ABSTRACTS
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POSTER PRESENTATIONS

*** Author Presenting Paper**

Contemporary and Emerging Issues

T1 Effect of inulin on the microflora of an ABT-type fermented milk during refrigerated storage. L. Varga*, B. Gyenis, N. Molnár, and J. Szigeti, *Institute of Food Science, Faculty of Agricultural and Food Sciences, University of West Hungary, Mosonmagyaróvár, Hungary.*

The purpose of this research was to investigate the influence of inulin on the microbial flora of a probiotic fermented dairy product during refrigerated storage. Inulin-supplemented and control fermented acidophilus-bifidus-thermophilus (ABT) milks were produced using a fast fermentation starter culture as the source of *Lactobacillus acidophilus* (A), bifidobacteria (B), and *Streptococcus thermophilus* (T), and were then stored at 4°C for 42 d. Microbiological analyses and acidity measurements were performed at weekly intervals. Our results showed that the presence of inulin at 1.0% to 5.0% (w/v) did not significantly influence ($P > 0.05$) the survival of either *S. thermophilus* or *L. acidophilus* during storage. The viable counts of bifidobacteria fell more sharply than did those of lactobacilli and streptococci; however, the addition of inulin at 5% had a significantly beneficial effect ($P < 0.05$) on their viability after 28 d of refrigerated storage. No spoilage organisms were detected at any sampling time, indicating the high degree of sanitation during processing and packaging of the fermented milk products. In conclusion, the commercial inulin product tested was found to have prebiotic properties for bifidobacteria and, thus, it might be used for improving the viability of bifidobacteria in refrigerated fermented dairy foods. **Acknowledgments:** This work was funded by a grant (FKFP 0197/2001) from the Ministry of Education, Hungary. László Varga is grateful to the Hungarian Academy of Sciences for the award of a János Bolyai Research Scholarship.

Key Words: Inulin, Prebiotic, Bifidobacteria

T2 Evaluation of methods for detection of *Escherichia coli* O157:H7 in milk and occurrence of *Escherichia coli* O157:H7 in ex-farm raw milks in Hungary. A. Hucker[1], I. Mike-Schummel[1], L. Varga*[2], and A. Unger[1], [1]*Hungarian Dairy Research Institute, Mosonmagyaróvár, Hungary,* [2]*Department of Dairy Science, Institute of Food Science, Faculty of Agricultural and Food Sciences, University of West Hungary, Mosonmagyaróvár, Hungary.*

Escherichia coli O157:H7 poses a significant threat to public health. The main objective of this study was to evaluate the efficacy of classical protocols and an automated immunoassay system (mini-VIDAS) for detection of *E. coli* O157:H7 in raw milks containing background coliforms and *E. coli*, and in UHT milks deliberately spiked with non-pathogenic *E. coli* strains at various levels. In addition, the incidence of *E. coli* O157:H7 in Hungarian ex-farm raw milks was determined. As for the traditional protocols, PHLS Method 1 and FDA-BAM Method C were found to be highly suitable for detection of *E. coli* O157:H7 in non-pathogenic *E. coli*-spiked UHT milk and real raw milk samples, respectively. However, the mini-VIDAS *E. coli* O157 (ECO) system proved to be superior to the classical methods, with sensitivity, specificity, and accuracy percentages of 100, 97.9, and 99.3, respectively. Two hundred and fifty ex-farm raw milk samples were tested then in mini-VIDAS-ECO and in parallel by the FDA-BAM traditional protocol. The latter method gave 65 negative and 185 uncertain results, which required further identification, whereas mini-VIDAS-ECO gave one positive and 249 negative results. With both methods, only one out of the 250 samples tested was finally confirmed positive. The Duopath *E. coli* O157 test showed that this single positive sample contained an *E. coli* O157:H7 strain, which did not produce verocytotoxin. In conclusion, mini-VIDAS-ECO appears to be a potent tool for detection of *E. coli* O157:H7 in raw milk. With this system, 0.4% of Hungarian ex-farm raw milk samples were found to contain *E. coli* O157:H7.

