76 Feeding status and the reponsiveness of bovine adipose tissue to human acylation stimulating protein (hASP). S. K. Jacobi*[1], K. Cianflone[2], and J. L. Miner[1], [1]*University of Nebraska,* [2]*McGill University.*

Human ASP stimulates triacylglycerol synthesis in human adipocytes and bovine adipose explants. Our objective was to determine whether feeding status affects the responsiveness of bovine adipose tissue to hASP. Nine, 9-mo-old steers were housed individually for two periods of 3 wk each. During the first period, four of the nine steers were fed to 50% of NE_m requirement and the other five consumed the same diet ad libitum. After the first period, steers were allowed ad libitum access to feed for 2 wk then were assigned the opposite ration for the second period. Steers gained 40.5 kg BW when intake was ad libitum but lost 30.2 kg BW when intake was restricted (SE = 7.84; P < .01). After each period, subcutaneous adipose tissue was sectioned into 20-mg explants and incubated for 3 h in M199, 1% BSA, 2.5 mM ^{14}C-acetate, and .75 mM ^{3}H-oleate. Incubation media were collected and frozen at -20°C. Media were assayed for NEFA concentrations to determine the effect of treatments on lipolysis. Explants were extracted in an organic solvent, washed with 1 M KCl:.15 N HCl solution and .38 M $NaHCO_3$ solution. Extracts were dried, reconstituted in hexane, and lipid was quantified by a β-counter. Four explants/steer·period were used to test effects of insulin (0 and 1 nM) and hASP (0, .01, .1, and 1 μM). Insulin did not influence incorporation of acetate or oleate into lipid. Acetate incorporation was 2.98, 3.09, 3.13, and 3.29 nmol/mg (SE = .384; P < .32); and oleate incorporation was 1.04, 1.07, 1.06, and 1.26 nmol/mg (SE = .066; P < .01) for 0, .01, .1, and 1 μM hASP, respectively. Feed restriction reduced (P < .01) acetate incorporation from 5.95 to .29 nmol/mg, and oleate incorporation from 1.37 to .84 nmol/mg. No interactions between feeding status, insulin, or hASP were detected. There was no difference in NEFA concentration between treatments. Feed restriction increased NEFA concentration in media to 254.34 μEq/L from 228.40 μEq/L in unrestricted steers (SE = 4.10; P < .01). In conclusion, the ability of hASP to promote fatty acid esterification is not influenced by feed restriction.

Key Words: Bovine, Adipose, Acylation stimulating protein

77 Adipose and skeletal muscle expression of genes related to lipid metabolism in finishing pigs deprived of feed. S. Q. Ji, R. L. Godat*, G. M. Willis, G. R. Frank, S. G. Cornelius, and M. E. Spurlock, *Purina Mills, Inc., St. Louis, MO.*

The objective of this study was to evaluate the expression of lipoprotein lipase (LPL), hormone-sensitive lipase (HSL) and mitochondrial uncoupling protein 3 (UCP3) in adipose tissue and(or) skeletal muscle of pigs in response to a 96-h period of feed deprivation. Thirty two barrows (87 kg 5%) were divided into 2 treatment groups, ad libitum intake vs. feed deprivation (FD). All pigs had free access to water. At 96 h, the pigs were slaughtered and longissimus and semitendinosus (ST, red and white components separated) muscle and inner layer subcutaneous adipose tissue samples collected for total RNA extraction. Sample RNA concentrations were determined fluorometrically using RiboGreen^{TM}. The abundance of LPL, HSL and UCP3 mRNA was quantified by respective ribonuclease protection assays developed in our laboratory. Feed deprivation caused a reduction (66%, P < 0.013) in LPL mRNA in adipose tissue. Likewise, LPL expression was decreased (P < 0.001) by FD in all skeletal muscle tissues; however, the magnitude of decrease in red ST (32%) was half that in white ST (62%) or longissimus muscle (68%). Red ST muscle also had approximately double (P < 0.001) the LPL mRNA as did either the white ST or the longissimus muscle, irrespective of intake. Longissimus muscle UCP3 mRNA was increased dramatically (237%, P < 0.001) by FD. As regards HSL, mRNA abundance in adipose tissue was increased by FD (46%, P < 0.04). These data indicate that LPL expression is responsive to FD in the pig in both adipose and skeletal muscle tissue. Furthermore, LPL mRNA in muscle containing predominantly red (more oxidative) muscle fibers seems considerably less responsive to FD and is more abundant than that in muscle containing predominantly white muscle fibers. The FD-induced increase in UCP3 is likely in keeping with a shift to lipids as a metabolic fuel. Finally, we provide evidence that HSL is regulated in part at the level of gene transcription in pigs deprived of feed long term.

