siduals from an animal model (EBLUP) were calculated for each trait; the linear model included fixed herd-year-season, age at calving and days in milk effects, and random additive genetic effects. Second, models with F and *I* of each animal as predictor variables were fitted to the EBLUP residuals, for each trait. Statistical tests indicated that ancestral inbreeding, as measured by *I*, significantly reduces the negative effect of inbreeding by 4.13 kg for milk and 0.16 kg for protein yield per unit of *I*. No evidence of purging was found for fat yield, and SCS was not affected by inbreeding.

Key Words: Inbreeding Depression, Purging

251 Between-founder heterogeneity in inbreeding depression for production and somatic cell score in Jersey cows. D. Gulisija*[1], D. Gianola[1], K. A. Weigel[1], and M. A. Toro[2], [1]*Department of Dairy Science, University of Wisconsin-Madison*, [2]*Departamento de Mejora Genética y Biotecnolog$\liacute;a, INIA*, *Madrid, Spain*.

Severity of inbreeding depression depends on the genetic load carried by a population. If the load is distributed unevenly among founder genomes, descendants from different founders will be differentially affected by inbreeding. Between-founder heterogeneity in inbreeding depression for production traits and somatic cell score in milk (SCS) was studied using records from 59,788 Jersey cows. Inbreeding coefficients (F) were partitioned into components due to four founders, plus a remainder. A two-stage analysis was performed. First, empirical best linear unbiased predictions (EBLUP) of residuals for milk, fat and protein yield, and for SCS, were computed using linear models including fixed effects of herd-year-season, age at calving and days in milk, and random additive genetic effects of cows. Second, models with total and partial inbreeding coefficients as predictor variables were fitted to EBLUP residuals, by trait. Tests of differences between slopes indicated that regressions of milk, fat and protein yield on partial inbreeding coefficients were heterogeneous; SCS did not exhibit inbreeding depression. Hence, alleles contributing to inbreeding depression for production in this Jersey population seem to derive from specific founders. This indicates that a homogeneous effect of inbreeding on production may be an incorrect statistical specification in genetic evaluation models that attempt to account for inbreeding depression.

Key Words: Inbreeding Depression, Between-Founder Heterogeneity

252 Variance components of test-day milk, fat, and protein production, and somatic cell score from all parities of dairy cows in South-eastern Sicily estimated with a random regression model. A. P. W. De Roos*[1], M. H. Pool[2], M. Caccamo[3], G. Azzaro[3], J. D. Ferguson[4], and G. Licitra[3], [1]*NRS, Arnhem, The Netherlands*, [2]*Animal Sciences Group*, *Lelystad, The Netherlands*, [3]*CoRFiLaC*, *Regione Siciliana, Ragusa, Italy*, [4]*University of Pennsylvania*, *Kennett Square*.

Consorzio Ricerca Filiera Lattiero-Casearia (*CoRFiLaC*) aims to develop management figures for dairy farmers with respect to milk production, nutrition, cow health, and farm economics. A proper statistical analysis of milk production records with a random regression test-day model may help to identify problems in herds and cows that need the farmer's attention. The aim of this study was to estimate the variance components of test-day milk, fat, and protein production, and somatic cell score (SCS) records of Sicilian dairy cows in the Ragusa area. The data set comprised 491,426 test-day records from 18,953 cows on 285 herds. Parity was between 1 and 13, and days in milk (DIM) between 5 and 450. Variance components were estimated with a multi-lactation, random regression, test-day animal model. The model comprised four fixed effects and a random herd x test date effect. Random regressions were included for herd x year of test, animal additive genetic effect, common permanent environment and lactation specific permanent environment, using fourth-order Legendre polynomials. The permanent environmental effect was split into a common and a lactation specific part to enable the inclusion of records from all parities. Parameters were estimated with a Bayesian analysis using Gibbs sampling. Heritabilities for test-day production increased from around 0.20 at DIM 5 to around 0.30 at DIM 365, whereas heritabilities of test-day SCS were between 0.12 and 0.20. The correlations of the herd effects between DIM 5 and DIM 365 were around 0.60, indicating differences in persistency across herds. In contrast with production traits, herd variances of SCS were much lower than variances of cow effects. The estimated variance components will be used for routine evaluation of Sicilian dairy cows, with the purpose to present management figures on the herd or cow level.

