

and 0%), B1 (0, 4.2 and 0%), respectively. We conclude that adipogenic and anti-adipogenic components interact to determine the activities and protein abundance of ACC and FAS in adipose tissue. As cattle near finish, the effects of anti-adipogenic components may outweigh the influence of adipogenic substances leading to low PA and activities of ACC and FAS and low esterification rates.

Key Words: Cattle, Lipogenesis, Adipogenicity, Acetyl-CoA carboxylase, Adipose tissue, Fatty acids synthesis

1413 Effects of diets high in linoleic acid on carcass fat and CLA content, serum leptin, and age at puberty in beef heifers. M. R. Garcia^{1,2}, M. Amstalden^{1,2}, C. D. Morrison³, D. H. Kelsler³, and G. L. Williams^{1,2}. ¹Texas A&M University Agricultural Research Station, Beeville, TX, USA, ²Texas A&M University, College Station, TX, USA, ³University of Missouri, Columbia, MO, USA.

Objectives were to determine the effects of feeding a diet high in linoleic acid on total carcass fat content and fatty acid composition, circulating metabolic hormones, and age at puberty in developing crossbred (Angus or Red Angus x Hereford x Brahman) beef heifers. Heifers were weaned and blocked by BW (Heavy, n=10; Light, n=10) and allocated randomly within block to receive isocaloric and isonitrogenous diets formulated with either added fat (HF, n=10) or no added fat (C, n=10) from 4 mos of age until post-pubertal slaughter. Whole sunflower seed (55% oil content) was utilized in HF diets to provide 5% added fat from the start of the study until heifers weighed 250 ± 8 kg, at which time added fat was increased to 7% of DM until slaughter. Puberty was confirmed based on serum concentrations of progesterone ≥ 1 ng/ml for 2 consecutive samples and visual confirmation of corpora lutea (CL) by transrectal ultrasonography. Heifers were slaughtered at 325 ± 10 d of age. Total carcass composition was estimated from longissimus muscle, with CLA composition determined in internal and s.c. fat. HF-Heavy heifers tended (P < 0.10) to reach puberty later than all other heifers, and one HF-Light heifer did not reach puberty during the study. Linoleic acid and *cis-9, trans-11* CLA tissue content was higher (P < 0.03) in the HF group, but neither total carcass fat nor percent DM differed due to diet, although the percent protein tended (P < 0.10) to be lower in HF heifers. Serum leptin did not differ due to diet; however, leptin increased (P < 0.01) linearly throughout the study. Serum GH and IGF-I increased or remained relatively constant during the first 2-10 weeks of feeding, then began a slow decline (P < 0.05) until the onset of puberty, with serum IGF-I lower (P < 0.01) in HF heifers. Serum insulin and total cholesterol increased (P < 0.01) throughout the study in both groups, but only total cholesterol was affected by the HF diet (P < 0.05). Growing diets high in linoleic acid appear to have little or no effect on total carcass fat, serum leptin, or age at puberty in beef heifers despite increased CLA tissue content.

Key Words: Puberty, CLA, Leptin

1414 The role of ghrelin and GHS receptor on proliferation and differentiation of ovine preadipocytes. S.G. Roh*, K.C. Choi, Y. Shrestha, C. Yoon¹, and S. Sasaki, Lab of Animal Molecular Physiology, Faculty of Agriculture, Shinshu University, JAPAN, ¹Dept of Animal Science, Iksan College, Iksan, KOREA.

Ghrelin is a novel endogenous natural ligand for the growth hormone secretagogue receptor (GHS-R or ghrelin receptor) that has been recently isolated from the rat stomach. These 28 amino acids constituting peptide has n-octanoylation in its serine-3 residue, which is essential for the ghrelin activation. Ghrelin has been demonstrated to regulate pituitary GH secretion via GHS-R when administered into the central nervous system or peripherally along with GHRH and somatostatin. GHS-Rs have been identified in many other tissues, other than the hypothalamic neurons and in the brainstem, like heart, lung, pancreas, intestine, uterus and adipose tissue, but their functions are unknown on those tissues. The mechanism by which ghrelin and GHS-R affect the proliferation and differentiation of ovine preadipocytes has remained largely unknown. This study was conducted to examine the role of ghrelin and GHS-R on the proliferation and differentiation of ovine primary preadipocytes in culture. The preadipocytes, which were obtained from sheep subcutaneous adipose tissues, were proliferated to confluence and then differentiated to adipocytes in differentiation medium for 10 days. The confluent preadipocytes and differentiated adipocytes at days 3, 7 and 10 were harvested for total RNA extraction and RT-PCR of GHS-R mRNA. Ghrelin decreased the proliferation of preadipocytes. The level

of GHS-R mRNA was significantly increased during the differentiation period, although this was not detected in the confluent preadipocytes. Furthermore, ghrelin stimulated the differentiation of preadipocytes and increased the level of GHS-R during the differentiation. In conclusion, our results demonstrate that ghrelin and GHS-R have an important role on the process of adipogenesis of ovine preadipocytes.

