from 55 to 70% and were equal for both sides at any given time. Blood samples were collected every 30 min for 8 h on d 7 (17 d after the first bleeding period), 14, 21 and 28. Immediately after the 1400 h blood sample on d 28, 200 μg of thyrotropin-releasing hormone (TRH)[5] were injected through the cannula to determine the capacity of the anterior pituitary to release PRL. Blood samples were collected at 10-min intervals for 1 h and every 30 min for the next 2 h. Blood was processed as previously described. Serum PRL was quantitated by radioimmunoassay as previously described in Exp. 1.

Serum LH and PRL peaks were defined by two separate methods. Samples were considered as part of a particular peak if the hormone concentration was 50% greater than a previous nadir or if the hormone concentration was greater than one standard deviation above the mean serum hormone concentration for each pig on each sampling day. Basal serum LH and PRL concentrations were then calculated after removal of all values which were associated with a serum hormone peak. An adequate volume of blood to assay all hormones in all samples of Exp. 1 and 2 was not available, therefore, the number of observations presented in the tables are not consistent with the number of animals utilized in each experiment. Data were subjected to the general linear model split-plot in time analysis of variance procedure of the Statistical Analysis System (SAS, 1979) with time within days as a discrete variable. The main effects of treatment, experiment and day and their interactions were included in the model. Serum PRL concentrations after TRH were subjected to a split-plot in time analysis of variance using time as a discrete variable by the SAS procedure. The model included the main effects of time and treatment and their interaction. Differences between means were determined by least-squares contrasts by the SAS procedure.

[5]Sigma Chemical Co., St. Louis, MO. Mention of a trade name, proprietary product or specific equipment does not constitute a guarantee or warranty by the USDA or the Univ. of Georgia and does not imply its approval to the exclusion of other products.

Results

Exp. 1 and 2. Mean serum PRL concentrations on d −10 prepartum and 7, 14 and 21 of lactation for sows exposed to 8L:16D and 16L:8D are shown in table 1. Serum PRL concentrations were similar for each experiment, therefore, data were pooled across experiments. Serum PRL concentrations were similar for sows in both photoperiods on all days sampled. However, serum PRL concentrations increased (P<.05) from d −10 to 7 and then decreased (P<.05) as length of lactation increased for both treatments.

TABLE 2. SERUM LUTEINIZING HORMONE CONCENTRATIONS IN PREPARTUM AND LACTATING SOWS EXPOSED TO 8 H (8L:16D) OR 16 H OF LIGHT (16L:8D) PER DAY[a]

Treatment	No. of sows	Day of lactation			
		−10[b]	7	14	21
8L:16D	9	.74 ± .09	.57 ± .08	.64 ± .09	.71 ± .08
16L:8D	12	.92 ± .13	.79 ± .12	.69 ± .08	.81 ± .12
Combined	21	.85 ± .08[c]	.70 ± .08[d]	.67 ± .06[d]	.77 ± .08[d]

[a]Mean (ng LER-786-3/ml) ± SE.

[b]Day −10 = d 10 prepartum.

[c,d]Means in a row with different superscripts differ (P<.05).

Mean serum LH concentrations for the two treatment groups on d −10 prepartum and 7, 14 and 21 of lactation are presented in table 2. Serum LH concentrations were greater for sows in Exp. 2 than for those in Exp. 1, but because data were corrected for experiment differences, data were combined across experiments. Serum LH concentrations were similar for sows in both photoperiods on all days sampled. Mean serum LH concentrations were greater (P<.05) on d −10 than on d 7, 14 or 21 in both treatments. Mean basal serum concentrations, peak heights and frequencies for PRL and LH were similar for sows in both photoperiods on all days sampled regardless of the method of calculation.

Treatment × experiment and treatment × day interactions for serum C concentrations were not detected. However, the experiment × day interaction was significant, therefore, the data for each experiment were analyzed separately and are presented in table 3. In Exp. 1, serum C concentrations were similar between treatments. Serum C concentrations were not different on d −10 compared with d 7, 14 and 21, but were lower (P<.05) on d 14 and 21 compared with d 7. In Exp. 2, serum C concentrations for sows exposed to 8 h of light were lower than those exposed to 16 h of light on d 7, 14 and 21. In addition, serum C concentrations were greater (P<.05) on d −10 compared with d 7, 14 and 21 while serum C concentra-

TABLE 3. SERUM CORTISOL CONCENTRATIONS IN PREPARTUM AND LACTATING SOWS EXPOSED TO 8 H (8L:16D) OR 16 H OF LIGHT (16L:8D) PER DAY[a]