Key Words: Random Regression, Test-Day Production, Dairy Cattle

Forages and Pastures: Beef Cattle and Pastures

253 Timing of herbage allocation 1. Effect on daily grazing pattern of beef heifers. P. Gregorini*[1,2], M. Eirin[1], R. Refi[1], M. Ursino[1], R. Flores[2], and O. Ansin[2], [1]*FCAyF Universidad Nacional de La Plata*, *La Plata, Buenos Aires, Argentina*, [2]*University of Arkansas*, *Fayeteville*.

Timing of grazing events (GE) determines how ruminants allot grazing to meet nutritional needs. Photosynthesis and respiration increases herbage DM and soluble carbohydrates concentrations daily, which may facilitate longer and intense GE at dusk. Linking the grazing pattern (GP) and the plant phenology with the time of herbage allocation (HA) emerges as an option to manipulate length and intensity of the GE. Herein, we analyzed the Spring daily GP of eight beef heifers in a crossover design. Heifers grazed annual ryegrass pastures using strip grazing. Behavioral activities of each heifer were recorded every 2 min, from 0600 to 1900 (total) and categorized into three intervals (morning, afternoon and evening) to determine time (minutes) of grazing (GT), rumination (RT), and idling (IT) along with bite rate (BR) at each time, when HA was allotted in the morning (0700; MHA) or afternoon (1500; AHA). An interval x HA affect was observed for GT, RT, IT and BR (Table). The AHA increased total IT (253 vs 213, P<0.01) and decreased GT (277 vs 331, P<0.01), concentrating GT in the evening, when BR was higher. The RT varied by time of the day, but total did not (166 AHA vs 152 MHA). With AHA, RT and IT were concentrated in the morning and afternoon. The time of HA alters the way heifers allot GT, RT and IT; AHA generates longer and more intense GE when herbage has higher quality.

	AHA				MHA			
Treatment/Time of the day[a]	GT	RT	IT	BR, bites/min	GT	RT	IT	BR, bites/min
Morning 0600 to 1000	80.5[b]	84.2[b]	95[b]	26.4[b]	119.2[c]	44[c]	75[d]	34.5[d]
Afternoon 1100 to 1400	57.2[c]	63[c]	108[c]	32.7[c]	80[b]	76[d]	76[d]	30.3[c]

[a]Minutes [b]-[e]Means in the same rows or columns with different superscripts differ (P < 0.001).

Key Words: Herbage Allocation, Beef Heifers, Grazing Behavior

254 Timing of herbage allocation 2. Effect on beef heifer weight gain, body condition score and daily herbage intake. M. Eirin[1], P. Gregorini*[1,2], C. Masino[1], R. Refi[1], M. Ursino[1], and O. Ansin[1], [1]*FCAyF Universidad Nacional de La Plata, La Plata, Buenos Aires, Argentina*, [2]*University of Arkansas, Fayeteville*.

The longer and most intensive meal of grazing ruminants occurs at dusk when herbage has an increased DM and soluble carbohydrates concentration. Thus, linking the daily grazing pattern, phenology of the plant, and changes of fresh herbage allocation (HA) emerges as a management tool to manipulate the pattern of nutrient intake of grazing ruminants. The aim of this work was to assess total weight gain (TWG), daily weight gain (DWG), change in body condition score (CBCS), and estimate herbage intake (HI) when HA was allotted in the morning (0700; MHA) or afternoon (1500; AHA). This experiment occurred in October, 2004; at the University of La Plata. Forty beef heifers were randomized across two treatments during one measurement period of five weeks, in a completely randomized design. They grazed annual ryegrass pastures using strip grazing. Heifers were weighed and evaluated for BCS (1 to 5 scale) weekly. Herbage intake was estimated weekly by measuring herbage offered and refused. Total weight gain and HI were tested by ANOVA and DWG and CBCS were analyzed as repeated measured in time; interactions between week x treatment were analyzed. The TWG (40.5 Kg AHA vs. 20.2 Kg MHA, $P < 0.001$), DWG ($P < 0.001$) and CBCS ($P < 0.02$) differed between treatments. Heifers in AHA gained 580 g (1.14 AHA vs. 0.56 MHA kg) and 0.012 points of body condition score more daily. Since herbage intake did not differ between treatments (5.62 AHA vs. 5.03 MHA; $P > 0.05$), nutrient intake may be higher in AHA. Therefore, the allocation of the new strip in the afternoon may increase animal performance.

