Physiology and Endocrinology: Pregnancy

M284 Blood urea nitrogen and nonesterified fatty acid concentrations in the umbilical blood of fetal pigs at day 90 and 110 of gestation. T. A. Wilmoth*, C. O. Lemley, and M. E. Wilson, *West Virginia University, Morgantown.*

Speculation as to why fetal size variation occurs has led to the investigation of placental efficiency and function. Unequal nutrient delivery and usage by the fetus can be a result of fetal or placental inefficiency. Measuring the metabolites of nutrient degradation such as blood urea nitrogen (BUN) and nonesterified fatty acids (NEFA) may give insight to placental and fetal usage of these nutrients. The objective of this study was to determine the concentrations of BUN and NEFA in arterial and venous umbilical blood of fetuses at d 90 and 110 of gestation. Gilts (n = 13) were randomly assigned to be ovariohysterectomized on d 90 or 110 of gestation at the time of breeding. Arterial and venous umbilical blood samples were collected for the determination of BUN and NEFA. Tissue sections were fixed in paraffin for the determination of placental and endometrial vascular densities. Placental efficiency (fetal weight divided by placental weight) was determined for each fetus. Means and correlation coefficients were determined using the correlation procedure of SAS. On d 90 of gestation, arterial BUN concentrations were 198.7 mg/mL, while venous BUN concentrations were 212.2 mg/mL. Arterial and venous NEFA concentrations were 0.24 mg/mL. A trend for a negative correlation between placental efficiency and the arterial venous difference (A-V) in BUN existed (r = −0.34, $P < 0.1$). On d 110, arterial and venous BUN were 242.6 mg/mL and 128.6 mg/mL, respectively. Arterial NEFA was 0.23 mg/mL and venous NEFA was 0.18 mg/mL. A positive correlation between endometrial vascular density and placental efficiency existed (r = 0.28, $P < 0.05$). A negative correlation existed between placental vascular density and the A-V difference in BUN (r = −0.35, $P < 0.05$). The change in metabolites being delivered to and returning from the placenta changes between d 90 and 110 of gestation suggesting that there is an increased amino acid catabolism by the fetus at d 110 of gestation and a greater removal of urea from fetal circulation at d 110.

Key Words: placental efficiency, blood urea nitrogen, nonesterified fatty acids

M285 Effect of dry period lengths on follicular dynamics in early lactation Holstein cows. A. Soleimani*[1,2], A. Heravi Moussavi[2], M. Danesh[2], G. Golian[2], and S. Safa[2], [1]*Islamic Azad University-Kashmar Branch, Kashmar, Khorasan Razavi, Iran*, [2]*Ferdowsi University of Mashhad, Mashhad, Khorasan Razavi, Iran.*

The study was designed to test the effects of dry period lengths on follicular dynamics parameters during the subsequent lactation in Holstein cows. Cows (n = 42) were randomly assigned in 1 of 3 treatments: 1) traditional 60 d dry period (DP) (n = 14), 2) 35 d DP (n = 15) and 3) 20 d DP. Holstein cows were blocked in pairs based on their previous 305 d milk, parity, and expected calving dates. All cows were fed by routine ration of farm (total mixed diet) twice a day and had at all time free access to water. To monitor follicular parameters, ultrasound measurements of follicular activity were made on alternate days from d 10 to 35 postpartum to determine the characteristics and fate of the 1st follicular wave. The data were analyzed using the General Linear Model (GLM) for a completely randomized design. Number of follicles (≥5 mm in diameter) on d 10 and 14 postpartum were similar among the groups. Length of dry period had no effect on days postpartum to first ovulation ($P = 0.91$; 24.69 ± 2.2, 24.07 ± 2.2, and 23.27 ± 2.4 d, respectively), number of days until detection of a follicle ≥10 mm in diameter ($P = 0.42$; 11.53 ± 1.0, 11.64 ± 0.9, and 13.23 ± 1.0 d, respectively), diameter of the largest follicle at first ultrasound ($P = 0.92$; 10.8 ± 0.91, 10.46 ± 0.8, and 13.11 ± 0.9 mm, respectively), and also days open ($P = 0.88$; 170.25 ± 25.8, 159.10 ± 28.3, and 178.72 ± 27.0 d, respectively). Diameter of the first dominant follicle ($P < 0.05$; 18.76 ± 1.1, 19.80 ± 1.1, and 14.46 ± 1.1 mm, respectively) and diameter of the dominant follicle on d 14 ($P < 0.05$; 13.65 ± 0.8, 12.96 ± 0.7, and 9.95 ± 0.8 mm, respectively) were different among the groups. Results from this experiment demonstrated that dry period length had no apparent effect on most follicular dynamics parameters and days open during the subsequent lactation. Meanwhile, a short dry period reduced the diameter of dominant follicle.