Treatment	Day of lactation[b]			
	−10[c]	7	14	21
Experiment 1[d]				
8L:16D	12.0 ± .9 (7)	15.9 ± 4.7 (7)	8.2 ± 1.0 (7)	8.2 ± 1.0 (6)
16L:8D	9.6 ± .8 (5)	14.1 ± 4.1 (6)	9.4 ± 1.1 (6)	9.5 ± .9 (6)
Combined	11.0 ± .7 (12)[ef]	15.1 ± 3.0 (13)[e]	8.8 ± .7 (13)[f]	8.8 ± .7 (12)[f]
Experiment 2[d]				
8L:16D	15.3 ± 1.6 (6)	9.2 ± .8 (6)	8.7 ± .8 (6)	9.8 ± 1.2 (6)
16L:8D	16.4 ± 2.4 (6)	13.1 ± 1.8 (5)	13.1 ± 1.9 (6)	13.8 ± 2.6 (6)
Combined	15.8 ± 1.4 (12)[e]	11.0 ± 1.1 (11)[f]	10.9 ± 1.2 (12)[f]	11.8 ± 1.5 (12)[f]

[a]Mean (ng/ml) ± SE.

[b]Number of observations in parentheses.

[c]Day −10 = d 10 prepartum.

[d]Treatment effect not significant in experiment 1 but significant in experiment 2 on d 7, 14 and 21.

[e,f]Means in a row with different superscripts differ (P<.05).

TABLE 4. SERUM GROWTH HORMONE CONCENTRATIONS IN PREPARTUM AND LACTATING SOWS EXPOSED TO 8 H (8L:16D) OR 16 H OF LIGHT (16L:8D) PER DAY[a]

Treatment	Day of lactation[b]			
	−10[c]	7	14	21
Experiment 1[d]				
8L:16D	3.5 ± .8 (5)	6.8 ± .7 (6)	6.9 ± .4 (7)	6.4 ± .6 (7)
16L:8D	4.1 ± .6 (7)	7.1 ± 1.0 (7)	7.9 ± .9 (7)	6.4 ± 1.0 (7)
Combined	3.9 ± .4 (12)[e]	7.0 ± .6 (13)[f]	7.4 ± .5 (14)[f]	6.4 ± .6 (14)[f]
Experiment 2[d]				
8L:16D	5.9 ± 1.1 (5)	6.7 ± .9 (5)	5.9 ± .4 (4)	6.3 ± 1.0 (4)
16L:8D	6.5 ± .4 (5)	6.4 ± 1.3 (5)	6.7 ± 1.1 (5)	5.0 ± .8 (5)
Combined	6.2 ± .5 (10)	6.6 ± .8 (10)	6.4 ± .6 (9)	5.6 ± .6 (9)

[a]Mean (ng USDA-pGH-B-1/ml) ± SE.

[b]Number of observations in parentheses.

[c]Day −10 = d 10 prepartum.

[d]Treatment effect not significant.

[e,f]Means in a row with different superscripts differ (P<.05).

tions on d 7, 14 and 21 were not different.

Similar to serum C concentrations an experiment × day interaction for serum GH concentrations was detected (P<.05). Therefore, the serum GH concentration data for each experiment were analyzed separately and are presented in table 4. In Exp. 1, serum GH concentrations were similar for sows exposed to 8 or 16 h of light. Serum GH concentrations were similar on d 7, 14 and 21 and were higher (P<.05) on d 7, 14 and 21 than on d −10. In contrast, serum GH concentrations were not different between treatments or days in Exp. 2.

Exp. 3. Mean serum PRL concentrations in the OVX gilts are presented in table 5. Serum PRL concentrations were similar for OVX gilts exposed to either 8L:16D or 16L:8D. Although the treatment × day interaction was not significant, serum PRL concentrations were greater (P<.01) on d 14 than on d −10, 7, 21 and 28 in gilts exposed to 8L:16D and serum PRL concentrations were greater (P<.06) on d 14 than on d 28 in gilts exposed to 16L:8D. As in Exp. 1 and 2 mean basal serum concentrations, peak heights and peak frequencies of PRL were similar in both photoperiods on all days sampled regardless of the method of calculation.

