T77 Estimating losses of dry matter from alfalfa-orchardgrass mixtures following rainfall events. W. K. Coblentz* and W. E. Jokela, *US Dairy Forage Research Center*, *Marshfield, WI*.

Studies designed to assess the effects of natural or simulated rainfall events on wilting experimental hays often have been hampered by questionable and erratic estimates of DM recovery following wetting. An alternative methodology for measuring losses of DM may be to use water-insoluble, cell-wall constituents as internal markers. Our objective was to verify this approach using insoluble cell-wall constituents [neutral-detergent fiber (NDF) without additives, NDF with alpha-amylase, NDF with sodium sulfite, NDF with alpha-amylase and sodium sulfite, acid-detergent fiber (ADF), hemicellulose, cellulose, and acid-detergent lignin] as internal markers. Forages consisted of 100, 75, or 50% alfalfa (*Medicago sativa* L.; wet basis), with the balance comprised of orchardgrass (*Dactylis glomerata* L.; 0, 25, or 50%, respectively). Forage mixtures were sealed into 18 × 30-cm custom-made Dacron bags (53-um pore size), dried under forced air (50°C) to determine accurately the initial mass of DM in each bag, and then wetted under a rainfall simulator for either 1, 2, 4, 6, 8, or 12 h at a calibrated rate of 70 mm/h (70, 140, 280, 420, 560, or 840 mm, respectively). These procedures resulted in actual losses of DM ranging from 0 to 10.4%. Following treatment, recoveries of all markers were high (≥90.1%), but deviations from 100% were smallest for the NDF-based markers, as well as ADF and cellulose. Linear regressions of predicted (marker-based) recoveries of DM on actual values determined gravimetrically were especially good ($r^2 \geq 0.775$) when NDF-based markers were used to estimate recovery. In all cases, neither slopes ($P \geq 0.103$) nor intercepts ($P \geq 0.083$) differed from unity and zero, respectively. Among markers requiring multiple digestion steps, ADF exhibited acceptable estimates of slope (0.84) and intercept (14.5%) that did not differ from unity ($P = 0.222$) and zero ($P = 0.231$), respectively. Neutral-detergent fiber appears to be a particularly suitable internal marker for measuring recoveries of DM following wetting; however, this approach remains contingent on complete recovery of shattered leaf particles prior to conducting laboratory analysis.

Key Words: Internal Marker, DM recovery

T78 Influence of cutting time and swath type on intake, site, and ruminal metabolism of alfalfa hay. T. Shenkoru, H. Hussein, and T. Wuliji*, *University of Nevada*, *Reno*.

Alfalfa (*Medicago sativa*) is important high protein legume forage. However, its nutritional value can be affected by various environmental and managerial factors. Among them cutting time and drying process affect alfalfa composition and nutritive value. This study investigates the effect of cutting time and swath width of alfalfa hay on the extent of ruminal and duodenal digestion of structural, nonstructural carbohydrate components and protein. Four ruminal and duodenal cannulated Suffolk ewes (90.5 ± 9.8 kg initial BW and 18 mo old) were used in a 4 × 4 Latin square design. Acid insoluble ash is used to calculate duodenal flow and digestibility of nutrients. Treatments were arranged as a 2 × 2 factorial with the main factors being cutting time (AM vs. PM), and swath width [narrow (1.3 m.) vs wide (1.6 m.)]. No interaction effect between harvesting time × swath width was found for daily organic matter intake. The daily gram intake of organic matter (OM), neutral detergent fiber, acid detergent fiber, hemicellulose, cellulose and total nonstructural carbohydrate (TNC) were higher ($P < 0.05$) for the narrow swath than wide swath. PM-harvesting increased ($P < 0.05$) TNC and nitrogen (N) intake from 216 to 260 g/d and 49.3 to 57.5 g/d, respectively. Ruminal digestion of structural carbohydrates, including TNC was not affected by treatments. Total short chain fatty acids, molar proportion of acetate and butyrate were not altered by treatments. However, PM-harvesting increased ($P < 0.05$) molar percentage of butyrate from 7.6 to 8.2 mol/100 mol. Branched chain fatty acids were not affected ($P > 0.05$) by treatments. Microbial N flow to duodenum was greater (16.5 vs. 13.4 g/d, $P < 0.05$) for PM- than AM-harvested alfalfa hays. Duodenal non-ammonia N and dietary N flow, including efficiency of bacterial protein synthesis (averaged 13.2 g N/kg OM digested), were not affected by treatments. The study indicated that PM-harvested hay and hay dried in narrow swath had a better nutritional quality compared with AM hay and hay dried in wide swath.

Key Words: Alfalfa, Cutting Time, Digestibility

T79 Plant maturity and genetic influences on *in vitro* NDF digestibility of alfalfa. A. Palmonari*[1], N. Brogna[1], G. Rossi[1], I. Fusaro[2], G. Biagi[1], and A. Formigoni[1], [1]*DIMORFIPA Universitá di Bologna*, *Ozzano dell'Emilia, Bologna, Italy*, [2]*Dipartimento di Scienze Degli Alimenti Universitá di Teramo*, *Teramo, Italy*.

Aging and excess of environmental stress conditions negatively affect alfalfa NDF digestibility (NDFd). This study evaluated the influence of plant maturity on in vitro NDFd (IVNDFd) of different varietes of alfalfa. Two cuttings from different four alfalfa varieties (A experimental, B, C and D commercial) were analyzed, each in five replicates, for chemical composition (CP, ADF, ADL, NDF) and 24h IVNDFd with Tilley & Terry technique. All varieties were grown in the same location under the same climatic and agronomic conditions. Each variety was cut at two stages of maturity: 20 days (II) and 30 days (III) after previous harvest. During the trial, temperature and amount of rainfall were: (II) 33.1°C max, 17.3°C min and 15.7 mm ; (III) 34.01°C max, 18.2°C min and 34.9 mm. Samples were harvested by hands at a 5.0 cm height and immediately dried at 65°C in a forced air oven. No statistical differences were found among varieties for CP, ADF, ADL and NDF in collection II and III, but differences ($P < 0.01$, Table 1) were observed for IVNDFd. These results demonstrate that variety A maintains better IVNDFd as maturity advances.

Table 1. Least Squares Means.