Key Words: Lipoprotein Lipase, Hormone-sensitive Lipase, Uncoupling Protein 3

78 Influence of swine dietary supplementation of modified tall oil and vitamin E on longissimus muscle quality characteristics and display color stability. A. T. Waylan*, P. R. O'Quinn, J. A. Unruh, R. D. Goodband, J. L. Nelssen, J. C. Woodworth, M. D. Tokach, and S. I. Koo, *Kansas State University, Manhattan.*

Seventy-two pork loins were used to determine the influence of diet supplementation of modified tall oil (MTO) and vitamin E on longissimus muscle (LM) quality. In a 2 x 3 factorial design, barrows (PIC) were blocked by initial BW (45.5 kg) and ancestry and randomly allotted to diet additions of no MTO, no vitamin E (NMNE); no MTO, 22 IU/kg vitamin E (NMLE); no MTO, 110 IU/kg (NMHE); .5% MTO, no vitamin E (MNE); .5% MTO, 22 IU/kg vitamin E (MLE); and .5% MTO, 110 IU/kg vitamin E (MHE). Pigs were fed to an average BW of 114.6 kg. Boneless loins were vacuum packaged at 24 h postmortem and cut into 2.54 cm chops at 7 d postmortem. Visual display color was evaluated by a 9-member panel on 0, 1, 2, 4, 6, and 8 d of display. At 2 d, LM chops from MHE fed pigs had (P<.05) lower (less deterioration) scores than NMHE and MNE chops. At 4 d, LM chops from MHE, MLE, and NMNE had (P<.05) lower scores than MNE chops. At 6 d, LM chops from MHE had (P<.05) lower scores than MNE, NMLE, and NMHE chops; and MLE and NMNE chops had (P<.05) lower scores than MNE chops. At 8 d, MHE chops had (P<.05) lower scores than all other treatments; and NMHE and MLE chops had (P<.05) lower scores than MNE chops. Instrumental Hunter L*, a*, and b*, and ratios of reflectance at %R630/%R580 and %R610/%R580 supported visual data suggesting a delay in color deterioration for MHE chops. At 0 d, LM chops from pigs fed NMHE, MLE, and MHE had (P<.05) lower thiobarbituric acid-reacting substance (TBARS) values than NMLE and MNE chops. At 4 d, LM chops from pigs fed high levels of vitamin E had (P<.05) lower TBARS values than chops from pigs fed no vitamin E and the MHE chops had the lowest numerical values. No differences (P>.05) were detected for Warner-Bratzler shear force and sensory panel evaluations. Feeding MTO in combination with high levels of vitamin E extended display life without affecting palatability.

Key Words: Pork, Modified tall oil, Longissimus muscle

79 Carcass and live value of cull beef cows. J. K. Apple*, *University of Arkansas, Fayetteville.*

Mature beef cows (n = 111) were slaughtered to determine the influence of body condition scores (BCS) on carcass and live animal value. All cows were weighed and assigned BCS, based on a 9-point scale, 24 h before slaughter. By-product weights were recorded during slaughter, and, after a 48-h chill period, the right side of each carcass was fabricated into boneless subprimal cuts, minor cuts, lean trim, fat, and bone. Cuts were progressively trimmed to 6.4 and 0.0 mm of external and visible seam fat, and weights were recorded at all stages of fabrication. Gross value was the sum of the carcass value and the offal value, and net value was calculated by subtracting a slaughter fee ($28.00/animal) and a processing fee ($7.75/45.45 kg hot carcass wt) from the gross value. Offal value decreased linearly (P < .001) as BCS increased from 2 to 8. Among U. S. Cutter carcasses, BCS-6 cows had higher (P < .05) carcass values than BCS-2 and 5 cows. Cutter-grade carcasses from BCS-2 cows had the lowest (P < .05) and carcasses from BCS-4 and 6 cows had the highest (P < .05) gross and net values at both fat-trim levels. Cows assigned a BCS of 2 had higher (P < .05) live values than cows assigned a BCS of 5 when carcasses received a quality grade of U. S. Cutter. Within the U. S. Utility grade, BCS-8 cows had lower (P < .05) carcass values than cows assigned a BCS of 3 through 7. Although gross and net values of BCS-7 and 8 cows were higher (P < .05) than BCS-3, 4, and 5 cows within the Utility grade, BCS had no effect (P > .05) on live value. Across the Utility/Cutter mix, gross and net value increased linearly (P < .001) as BCS increased from 2 to 8. When subprimal cuts were trimmed to 6.4 mm of fat, live value also increased linearly (P < .001) from 2 to 8, with BCS-2 cows having the lowest (P < .05) and BCS-7 cows having the highest (P < .05) live values. Although no differences (P > .05) were noted between BCS when cuts were trimmed free of visible fat, the same linear (P = .02) trend was found where live value increased from a low of $42.10/45.45 kg at BCS of 2 to a high of 46.10/45.45 kg at a BCS of 7.

Key Words: Beef Cows, Value, Body Condition