323 Effect of supplemental fat source on immunity of periparturient Holstein cows. B. C. do Amaral*, C.R. Staples, O. de F. Zacaroni, S. A. Sennikov, L. Badinga, F. Silvestre, J. D. Arthington, and W. W. Thatcher, *University of Florida*, *Gainesville*.

The study objective was to evaluate if dietary supplemental polyunsaturated fatty acids, enriched in omega-6 or omega-3 fatty acids, can regulate and improve the immunosuppressive state that is typical of periparturient Holsteins heifers (n=16) and cows (n=29). Treatments were: 1) Control (CO, no fat supplement), 2) Ca salts of fatty acids made from safflower oil (Omega-6, 63% C18:2), and 3) Ca salts of fatty acids made from palm oil and fish oil (Omega-3, 11% eicosapentaenoic acid plus docosahexaenoic acid, StrataG™). Supplemental fats (Virtus Nutrition, Corcoran, CA) were fed at 1.5% of dietary DM during pre and postpartum periods. Blood samples were taken thrice weekly for 7 wk for determination of acute phase proteins. Phagocytotic and oxidative burst activities of neutrophils were measured using flow cytometry in whole blood samples taken at -18, 0, 7, and 40 DIM. Multiparous cows fed Omega-6 had greater concentrations of fibrinogen (259 vs 206 mg/dl) compared to Omega-3-fed cows, but values were not different for primiparous cows (226 vs. 254 mg/dl; treatment by parity interaction P<0.05). Heifers fed omega-3 had reduced concentrations of ceruloplasmin compared to omega-6-fed heifers (10.5 vs. 11.9 mg/dl) but values were not different for cows (11.4 vs. 11.1 mg/dl; treatment by parity interaction; P<0.05). Multiparous cows fed fat supplements had greater (59.8 µg/ml) concentrations of acid soluble protein in plasma during the first 3 wk postpartum compared to CO cows (42.9 µg/ml), but this was reversed for primiparous cows (51.7 vs. 45.0 mg/dl; treatment by parity by DIM interaction; P=0.06). Concentrations of WBC (8796 vs 11,492 WBC/µl; P=0.06) and neutrophils (2463 vs 3495 per µl; P<0.01) were lower for omega-3 fed cows compared to cows fed CO or omega-6. Based on median fluorescence intensity, the average neutrophil from omega-3-fed cows phagocytised less E. Coli than those from CO or omega-6-fed cows. Omega-3 attenuated immune responses compared to Omega-6-fed animals.

Key Words: Fat, Immunity, Dairy

324 Effect of supplemental fat source on production, metabolism, and milk composition of periparturient Holstein cows. B. C. do Amaral*, C. R. Staples, O. F. Zacaroni, S. A. Sennikov, L. Badinga, and W. W. Thatcher, *University of Florida*, *Gainesville*.

Objective was to evaluate two sources of supplemental lipid enriched in omega-6 or omega-3 fatty acids for influence on production, metabolism and milk composition of periparturient Holsteins heifers (n=16) and cows (n=29). Treatments were the following: 1) Control (no fat supplement), 2) Ca salts of fatty acids made from safflower oil (Omega-6, 63% C18:2), and 3) Ca salts of fatty acids made from palm oil and fish oil (Omega-3, 11% eicosapentaenoic acid plus docosahexaenoic acid, StrataG™). Supplemental fats (Virtus Nutrition, Corcoran, CA) were fed at 1.5% of dietary DM. Blood was taken daily for 10 DIM for PGFM analysis and thrice weekly thereafter until 49 DIM for measures of plasma metabolites. Milk yield was recorded twice daily and weekly samples were taken for milk composition. Milk samples from wk 5, 6, and 7 were pooled for fatty acid analysis. Orthogonal contrasts were 1 vs. 2+3, and 2 vs. 3. The mean DMI prepartum (13.4, 13.7, and 13.5 kg/d; SE = 0.6) and postpartum (18.0, 18.7, and 16.9 kg/d; SE = 0.8), mean milk yield (32.8, 34.4, and 31.2 kg/d; SE=1.4), mean milk protein concentration (3.0, 2.9, and 2.9%; SE=0.1), mean BW (603, 593 and 593 kg; SE = 18), mean BCS (3.12, 3.26, and 3.15; SE = 0.10), plasma glucose (68.8, 69.5, and 69.5 mg/dl; SE=1.8), plasma NEFA (459, 391, and 433 µEq/l; SE=38), and plasma BHBA (5.7, 5.7, and 5.9 mg/dl; SE=0.5) for treatments 1, 2, and 3, respectively were not different among treatment groups. Heifers fed Omega-3 had greater plasma concentration of PGFM at 6 DIM compared to Omega-6-fed heifers (treatment by parity by DIM interaction; P<0.05). Concentration of milk fat from cows fed omega-6 (3.52 %) or omega-3 (3.21%) was lower than that from control cows (3.76%). Cows fed fats had greater milk concentrations of CLA isomers and C18:1 trans-10, and Omega-3-fed cows had greater concentrations of these FA compared to Omega-6-fed cows. Fat supplementation changed the fatty acid profile of milk without changing milk yield or plasma metabolites.