CUT	Variety	C.P. (%DM)	ADF (%DM)	ADL (%DM)	NDF (%DM)	IVNDFd (%DM)
II	A	24.55	24.87	5.07	45.65	64.23 A
II	B	23.02	26.24	5.32	47.54	60.19 B
II	C	23.04	25.24	5.12	46.68	58.47 B
II	D	23.16	25.67	5.26	46.32	57.91 B
	SEM	0.23	0.21	0.17	0.28	0.65
III	A	20.55	25.77	5.43	48.66	59.79 A
III	B	22.03	25.41	5.46	49.27	54.14 B
III	C	20.94	26.42	5.61	48.94	50.04 B
III	D	20.47	25.33	5.32	48.78	53.49 B
	SEM	0.25	0.15	0.12	0.22	0.98

Values within rows within cut with different letters differ ($P < 0.01$).

Key Words: Alfalfa, Maturity, Neutral Detergent Fiber Digestibility

T80 Effect of a lactic acid-*lactobacillus* product and bale moisture on forage quality, and voluntary intake and digestibility of crabgrass hay by lambs. L. Hardin[1], A. Killion[1], J. Caldwell[1], K. Coffey*[1], D. Philipp[1], and W. Coblentz[2], [1]*University of Arkansas*, *Fayetteville*, [2]*USDA-ARS*, *Marshfield, WI*.

A 1.6-ha field of common crabgrass (*Digitaria ciliaris* [Retz.] Koel.) was divided into 12 plots that were used in a randomized complete block design with a 2 x 2 factorial treatment arrangement to determine the impact of a lactic acid-*lactobacillus* hay preservative and moisture concentration at baling on post-storage forage quality, and intake and digestibility by lambs. Half of the plots within each block were treated with 81 mL/tonne DM of a solution containing 11% lactic acid and non-viable *Lactobacillus acidophilus* at the time of mowing (T) and half were not treated (U). Within T and U plots, half were baled at 18% (M18) and half at 28% moisture (M28). Six bales per plot were selected at random, weighed, and stored in insulated 6-bale stacks. Core samples were taken from 3 of the bales after 42-d of storage. Black-faced wether lambs (n=16) were allocated randomly by weight to receive 1 of the 4 treatment combinations. Hay was chopped, then offered ad libitum to lambs housed in individual 1.1 x 1.5-m pens with expanded metal floors. Following a 10-d adaptation, total feces were collected for 5 d using fecal bags and dried at 50 C. Ash, CP, and ADF did not differ (P≥0.15) among treatments, but NDIN and lignin were greater (P<0.05) and IVDMD was lower (P<0.05) from M28 vs. M18. Maximum bale temperature was higher (P<0.01) from M28 vs. M18 (55 vs. 35 C). Total DMI (g/d and g/kg BW) did not differ (P≥0.16) among treatments. In vivo DMD was greater (P<0.01) from M28 vs. M18 (55.5 vs. 50.1%) and from T vs. U (56.0 vs. 49.7%). Digestible DMI was greater (P<0.05) from T vs. U (12.7 vs. 10.1 g/kg BW). Therefore, treating crabgrass with a lactic acid-*lactobacillus* product prior to baling may not affect forage quality, but may improve DM digestion and digestible DMI by lambs. Baling moist crabgrass hay may have negative impacts on some measures of forage quality but may increase DM digestion by lambs.

Key Words: Crabgrass, Digestibility, Lambs

T81 Harvest management effects on Tifton-85 bermudagrass greenchop nutritive value. Y. C. Newman*, C. R. Staples, A. T. Adesogan, A. R. Blount, and C. Mackowiak, *University of Florida*, *Gainesville*.

One way of minimizing costs in dairy nutritional programs is to grow forages of high nutritive value and quality that can be used as part of the ration and in addition be used to attenuate excess soil nutrients. Tifton-85 bermudagrass (*Cynodon spp.*;T-85) provides high yield and nutritive value but defoliation management practices and their implications in nutritive value have not been evaluated under intensive greenchop production. The objective of the study was to examine the effects of harvest management (harvest interval × stubble height) on nutritive value (CP, IVTD, TDN, NDF, ADF, NDF digestibility) of T-85 when harvested for greenchop. A factorial combination of harvest interval (21, 24, 27, and 35 d) and stubble height (7 and 14 cm) was arranged in a split-plot design in an on-farm study. Experimental units were 120-m^2 plots replicated three times. Data were analyzed using mixed model methodology through MIXED procedure of SAS. There were a total of 6, 5, 4, and 3 harvests during the 2007 season (June-Oct) for 21, 24, 27, and 35 d harvest frequencies, respectively. First year data show that stubble height did not have an effect (P>0.05) on nutritive value. There were interactions with harvest frequency (P ≤ 0.01); therefore, data was analyzed by harvest frequency. Crude protein was highest (217 g kg^{-1}) when forage was cut at 21 d and lowest (201 g kg^{-1}) at 35 d. NDF for 21 d was not affected by season and averaged 685 g kg^{-1} but NDF digestibility declined toward the fall months; and was 720 g kg^{-1} at 21 d and lowest (702 g kg^{-1}) at 35 d. In vitro true digestibility followed similar response. Harvest intervals of 21 days provides greenchop of excellent quality but 24 and 27 days seem to provide the best compromise for nutritive value, production and associated pests in production of T-85 greenchop.

Key Words: Tifton-85, Bermudagrass, Greenchop

T82 Chemical composition and nutritive value of forage silages produced in the Italian Po Valley. S. Colombini*[1], L. Rapetti[1], N. Rizzi[2], P. Amodeo[2], G. Galassi[1], and G. M. Crovetto[1], [1]*University of Milan*, *Milan, Italy*, [2]*Dairy Farmers Association of Lombardy*, *Crema, Italy*.

