

does not appear to affect ruminal fiber digestion. Increasing rate of ruminal oil release by rolling sunflowers also does not appear to affect ruminal fiber digestion.

Key Words: Sunflower Seeds, Supplementation, Cows

362 Determining time of intramuscular fat deposition using ultrasound data. C.A. Urdahl*¹, J.J. Harlan¹, G.A. Younglove¹, S. Nash², S. Harrison², J. Packham², R. Panting², D.M. Sanchez³, and J. Findlay², ¹Chadron State College, Chadron, NE, ²University of Idaho Cooperative Extension, ID, ³University of Wyoming Uinta County Extension, Evanston, WY.

The ability to predict when market cattle move from select quality to choice quality grade would assist feeders in preventing over feeding of market cattle and thus reduce costs and possibly increase profit. Ultrasound technology has been used in the livestock industry for almost 50 years. However, most studies looking at intramuscular fat (IMF) deposition over time on feed have utilized different animals for measurements as steers were harvested in order to measure IMF. Thus, this study was conducted to evaluate IMF deposition over time utilizing ultrasound measurements. Fifty-seven crossbred steers were fed a traditional feedlot ration designed for growth to market weight within 150-160 days on feed. Intramuscular fat was measured using real time ultrasound on approximately days 60, 90, 120, and 150. Data were analyzed using the general linear model of SAS appropriate for a repeated measures design. Data collected to date suggest on average market cattle deposit the largest percent of backfat between approximately day 90 and day 120 (21% increase) as opposed to the other two time periods (12-12.5% increase).

Key Words: Intramuscular Fat, Ultrasound, Fat Deposition

364 Effects of selenium source and physiological state on body, heart, and liver mass, small intestinal growth, and crypt cell proliferation in female rats. B. C. Stegman*¹, J. B. Taylor², L. P. Reynolds¹, J. W. Finley³, D. M. Schafer³, and J. S. Caton¹, ¹North Dakota State University, Fargo, ²USDA, ARS, U.S. Sheep Experiment Station, ³USDA, ARS, Human Nutrition Research Center, Grand Forks.

Sixty female Sprague-Dawley rats were used to evaluate effects of Se source and physiological state on body, heart, and liver mass, small intestinal growth, and crypt cell proliferation. Treatments were arranged in a 2 x 3 factorial with dietary Se source (Se-met vs Se-cys) and physiological state (non-pregnant, pregnant, and lactating) as factors. Rats were fed Se-deficient torula yeast diets from weaning to breeding (72 d) and then supplemented to provide 2 ppm of Se from either Se-met or

Se-cys. Rats were fed Se treatments for 17 d prior to necropsy. Data are reported as means pooled SEM. Body mass tended ($P = 0.07$) to be lower in rats fed Se-cys compared with Se-met (313 vs 296 6.6 g). Compared with Se-cys, dietary Se-met increased ($P = 0.04$) heart mass during lactation (1.06 vs 1.25 0.06), but not in non-pregnant or pregnant rats (Se-source x physiological state interactions; $P < 0.06$). Liver mass was not affected ($P = 0.70$) by Se source. Liver mass was highest in lactating, intermediate in pregnant, and lowest in non-pregnant rats ($P < 0.01$; 23.5 vs 15.6 vs 11.2 0.6 g). Intestinal RNA and DNA were unaffected by Se source but RNA was higher ($P < 0.01$) in lactating compared with non-pregnant or pregnant rats. Se-cys reduced ($P < 0.03$) intestinal protein (mg/g) compared with Se-met in both pregnant and lactating rats (40 vs 62 and 50 vs 89 7.1 mg/g, respectively). Intestinal DNA:RNA, protein:DNA, and crypt cell proliferation were unaltered ($P > 0.20$) by treatment. These data indicate that liver mass, intestinal RNA, and protein concentrations are impacted by physiological state. In addition, Se source influences heart mass and intestinal protein concentration. Crypt cell proliferation appears unaltered by amino acid source of Se or physiological state.