Key Words: Fat, Milk, Fatty Acid

325 Effects of supplemental flaxseed or corn on site and extent of digestion in beef heifers grazing summer rangelands in the northern Great Plains. E. J. Scholljegerdes* and S. L. Kronberg, *USDA-ARS, Northern Great Plains Research Laboratory*, *Mandan, ND*.

Six Angus heifers (367 ± 8.0 kg) fitted with ruminal and duodenal cannulas were used in a split-plot designed experiment to determine the effects of ground flaxseed or corn and advancing season on site and extent of digestion when beef heifers grazed summer range in the northern Great Plains. Starting on June 9, 2006 heifers were rotationally grazed on three 12 ha native pastures and were randomly allotted to one of three treatments being: no supplement (**CON**); a cracked corn-soybean meal supplement fed at 0.35% of BW once daily (**CRN**); or a ground flaxseed supplement fed at 0.2% of BW once daily (**FLX**). Supplements were formulated to be isonitrogenous and isocaloric on a TDN basis. There were three experimental periods that were 28 days in length with 18 d for diet adaptation and 10 d for intensive sampling. Provision of supplement did not affect (P = 0.22) masticate IVOMD, however, between supplemented treatments, cattle fed FLX tended (P = 0.08) to select a lower quality masticate than CRN. Forage OM intake was not affected (P = 0.12) by supplementation nor was there a difference (P = 0.49) between CRN and FLX. A quadratic (P = 0.001) response was observed for forage OM intake as the grazing season advanced. Duodenal and fecal OM flow was not different (P = 0.39) across treatments. Therefore, true ruminal and total tract OM digestibility (% of intake) did not differ (P = 0.37 to 0.56) between CON and supplemented treatments and total tract digestibility was greater (P = 0.01) for CRN than FLX. Total duodenal N flow did not differ (P = 0.16) across treatments but responded quadratically (P = 0.03) with advancing season. True ruminal N digestibility was not affected by supplementation (P = 0.16 to 0.26). Likewise, ruminal NDF digestibility also did not differ (P = 0.26) with supplementation and CRN was not different (P = 0.22) from FLX. Total ruminal VFA decreased with supplementation (P = 0.04) and ruminal molar proportion of acetate was greater (P = 0.02) for FLX than CRN. Therefore, ground flaxseed appears to be a suitable energy supplement for cattle grazing summer rangelands.

Key Words: Digestibility, Flaxseed, Grazing

326 The influence of single essences on conjugated linoleic acid and vaccenic acid content in cows milk. S. La Terra*[1], M. Manenti[1], F. La Terra[1], M. Caccamo[1], G. Azzaro[1], S. Carpino[1], and G. Licitra[1,2], [1]*CoRFiLaC, Regione Siciliana*, *Ragusa, Italy*, [2]*D.A.C.P.A., Catania University*, *Catania, Italy*.