In order to characterize the nutrient composition and the feed value of ensiled forages produced in the Po Valley, 92 silage samples were collected in 2004 and 2005: 15 corn, 15 wheat, 5 barley, 3 rye, 3 sorghum grain, 18 sorghum forage, 15 alfalfa, 11 Italian ryegrass and 7 permanent pasture. Samples were analyzed for chemical composition, N solubility and fermentative profile. The energetic content was determined according to the gas production (GP) technique (Menke and Steingass, 1989). Data were analyzed by GLM procedures of SAS.
Dry matter and crude protein contents were higher (P<0.001) for alfalfa (61.0 and 21.0%) and permanent pasture (57.6 and 17.0%) silages due to field wilting. Alfalfa silages were characterized by a high concentration (P<0.001) of NPN (8.3% DM).
Corn showed the highest gas production(P<0.001) at 24 hours (58.6 ml/200 mg DM), due to its starch content. Italian ryegrass also was very fermentable because of its highly digestible fibre. The NEl values (Mcal/kg DM) were 1.58 (corn), 1.46 (wheat), 1.45 (Italian ryegrass), 1.36 (permanent pasture), 1.33 (barley), 1.31 (sorghum grain), 1.29 (alfalfa), 1.22 (rye), 1.16 (sorghum forage).
Dry matter concentration was positively correlated (P<0.001) to pH, CP, fiber-bound N and sugars, and negatively correlated (P<0.001) to acetic, propionic and lactic acid, total organic acid, ethanol and NH3-N. Lactic acid concentrations (% DM) were: 10.4% in barley, 8.0% in sorghum grain, 7.8% in Italian ryegrass, 6.9% in corn and wheat. Alfalfa (2.9%) and rye (2.4%) had lower (P<0.05) lactic acid content compared to barley, sorghum grain and Italian ryegrass. Rye also had the highest (P<0.05) concentrations of acetic (4.3%), propionic (1.4%) and butyric (2.4%) acids, and NH3-N (6073 mg/kg DM). All the other silages had low VFA and NH3-N contents (P<0.05). In conclusion, corn silage had the highest (P<0.001) NEl content, while alfalfa had the highest protein content, but with a high proportion of NPN. Italian ryegrass was very fermentable with a high nutritive value.

Key Words: Silage, Nutritive Value

T83 Nutritive value of sunflower silage associated with different by-products. R. H. de T. e Buschinelli de Goes*[1], A. C. Martinez[2], E. S. Miyagi[3], C. O. de Abreu[2], R. de C. M. Tramontini[2], K. C. da S. Brabes[1], and E. R. de Oliveira[1], [1]*Universidade Federal da Grande Dourados*, *Dourados, MS, Brasil*, [2]*Universidade Estadual de Maringá*, *Umuarama, PR, Brasil*, [3]*Universidade Federal de Goiás*, *Goiânia, GO, Brasil*.

Sunflower plants (20.0%DM and 10.0%CP) were ensiled in experimental silos to evaluate the effect of adding soybean hulls or crushed sunflower seeds, and ensiling period, on the fermentation and nutritive value of sunflower silage. A 3X3 factorial treatment design was replicated 3 times. Treatments were: Control (100% sunflower plants; SS), SS+5% soybean hulls (SS+SBH) and SS+5% crushed sunflower seeds (SS+CSS) with 14, 21 or 28 days ensiling. At 28 days, pH of SS was lower (3.08; P<0.05) than SS+SBH (3.32) and SS+CSS (3.25). A limitation of SS is DM content (19.93%). Adding soybean hulls or crushed sunflower seeds increased DM% to 31.32% and 27.77%, respectively. There was interaction (P<0.05) between the days of fermentation and the treatments. There was no difference for DM presented by SS+SBH, for 14 and 28 days ensiling; however for SS+CSS, the 21 day ensiling presented mean of 30.37%, and 14 and 28 days ensiling didn't differ. For SS there was effect after 21 days of ensiling. Crude protein, ash, and ADF were not different (P>0.05; mean = 11.62, 8.83, and 46.60 %DM, respectively). However ADIN was higher in SS (0.14%DM; P<0.05) than SS+SBH (0.12) or SS+CSS (0.11). The SS+SBH contained more NDF (64.64%DM) and lignin (30.48%DM) and reflect the higher concentration of NDF in soybean hulls. At the 28 days ensiling, the SS+CSS presents the smallest value (mean = 56.62), and NDF for SS and SS+SBH was 62.98%, and 65.69%, respectively. The values of NDF (59.73%) and ADF (44.68%) in SS are comparable to plants with plants unproved hemicelluloses (HCEL), as the sunflower. Adding soybean hulls or crushed sunflower seeds did not alter the concentration of HCEL (mean = 15.37%DM). Adding soybean hulls or crushed sunflower seeds increased silage DM and NDF but did not affect silage CP and ADF.

Key Words: Soybean Hulls, Sunflower Crushed, Chemical Composition

T84 The use of hybrid or native corn byproducts for the manufacture of nutritional blocks or silages: A simulation model. J. M. Tapia-Gonzalez*[1], A. Tewolde-Medhin[2], W. E. Grant[3], J. C. Martinez-González[2], H. Diaz-Solís[4], A. Moreno-Valdéz[5], O. D. Montañez-Valdez[1], and G. Rocha-Chavez[1], [1]*CUSUR, Univ de Guadalajara*, *Cd. Guzmán, Jalisco, México*, [2]*Unidad Académica Multidisciplinaria Agronomía y Ciencias. UAT*, *Cd. Victoria, Tamaulipas, México*, [3]*Texas A&M University*, *College Station*, [4]*Área de Recursos Naturales, UAAAN*, *Saltillo Coahuila, México*, [5]*Área de Recursos Naturales, Instituto Tecnológico de Ciudad Victoria*, *Cd. Victoria, Tamaulipas, México*.

A simulation study was carried out using the Software STELLA® II Ver 5 for comparing a real corn production system and corn byproducts (corn straw or green plant) for making multi nutritional blocks or silages respectively. Two types of corn were compared: the native corn against the INIFAP HV-1 variety. Nutritional blocks and silage are intended for cattle feeding during dry season and unspecific genotypes of steers or crosses of Bos taurus x Bos indicus were used for the present study. The simulation model was formed in several steps following the mathematical approach of seeding both types of corn with or without post seeding management; A hundred runs were performed each year (system simulations). Native corn crops with post-seeding management yielded the highest amount of corn and dry forage according with both the real and simulated model. The model revealed cycles of reduced pluvial precipitation (300 to 400 mm PP) which were insufficient for the proper grow and development of both the native and hybrid corn crops which in turns yielded less grain and byproducts. These data reveals the uncertain and adverse climatic condition of that geographic area. The hybrid corn variety showed the lowest grain and forage yield out of 100 years of cropping. These values are in agreement with the observed real yields of this production system.

Key Words: Simulation, Multinutritional Blocks, Corn Silage

T85 Factors effecting corn silage starch hydrolysis potential. A. E. Dorshorst*, P. C. Hoffman, N. M. Esser, M. G. Bertram, and T. K. Seeger, *University of Wisconsin*, *Madison*.