Key Words: Selenium, Intestine, Growth

365 Evaluating chute-side ultrasound accuracy in market cattle. J.J. Harlan*¹, C.A. Urdahl¹, G.A. Younglove¹, S. Harrison², S. Nash², J. Packham², R. Panting², and D.M. Sanchez³, ¹Chadron State College, Chadron, NE, ²University of Idaho Cooperative Extension, ID, ³University of Wyoming Uinta County Extension, Evanston, WY.

Carcass measurements on market beef are becoming increasingly difficult to obtain, as processing plants are less willing or able to allow outside people into facilities to acquire carcass data. Ultrasound technology, which has been used since the 1950's, has provided producers with the ability to collect carcass data on live animals. However, predicting intramuscular fat (IMF) has not proven to be accurate with chute-side service. Thus, this study was conducted to evaluate the accuracy of new software designed to measure IMF at chute-side utilizing ultrasound. Fifty-seven crossbred market steers were fed a tradition feedlot ration designed for growth to market weight within 150-160 days on feed. Steers were measured ultrasonically using chute-side methods and Central Ultrasound Processing for 12th rib fat thickness, longissimus muscle area and percent IMF on approximately days 90 and 150. Steers were harvested five days after the second scan and carcass data collected. In addition a one-inch steak was collected from the 12-13th rib region and chemically analyzed for fat content of the longissimus dorsi muscle. Data will be analyzed utilizing the general linear model of SAS.

Key Words: Ultrasound, Chute-side Accuracy, Carcass Quality

Nonruminant Nutrition (Addendum)

366 Comparison of antimicrobial alternatives in irradiated diets for nursery pigs. T. P. Keegan*, J. M. DeRouchey, J. L. Nelssen, M. D. Tokach, R. D. Goodband, S. S. Dritz, and C. W. Hastad, Kansas State University, Manhattan.

Previous research at Kansas State University indicated irradiation can effectively reduce the bacterial concentration in nursery diets. Our hypothesis for this research was that eliminating bacteria in the feed via irradiation would allow the impact of antimicrobial alternatives to be more easily measured. In a 27 d growth assay, 354 weaning pigs (PIC, 6.9 kg and 18 ± 2 d of age) were fed one of 9 experimental diets: 1) control diet with no antimicrobials, 2) irradiated control diet with no antimicrobials, and irradiated control diet with added; 3) Carbadox (50 g/ton), 4) Probios[®] (1.6% from d 0 to 14 and 0.8% from d 14 to 21), 5) BioSaf[®] (0.3%), 6) Biomate Yeast Plus[®] (0.1%), 7) Bio-Mos[™] (0.3%), 8) Bio-Plus[®] 2B (0.05%), or 9) LactoSacc[®] (0.2%). There were 8 pens/treatment and 5 pigs/pen. BioSaf[®], Biomate Yeast Plus[®], and Lacto Sacc[®] are all concentrated forms of selected live yeast cells while Bio-Mos[™] is a mannanoligosaccharide derived from yeast.

Probios[®] is a form of lactic acid bacteria and Bio Plus[®] 2B contains two bacillus strains. All antimicrobials were added after diets were irradiated. Neither irradiation nor feed additives in an irradiated-diet improved growth performance compared to the non-irradiated control. From d 0 to 27, ADG was 296, 300, 301, 290, 255, 285, 303, 295, and 284 g and Gain/feed (G/F) was 0.78, 0.79, 0.76, 0.71, 0.75, 0.76, 0.77, 0.79, and 0.76 for diets 1 to 9, respectively. Pigs fed the non-irradiated control diet, irradiated control diet or irradiated diets containing Carbadox, Bio-Mos[™], or Bio-Plus[®] 2B had greater ADG ($P < 0.05$) than pigs fed BioSaf[®]. Pigs fed Probios[®] had a poorer G/F ($P < 0.05$) compared to all other test diets. Pigs fed the irradiated control or Bio-Plus[®] 2B had improved G/F ($P < 0.05$) compared to pigs fed BioSaf[®]. In conclusion, irradiating the control diet or adding the feed additives to the irradiated diet did not improve growth performance. Eliminating the bacteria in the control diet by irradiation did not allow the impact of antimicrobial alternatives to be more easily measured.

Key Words: Nursery Pig, Irradiation, Feed Additive