Milk from cows fed fresh green forage, especially those grazing grass, had a much higher unsaturated: saturated FA proportion, with more poly-unsaturated FA and more Conjugated Linoleic Acid (CLA). Rumenic acid, in particular, was higher in milk from silage-fed cows. *Anthemis arvensis, Calendula arvensis, Sinapis arvensis, Chrysanthemum coronarium* and Geraniaceae species were evaluated individually for their capacity to influence the content of CLA in milk. The plant species were collected at flowering age, and part of the forage was dried to produce hay. A single dose of both, fresh and dried forage was fed individually, ad libitum to two Holstein cows of similar lactation and milk production. The cows were adapted to a TMR ration, and TMR was given to the cows at the middle and at the end of the experiment as controls. A minimum time of seven days among treatments was maintained. Animals were held off feed for five hours before offering treatments. Feed intake was recorded by weighing provided forage or TMR and refusal. Milk was sampled the day before and the day of the treatment during the evening milking before and after treatment feeding, respectively. Generally, more hay was ingested compared to fresh forage. CLA level increased after treatment feeding with *Calendula arvensis* from 13.55 to 18.65 (nmol/mg fat), *Chrysanthemum coronarium* from 8.7 to 11.2 (nmol/mg fat), and *Anthemis arvensis* from 6.1 to 9.45 (nmol/mg fat). Vaccenic acid followed the same trend of CLA 38.19-43.3 (nmol/mg fat) in *Calendula arvensis*; 26.83-29.73 (nmol/mg fat) in *Chrysanthemum coronarium*; and 25.93-28.93 (nmol/mg fat) in *Anthemis arvensis*. Our data also shows that concentration of the total CLA and the Vaccenic acid do not have variations with *Sinapis arvensis* and Geraniaceae species. These differences may be due to fresh forage composition or the lesser amounts fed. We also found higher levels of Vaccenic acids and Rumenic acid in milk from fresh forage compared to milk from hay.

Key Words: Essence, CLA, Vaccenic Acid

327 Dietary coconut oil and animal fat blend decrease lactational performance of Holstein cows fed a high starch diet. M. Hollmann* and D. K. Beede, *Michigan State University*, *East Lansing*.

Medium-chain fatty acids in coconut oil (CO) are known to suppress methane generation in the rumen. However, little is known about the impact of CO on lactational performance. Our objectives were to evaluate the supplementation of dietary lipids in a high-starch diet fed to mid-lactation Holstein cows and to compare the incremental replacement of an animal fat blend (AFB) with CO. Thirty-two multiparous cows were adapted for 4 wk to a basal diet (CONTROL) with 60% concentrate: 28% corn silage: 12% alfalfa silage and hay, dry basis. CONTROL was formulated to contain: 16.5% CP (10.1% RDP and 6.4% RUP), 27.4% NDF (67% of NDF from forage), 3.0% fat, and 36.8% starch, dry basis. During the last week of adaptation, covariates of performance were measured daily (Table 1). Cows were blocked by covariate MY and assigned to one of four iso-nitrogenous diets (n = 8 per trt): CONTROL; 5% AFB; 2.5% AFB:2.5% CO; or, 5% CO, dry basis. When fat was substituted for dry ground corn, corn gluten meal was added to maintain N content of all diets. Measurements of cow performance and milk composition monitored during wk 3 of feeding treatment diets are presented in Table 1. However, DMI and MY dropped 39% and 24%, respectively, within 3 d with 5% CO and those cows were removed from the trial on d 6; their data were excluded from statistical analysis. Fat supplementation reduced DMI, MY and milk component yields and depressed milk fat and lactose concentrations. Replacing AFB partially with CO additionally lowered milk fat content and yield.

Table 1.