Digestibility of corn silage starch influences lactation performance of dairy cows. To investigate nutritional markers that explain starch digestibility in corn silage a factorial (3×3×3×3) set of corn silages was developed. Three varieties of corn (110,93,74 d), were planted on three planting dates and harvested on three dates. Grain samples for each variety, planting and harvest date were obtained by selecting corn stalks immediately prior silage harvest and hand shelling grain. Grain samples were dried, determined for kernel density, DM, starch, P, CP, globulin-albumin, and zein proteins. Corn silage was chopped, and ensiled without or with two degrees of kernel processing (1 or 3 mm). Approximately 1.5 kg of fresh corn silage was placed into plastic bags, vacuum sealed, and allowed to ferment for 150 d. Triplicate samples were conserved. Corn silages were evaluated for DM, starch, NDF, P, mean starch particle size, starch particles/g, starch surface area and kernel processing score. Starch hydrolysis potential of un-dried, un-ground corn silages was determined by the procedures of Blasel et al., 2006 where the percentage of starch hydrolyzed to glucose by amylase and amyloglucosidase is determined. Main effects and their interactions of the factorial set of corn silages on starch hydrolysis potential were evaluated using the GLM procedures of SAS. As designed, variety, planting date, harvest date and kernel processing significantly (P < 0.05) altered starch hydrolysis potential in corn silage. Nutritional markers in corn silage or grain samples and were compared to starch hydrolysis potential in un-dried, un-ground corn silage using the CORR procedures of SAS. Starch hydrolysis potential of corn silages were negatively related (P < 0.002) to starch particle size (r = -0.64), whole plant DM (r = -0.53), zein protein (r = - 0.51) and positively related to albumin-globulin protein (r = 0.35). Data suggest starch hydrolysis potential in corn silage decreases with advancing maturity (increasing DM) due to increased encapsulation of starch by zein proteins.

Key Words: Starch Digestibility, Corn Silage, Zein

T86 Comparing three different methods for assessing corn silage density. R. J. Norell*[1], M. Chahine[2], S. Hines[3], T. Fife[2], M. De Hario[4], and S. C. Parkinson[5], [1]*University of Idaho*, *Idaho Falls*, [2]*University of Idaho*, *Twin Falls*, [3]*University of Idaho*, *Shoshone*, [4]*University of Idaho*, *Gooding*, [5]*University of Idaho*, *Preston*.

The objective of this study was to compare three methods for estimating corn silage density: core sampling (Core), Wisconsin density calculator (Calculator) and feedout method (Feedout). Eighteen storages were enrolled in the study (9 bunkers, 7 piles, and 2 piles with a bunker wall). Three core samples were collected with a Master Forage probe (DairyOne, Ithaca, NY) during each of two farm visits. Core samples were collected at mid height of the silage mass and were sampled at the center, left, and right of the silage face. The Wisconsin density calculators for silage bunkers and piles are available at (www.uwex.edu/ces/crops/

uwforage/dec_soft.htm). Required inputs to the silage density calculator include: storage dimensions, loading rate, layer thickness, number of packing tractors, tractor weight, and percent packing time for each tractor. Silage face measurements were obtained during three farm visits (10 to 14 d intervals). With the Feedout method, density was calculated by dividing the weight of silage fed by the volume of silage removed during the interval between farm visits. Mean dry matter density (kg/m^3) and SE for Core, Calculator, and Feedout were: 229.4±6.0; 234.8±8.2; and 253.0±16.8; respectively. Mean density did not differ between methods ($p=0.18$) but the variation in density between storages was significantly higher for Feedout ($p<0.001$) than Core and Calculator methods. Core density measurements were highly correlated with Calculator estimates ($r=0.71$, $p<0.001$) but not with Feedout density estimates ($r=-0.06$, $p<0.82$). The Feedout method did not perform satisfactorily due to non-uniform silage faces and the inherent challenges in measuring volume of silage fed at the farm level. Core sampling is recommended for measuring silage density and the Calculator method is recommended for evaluating alternatives during the packing process.

Key Words: Corn Silage, Density

T87 Effect of length of time ensiled on dry matter, starch and fiber digestibility in whole plant corn silage. C. M. Hallada*[1], D. A. Sapienza[2], and D. Taysom[3], [1]*Vita Plus Corporation*, *Madison, WI*, [2]*Sapienza Analytica,LLC*, *Slater, IA*, [3]*Dairyland Laboratories Inc.*, *Arcadia, WI*.

To test the hypotheses that starch and fiber digestibility in whole-plant corn silage change with time ensiled, two separate hybrids from two commercial dairy farms were sampled. All samples were taken from one incoming load of corn forage chopped with a commercial harvester at each farm. For each farm, this forage was divided and 750 g placed into each of 48 vacuum-sealed polyethylene bags (4 replications of 12 ensiling periods). The bagged, ensiled samples were maintained in a temperature controlled room (25ºC, 55% RH). Each month over the next 12 months, four silo-bags from each hybrid at each farm were taken and frozen until analyzed. Silage samples were evaluated (fresh basis) for fermentation acids (HPLC, Shimadzu, Columbia,MD). Samples were dried at 62ºC (forced air oven, Sheldon Manufacturing, Cornelius OR) to a constant weight, ground to pass a 6mm screen (Wiley Mill, Thomas Scientific, Swedesboro, NJ) and analyzed for total-tract starch digestibility (ttSTRD), 12-hour ruminal starch digestibility (STRD12), 30-hour ruminal NDF digestibility (NDFD30) and ruminal dry-matter digestibility at 12 hours (DMD12) and 30 hours (DMD30) via in-vitro methods (Sapienza Analytica Standard Procedures). Values for all digestibility measures increased with time ensiled ($p < 0.05$ to 0.001, ANOVA and quadratic effect by non-linear regression analyses (XLSTAT, Addinsoft, NY, NY)). During the six months of active change, ttSTRD changed approximately 1.63 units per month ensiled ($p < 0.01$) and NDFD30 changed approximately 1.16 units per month ensiled ($p< 0.001$). All other digestibility traits changed approximately 0.06 units per month ensiled ($p < 0.05$ to 0.001). The changes in digestibility values appeared to plateau after 6-months of ensiling.

Key Words: Corn Silage, Digestibility, Starch

T88 Effect of month of sample submittal on corn silage nutrient fractions, starch availability, NDF digestibility, and fermentation profiles measured at a commercial forage-testing laboratory. R. T. Ward*[1] and M. B. de Ondarza[2], [1]*Cumberland Valley Analytical Services, Inc.*, *Hagerstown, MD*, [2]*Paradox Nutrition, LLC*, *West Chazy, NY*.