Key Words: dairy cows, dry period, follicular dynamic

M286 The application of TARGET bovine CL progesterone test kit for early pregnancy diagnosis in ewes. W. Chen*, T. Wuliji, H. Wang, N. Li, and A. Qi, *Animal Biotechnology, University of Nevada-Reno, Reno.*

The objective of the experiment was to identify the applicability of TARGET Bovine CL progesterone test kit (TARGET) for early pregnancy diagnosis in ewes. TARGET is a commercial test kit to identify pregnant cows from non-pregnant cows in field. When the blood or milk sample progesterone level is high, the test kit shows a white color and the cow is diagnosed as pregnant, and the dark blue color indicates non-pregnant, whereas the light blue or faint blue indicates that there is no definite diagnosis, so a second test is required. Three other methods were applied to verify the accuracy of TARGET. They are ELISA analysis of the blood progesterone level, ultrasound scanning for the pregnancy diagnosis, and the lambing record. 82 ewes were assigned in a spring breeding flock, of which 52 ewes with the TARGET test, while 30 ewes were assigned with non-TARGET test group. Blood samples were collected from ewes on 20d of post-breeding and the serum samples were used for the TARGET test and the ELISA analysis. Sample color grade readings were assigned to the standard color grade chart provided by TARGET. Ultrasound scanning diagnosis was conducted on 50d of post-breeding. TARGET color grade readings, ELISA analysis, ultrasound scanning results, and lambing records were analyzed by the CORR procedure of SAS program. The correlation coefficients between ELISA analysis and Ultrasound scanning diagnosis was the highest as 0.89 ($P < 0.001$) when the serum progesterone level was 2ng/ml or higher. Therefore, this level is defined as the threshold for the status of pregnancy. Six possible color grades recombination within 4 color grades were evaluated. The correlation analysis was conducted with the results obtained from all 4 procedures. The combination of the color indicator with the TARGET kit standard chart showed the highest correlation ($P < 0.01$) with ELISA progesterone level, ultrasound scanning diagnosis, and lambing record which are 0.85, 0.89, and 0.62, respectively (Table 1). Therefore, the bovine TARGET test kit is applicable to the early pregnancy diagnosis in ewes with a high degree of accuracy.

Table 1. Correlation coefficients of TARGET kit color grade assignments for pregnancy diagnosis with three other pregnancy diagnostic methods

Groups	Pregnant	Unassigned	Non-Pregnant	ELISA	Ultrasound	Lambing Record
A	1	2,3	4	0.85**	0.89**	0.62**
B	1,2	3	4	0.75**	0.81**	0.56**
C	1,2,3	–	4	0.56**	0.64**	0.44**
D	1	2	3,4	0.74**	0.77**	0.55*
E	1	–	2,3,4	0.45**	0.42**	0.28**
F	1,2	–	3,4	0.65**	0.69**	0.49**

1 = white, 2 = light blue, 3 = faint blue, 4 = dark blue; $**P < 0.01$, $*P < 0.05$.

Key Words: progesterone, pregnancy, ewes