Basal serum PRL concentrations of approximately 20 ng/ml before TRH administration

TABLE 5. SERUM PROLACTIN CONCENTRATIONS IN OVARIECTOMIZED GILTS EXPOSED TO 8 H (8L:16D) OR 16 H OF LIGHT (16L:8D) PER DAY[a]

Treatment	No. of gilts	Day				
		−10[b]	7	14	21	28
8L:16D	5	22.2 ± 4.0[c]	24.2 ± 4.0[c]	39.9 ± 4.0[d]	21.1 ± 4.0[c]	22.4 ± 4.0[c]
16L:8D	5	23.4 ± 4.0[ef]	23.6 ± 4.0[ef]	32.4 ± 4.0[e]	22.7 ± 4.6[ef]	21.0 ± 4.0[f]
Combined	10	22.8 ± 2.8	23.9 ± 2.8	36.1 ± 2.8	21.9 ± 3.0	21.7 ± 2.8

[a]Mean (ng LER-2073/ml) ± SE.

[b]Day −10 = d 1 of adjustment period.

[c,d]Means in a row with different superscripts differ (P<.01).

[e,f]Means in a row with different superscripts differ (P<.06).

were similar for both treatments (figure 1). Within 10 min after TRH administration, serum PRL concentrations were greater ($P<.0001$) in gilts exposed to 8L:16D than in gilts exposed to 16L:8D (340 vs 270 ng/ml). Serum PRL concentrations decreased throughout the remainder of the sampling period in all gilts, with gilts exposed to 8L:16D having significantly greater PRL concentrations than those exposed to 16L:8D for 90 min after TRH administration. By 180 min after TRH administration, serum PRL concentrations in both groups of gilts were approximately 30 ng/ml. Therefore, the capacity to release PRL was greater for gilts exposed to 8L:16D than for those exposed to 16L:8D.

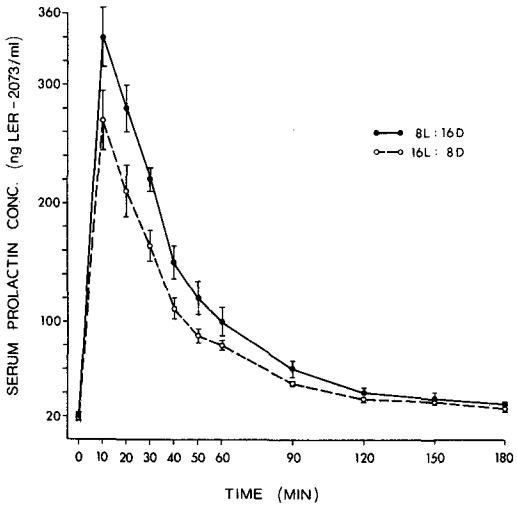

Figure 1. Serum prolactin (PRL) concentrations after injection of thyroid stimulating hormone releasing hormone (TRH) in ovariectomized (OVX) gilts exposed to 8 h of light (8L:16D; n = 5) or 16 h of light (16L:8D; n = 5) per day for 38 d.

Discussion

Results of Exp. 1 and 2 are similar to those of van Landeghem and van de Wiel (1978), Dusza and Krzymouska (1981) and Whitacre and Threlfall (1981) who demonstrated greater serum PRL concentrations in the sow during lactation than before parturition. In addition, Bevers et al. (1978), van Landeghem and van de Wiel (1978), Mulloy and Malven (1979), Dusza and Krzymouska (1981), Stevenson et al. (1981) and Whitacre and Threlfall (1981) also reported that serum concentrations of PRL in the sow decreased as length of lactation increased. Increased photoperiod in these experiments and that of Hoagland et al. (1981) failed to increase serum PRL concentrations in pigs as was observed in sheep (Pelletier, 1973; Thimonier et al., 1978) and cattle (Leining et al., 1979; Peters and Tucker, 1978). There was the possibility that in the lactating sow, the suckling-induced increase in PRL (van Landeghem and van de Wiel, 1978; Stevenson et al., 1981) masked any possible influence of photoperiod on serum PRL concentrations. Therefore, Exp. 3 was conducted to determine if the suckling stimulus was masking the influence of photoperiod on serum PRL concentrations in the sows. Because Wilfinger et al. (1974) and Hoover et al. (1977) reported that OVX failed to influence blood PRL concentrations, gilts were OVX to eliminate any fluctuations in serum PRL concentrations during the estrous cycle. As in Exp. 1 and 2, photoperiod failed to alter serum PRL concentrations in OVX gilts.

The pattern of PRL release in response to the TRH challenge was similar to that reported by van Landeghem and van de Wiel (1978). However, these results are in contrast to those of Leining et al. (1979), who found that the capacity to release PRL after a TRH challenge in prepuberal bulls was greater in animals exposed to a longer photoperiod. An explanation for the difference in response to TRH in cattle and pigs is not evident. Although photoperiod influenced the releasable stores of pituitary PRL in the OVX gilts, perhaps differences in suckling-induced PRL secretion in the lactating sows and basal PRL secretion in the OVX gilts could not be detected by our experimental procedures. The failure of photoperiod to alter serum LH concentrations agrees with data of Diekman and Hoagland (1981), who reported that supplemental lighting given during periods of increasing daylength failed to hasten puberty, increase growth or influence serum LH concentrations in prepuberal gilts.