The objective of the study was to determine if nutrient fractions, starch availability, NDF digestibility, and fermentation profiles in corn silage samples significantly differed according to the month in which they were submitted for laboratory analysis. Month of sample submittal was assumed to relate to length of crop fermentation. The dataset (n=19184) included corn silage samples between 25 and 45% DM from New York that were submitted to Cumberland Valley Analytical Services, Inc. between January, 2004 and February, 2008. All samples were analyzed using near-infrared (NIR) technique. Soluble CP (%DM) was lower from Sept through Nov (3.80) vs. from March through July (4.47) ($P<0.05$). Ammonia (%DM) was lower from Sept through Feb than during the rest of the year (1.24 vs. 1.40) ($P<0.05$). Sugar (%DM) was higher from Sept to Dec than the rest of the year (1.37 vs. 1.03) ($P<0.05$). Starch (%DM) was higher in samples received in Nov and Dec than during the rest of the year (30.83 vs. 29.41) ($P<0.05$). Starch availability was defined as the amount of starch degraded by a one-hour amylase and glucoamylase treatment at 40ºC. Available starch (%DM) (n=8662) was lower during Oct and Nov than during the rest of the year (4.62 vs. 5.66) ($P<0.05$). NDF digestibility (30 h) (%NDF) (n=17745) was higher in samples received from Sept through Jan than the rest of the year (55.38 vs. 51.26) ($P<0.05$). Titratable acidity (meq/g) was lower from Sept to Dec than the rest of the year (6.56 vs. 8.41 ($P<0.05$) while pH was higher during that time (3.81 vs. 3.73) ($P<0.05$). Lactic acid (%DM) was lower from Sept to Dec than during the rest of the year (4.26 vs. 5.06) ($P<0.05$). Acetic acid (%DM) was lower from Sept to Feb than during the rest of the year (2.41 vs. 3.01) ($P<0.05$). These data suggest that at least four months are required for full fermentation of corn silage.

Key Words: Corn Silage, Fermentation Profile, Starch Digestibility

T89 Aerobic stability and silage quality parameters. Y. Acosta Aragón*, G. Boeck, A. Klimitsch, G. Schatzmayr, and S. Pasteiner, *Biomin GmbH*, *Herzogenburg, Lower Austria, Austria*.

The deterioration of silage under aerobic conditions was determined by physical, chemical, and microbiological factors. The aim of the present study was to determine the correlations existing between different silage quality parameters and the aerobic stability (AS).
Five different substrates (grass, alfalfa, clover, green wheat and whole crop maize) were ensiled under laboratory conditions in buckets (5 liters), using silage additives: a negative control (without); 3 variations of the biological silage product Biomin® BioStabil Plus in different proportions between homo- and heterofermentative lactic acid bacteria (LAB) (*L. plantarum, E. faecium and L. brevis*), and dosage in cfu/g silage (A, B and C); and 3 positive controls, two chemical silage additives (3.0 and (2.5l/ ton), and a mixture of *L. plantarum* (2×10^5 CFU/g) and other chemical product. Each treatment had 2 repetitions. The opening of the model silos occurred after 50 days. The changes in the pH values, the fermentation acid contents, ethanol, as well as the AS during 7 days (differences over 2°C between the room temperature and the inner silage temperature were considered as a sign for instability), the dry matter (DM) losses (Honig, 1990) and an organoleptic assessment using a negative point system according to the DLG- Schlüssel

(2006) were measured. Correlations between selected parameters and AS were done using 2- tailed Pearson correlations.
The correlation between the AS and the proportion of hetero- to homofermentative LAB, acetic acid content, and total acid amount was positive (P<0.01) correlated (r = 0.37, 0.46 and 0.30; for n = 48, 47 and 47 respectively). It corroborates the scientifical results availing the use of heterofermentative LAB and their production of acetic acid for increasing the AS.
The AS was negatively correlated with fructose content, propionic acid and ethanol content, as well as with DM losses and organoleptic assesment (correlation coefficients of -0.31, -0.41, -0.33, -0.82 and -0.75; for n = 44, 44, 42, 48 and 48 respectively).

Key Words: Silage, Aerobic Stability, Silage Quality

T90 *Streptococcus bovis* as a silage inoculant: A second chance. F. E. Contreras-Govea*[1], R. E. Muck[2], and J. B. Russell[3], [1]*University of Wisconsin*, *Madison*, [2]*USDA-ARS Dairy Forage Research Center*, *Madison, WI*, [3]*USDA-ARS*, *Ithaca, NY*.

Previous research indicated that *Streptococcus bovis*, a lactate producing ruminal bacterium, was similar or better than commercial silage inoculants (Jones et al., 1991). This study assessed the potential of two *S. bovis* strains, **JB1** (a bacteriocin negative strain) and **HC5** (a bacteriocin producing strain). Four treatments were used, uninoculated (**C**ontrol), a commercial inoculant *Lactobacillus plantarum* (Ecosyl **MTD/1**), **JB1** and **HC5** using third cut alfalfa (50% DM, **AS1**) in 2005 and third cut alfalfa (38.3% DM, **AS2**) in 2006. All inoculants were applied at 10^5 CFU/g forage. Ten 0.5-L mini-silos were used for each treatment. Silages were allowed to ferment at 39°C for 1, 2, 4, and 60 days and analyzed for pH, ammonia-N, non-protein nitrogen (NPN), organic acids, and ethanol. Two mini-silos per treatment were opened after 1, 2, and 4 d, and four mini-silos on d 60. After 60 d with AS1, **MTD/1** was the only inoculant having pH < 5.0 (4.84). The pH values for **C**, **JB1**, and **HC5** ranged from 5.36 to 5.44. With AS2, pH was lower for **MTD/1** (4.57) and **JB1** (4.62) than **C** (4.73) and **HC5** (4.72) (P > 0.05). With AS1, ammonia was lower for **MTD/1** (1.62 % TN) than **C** (1.97% TN), **JB1** (1.94% TN), and **HC5** (2.21% TN) (P < 0.05). With AS2, ammonia was lower for **MTD/1** (2.35% TN), **JB1** (2.34% TN), and **HC5** (2.46% TN), than **C** (2.59% TN) (P > 0.05). With AS1, lactate was greater for **MTD/1** (60.2 g/kg DM) than the other treatments (P < 0.05) whereas with AS2 lactate was similar among treatments (P > 0.05). We conclude that *S. bovis* **JB1** was a more effective inoculant than **HC5**, and similar to the commercial inoculant in one of two trials. The inability of **HC5** to perform as well as (or out-perform) **JB1** maybe related a 10% slower growth rate, and the susceptibility of its cell-free bacteriocin to peptidases.