Key Words: Time of Herbage Allocation, Beef Heifers, Performance

255 Fatty acid composition in subcutaneous and intramuscular fat of steers grazing pasture supplemented with corn oil. E. Pavan*[1,2] and S. Duckett[1], [1]*University of Georgia, Athens*, [2]*Instituto Nacional de Tecnología Agropecuaria, Balcarce, Bs. As., Argentina*.

To evaluate the effect of increasing corn oil (55.3% linoleic acid) supplementation of grazing steers on fatty acid (FA) composition, subcutaneous (s.c.) and intramuscular (i.m.) (longissimus at the 13th rib) samples were taken from the left side of the carcass of 18 steers. Steers were finished on a rotationally grazed tall fescue pasture for 117 d. Corn oil was supplemented at 0, 0.075 and 0.15% BW. Cottonseed hulls were used as a carrier for the corn oil and supplemented according to pasture availability (0.7 to 1% BW). Fatty acid composition was determined by GLC. A completely randomized design with a 3 oil level × 2 tissues factorial arrangement was used for data analysis. Linear and quadratic oil effects were tested. Saturated FA (SFA) tend to be higher in s.c than in i.m. fat ($P<0.08$), whereas monounsaturated FA (MUFA) and PUFA were lower ($P<0.01$) in s.c than in i.m. fat. Myristic acid was ($P<0.01$) higher in s.c. than in i.m., palmitic and stearic acids were not different ($P>0.44$). Trans-11 vaccenic acid and also CLA c9, t11 were higher in s.c. than in i.m ($P<0.01$). The percentages of n3, n6 and its ratio were lower in s.c. than in i.m. fat ($P<0.01$). Corn oil supplementation generated a quadratic decrease ($P<0.01$) of myristic acid and linear ($P<0.01$) of palmitic acid, but not of stearic acid ($P>0.10$). Total SFA tended to decrease linearly with increasing oil supplementation ($P=0.10$). A linear decrease was observed for palmitoleic acid ($P = 0.02$). Oleic and linoleic acids were not affected by oil supplementation ($P>0.10$). Linolenic acid was affected by treatments, decreasing linearly with increasing oil level ($P<0.01$); whereas other PUFA were not changed ($P>0.10$). PUFA, n6 and n3 proportion were not affected by oil level ($P > 0.10$). Both, trans-11 vaccenic acid and CLA c9, t11 showed a quadratic increase as oil level increased ($P<0.01$). The ratio n6:n3 increased linearly ($P<0.01$) with oil level. Corn oil supplementation to grazing steers reduced the high atherogenic myristic and palmitic acids concentration and increased the anticarcinogenic trans-11 vaccenic acid and CLA c9, t11 concentration.

Key Words: Pasture, Corn Oil, Fatty Acids

256 Corn oil supplementation to pasture fed steers: *in vivo* digestibility, performance and carcass traits. E. Pavan*[1,2], S. Duckett[1], and J. Long[1], [1]*University of Georgia, Athens*, [2]*Instituto Nacional de Tecnología Agropecuaria, Balcarce, Bs. As., Argentina*.

Eighteen Angus steers (438 ± 4kg) rotationally grazing endophyte free tall fescue (15.3 ± 0.6% PB, 61.4 ± 1.0% NDF and 1.7 ± 0.1% fatty acids) were supplemented during 117 days either 0, 0.075 or 0.15% BW of corn oil under a completely randomized design to study the effect of oil level on in vivo digestibility, performance and carcass traits. Cottonseed hulls were used as a carrier for the corn oil and supplemented according to pasture availability (0.7 to 1% BW). Chromic oxide (slow release boluses, CAPTEC®) and INDF were use as markers to estimate forage intake and in vivo total diet digestibility. Live weights (LW), ultrasound s.c. fat thickness (FT) and ribeye area (REA) were measured at different times during the supplementation period and evaluated as repeated measurements. Initial weight was used as a covariate, when significant. At the end of the supplementation steers were slaughtered and carcass traits evaluated. Pasture and total DM intake were linearly depressed ($P < 0.01$), and total fatty acids intake linearly increased by oil level ($P < 0.01$; 0.08, 0.13 and 0.16 as %BW for 0, 0.075 and 0.15% BW of supplemented oil, respectively). There was negative linear effect of corn level on the in vivo organic matter and NDF digestibility ($P < 0.01$). However, no interaction or oil level effects were significant ($P > 0.10$) for LW, ultrasound s.c. or REA. Live weight, ultrasound s.c. and REA increased ($P < 0.01$) over time and were 532 ± 3 kg, 0.59 ± 0.04 cm and 67.3 ± 1.2 cm^2 at the end of the trial. Weight gain tended to increase linearly in response to oil level ($P = 0.08$). Dressing percentage ($P = 0.09$), carcass weight ($P = 0.01$) and s.c. fat ($P = 0.01$) increased linearly with oil supplementation. No treatment effect was observed for carcass REA, KPH fat percentage, marbling score or yield grade ($P > 0.10$). These results show that, although corn oil supplementation depressed total intake and digestibility of pasture finished steers, performance was not negatively affected, but carcass weight and s.c. fat thickness improved.