Key Words: *Escherichia coli* O157:H7, Raw Milk, Immunoassay

T3 Use of powdered microalgae to stimulate acid production and growth of *Lactobacillus plantarum* and *Enterococcus faecium* in milk. B. Gyenis, L. Varga*, J. Szigeti, and N. Molnár, *Institute of Food Science, Faculty of Agricultural and Food Sciences, University of West Hungary, Mosonmagyaróvár, Hungary.*

The objective of this research was to test the capability of microalgal biomasses to stimulate selected lactobacilli and enterococci in milk. Microalgae are photosynthetic microorganisms that can be used to produce high value compounds. Spray-dried microalgal biomasses typically contain 3% to 7% moisture, 46% to 63% protein, 8% to 17% carbohydrates, 4% to 22% lipids, 2% to 4% nucleic acid, 7% to 10% ash, 8% to 10% fiber, and a wide range of vitamins and other biologically active substances. *Chlorella vulgaris* is a green algal species that produces astaxanthin, canthaxanthin and, in minor amounts, β-carotene and luthein. *Arthrospira (Spirulina) platensis* is a planktonic cyanobacterium belonging to prokaryotic algae. It produces γ-linolenic acid in large amounts. The effect of powdered *A. platensis* and *C. vulgaris* biomasses, added at a concentration of 3 g/L, on growth and acid production of *Lactobacillus plantarum* and *Enterococcus faecium* strains primarily used for feed fermentation purposes was evaluated in milks with total solids contents ranging from 12% to 30%. The growth rate of and acid development by *L. plantarum* and *E. faecium* were found to be stimulated significantly ($P < 0.05$) by both *A. platensis* and *C. vulgaris* in all culture media formulations used. Microalgal biomasses had a more stimulatory effect on *E. faecium* than on *L. plantarum*. However, the dry matter content of milks did not influence the growth and acidification properties of the starter organisms tested. In conclusion, the *Chlorella* and *Arthrospira* biomasses rich in bioactive compounds are potentially suitable for use in cost-effective production of milk-based functional fermented feeds.

Key Words: Microalgae, *Lactobacillus plantarum*, *Enterococcus faecium*

T4 Do dairy producers market and manage dairy cows to improve beef quality? P. R. Tozer, G. A. Varga, D. Kniffen*, and W. R. Henning, *Pennsylvania State University, University Park.*

A survey of dairy producers in Pennsylvania was undertaken to ascertain the management of market cows and identify practices to improve the quality of beef from these animals. Ninety progressive dairy producers in Pennsylvania were selected based on recommendations from financial advisers and consultants. Of these 90 producers surveyed 69 provided usable responses to the survey. Producers were asked questions regarding how market cows were sold; condition of cows sold; drug residue notifications; vaccination and injection administration; foot trimming frequency and perceived mobility of market cows. Average herd size of respondents was 250 ± 218 cows, which is much larger than the Pennsylvania state herd average of 69 cows. The results of the survey indicated that most producers still market cattle through auction markets, however, the method of marketing varied across herd size, with smaller producers favoring auctions while larger producers preferred direct sales to the packer. The survey also showed that producers did not use marketing strategies to take advantage of seasonal cow beef price variability. The average number of injections given annually to dairy cows was 19.4 ± 12.4. The percentage of injections given in the neck varied across strata, very few producers gave all injections in the neck, with a majority of injections (65%) given in other sites, with the tailhead or the hip/rump/flank area being identified as the most common site. Producers also reported an annual rate of 5 % of the cows in the herd as downer cows. A downer cow is defined as one that cannot move without assistance. The principal cause of downer cows was metabolic disorders, although again there were differences observed across the different herd size strata. Smaller herds reported metabolic disorders as the principal cause of downer cows, whereas larger herds reported injuries as the major cause of downer cows. The results of this survey suggest that dairy producers have not identified the value in undertaking on-farm meat quality assurance programs.