			Diets		Contrasts ($P <$)	
	Covariate	Control	AFB	AFB-CO	Control vs. AFB, AFB-CO	AFB vs. AFB-CO
DMI, kg/d	25.0	27.1	24.2	22.7	0.01	0.19
MY, kg/d	43.9	42.8	39.0	36.8	0.02	NS
ECM yield, kg/d	46.2	39.6	33.1	30.7	0.01	NS
Milk fat, %	3.02	3.06	2.59	2.11	0.01	0.02
Milk fat, kg/d	1.37	1.30	1.06	0.74	0.01	0.02
Milk protein, %	2.97	3.03	3.12	3.05	NS	NS
Milk protein, kg/d	1.36	1.30	1.20	1.10	0.02	0.12
Milk lactose, %	4.77	4.95	4.80	4.76	0.02	NS
Milk lactose, kg/d	2.20	2.14	1.84	1.76	0.01	NS
SNF, %	8.65	8.92	8.84	8.69	NS	NS
SNF, kg/d	3.98	3.85	3.39	3.18	0.01	NS

Key Words: Coconut Oil, Milk Fat Depression, Feed Intake

328 Effect of supplementation with sunflower oil (SO) or seeds (SS) combined or not with fish oil (FO) on milk production in grazing dairy cows. G. A. Gagliostro*[1], D. A. Garciarena[1], F. Luparia[1], A. Ferlay[2], and Y. Chilliard[2], [1]*Instituto Nacional de Tecnología Agropecuaria, INTA*, *Balcarce, Buenos Aires, Argentina*, [2]*Institut National de la Recherche Agronomique*, *Saint Genès Champanelle, France*.

After a covariate period (2 wk) without lipid supplement sixty four Holstein cows were assigned to four treatments (16 cows/treatment) during 5 experimental weeks. During each milking cracked corn grain (1.3 kg DM/cow) and a mineral-vitamin premix were consumed. Between the morning and the afternoon milkings cows grazed a pasture (Avena sativa L) at an herbage allowance of 11 kg DM/cow/day. Pasture DM intake was estimated by group within treatments and averaged 6.28, 5.51, 5.10 and 5.44 kg/cow/day in SS, SS-FO, SO, and SO-FO. After the p.m. milking, cows received four TMR diets: 1) SS = 74.7% corn silage (CS); 25.3% SS, 2) SO = 76.7% CS, 12.3% sunflower meal (SM), 11% SO; 3) SS-FO = 72.4% CS, 24.5% SS, 3.1 % FO and 4) SO-FO = 74.3% CS, 11.9% SM, 10.6% SO, 3.2% FO. SS were roughly ground before mixing. Intake of TMR was estimated by group resulting in 7.52, 7.33, 3.45 and 4.63 kg DM/cow/d for SS, SO, SS-FO and SO-FO respectively. FO represented 0.91 and 1.14% of total DMI in SS-FO and SO-FO. Cows were weighed at the start (wk -2) and the end (wk 5) of the trial and the subcutaneous fat depth (SFD) between the 12th and 13th ribs was also measured (scanner). Data were analyzed as a completely randomized design with repeated measures adjusted by covariable. Significant interactions between sources of vegetable oil

(SS or SO) and FO were not detected. No differences in milk yield (15.4 kg/d) were detected (P>0.10). Milk fat content (29.95 vs 28.05 g/kg, P<0.01), 4%FCM (13.22 vs 12.52 kg/d, P<0.04) and milk fat yield (0.47 vs 0.43 kg/d, P<0.01) were higher in SO than in SS diets. Feeding FO decreased (P<0.01) milk fat content (25.5 vs 32.5 g/kg), 4%FCM (11.9 vs 13.8 kg/d), milk fat yield (0.39 vs 0.50 kg/d), milk protein content (36.0 vs 37.2 g/kg) and yield (0.54 vs 0.57 kg/d) and lactose content (48.0 vs 49.35 g/kg). Cows lost BW only when FO was included in the diet (-0.203 vs +0.138 kg/d, P<0.01). Changes in SFD were not detected (P>0.29). Effects of FO are more important on milk production and composition than those of C18:2n-6 source.