Key Words: Oil Level, Pasture, Supplementation

257 Effects of winter stocker growth rate and finishing diet on beef rib composition and color. R. N. Sonon, Jr.*[1], S. K. Duckett[1], J. Neel[2], C. Realini[1], J. Fontenot[3], and W. Clapham[2], [1]*University of Georgia, Athens*, [2]*USDA-ARS, Beaver, WV*, [3]*Virginia Polytechnic Institute and State University, Blacksburg*.

Angus-cross steers (n=68, year 1; n=63, year 2; n=67 year 3) were used in a three-year study to assess the effects of winter stocker growth rate (LOW, MED, or HIGH) and finishing diet (corn silage-concentrate, CONC or pasture, PAST) on rib composition and color. The steers were slaughtered in a commercial meat plant and ribs (IMPS 107) from each carcass were removed, vacuum-packaged and shipped to the University of Georgia Meat Science Technology Center. At 14-d postmortem, the ribs were unpacked and allowed to bloom for 30 min prior to reading objective color score, L* (lightness), a* (redness), and b* (yellowness) in the exposed longissimus (LM) and subcutaneous (s.c.) fat using a Minolta colorimeter. The 9-10-11th rib section was then removed and separated into LM, s.c. fat, lean-trim, seam fat, and bone. The percentage of s.c. fat differed between years and was greater ($P < 0.01$) for CONC than PAST (13.57% vs 7.90%) whereas, PAST was higher ($P < 0.01$) than CONC in percentages of LM (28.94% vs 26.49%) and lean-trim (26.63% vs 21.32%). Seam fat percentage in year 1 for steers at LOW was similar to HIGH but was greater ($P < 0.01$) than MED, while in year 3, steers at MED and HIGH had larger ($P < 0.05$) proportions than those at LOW. Percent seam fat did not differ between growth rates in year 2. Percent bone of steers at HIGH was similar to MED but was higher ($P < 0.05$) than those at LOW in years 1 and 2. The proportion of bone was similar between growth rates on the third year. Longissimus muscle was lighter ($P < 0.01$; L* 42.1 vs 38.9), redder ($P < 0.01$; a* 25.0 vs 23.2) and yellower ($P < 0.01$; b* 11.8 vs 10.7) for CONC than PAST. Subcutaneous fat was yellower ($P < 0.01$; b* 17.4 vs 13.8) and darker ($P < 0.01$; L* 74.9 vs 77.0) for PAST than CONC. Total rib weight and weight of the 9-10-11th rib section was greater for CONC than PAST, however, about 62% of the difference was accounted for by higher proportions of s.c. and seam fat in CONC.

Key Words: Stocker Growth Rate, Finishing Diet, Rib Composition and Color

258 Cow-calf performance on Coastal or Tifton 85 pastures with access to aeschynomene for creep grazing. V. A. Corriher*[1], G. M. Hill[1], J. G. Andrae[2], M. A. Froetschel[1], and B. G. Mullinix, Jr.[1], [1]*University of Georgia*, *Tifton*, [2]*University of Georgia*, *Athens*.