Key Words: *Streptococcus bovis*, Silage Inoculants, Lactic Acid

T91 An evaluation of the effectiveness of *Lactobacillus buchneri* 40788 to improve the aerobic stability of corn silage in farm silos. L. J. Mari[1,3], R. J. Schmidt*[1], L. G. Nussio[3], C. M. Hallada[2], and L. Kung, Jr.[1], [1]*University of Delaware*, *Newark*, [2]*Vita Plus Corporation*, *Madison, WI*, [3]*University of Sao Paulo*, *Piracicaba, SP, Brazil*.

The objective of this study was to determine the effectiveness of inoculants containing *L. buchneri* 40788 (Lallemand Animal Nutrition, Milwaukee, WI) on fermentation and the subsequent aerobic stability of corn silage stored in farm silos. Corn silage was randomly sampled from farms in Wisconsin and Minnesota using no inoculant (n = 15) or using an inoculant (n = 16) containing either *L. buchneri* 40788 alone or this organism combined with *P. pentosaceus* during May through June of 2007. All silages had been ensiled in the Fall of 2006. Corn silage that was removed from the silo face during the morning feeding was sampled, vacuumed sealed and shipped immediately to the University of Delaware for analyses. Silage samples were analyzed for DM, fermentation end products, aerobic stability and microbial populations. The population of *L. buchneri* in silages was determined using a real time-qPCR technique. Aerobic stability was measured as the time after exposure to air that it took for a 2°C rise above an ambient temperature of about 23°C. The DM and concentrations of lactic and acetic acid were 35.6 and 34.5%, 4.17 and 4.85%, and 2.24 and 2.41% respectively for control and inoculated silages. The concentration of 1,2 propanediol was greater ($P < 0.05$) in inoculated silages (1.26 vs. 0.29%). Numbers of lactic acid bacteria determined on MRS agar were not different between treatments. However, the numbers of *L. buchneri* based on real time-qPCR analysis was higher ($P < 0.05$) and averaged 6.46 log cfu/g compared to 4.89 log cfu for uninoculated silages. Number of yeasts was lower and aerobic stability was greater ($P < 0.05$) in inoculated silages (4.75 log cfu/g and 74 h of stability) than in uninoculated silages (5.55 log cfu/g and 46 h of stability). This study supports the effectiveness of *L. buchneri* 40788 on dairy farms.

Key Words: Corn Silage, *Lactobacillus buchneri*, Polymerase Chain Reaction

T92 The effect of *Lactobacillus buchneri* 40788 or *Lactobacillus plantarum* MTD-1 on the fermentation and aerobic stability of corn silages ensiled at two dry matter contents. W. Hu*, R. J. Schmidt, E. E. McDonell, C. M. Klingerman, and L. Kung, Jr., *University of Delaware*, *Newark*.

Whole plant corn at normal and high dry matter (DM) contents (33.1 vs. 40.6%) was ensiled in quadruplicate 20-L laboratory silos to investigate the effects of inoculants *Lactobacillus buchneri* 40788 (LB) or *L. plantarum* MTD-1 (LP) on fermentation and aerobic stability. Aerobic stability was defined as the time after silo opening for silage temperature to reach 2^0C above ambient. Chopped forage was used in a 2 × 2 × 2 factorial arrangement of treatments: DM contents at 33.1 or 40.6%, LB at 0 (untreated) or 4×10^5 cfu/g, and LP at 0 or 1×10^5 cfu/g of fresh forage. After 240 days ensiling, an interaction effect of LB by forage DM content on concentrations of lactic and acetic acids was observed. For LB-treated silage in normal forage DM content, concentration of lactic acid on DM basis decreased (2.28 vs. 3.76%; P< 0.01), and that of acetic acid increased (1.78 vs. 0.93%; P< 0.01); whereas, for LB-treated silage in high forage DM content, concentration of lactic acid was unchanged (3.37 vs. 3.05%), and that of acetic acid increased (2.14 vs. 0.58%; P< 0.01) when comparing with LB-untreated silage. The effect of LP on concentration of lactic acid occurred only in silage with normal forage DM content (treated, 3.36% vs. untreated, 2.68%; P = 0.02). It was also shown that silage treated with LP had greater concentration of acetic acid (1.62 vs. 1.09%; P< 0.01) for silage with normal forage DM content, and lower concentration of acetic acid (1.14 vs. 1.57%; P< 0.01) for silage with high forage DM content when comparing with the LP-untreated silage. Appreciable amounts of 1,2-propanediol existed in all LB-treated silages with both forage DM contents (average 1.65%). Aerobic stability was improved consistently in all LB-treated silages

(average LB-treated, 189 h vs. LB-untreated, 50 h; P< 0.01), the silage with high forage DM content having greater aerobic stability than did the silage with normal forage DM content (268 vs. 109 h; P< 0.01). No effect of LP on aerobic stability was found in this experiment.

Key Words: Corn Silage, Inoculants, Aerobic Stability

T93 The effect of combining *Lactobacillus buchneri* 40788 with lactic acid bacteria on the fermentation, microbial populations and aerobic stability of brown midrib corn silage. L. J. Reich*, M. W. Hofherr, R. J. Schmidt, W. Hu, and L. Kung, Jr., *University of Delaware*, *Newark*.

The objective of this study was to determine the effects of combining *Lactobacillus buchneri* 40788 (**LB**) (Lallemand Animal Nutrition, Milwaukee, WI) with classical homolactic acid bacteria on the ensiling of corn silage. Mycogen F697, a brown midrib hybrid, was harvested at about 31% DM and was: a) untreated, or treated with b) LB (4×10^5 cfu/g of forage) and *Pediococcus acidilactici* (1×10^5 cfu/g) (**LBPA**), c) LB (4×10^5 cfu/g of forage) and *L. plantarum* (1×10^5 cfu/g) (**LBLP**), or d) LB (4×10^5 cfu/g of forage) and *P. pentosaceus* (1×10^5 cfu/g) (**LBPC**). Forage was ensiled in 20-L silos (quadruplicate per treatment) and the tops were sealed with an oxygen barrier plastic. After ensiling for 210 d, the top 10 cm of each silo was separated from the bottom 26 cm which added an effect of location to the design. Visibly spoiled silage from the top was weighed. Silages from both sections were analyzed separately for fermentation end products and microbial populations. Silage from the bottom section was also analyzed for aerobic stability and populations of LB by using a real time quantitative polymerase chain reaction. Untreated silage had more ($P < 0.01$) visible spoilage on the top than did inoculated silages. Untreated silage also had more (5 log cfu/g, $P < 0.01$) yeasts than inoculated (< 2 log cfu/g) silages in the top and bottom of the silos. There were treatment × location interactions for all fermentation end products but the final concentrations of acetic acid and 1,2 propanediol were greatest ($P < 0.01$) for LBPC > LBPA > LBLP > untreated. Untreated silage contained only 5.62 log cfu of LB per g of wet silage and was less than that found in inoculated silages (range 7.97 to 8.80 cfu/g). The aerobic stability of untreated silage was 186 h but it was greater ($P < 0.01$) for inoculated silages (average > 500 h). Although combining LB with various lactic acid bacteria resulted in differing magnitude of responses in fermentation end products, the combinations were equally effective in improving the aerobic stability of corn silage.

