cows treated with the CO-Synch protocol (n = 16), and anestrous control cows (n = 9). CO-Synch treated cows received GnRH (100 µg; i.m.) on d 0 of treatment, and all cows received PG (25 mg; i.m.) on d 7. Forty-eight hours following PG injection, cows received GnRH (100 µg; i.m.) and were artificially inseminated. Blood was collected daily from d 0 to d 31 and once weekly from d 34 to d 69. Ovarian follicles were measured by transrectal ultrasonography on d 7, 8, and 9 to determine growth rate and ovulatory size. Transrectal ultrasonography was used to determine pregnancy rates on d 34 and fertility viability on d 41, 48, 55, 62, and 69. Cyclic cows were further parturition than anestrous cows (51.4 ± 1.9 d and 36.8 ± 1.7 d; P < 0.05) on trial start date. Follicular growth rate (d 7 to 9) and size of the ovulatory follicle did not differ among treatments (P > 0.05). CO-Synch treated cows had longer luteal lifespan than control cows (19.7 ± 0.9 d and 9.6 ± 1.8 d; P < 0.05). Cows that were pregnant on d 25 post breeding had higher (P < 0.05) concentrations of progesterone than nonpregnant cows from d 10 to d 22 post breeding. On d 25 post breeding, there was no difference (P > 0.05) in pregnancy rates among follicle size groups of CO-Synch cows [4/7 (57%), 8/10 (80%), 10/13 (77%), and 4/6 (67%)] for 10 to 12, 12.5 to 14, 14.5 to 16, and > 16 mm; respectively; however, by d 60 post breeding, cows that ovulated 10 to 12 mm follicles maintained fewer pregnancies (2/7 [29%]; P < 0.05) than cows that ovulated 14.5 to 16 [9/12 (75%) mm follicles. This decrease in pregnancy rate was due to greater embryonic mortality in cows that ovulated 10 to 12 mm follicles. In summary, ovulation of smaller follicles does not affect CL formation and progesterone secretion, but may lead to increased embryonic death.

Key Words: Fixed-time AI, Follicle Size, Embryonic Mortality

41 Production responses to range supplements with increasing concentrations of glucogenic precursors fed to young postpartum beef cows. R.C. Waterman1, L.A. Stalker1, W.D. Bryant1, J.E. Sawyer1, D.E. Hawkins1, E.E. Parker1, S.H. Cox, J.A. Hartung1, F. Valdez2, J. Horton2, and M.K. Petersen1, 1New Mexico State University, Las Cruces, NM/USA, 2Kemin Industries, Inc., Des Moines, IA/USA.

Cattle grazing winter range forage often exhibit yearly variation in response to supplementation. This variation may be predisposed by circulatory concentration and subsequent metabolism of glucose, which is significantly influenced by the quality and availability of dormant range forage. Therefore, a study conducted at the Corona Range and Livestock Research Center during two dry years, 2000 and 2001 (driest), evaluated the responses of supplements differing in glucogenic precursors fed to young postpartum beef cows. Supplements were fed at 908 g/d for approximately 95 d postpartum and provided 327 g CP, 118 g UIP (Logluc); 327 g CP, 158 g UIP (Midgluc); 327 g CP, 164 g UIP + 100 g propionate salt (Higluc; NutroCal73), 3 Kemin Industries, Inc.). Days to postpartum nadir were similar (P = 0.26) for both years among supplemented cows (46.50, and 48.24 d for Logluc, Midgluc, and Higluc, respectively). Adjusted weaning weights for calves were lighter by 16 to 20% in yr 1 when compared to yr 2 (P < 0.05; 160, 165, and 155 3.5 kg vs. 191, 199, and 194 3.4 kg for Logluc, Midgluc, and Higluc, respectively), but were not influenced by treatment in either year (P > 0.1). These results emphasize yearly variations encountered in response to supplementation and tend to suggest that alterations in nutrient partitioning do occur depending on availability of circulating glucose and quality of dormant range forages.

Key Words: Glucose, Propionate, Protein Supplements

42 Effects of Vitamin E Supplementation on Lipid Oxidation and Sensory Characteristics of Irradiated Beef Patties. K. A. Stith1, K. D. Suth1, H. D. Woody1, M. J. Roeder1, H. L. Ashraf1, S. Ohene-Adjei1, and R. A. Roeder1, 1Southern Illinois University at Carbondale, 2Purina Mills, Inc., 3University of Illinois.