Summer grazing cow and calf performance was determined in a replicated 2 X 2 factorial experiment using Coastal (C) or Tifton 85 (T85) bermudagrass pastures (4 pastures each; 4.86 ha) without or with aeschynomene creep grazing paddocks (n= 4; 0.202 ha; planted in May, 2004, 13.44 kg/ha). On June 10, 2004, 96 tester winter-calving beef cows and their calves were grouped by cow breed [9 Angus (AN), 3 Polled Hereford (PH)/group], initial cow BW (579.2 ± 75.3 kg), age of dam, calf breed (AN, PH or AN X PH), calf sex, initial calf age (113 ± 19.6 d), initial calf BW (155.1 ± 32.3 kg), and randomly assigned to pastures. Additional cow-calf pairs and open cows were added as grazers as forage increased during the season. Forage mass from each pasture was estimated using bi-weekly ground-level samples averaged for the 91-d grazing period. Animal unit equivalents (AU) were computed for cows and calves. Main effect interactions did not occur ($P > 0.10$) for variables, and least squares means were adjusted for significant covariate effects of calf birthweight, breed, sex, initial BW for calves; and, cow breed, calf breed and cow age for cow data. Weaning weights (Calf BW Sep 9) were further adjusted to 205 days of age and for sex and dam age adjustments of Beef Improvement Federation, and adjusted for appropriate covariate effects. Cow and calf performance were improved and cow stocking rates (SR) were higher for Tifton 85 pastures. Calves with access to aeschynomene creep grazing paddocks had higher ADG and weaning weights. Forage mass was abundant throughout the study, and tended to be higher for T85 pastures.

	Pasture		Creep grazing		Probability, $P <$		
Item	C	T85	Without	With	SE	Pasture	Creep
Calf BW Sep 9, kg	227.5	241.5	230.7	238.3	1.72	0.01	0.06
205-d BIF adj. BW, kg	239.0	242.1	241.4	248.8	2.49	0.01	0.06
Calf 91-d ADG, kg	0.80	0.96	0.84	0.92	0.02	0.01	0.06
Calf gain, kg/ha	215.4	243.0	221.5	237.4	6.88	0.07	0.20
Cow 91-d ADG, kg	0.06	0.17	0.04	0.18	0.02	0.01	0.01
Cow gain, kg/ha	17.3	63.1	19.8	60.4	9.07	0.05	0.06
Cow SR/ha	3.13	4.23	3.86	3.49	0.10	0.01	0.08
AU, cows/ha	4.08	3.84	3.89	4.03	0.04	0.05	0.05
Forage mass, kg DM/ha	6984	7775	7301	7459	223.0	0.10	0.66

Key Words: Forage, Bermudagrass, Calf

259 Coastal, Russell, and Tifton 85 bermudagrass hay and supplement intake and digestion by steers. G. M. Hill*[1], J. G. Andrae[2], B. C. Hand[1], and B. G. Mullinix, Jr.[1], [1]*University of Georgia*, *Tifton*, [2]*University of Georgia*, *Athens*.

Coastal (C), Tifton 85 (T85) and Russell (R) bermudagrass hays (H) harvested at 5-wk maturity were fed without or with a supplement (SUP) to steers to determine DMI and digestibility. Hays were third harvest, and had been fertilized 35 d before harvest (84 kg N/ha). Beef steers (n = 36; age = 11 mo; BW = 284.4 ± 12.6 kg) were randomly assigned to treatments (TRT) in a 3 X 2 factorial experiment. Steers had recently completed a similar experiment; therefore, steers were individually-fed C, T85 and R hays free-choice for 17d, without or with a SUP (1.78 kg DM/d; 24.4% CP; 32.8% soybean meal, 67.2% ground corn, DM basis). Steers not fed the SUP were fed corn at 0.20 kg DM/d. Chromic oxide was fed in corn and SUP (10 g/steer daily, d 8 to d 17) as indigestible marker, and fecal samples (12/steer; d 8 to d 18) were analyzed for Cr and nutrients. Hay DM, CP, ADF, and NDF (%, DM basis), respectively, were: C = 90.8, 12.0, 39.2, 76.4; T85 = 91.4, 12.6, 39.9, 75.6; R = 91.3, 15.1, 38.8, 75.4, and all diets provided 12.0 to 15.6 % CP in DM. Least squares means for hay DMI, total dietary DMI (TDMI), and digestion coefficients (DC; Table) were adjusted for steer initial BW. Hay DMI and total DMI were each higher ($P <$ 0.01) for C than R and T85, and DMI was higher ($P < 0.01$) with SUP than without SUP. Digestion of OM, CP, ADF and NDF were lower for R than C and T85 without SUP, but with SUP digestion of these components for R increased to levels similar to C and T85, creating H X SUP interactions. Although similar in composition, R hays had lower DMI and digestibility, but digestion of R was improved greatly by SUP feeding, which supplied additional energy that compensated for low fiber digestion of this hay.