Inhibition of LH secretion in the suckled lactating sow has been reported by Parvizi et al. (1976), Stevenson et al. (1981) and Whitacre and Threlfall (1981). Crighton and Lamming (1969) reported that pituitary LH concentrations were lower during lactation than during the estrous cycle and that OVX caused an increase in pituitary LH concentration in gilts during the estrous cycle, but failed to alter pituitary LH concentration during lactation. Therefore, the lower serum LH concentrations

during lactation compared with serum LH concentrations prepartum were probably due to suckling-induced inhibition of LH synthesis by the pituitary gland.

The influence of photoperiod on serum C concentrations in lactating sows was not consistent because serum C concentrations were similar between treatments in Exp. 1, whereas in Exp. 2, serum C concentrations for sows exposed to 8L:16D were lower than those exposed to 16L:8D on d 7, 14 and 21. These results are contrary to data on cattle, which indicated that glucocorticoids decreased by 29 to 58% when daily light exposures were increased from 8 to 15.7, 16 or 20 h. Decreasing daily light exposure from 15.7 to 8 h resulted in a 118% increase in serum concentrations of glucocorticoids in cattle (Leining et al., 1980).

There is no apparent explanation for the differences in serum GH concentrations between prepartum and lactation in Exp. 1, but not in Exp. 2. The most obvious procedural differences between experiments were breed and parity of the sows and season of the year. However, Koprowski and Tucker (1973) reported that serum GH concentrations in cattle were not affected by changes in season, and photoperiod alone had no affect on serum GH concentrations (Bourne and Tucker, 1975; Peters and Tucker, 1978).

From our data we conclude that, unlike cattle and sheep, changes in length of photoperiod did not affect serum PRL and LH concentrations in the lactating sow or serum PRL concentrations in the OVX gilt. However, Ravault et al. (1982) have recently reported a seasonal influence on PRL secretion in European wild and domestic pigs; i.e., serum PRL concentrations were highest in the summer when photoperiod was longest. This seasonal influence was not as pronounced in domestic pigs as in European wild pigs. In order to observe a photoperiod influence on PRL, LH or C secretion, the pig may require exposure to the altered photoperiod for longer than 38 d or photoperiod must change at a particular rate. Because temperature and photoperiod increase and decrease simultaneously throughout the year it is possible that temperature alone is the seasonal regulator or that temperature and photoperiod must fluctuate simultaneously in order to alter PRL secretion in the pig. Perhaps the domestic pigs used in this study failed to respond to photoperiod due to intense genetic selection for traits unrelated to reproductive efficiency. Growth hormone was not affected by photoperiod, but this is consistent with data in cattle. Increased photoperiod increased baby pig survival and tended to increase 21-d litter weight of the sows used in this experiment (Mabry et al., 1982b). This possible direct influence of photoperiod on the baby pigs is consistent with increased growth observed in sheep and cattle due to increased photoperiod (Pelletier, 1973; Forbes et al., 1979a,b; Peters et al., 1978, 1980; Schanbacher and Crouse, 1980). However, Diekman and Hoagland (1981) have reported that supplemental lighting failed to increase growth in gilts.

Milk volume was greater ($P<.05$) for the sows exposed to 16 h of light than for sows exposed to 8 h of light (Mabry et al., 1982b). The increase in milk volume for 16L:8D sows was in agreement with the results obtained by Peters et al. (1978) who observed a 3 kg/d increase in milk production in Holstein heifers exposed to 16 h of light compared with heifers exposed to natural photoperiod. However, unlike our data for the lactating sow, Peters et al. (1978), observed that serum PRL concentrations in the lactating cow were altered by photoperiod. The reason for an increased milk volume without a corresponding increase in serum PRL concentrations in the sows of this experiment is not clear. Recently, Mabry et al. (1982a) indicated that suckling frequency increased in pigs of sows exposed to 16L:8D compared with pigs of sows exposed to 8L:16D. Therefore, differences in milk removal rather than differences in PRL secretion could account for differences in milk volume. Perhaps length of photoperiod influenced the pituitary stores of PRL, but differences in suckling-induced PRL secretion in the lactating sows and differences in basal PRL secretion in the OVX gilts could not be detected. The absence of a detectable difference in serum PRL concentrations in animals exposed to the two photoperiods could be due to differences in metabolic clearance rate of PRL between the treatment groups as indicated by the difference in response to the TRH challenge.

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