Key Words: *Lactobacillus buchneri*, Silage, Aerobic Stability

T94 Effect of the silage additive and the ensiled substrate on the silage quality parameters. Y. Acosta Aragón*, G. Boeck, A. Klimitsch, G. Schatzmayr, and S. Pasteiner, *Biomin GmbH*, *Herzogenburg, Lower Austria, Austria*.

Five different substrates (grass, alfalfa, clover, green wheat and whole crop corn) were ensiled under laboratory conditions in buckets (5 liters), using silage additives: a negative control = NC (without); 3 variations of the biological silage product Biomin® BioStabil Plus in different proportions between homo- and heterofermentative lactic acid bacteria (LAB) (*L. plantarum, E. faecium and L. brevis*) of 1 : 1 and 1 : 10; and dosage in cfu/ g silage (1×10^5 and 1×10^6) (A, B and C); and 3 positive controls, two chemical silage additives (mixture of acids) D (3.0 l/ ton) and E (2.5l/ ton), and F, a mixture of *L. plantarum* (2×10^5 CFU/g) and a chemical product (mixture of acids and salts). Each treatment had 2 repetitions. Model silos were opened after 50 days. The following parameters were analysed: pH, fermentation acid content, ethanol, aerobic stability during 7 days and dry matter (DM) losses (Honig, 1990). For the analysis of variance between the groups (different silage additive or substrates) a one-way ANOVA procedure was conducted. Silage additives, across all forage species, affected ($P < 0.05$) silage pH ((A > (NC = B = C = D) > E = F), the proportion of acetic acid content in total acid (F > ((NC = A = B = C = D) > E) and aerobic stability ((A = B = C) > (D = E = F) > NC). Other parameters were not different. Propionic acid content and DM losses were not affected by the substrate. The final pH was different ($P < 0.05$) in the following order: alfalfa > green wheat = clover grass = grass > whole crop maize. This corresponds with lactic acid content reached by the substrates. Acetic acid content was very high for clover grass and green wheat (31.85 and 44.11 g/ kg DM, respectively) and not different from grass; but grass was in the range given by the DLG-Schlüssel (2006) of 15 to 30 g/kg DM as optimum. Aerobic stability was closely correlated to the acetic acid content which reached for these substrates (clover grass, green wheat and grass) 7, 7 and 6 days respectively.

Key Words: Silage, Additive, Substrate

T95 Effect of a microbial inoculant producing ferulic acid esterase on the fermentation and NDF digestibility of normal and BMR corn silages. M. W. Hofherr*, L. J. Reich, M. C. Der Bedrosian, M. C. Santos, W. Hu, and L. Kung, Jr., *University of Delaware*, *Newark*.

Three corn silage hybrids were untreated or treated with the Pioneer inoculant 11CFT (Pioneer Hi-Bred International, Inc., Johnston, IA) to determine its effects on silage fermentation and NDF digestibility (**NDF-D**). The three hybrids included Pioneer 33A87 (34% DM), Pioneer 33J57 (31% DM) and Mycogen F697 BMR (34% DM). The inoculant contained a strain of *Lactobacillus buchneri* capable of producing ferulic acid esterase and a strain of *L. casei*. The theoretical rate of inoculation achieved a final count of 1×10^5 cfu of *L. buchneri* and 1×10^4 cfu of *L. casei* per g of wet forage. Forages were chopped to a theoretical cut length of 1.9 cm and approximately 600 g were ensiled in quadruplicate, vacuumed and heat-sealed bags for each inoculant, hybrid and day of ensiling. Silos were opened for each treatment after 60, 180 and 360 days of fermentation. Silages were analyzed for nutrients and fermentation end products. The digestibility of silage NDF was determined using dried samples ground through a 6-mm screen in a Wiley mill, weighed into in situ bags (5.5 × 5.5 cm, 40 ± 15 microns, Ankom Technology) and incubated in rumen fistulated steers for 48 h. Steers were fed a diet consisting of 45% corn silage, 15% alfalfa hay and 40% concentrate. Over all sampling days, inoculation resulted in a lower concentration ($P < 0.01$) of lactic acid (4.34 vs 4.80%, DM basis) but a higher ($P < 0.01$) concentration of acetic acid (1.60% vs. 1.17%) compared to untreated silage. There was an inoculation × hybrid × day effect for acetic acid. The NDF-D averaged across all sampling days by hybrid was greatest ($P < 0.01$) for BMR (58.1%) compared to 33J57 (45.3%) and 33A87 (44.3%). However, there was a hybrid × inoculation effect. Averaged over all sampling days, inoculation did not affect the

NDF-D of BMR (57.6 vs. 58.6%) but it improved NDF-D ($P < 0.05$) for 33A87 (45.3 vs. 43.2%) and for 33J57 (46.3 vs. 44.3%).

Key Words: Ferulic Acid Esterase, Silage, Digestibility

T96 Nutritive value of sorghum silage added bacterial inoculants. R. H. de T. e Buschinelli de Goes*[1], A. C. Martinez[2], C. O. de Abreu[2], and K. C. da S. Brabes[1], [1]*Universidade Federal da Grande Dourados*, *Dourados, MS, Brasil*, [2]*Universidade Estadual de Maringá*, *Umuarama, PR, Brasil*.