Key Words: Milk Yield, Sunflower Oil, Fish Oil

329 Effects of particle size of calcium salts of fatty acids on rates of biohydrogenation and disappearance of essential fatty acids *in sacco*. E. Block*[1], E. Evans[2], C. J. Sniffen[3], and N. Clark[4], [1]*Church & Dwight Co Inc*, *Princeton, NJ*, [2]*Technical Advisory Services Inc*, *Bowmanville, ON, Canada*, [3]*Fencrest LLC*, *Holderness, NH*, [4]*Atlantic Dairy and Forage Institute*, *Fredericton Junction, NB, Canada*.

Calcium (Ca) salts of fatty acids (FA) can be produced to contain varying quantities of unsaturated fatty acids, yet remain in the solid form. The Ca salt must dissociate into free Ca and FA before biohydrogenation (BH) takes place, thus impacting the rate of BH. Estimates of rate of dissociation and BH are widely varied in the literature. The purpose of this research was to assess the relative effects of particle size on net BH. A sample of the commercial product MEGALAC-R® (Church & Dwight Co., Inc., Princeton, NJ) was obtained from a local feed mill. A portion was ground to pass through a 1 mm screen. Samples (5 g) of intact and ground MEGALAC-R were placed in 10 cm X 15 cm Ninex bags and quadruplicate samples were incubated in the rumens of two rumen cannulated lactating dairy cows for 1, 6, 12 and 18h. FA recovery was determined for the samples. Regression of total of each FA recovered vs. incubation time was used to compute rate functions. A paired T test was used to compare intact and ground rates. Rates of increase in saturated fatty acids and rates of decline in unsaturated fatty acids were higher (P<0.05) with the ground Ca salt sample (Table 1). Additionally, these rates varied for the individual fatty acids in the samples. Calculated passage rates for unsaturated fatty acids averaged 53.0% higher with intact samples. This trial demonstrates that particle size of Ca salts of FA is an important factor for reducing BH and improving unsaturated fatty acid supply past the rumen.

Table 1. Rates of change of Fatty Acids, %/h

Fatty acid	Intact rate	Ground rate	Intact R^2	Ground R^2
C16:0	+0.872	+1.779	0.786	0.813
C18:0	+1.230	+3.775	0.839	0.961
C18:1	-0.521	-2.469	0.716	0.681
C18:2	-2.850	-8.755	0.851	0.823
C18:3	-2.895	-8.583	0.831	0.837

Key Words: Biohydrogenation, Fatty Acids, Fatty Acid Kinetics

330 Calcium status influences the periparturient cow's ability to consume and utilize high levels of supplemental ruminal inert fat and is potentially mediated by insulin. L. M. Norat-Collazo*, A. Lukose, P. G. Smith, L. O. Ely, and M. A. Froetschel, *The University of Georgia*, *Athens*.

The mechanism for calcium status to influence the transition cow to utilize greater supplemental fat postpartum was investigated using a factorial designed experiment (2 X 2) with 12 multiparous Holstein cows. Cows were fed 2 weeks prepartum diets containing either 0 (+DCAD) or 9.3 % (-DCAD) of an anionic salt product (Biochlor®) to provide a cation-anion difference of 138 VS -143 meq/kg DM. Postpartum diets contained either 0 (LF) or 5.3 % (HF) of rumen inert fat (Megalac-R®). Daily intake and milk were measured for 12 weeks postpartum. At hourly intervals intake and diurnal circulating concentrations of hormones and metabolites (insulin, glucose, blood urea nitrogen (BUN), non-esterified fatty acids (NEFA), and plasma calcium) were measured during a 24 h period within week 1, 4 and 8 postpartum. Digestibility and energy balance were measured on week 6 and 12 postpartum. Cows fed HF diets consumed 9.8-16.3% less DM as compared to LF. Cows fed -DCAD had 13.8 to 15.2% lower DMI week 1-2 and increased DMI 7.8 to 10.7 % from week 7-11 postpartum. Cows fed +DCAD and HF produced 18% less milk week 1- 9; whereas, cows fed -DCAD and HF produced 28.6% more milk during week 8-12 as compared to controls. Insulin decreased in -DCAD fed cows wheras it was increased in cows fed HF. Insulin sensitivity appears to increase with prepartum -DCAD and decrease with HF. Feeding -DCAD did not counteract effects of fat supplementation on circulating insulin concentrations. Insulin was more related to meal feeding than other blood parameters measured. Insulin taken at h intervals during meal feeding was negatively correlated with meal size and this relationship increased as smaller meal size data was removed from the data set. Endocrine and metabolic parameters were influenced by dietary treatments indicating that differences in productivity and intake were related to greater insulin responsiveness, dietary fat utilization, and adipose tissue mobilization of cows in early lactation.