Key Words: Ghrelin, Adipocyte, Sheep

1415 Slow-release somatotropin reduces plasma leptin in lactating dairy cows. F. Rosi¹ and L. Pinotti², ¹Ist. Zootechnia Generale, Facoltà di Agraria, ²Dept. VSA, Facoltà di Medicina Veterinaria- Università di Milano I-20133 Milan Italy.

Somatotropin has dramatic effects on adipose tissue and lipid metabolism. Leptin, produced and released primarily by adipose cells, exerts a regulatory control on energy homeostasis. The aims of this study were to determine the effects of bST administration on milk production, plasma leptin and selected plasma metabolites in lactating dairy cows. Forty Holstein cows (90 ± 33) were randomly divided into 2 groups: Control and bST. The bST group received 640mg/4wk of slow-release bST (Posilac) for two cycles. Milk yield and composition were measured at 7 days post-injection of each cycle. Blood samples were collected on the same day before feeding, and analyzed for leptin, NEFA, total protein, α-amino nitrogen, and urea nitrogen. Both milk yield and milk fat percentage were increased (29.9 vs. 35.3 kg/d; P < .01; 3.59 vs. 3.92%; P < .06) by bST administration, while milk protein content was unaffected by treatment (3.19 vs. 3.13%). At 7 days post-injection, bST decreased (P < .01) plasma leptin by 33% (4.26 vs. 2.86 μg/l) whereas plasma NEFA was drastically increased (225 vs. 875 μmol/l; P < .01). Plasma total protein was increased by bST (78.9 vs. 81.4 g/l; P < .05), while both α-amino nitrogen and urea in plasma of treated cows were reduced (P < .01) by 20% (2.64 vs. 2.03 mmol/l; 6.55 vs. 5.27 mmol/l, respectively). These data confirmed a galactopoietic effect of bST, which imposed, on peak of response, a higher demand of nutrients sustained by an enhanced lipolysis in adipose tissue. Lower plasma leptin observed in present study could be due to reduced body fat mass as consequence of lipolysis induced by bST. This is in line with higher plasma NEFA concentration observed in bST group. Plasma nitrogen metabolites indicate a higher efficiency in protein metabolism in treated cows. This study show that plasma leptin is linked with the nutritional status of cows, even though other hormones and metabolites are also involved in the signaling and control of body energy store.

Key Words: bST, Leptin

1416 The influence pre-calving Somatotropin treatment on the quantity and quality of colostrum in beef cattle. N. Macewko, G.A. Angliss, E.F. Jones, K.E. Govoni, M.F. Loughlin, D. Cissel, S.A. Zinn, D. Schreiber, and T.A. Hoagland, University of Connecticut, Storrs, Connecticut.

Fourteen Hereford beef cows (3-8 years old) were randomly assigned to receive no Posilac (Monsanto) or Posilac (500mg) every two weeks for either four (three injections) or eight (five injections) weeks before calving. At calving, all cows were milked with a portable vacuum machine for 15 minutes. The weight and colostrum meter reading of the milk was recorded. Samples of milk were obtained for determination of IgM, IgG1, and IgG2 concentrations. Percent fat, protein, and total solids of the milk were determined. The weight of milk was similar for the control, four, and eight week Posilac treated cows (1.5, 1.3, and 1.3 kg respectively; SEM=0.3). Colostrum meter readings and the concentrations of IgM and IgG1 were not significantly influenced by the Posilac treatments. There was a linear effect (P < 0.05) of Posilac treatment on milk IgG2 concentrations for the control, four and eight week Posilac treated cows (5370, 5864, and 8208 mg/dl respectively; SEM=1452). The percent fat, protein, and total solids were similar in the milk across treatments; however, the percent protein and total solids were greater (p=0.21) in the Posilac treated groups. The average daily gain from birth to weaning (0.9, 1.1, and 1.2 kg/day; SEM=0.05 respectively for the control, four, and eight week Posilac treated cows) was significantly (P < 0.05) greater for the calves suckling the Posilac treated cows. In conclusion, Posilac treatment pre-calving influenced the quality of colostrum by increasing the concentration of IgG2 and increased the average daily gains of the calves suckling the treated cows.

Key Words: colostrum, beef cows, immunoglobulins