Thirty six PVC silos (4 in. diameter with 40cm of height and capacity of 3.2L) were utilized to evaluate the addition of corn meal and bacterial inoculants (*L.plantarum, S. faecium, and Lactobacillus spp.*) on the quality of the sorghum silage harvested 125 days after planting. The inoculant was supplied in the dose of 2.0 forage mg/kg; the product contains $5.26x10^{10}$ CFU/g. A 3x2x6 factorial design with 3 levels of corn meal, 2 inoculant (none or inoculated), and 6 ensiling periods was applied in a randomized design with 02 replications. Corn meal was included at 0, 10, and 20% of natural matter. Silage was removed from each silo on day 0, 7, 14, 21, 28 and 35 after ensiling. The pH was not altered by the use of corn meal with or without inoculant. Silage DM was increased by corn meal inclusion (P<0.05) but not by inoculant (P>0.05). Neither corn meal inclusion or inoculant affected (P>0.05) CP, EE, ash, NDF, NPN, ADIN, soluble N or total CHO (means = 15.47, 2.10, 10.83, 76.99, 0.72, 0.48, 1.12, 16.87, respectively). Silage crude protein (mean = 15.47%) is due to presence of panicle in the silage; the proportion of panicle might interfere in the ADIN. The length of fermentation, increased silage ADIN, for 20% of corn meal (mean = 0.54); and the CP after 21 days ensiling. The ADIN for 0%, and 10% of corn meal was 0.49. Silage ADF was not affected (P>0.05) by inoculant but as reduced (45.17 vs 49.42 and 48.82%; (P<0.05) with 20% corn meal inclusion. This suggests that 20% corn meal altered silage fermentation. The addition of inoculant not altered the quality of sorghum silage.

Key Words: Chemical Composition, Corn Meal, *L. plantarum*

T97 Microbial inoculant effects on in situ ruminal dry matter and neutral detergent fiber disappearance of corn silage. K. E. Cowles* and M. R. Murphy, *University of Illinois*, *Urbana*.

The efficacy of a prototype microbial inoculant on composition, and in situ ruminal dry matter (DM) and neutral detergent fiber (NDF) disappearance, of corn silage was evaluated. Two corn hybrids, Pioneer 31N27 (H1) and 33D31 (H2) were treated after harvest with either a control (no inoculant) or a blend of*Lactobacillus buchneri* and *L. casei*(Pioneer Hi-Bred, a DuPont Business, Johnston, IA) applied at 2 ml/kg of fresh forage in a completely random design with 32 mini-silos. Sixteen silos were opened 60 and 120 d post-ensiling. Disappearance of DM and NDF was measured after 24 or 48 h of ruminal incubation. At harvest, H2 was drier than H1 (34 vs. 40%; P=0.01); crude protein, NDF, acid detergent fiber, nonfiber carbohydrate, ash, and pH were similar. Compositions differed after 60 d: lactate and lactate:acetate increased more, and acetate and propionate decreased more, for the blend applied to H2 than H1 (interactions P≤0.02). Percentages of DM, nonfiber carbohydrate, acetate, and propionate increased more after 60 d when the blend was applied to H2 than when applied to H1 (interactions P≤ 0.02). Content of NDF, lactate, and lactate:acetate decreased more after 60 d when the blend was applied to H2 than when applied to H1 (interactions P≤ 0.02). The DM disappearance in the rumen of H2 after 60 d tended to be higher for the blend than for the control (36 vs. 38%, P= 0.11). After 120 d, DM disappearance of H1 was 6% higher (42 vs. 45%;P=0.11) for the blend than for the control; whereas, it was unchanged for H2. An interaction of hybrid, treatment, and time in the rumen (P≤0.02) indicated that the blend enhanced ruminal DM disappearance of H2 but not H1. Ruminal disappearance of NDF for H2 after 60 d was 110% higher (11 vs. 24%; P=0.02) for the blend than for the control. Neither treatment nor time of ensilage affected NDF disappearance for H1. After 120 d, NDF disappearance in the rumen of H2 was still 14% higher for the blend than for the control. Differences in composition and ruminal degradation of silages indicated that the blend improved conservation and feeding values of H2 but not H1.

Key Words: Corn Silage, Inoculant, Ruminal Degradation

T98 Impact of chloride fertilization and Silo-King® on the nutrient content, digestibility, and mycotoxin concentrations in corn silage. D. H. Kleinschmit*, D. P. Casper, and D. A. Spangler, *Agri-King, Inc.*, *Fulton, IL*.

Producing corn silage from soils fertilized with Cl has resulted in improved forage quality via reducing the plant's susceptibility to mycotoxins. The feeding value of corn silage may be further enhanced by using a forage fermentation additive. The experiment was conducted using a 2 × 3 factorial randomized complete block design. Three blocks were randomly selected within a corn field and within each block, three plots were assigned to one of three fertilization treatments: 1) no fertilization (CON), 2) fertilization with CaCl at a rate of 227 kg/ha (CaCl), or 3) fertilization with KCl at 227 kg/ha (KCl). Two weeks prior to harvest, plant ears were inoculated via toothpicks with *Fusarium graminearum*. Within each plot, corn silage was either untreated (UNT) or treated with Silo-King® (SK; Agri-King, Inc., Fulton, IL) at a rate of 0.20 kg/tonne of fresh forage in triplicate silos and ensiled for 65 d. With the exception of having the greatest ($P < 0.01$) concentration of Cl (0.11, 0.37, and 0.34% for CON, CaCl, and KCl, respectively), CaCl had little impact on nutrient content of corn silage compared to the other fertilization treatments. Compared to CON, KCl had lower ($P < 0.05$) concentrations of ADF (30.6, 30.1, and 28.4%), NDF (50, 48.8, and 46.2%), and lignin (3.43, 3.38, and 3.16%) and greater ($P < 0.05$) concentrations of starch (24.3, 26.0, and 28.7%), thus numerically improving *in vitro* DM digestibility (64.0, 64.2, and 65.3%; IVDMD). Treating corn silage with SK lowered ($P < 0.01$) concentrations of ADF (31.2 vs. 28.2% for UNT and SK, respectively), NDF (50.5 vs. 46.2%), and lignin (3.47 vs. 3.18%) and increased ($P < 0.01$) concentrations of starch (23.6 vs. 29.0%) and crude fat (2.00 vs. 2.30%), thus improving ($P < 0.04$) IVDMD (63.7 vs. 65.4%). Chloride fertilization or treatment with SK did not affect mycotoxins. In conclusion, fertilizing with KCl shows potential to improve the digestibility of corn silage via reduced fiber components and increased the starch concentrations. Treating corn silage with Silo-King® at ensiling increased the digestibility of DM.

Key Words: Mycotoxins, Corn Silage, Chloride Fertilization