This study was to determine if vitamin E (VE) supplementation in feedlot steers decreased the incidence of lipid oxidation (LO) and undesirable sensory characteristics in irradiated (CP) beef patties. Twelve Angus x Hereford steers (BW: 383 ± 41 kg) were penned in concrete-slatted facility steers. Steers were fed a ration formulated to meet NRC (1996) requirements. Six steers received 1000 IU VE daily (VEST) as alphatocopheryl acetate (Rovimix E 20, Roche Vitamins) and six steers received no supplemental VE (CON). After a 122-d feeding period, the steers were harvested. High-fat (28.75%; HF) patties were made from the chuck and low-fat (13.84%; LF) patties were obtained from the sirloin of each animal. The patties were vacuum-packed, frozen, and irradiated at 0.2, 2.3, and 7.6 kGy. High performance liquid chromatography measured an average of 3.53 and 3.50 µg/g alpha-tocopherol for CON and 8.7 and 7.5 µg/g alpha-tocopherol for VEST in HF and LF patties, respectively (P < 0.05). Thioarbituric acid residue (TBAR) values were determined at 30 d of storage to measure LO. Lipid oxidation was increased 44% by CP (P < 0.008), and there was a dose response between 0 and 7.6 kGy (P = 0.002) but none between 2.3 and 7.6 kGy. Vitamin E did not (P > 0.05) decrease CP-induced LO regardless of fat level. High-fat patties had higher (P = 0.004) TBAR values than LF patties. After 3 mo of storage, the patties were submitted for trained sensory panel evaluation. The sensory characteristics brothy, serumy/bloody, astringent, and wet dog/hairy increased (P < 0.05) as a result of CP regardless of fat or VE. Wet dog/hairy was the most prevalent off-flavor occurring in all 2.3 and 7.6 kGy treatments (P < 0.0001). Vitamin E was unable to alter LO and the development of off-flavors caused by CP in this experiment. This research was supported by the Illinois Council for Food and Agricultural Research.

Key Words: Vitamin E, Cold pasteurization, Lipid oxidation

43 Ability of the uterus in anestrous ewes to resist infections. L. E. Mink1, M. C. Wulster-Radcliffe2, and G. S. Lewis1, 1USDA, ARS, U.S. Sheep Experiment Station, 2Fort Dodge Livestock Health.

When progesterone (P4) is basal, the uterus can contain bacteria without developing infections. Infections typically develop with onset of luteal function. Thus, we used an anestrous ewe model to study events associated with this phenomenon. For this study, bacterial inoculations contained 750 x 106 cfu of E. coli and 350 x 106 cfu of A. pyogenes in 5 mL of saline. Blood samples were collected from vena caval catheters placed just cranial to the entry of uteroovarian blood. Uteri were removed and flushed on d 6. In Exp. 1, none of the ewes developed infections. Progesterone in all ewes was basal throughout. Treatment did not affect basal, lipopolysaccharide (LPS)-stimulated, or concanavalin A (Con A)-stimulated lymphocyte proliferation in vitro. Number of lymphocytes per 100 white blood cells (WBC) was greater (60 vs 40; P < 0.01) and number of neutrophils was less (35 vs 54; P < 0.01) in bacteria than in saline ewes. In Exp. 2, P4 increased (P < 0.05) the incidence and severity of infections. Treatment did not affect basal, LPS-stimulated, or Con A-stimulated lymphocyte proliferation, nor did it affect lymphocyte and neutrophil numbers per 100 WBC. However, lymphocytes per 100 WBC increased (P < 0.01) between d 0 and 3 (from 42 to 63), while neutrophils per 100 WBC decreased (P < 0.01) between d 0 and 3 (from 55 to 35). We conclude that the uterus in anestrous ewes can resist infections until P4 concentrations increase.

Key Words: Anestrus, Sheep, Endometritis

44 Selenium concentration and distribution in range forages from four locations in the Northern Great Plains. T. L. Lawler1, T. G. Lawler1, E. E. Griggs1, E. J. Finney1, and J. S. Caton1, 1North Dakota State University, Fargo, ND, 2USDA-ARS, Dubois, ID, 3USDA-ARS, Miles City, MT, 4USDA-ARS, Grand Forks, ND.

Locations representing high to low selenium areas were selected to assess selenium concentration in diets vs available forage [masticate (MS) vs clipped grass (TG)] and distribution in forage fractions [grass stems (GS) vs grass leaves (GL)] across season. Locations were near Pierre,