Key Words: Transition Cow, Intake, Calcium

331 Fat from corn germ compared with corn distillers grains and corn oil in dairy cow diets. M. M. Abdelqader*, A. R. Hippen, D. J. Schingoethe, and K. F. Kalscheur, *South Dakota State University*, *Brookings*.

The objective of this study was to determine the effect of feeding fat from corn germ compared with fat from distillers grains and corn oil on milk production and composition of dairy cows. Eight multiparous and eight primiparous lactating Holstein cows were used in a replicated 4 × 4 Latin square with 4-wk periods. Dietary treatments were a control (CON) diet containing 2.5% of ruminally inert lipid (Energy Booster 100®; Milk Specialties Co., Dundee, IL), 14% corn germ (CG), 30% distillers grains (DDGS), and 2.5% corn oil (CO). All diets were formulated to be isonitrogenous (18.0% CP, DM basis) and isolipidic (6.0% EE, DM basis). Dry matter intake was increased by feeding CG compared with CON; however, no difference in DMI was observed among CG, DDGS, and CO. Treatments had no effect on milk yield or energy-corrected milk. Feeding CG had no effect on milk fat percentage when compared with CON; however, DDGS tended to decrease ($P = 0.10$) milk fat percent-

age, and CO decreased ($P < 0.01$) milk fat percentage when compared with CG. Both DDGS and CO decreased ($P < 0.01$) concentrations of de novo synthesized fatty acids and increased ($P < 0.01$) the concentrations of preformed fatty acids in milk when compared with CON. Feeding DDGS and CO increased the concentration of vaccenic and conjugates of linoleic acid in milk fat. In conclusion, feeding dried distillers grains at 30% of DM decreased milk fat compared with a control diet, though fat from corn germ appeared to have minimal impact on milk fat when compared with dried distillers grains and corn oil.

Table 1.

	CON	CG	DDGS	CO	SEM
DMI, kg/d	24.8[b]	27.2[a]	26.3[ab]	25.2[ab]	0.88
Milk yield, kg/d	33.6	34.7	35.5	34.7	1.48
ECM, kg/d	35.6	36.3	36.4	34.8	1.43
Fat, %	3.88[a]	3.80[ab]	3.59[bc]	3.50[c]	0.12
Protein, %	3.24[a]	3.19[ab]	3.21[ab]	3.15[b]	0.06
Fatty acids, g/100g					
C18:1 *t*-10	0.57[c]	0.66[b]	0.66[b]	0.79[a]	0.02
C18:1 *t*-11	1.11[b]	1.33[b]	2.11[a]	2.08[a]	0.10
C18:2 *t*-10, *c*-12	0.05[b]	0.06[b]	0.09[a]	0.10[a]	0.01
C18:2 *c*-9, *t*-11	0.53[b]	0.60[b]	0.91[a]	0.94[a]	0.04

[a–c]Means within a row with different superscripts are significantly different ($P < 0.05$).

Key Words: Corn Germ, Fat, Distillers Grains

332 Duodenal flow and intestinal disappearance of fatty acids in lambs fed canola, brown mustard, or camelina seeds. P. L. Price*, V. Nayigihugu, C. M. Murrieta, D. C. Rule, J. M. Krall, and B. W. Hess, *University of Wyoming*, *Laramie*.