Key Words: Beef Quality, Dairy, Marketing

T5 Effect of using aqueous extracts of Neem (*Azadirachta indica* A. Juss) seeds and leaves on oocyst count in calves. S. Pietrosemoli* and R. Olavez, *La Universidad del Zulia, Maracaibo, Venezuela.*

Aqueous extracts of seeds (**AES**) and leaves (**AEL**) of Neem tree were prepared in order to evaluate its potential effect on the oocyte counts (**OPG**) of grazing calves. Twenty-four crossbred *B. taurus* * *B. indicus* calves (45.6 ± 7.3 kg BW and 38.5 ± 2.49 d) naturally infected were allocated into 4 groups of 6 each; control (**T0**), 3 cc sulfonamide (25 %) / kg BW (**T1**), **AES** (**T2**) 15 cc/ kg BW, and **AEL** (**T3**) 15 cc/ kg BW. Aqueous extract were prepared with 60 g of grounded Neem seeds (**T2**) and 300 g of freshly ground Neem leaves (**T3**), per liter of water, soaked during 12 hours before being filtered and orally administered once. Calves were fed milk (2 l/d), commercial concentrate (16 % CP) *ad libitum*, and handled in *Brachiaria humidicola* pens. Pre and post treatment oocyst counts were performed by using the Mcmaster modified method on days -3, 7, 14, 21 and 28. Experimental design was a split plot, with treatment as main plots, and days of parasites count as split plots. Initial infestation (4956,52 ± 2127,74) was used as covariate. Data were Log transformed as Log (n+1). Differences between treatments ($p \leq .03$) and days ($p \leq .004$) were found with **T0** having the highest **OPG** count ($p \leq .05$). Although no statistic differences were observed between **T1**, **T2** and **T3**, lowest **OPG** was recorded in **T3** group. It was concluded that **AES** and **AEL** can reduce the oocyst count in calves.

Key Words: Coccidiosis, Calves, *Azadirachta indica*

T6 Neem's (*Azadirachta indica* A. Juss) leaves as feeding substrate for vermicomposting earthworm (*Eisenia andrei*). J. Hernández[1,2], S. Pietrosemoli[1,2], R. Palma[2], C. Tang*[2], C. Perozo[2], and R. Romero[2], [1]*La Universidad del Zulia, Maracaibo, Venezuela,* [2]*Proyecto S1-2000000792 FONACIT, Venezuela.*

Four mixtures were tested in a small scale laboratory study, to evaluate Neems leaves potential to be used as feeding substrate for vermicomposting earthworm. Substrates tested were: 100 % horse manure **M**, as substrate for comparison (**S1**); 100 % Freshly-ground Neems leaves **FN** (**S2**); 50 % **M** : 50% **FN** (**S3**) and 50 % **M** : 50 % 15 days shade dried Neems leaves (**S4**). Before being inoculated, all substrates were composted during 21 days. Four clitellated earthworm were maintained in cylindrical, covered, plastic containers (350 cc) during 84 days, with five replicates for treatment. Biomass and Total cocoon production were recorded weekly. Experimental design used was a split plot design, with substrates as main plot, and days of measurement as split plot. Initial weight (260.5 ± 3.1 mg / earthworm) was used as covariate. Cocoons production data were Log (Log (n+1)) transformed. All substrates supported growth and reproduction, and were successfully vermicomposted. Statistical differences were established between treatments for biomass ($p \leq 0.0001$) (407.0 ± 9.2; 844.9 ± 18.1; 490.1 ± 17.9, 497.0 ± 16.3 mg/ earthworm for **S1**, **S2**, **S3** and **S4** respectively) , and for Total cocoon production ($p \leq 0.01$) (14.2 ± 1.2; 19.9 ± 1.4; 16.9 ± 0.6 and 13.6 ± 1.3 cocoons/earthworm, for S1, S2, S3 and S4 respectively). Earthworm biomass was higher in **S2** substrate than in manure only substrate, which showed the lowest value, **S3** and **S4** achieved intermediate values. **S2** showed also the highest values for cocoon production with statistical differences ($p \leq 0.05$) with the other substrates. The 100 % Freshly-ground Neems leaves treatment (**S2**) was considered the best substrate for vermicomposting. It is concluded that Neems leaves can be vermicomposted successfully.

