prostaglandin for inducing cyclicity in cows with postpartum anoestrus.
Key Words: Progesterone, postpartum, anoestrus, dairy cows, GnRH

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Endocrine profiles during the peripartum of primiparous rangeland beef cows of different body condition score (BCS) at calving

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The objective of this study was to evaluate temporal changes on endocrine profiles during the peripartum and early lactation, and its association with milk energy (NEL) output and resumption of luteal activity, of rangeland beef cows of different BCS at calving. Twenty primiparous crossbred (Hereford × Angus; 32 months) spring-calving cows with a BCS of 6 (scale 1–8) at −112 days from parturition (days; Day 0 = parturition) were selected from a contemporary group (n = 60) according with their BCS at −35 ± 6 days. Cows were classified into low (BCS < 4.5) or moderate (BCS ≥ 4.5) BCS groups and blocked by expected calving date (calving dates within a 28 day period). Changes in BCS from −112 to −35 days were not due to dietary treatments as all cows grazed together on a native pasture paddock (60 ha), with an average forage mass available of 503 ± 60 kg dry matter/ha (13.8% crude protein and 26.5% acid detergent fiber) from −49 to +49 days. Cow BCS was recorded every 2 weeks from −112 to +49 days and serum samples were collected weekly from −49 to +120 days. Milk yield was obtained at +15 and +35 days by machine milking, samples were collected for milk composition, and NEL output was calculated according to NRC. Resumption of luteal activity was determined by progesterone analysis and considered as the interval from calving to first luteal sample (P4 ≥ 1 ng/ml). Data were analyzed as repeated measures with a mixed model that included BCS group, days (−49 to +49 days), and their interaction as fixed effects. Cow BCS was greater ($p < 0.05$) for moderate than low throughout the period evaluated. Leptin concentrations tended to be greater in moderate than low cows (4.8 vs. 4.3 ± 0.3 ng/ml; $p = 0.10$) and did not vary during the period evaluated. Adiponectin concentrations were less in moderate than low cows (152 vs. 106 ± 18 ng/ml; $p < 0.05$) and were affected by days ($p < 0.05$). Serum adiponectin increased from −49 to −21 days, decreased from −21 to +21 days, and remained stable through +49 days. Concentrations of IGF-I were only affected by days ($p < 0.05$) as serum IGF-I did not change from −49 to −7 days, decreased at +7 days, increased at +21 days, and remained stable thereafter. However, when only the prepartum period was considered, serum IGF-I was greater in moderate than low cows. Although there was no effect of days on insulin concentrations, serum insulin was less in moderate than low cows (1.28 vs. 1.88 ± 0.38 μUI/ml; $p < 0.05$), due to increased ($p < 0.05$) serum insulin after +15 days in low cows. NEL output during the first 35 days was greater in moderate than low cows (16.4 vs. 12.1 ± 1.3 MJ/days). Resumption of luteal activity was earlier in cows with moderate BCS (94.5 vs. 113.3 ± 2.3 days). Primiparous beef cows of moderate BCS tended to have greater serum concentrations of leptin and reduced concentrations of adiponectin and insulin during the periparturient period and had greater prepartum concentrations of IGF-I. The endocrine profiles of beef cows with moderate BCS were associated with greater NEL output and earlier resumption of luteal activity.
Key Words: Beef cattle, postpartum anestrus, grazing

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Gene expression profiles and differentiation in new developing bovine trophoblastic cell lines

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To characterize bovine trophoblastic cells, we have been developing cell lines. We raised 12 new cell lines (BT-A to -L) from blastocysts that were produced by *in vitro* production using abattoir oocytes. The aims of this study were to analyze global gene expression profiles in 12 cell lines and some differentiation induced cell lines with Matrigel (BD Matrigel™ Basement Membrane Matrix; BD Biosciences, USA). We used a custom-made oligo-microarray and a quantitative real-time PCR (qPCR) for analyzing gene expression. Three cell lines, which were selected by the intensity of CSH1 expression (BT-1: less but was developed previously, -C: less and -K: higher), were cultured on thick Matrigel prepared using the manufacturer's instructions. Totally about 7000 genes were selected for expression analysis. Gene ontology analysis showed no difference among the cell lines except BT-J that expressed a much smaller number of significant genes compared to that of *in vivo* embryos. New cell lines were divided into three major sub groups with a hierarchical clustering analysis and a principal component analysis. Group 1 involved cells that expressed trophoblastic binucleate cell (BNC) specific genes like CSH1, PRP1, and PAGs. Group 2 contained cells with less intensity of BNC specific genes. Group 3 was similar to Group 1 but was mainly characterized by some other trophoblastic genes. Some undifferentiated-marker genes like Oct3/4, Sox2, c-Myc, were found in most cell lines. We only applied BT-C for microarray analysis in Matrigel culture, and the analysis showed differences in expression profiles: the intensities of 120 genes were increased more than 2-times after on-Matrigel culture. They contained various trophoblast specific genes. The differentiation from trophoblastic mononucleate (MNC) to BNC on-Matrigel culture was found in BT-1 and C but not in BT-K: the intensities of CSH1, PRP1 and PAG1 genes expression were confirmed more than 10-times by qPCR. IFNT was significantly increased 2-times in BT-C on-Matrigel culture. These increments were confirmed with immunochemical analysis. These results suggest that BNC derives from MNC, and for this purpose BT-1 and -C cells are an excellent model. CSH1, PRP-1 and PAG1 are good indicators for the differentiation from MNC to BNC, and IFNT is an indicator as MNC. New developing cell lines maintain the undifferentiated status and contain trophoblastic stem cells similar to the trophoblast cell lineage in early embryos. They are a useful tool for analyzing bovine trophoblast cell lineage. This study was supported by a Grant-in-Aid from JSPS (Kiban-Kenkyu B 23380162).
Key Words: Trophoblast, gene, differentiation, cell, bovine

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Relationship between acute phase proteins and subsequent fertility of dairy cows after postpartum uterine inflammation

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The potential relation of serum Hp, SAA, and Fb with subsequent fertility in cows suffering from acute puerperal metritis (APM), clinical metritis (CM) or clinical endometritis (CE), treated with different methods were studied. Late pregnant cows (n = 138) from two farms were used. Diagnosis of APM and CM was made on the 3rd and 5th day postpartum (PP) in farm 1 and 2 respectively. Clinical metritis was