Four black-face wether lambs (77.5 ± 4.2 kg BW) fitted with ruminal, duodenal, and ileal canulae were used to compare site and extent of fatty acid digestion of diets with canola, brown mustard, or *Camelina sativa* seeds. Experimental design was a 4 × 4 Latin square and experimental diets consisted of 18% ground (2.54 cm) bromegrass hay, 65.2% cracked corn, 15% soybean meal, and 1.8% limestone (as-fed basis, Control) with oil seeds replacing enough of the soybean meal to provide 3% added fatty acid from each of the whole oil seeds. Urea was added to produce isonitrogenous diets. A 7–d adaptation period was followed by 2 d of duodenal and ileal sampling. Duodenal flow of 18:0 was greater ($P = 0.001$) for lambs fed canola and brown mustard than lambs fed the Control and camelina diets. Duodenal flow of 18:1 *c*9 was greater ($P < 0.001$) for lambs fed canola than lambs fed Control with lambs fed brown mustard and camelina being intermediate. Duodenal flow and apparent small intestinal disappearance (g/d) of 18:1*t*11, 18:3*c*9*c*12*c*15, and 22:1*c*11 were greatest ($P \leq 0.003$) in lambs fed camelina. Intestinal disappearance (% entering the duodenum) of 18:1*c*9 ranked ($P = 0.001$) canola < brown mustard < camelina = Control. Lambs fed Control and camelina had a greater ($P < 0.001$) percentage of total fatty acids digested in the small intestine than lambs fed canola; lambs fed brown mustard were intermediate. Although lambs fed canola or brown mustard had greater ($P = 0.007$) amounts of 18:0 disappearing from the small intestine, a lesser ($P = 0.001$) percentage of 18:0 disappeared from the small intestine of lambs fed brown mustard or canola. We conclude that the likelihood of enhancing unsaturated fatty acid content of food products derived from lamb is greatest for diets containing camelina seeds. Furthermore, total energy available from fatty acids digested in the small intestine would not be comparable among the various oil seeds.

Key Words: Lambs, Fat Supplementation, Oil Seeds

333 Effect of a dietary antioxidant AGRADO® Plus on production performance of early lactation dairy cows. G. R. Bowman*[1], M. Vazquez-Anon[1], and J. Nocek[2], [1]*Novus International, Inc.*, *St. Charles, MO*, [2]*Spruce Haven Research*, *Union Springs, NY*.

The objective of this study was to evaluate the effect of feeding a dietary antioxidant (AOX, AGRADO® Plus) on milk production and milk constituents during early lactation. Thirty multiparous lactating Holstein cows (30 days postpartum) housed in a tie stall facility were randomly assigned to one of the two treatments. Cows were balanced for DIM, milk yield at 30 days postpartum, and body condition score. All cows received the same basal diet throughout the 12 week study; however, cows assigned to AOX treatment received 250 mg/kg DM of the dietary antioxidant. Cows receiving the AOX significantly ($P = 0.01$) increased DMI by 2.3% over control (22.7 vs 22.2 ± 0.15) and tended to increase milk yield ($P < 0.10$). Both 3.5% fat corrected milk and energy corrected milk increased with AOX supplementation by 5.5% ($P < 0.01$; 44.8 vs 42.5 ± 0.4) and 4.8% ($P < 0.01$; 43.7 vs 41.7 ± 0.4), respectively. Milk fat percent was 3.3% for cows receiving the control diet and increased to 3.5% for AOX supplementation. No significant changes were observed in milk protein yield and percentage. Although mammary health was excellent throughout the study there was a decline in somatic cell count (SCC; 220,780 control and 129,480 AOX, ± 28,260) when the dietary antioxidant was fed ($P = 0.02$). No changes were observed in blood plasma concentration for the antioxidant enzymes superoxide dismutase and glutathione peroxidase or total antioxidant status between cows supplemented with and without AOX. The dietary antioxidant, AGRADO® Plus, increased feed intake, FCM, fat yield, fat percent, and tended to increase milk yield. This study also indicated that AOX may have a positive influence on the immune system as indicated by the decline in SCC.

Key Words: Antioxidant, Milk, Fat