	Without SUP			With SUP				H x SUP
Item	C	R	T85	C	R	T85	SE	$P <$
Hay DMI, kg	4.15	3.40	3.61	4.38	3.58	3.45	0.18	0.53
TDMI, kg	4.35	3.60	3.81	6.15	5.36	5.22	0.18	0.53
OM DC, %	73.0	54.4	70.6	77.0	74.6	77.7	2.76	0.02
CP DC, %	76.9	67.6	70.3	65.1	66.4	58.7	2.76	0.10
ADF DC, %	67.0	43.1	67.4	65.7	60.9	68.8	3.79	0.04
NDF DC, %	70.6	49.4	68.3	67.0	64.1	70.0	3.34	0.03

Key Words: Steer, Hay, Digestion

260 Effects of winter stocker growth rate and finishing diet on beef longissimus fatty acid composition. R. N. Sonon, Jr.*[1], S. K. Duckett[1], J. Neel[2], C. Realini[1], J. Fontenot[3], and W. Clapham[2], [1]*University of Georgia*, *Athens*, [2]*USDA-ARS*, *Beaver, WV*, [3]*Virginia Polytechnic Institute and State University*, *Blacksburg*.

Longissimus muscle (LM) of Angus-cross steers (n=68, year 1; n=63, year 2; n=67, year 3) was assayed to determine the effects of winter stocker growth rate (LOW, MED, or HIGH) and finishing diet (corn silage-concentrate, CONC or pasture, PAST) on total lipid content and fatty acid composition. Total lipids were extracted by organic solvents and fatty acid composition was determined by GLC. Total LM lipid content was greater ($P < 0.01$) for CONC than PAST (4.0% vs 2.3%) and was higher ($P < 0.01$) in years 1 and 3 than year 2. Regardless of year and growth rate, LM trans vaccenic acid (C18:1t11) concentration was higher ($P < 0.01$) for PAST than CONC except for steers grown at LOW in year 2. The PAST LM CLAc9t11 concentration was higher by about 100% than in the LM of CONC. Total saturated fatty acids concentration in LM tended to be greater ($P = 0.06$) for steers on PAST than on CONC and was higher ($P <$ 0.01) in year 1 than years 2 and 3. Monounsaturated fatty acids (MUFA) concentration was higher ($P < 0.01$) in the LM from year 1 than year 2 but similar to year 3. Between growth rates, LM MUFA of steers grown on HIGH rate was greater ($P = 0.01$) than those on LOW but was similar to those on MED. Steers finished on CONC had greater ($P < 0.01$) LM MUFA concentration than PAST. In years 1 and 2, LM total omega-6 fatty acids concentration did not differ between growth rates but was greater ($P < 0.01$) for steers at LOW than those on HIGH in year 3. Omega-6 fatty acids concentration was higher ($P = 0.042$) in the LM of CONC than PAST when steers were grown at LOW but was unaffected by diet when stockered at MED or HIGH. Total omega-3 fatty acids concentration was higher ($P < 0.01$) for PAST than CONC in all years. Omega-6 to omega-3 fatty acids ratio in the LM was lower ($P < 0.01$), thus more desirable for human health. Pasture finishing systems produced leaner beef with greater concentration of CLA and omega-3 fatty acids.

Key Words: Stocker Growth Rate, Finishing Diet, Fatty Acids

261 Volatile flavor compounds in beef from cattle finished on pastures or concentrates. S. Duckett*[1], J. Neel[2], W. Clapham[2], and J. Fontenot[3], [1]*University of Georgia*, *Athens*, [2]*USDA-ARS*, *Beaver, WV*, [3]*Virginia Polytechnic and State University*, *Blacksburg*.

Angus-cross steers (n = 68) were stocked at three growth rates (LOW, MED or HIGH) during the winter months prior to finishing on pasture (PAST) or corn

silage-concentrate diet (CONC) to assess differences in volatile flavor compounds as influenced by finishing system. Ribeye steaks were broiled to an internal temperature of 71°C and served to an eight member sensory panel for determination of off-flavor intensity (0 = none; 8 = intense). Sensory off-flavor ratings were averaged for each steak and ranked from highest to lowest by finishing treatment. A sub-sample (n = 20) was selected based on sensory off-flavor ratings to represent lowest (LOW) and highest (HIGH) off-flavor scores for each finishing treatment. Steaks were broiled, cut into cubes, and samples (2.5 g, in duplicate) taken immediately for static headspace analyses by GLC. Flavor compounds reported to impact meat flavor were identified based on retention time. Data were analyzed with finishing treatment, off-flavor score and interaction in the model. Total peak area of all flavor compounds and total aldehydes did not differ due to dietary treatment, off-flavor score, or their interaction. Hexanal, an oxidation product of linoleic acid, was present in greater ($P < 0.05$) amounts for CONC than PAST, regardless of off-flavor score. 2-Methyl propanal was present in greater ($P < 0.01$) concentration for PAST than CONC, regardless of off-flavor scores. Volatile flavor compounds did not differ between steaks of LOW or HIGH off-flavor scores but several interactions between dietary treatment and off-flavor were detected. Propanal peak area was greater ($P < 0.05$) for PAST-HIGH than PAST-LOW or CONC-HIGH. Three unidentified peaks were greater for CONC-HIGH than CONC-LOW and PAST. One unidentified peak, peak 48, was present in higher ($P < 0.01$) amounts for PAST-HIGH than PAST-LOW and CONC. Equations developed to predict off-flavor score using stepwise regression included unidentified peak 48, octanal, and propanal, and explained 31% of the variation in off-flavor scores.

Key Words: Beef, Pasture, Off-flavor

262 Using stockpiled non-toxic endophyte-infected tall fescue to develop beef heifers in the Piedmont of North Carolina. E. J. Oliphant*, M. H. Poore, J. T. Green, and M. E. Hockett, *North Carolina State University*, *Raleigh*.

A 2-yr grazing study was conducted from Dec to Feb of 2002-2003 and 2003-2004. The objective of this study was to evaluate Jesup non-toxic endophyte-infected fescue (EN) compared to endophyte-infected (E+) and endophyte-free fescue (E-) from an animal performance and agronomic persistence standpoint. Forty-eight (yr 1) and 60 (yr 2) Angus X heifers were grazed on E+, E- or EN for 70 d in yr 1 and 86 d in yr 2. Plots were established in the autumn of 1999 and averaged 1.01 ha. Plots were clipped in Aug and fertilized in Sept with 95 kg/ha (yr 1) and 84 kg/ha (yr 2) 30% liquid N. Heifers were allocated fresh forage daily in a stripgrazing system. Forage quality did not differ by treatment (trt) but was higher in yr 1 than in yr 2 (IVTDMD 80% yr 1, 65% yr 2; $P < 0.01$). Crude protein tended to be greater in yr 1 (10.9%) than in yr 2 (9.74%; $P = 0.08$). Average daily gain did not differ by trt but was higher during yr 2 than yr 1 (0.48 kg/d yr 2, 0.40 kg/d yr 1; $P = 0.03$). Serum urea N concentrations did not differ by yr or trt but there was a yr by trt interaction ($P = 0.02$). Serum urea N was below 8.14 mg/dL both years, suggesting CP deficiency. Serum progesterone levels indicated that trt and yr did not affect estrous cycles. Area grazed was greater both years for E- (0.87 ha yr 1, 0.66 ha yr 2) than for E+ (0.68 ha yr 1, 0.56 ha yr 2) or EN (0.71 ha yr 1, 0.58 ha yr 2; $P = 0.01$). Non-fescue plants in the sward was greater for E- (18.9% yr 1, 25.0% yr 2) than E+ (12.2% yr 1, 13.1% yr 2) or EN (12.5% yr 1, 15.9% yr 2; $P = 0.02$). Total forage mass was lower both years for E- than E+ or EN ($P = 0.05$). The percentage of total fescue that was green was greater in yr 1 (66.5%) than in yr 2 (51.8%), but did not differ by trt. Results indicate E+ may not negatively affect animal performance when stockpiled and stripgrazed in the piedmont of North Carolina over the winter. EN appears to have agronomic persistence equal that of E+ and may provide a viable alternative to E+ and E-.

Key Words: Stockpiled Tall Fescue, Beef Heifers, Endophyte

263 Effect of condensed corn distiller soluble supplementation on the fatty acid composition of ribeye steaks from pasture-fed and feedlot steers. H. Koknaroglu*[1], P. Tsengeg[2], T. Knight[2], D. Beitz[2], and P. Hoffman[2], [1]*Suleyman Demirel University*, *Isparta, Turkey*, [2]*Iowa State University*, *Ames*.

A grazing and feedlot finishing trial was conducted to compare the effects of condensed corn distiller solubles (CCDS) on the fatty acid composition of ribeye steaks from steers. Calves (n=112) were weighed and assigned to four treatments group by weight and color pattern. Treatments one (TRT1) and two (TRT2) was rotational grazing (May-September) followed by chopped alfalfa hay and corn (TRT1) or corn stalks and CCDS (TRT2) during the feedlot finishing period. Treatments three (TRT3) and four (TRT4) were fed in the feedlot from May until harvested. TRT3 included chopped alfalfa hay and corn, and TRT4 included corn stalks and CCDS. Cattle were weighed every 28 days and, when cattle reached an average of 586 kg of liveweight, they were harvested. Ribeye steaks were removed from the carcasses and were transferred to the laboratory for analysis. Lipid was extracted and methylated for analysis by gas chromatography. TRT4 caused a greater CLA content in ribeye steaks than did the other treatments ($P<0.05$). TRT1 caused a lesser CLA content than did TRT2 ($P<0.05$). TRT4 caused a greater concentration of trans-vaccenic acid than did the other treatments ($P<0.05$). TRT4 caused a greater total saturated fatty acid content and a lesser total monounsaturated fatty acid content than did TRT1 and TRT3. Polyunsaturated fatty acid content of beef did not differ among treatments. Atherogenic index did not differ among treatments, even though TRT4 caused a numerically greater score ($P>0.1$). Results showed that providing condensed corn distiller solubles into the diet of pasture-fed cattle increases the CLA content of beef.

Key Words: Cattle, Feedlot, CCDS

264 Characterization of protein degradability and diet nutritive value of beef cows grazing native range in eastern colorado. V. A. Aznarez*, J. C. Whittier, T. E. Engle, P. A. G. A Sampaio, and W. S. Mackay, *Colorado State University*, *Fort Collins*.

Our objective was to determine the nutritive value, characterize the protein degradability, and determine the effects of seasonal changes on diets consumed by cows grazing on Eastern Colorado rangelands. Nutrient content of diets was determined from grab-samples collected from 3 fistulated cows, using the rumen evacuation technique. Samples were collected 2x/mo in spring (**SP**) and summer (**S**), and 1x/mo in fall (**F**) and winter (**W**), over a 3 yr period (Oct. 1999-Sep. 2002). Forage availability was determined as adequate by ocular assessment. Ingested forage was analyzed for CP, NDF, ADF, ADL, EE and AIA. *In situ* neutral detergent insoluble nitrogen kinetics of digestibility were determined. Microbial yield was calculated from: Bacterial CP (**BCP**)=2.619948 +1.782321X -0.095981X^2 +0.001777X^3 -0.000010524X^4 (X = %TDN). No interaction between collection-cow and season or yr was found ($P>0.05$). Proximal analysis data showed no difference between yr 1 (**Y1**) and 2 (**Y2**; $P>0.05$). Values for NDF and ADF on yr 3 (**Y3**), were higher than those for Y1 and 2 in early-S and SP, but lower in F ($P<0.05$). Levels of CP in F were higher for Y3 (14.1 ± 1.06%DM) with respect to Y1 and 2 (10.4 ± 1.49 and 9.2 ± 1.48%DM respectively, $P<0.05$), but lower in SP (Y1=15.8 ± 1.23, Y2=18.3 ± 0.64 and Y3=12.8 ± 1.06%DM, $P<0.05$). On average for the 3 yrs, CP was highest in SP (15.6 ± 0.59%DM) and lowest in W (9.2 ± 0.47%DM; $P<0.05$). However, for Y1 degradable intake protein (**DIP**) was highest in W, reaching a maximum of 94.8 ± 0.72%CP ($P<0.05$). Although DIP was adequate yr-round for Y1, metabolizable protein content did not meet the expected animal requirements for W and late-S ($P<0.05$), which was mainly due to the low TDN of the diet that likely restricted the BCP synthesis. Analyses for Y2 and 3 ADL and protein degradability are currently underway. Understanding seasonal effects on native range nutritive values is important for developing cost effective nutrition programs for the cow herd.

Key Words: Ruminal Degradable Protein, Native Range, Beef Cows