T7 Development and reproduction of *Eisenia andrei* using mixtures of cattle manure and Neems (*Azadiracta indica* A. Juss.) leaves. J Hernández[1,2], S Pietrosemoli*[1,2], C Contreras[2], R Palma[2], and A Faria[1,2], [1]*La Universidad del Zulia, Maracaibo, Venezuela,* [2]*Proyecto S1-2000000792, Venezuela.*

Two laboratory scale experiment were performed in order to evaluate the suitability of use of freshly Neems leaves (**NL**), alone or mixed with cattle manure (**M**) to obtain vermicompost. In the first trial, biomass and reproduction were measured during eight weeks. The experimental design was a completely randomized, with 6 treatments and 7 replicates. Pairs of adult earthworms (767.78 ± 274.0 mg BW) were located in plastic containers (350 cc) with six different substrates: 100, 80, 60, 40, 20 and 0% of **NL** : **M**, which was used as control. Substrates were composted during 20 days before starting the trial. Weight gain and

cocoon numbers were recorded weekly. Statistical differences between substrates were not found. In the second trial, lasting 10 weeks, newborn earthworms (< 50 mg) from cocoons of the previous experiment were placed in plastic containers (950 cc; 10 per container) with the same substrates tested previously. Weight gain and established growth stage (Juvenile, Preclitelleate, clitelleate and regression of clitellum) were recorded weekly. The experimental design used was a completely randomized, with 6 treatments and 10 replicates. Statistical differences were observed between treatments; with highest biomass recorded in 80 % **NL** (535.3 ± 101.0 mg /earthworm), and the lowest in 100 % **NL** (302.6 ± 124.0 mg /earthworm). Reproductive activity started in week 5 and was observed until week 8. Substrates with 80 and 40 % **NL** showed highest total cocoon production (22.2 ± 16.88 and 31.0 ± 22.89 cocoons /earthworm respectively); meanwhile the lowest was registered with 100 % **NL** (4.2 ± 3.27 cocoons /earthworm). All substrates tested were completely vermicomposted. Success with these substrates, suggest that manures offer a well balanced nutrient content, able to satisfy growth and reproduction requirement.

T8 Acquisition and persistence of a high level macrolide resistant *Veillonella* sp. without selection pressure. T. Poole*, J. McReynolds, T. Callaway, and D. Nisbet, *USDA, ARS, College Station, TX*.

High level resistance to macrolide antibiotics, but not lincosamide or streptogramin antibiotics, is characteristic of enzymatic drug inactivation by macrolide phosphotransferase (*mph*) or esterase (*ere*) gene families. A *Veillonella* sp (VL2) was found to have acquired high level resistance to tylosin (a macrolide antibiotic), but not lincomycin, in a closed population of chicken cecal bacteria cultured anaerobically without antibiotic selection pressure. This suggests that a gene, or gene complex, conferring high-level macrolide resistance was acquired from a bacterial species present in the mixed anaerobic population. PCR amplication of VL2 genomic DNA with primers specific to known macrolide, lincosamide, and streptogramin resistance genes (*erm*, *ere*, *vat*, *mef*, and *msr* gene families) were negative. However, PCR amplification with *mph* A/B primers generated a DNA fragment of approximately 750 bp with tylosin resistant (TY^r) VL2, but not tylosin susceptible (TY^s) VL1 DNA. PCR amplification of genomic DNA from three *E. coli* isolates present in the same culture generated the expected (836bp) *mph* specific fragments. To date sequence alignments of the 750 bp fragment have shown partial amino acid identity with a Salmonella tyrosine kinase, but very little homology to published sequences of macrolide phosphotransferases. Additional studies are underway to determine the protein responsible for high level macrolide resistance by VL2, as well as the source of gene acquisition. To determine the competitive fitness of VL2, 10^7 CFU/ml was inoculated simultaneously with 100ml of reconstituted PREEMPT (devoid of high-level tylosin resistant veillonella) to three continuous-flow fermentation devices. To date, two cultures have maintained VL2 for four months at 10^3 CFU/ml without selective pressure. These preliminary experiments suggest a low metabolic cost from the acquisition of high level macrolide resistance.

Key Words: Antibiotic Resistance, Macrolide, Anaerobe

T9 Predation survival in rumen protozoa enhances *Salmonella* virulence. M. A. Rasmussen, S. L. Franklin*, and S. A. Carlson, *National Animal Disease Center, ARS,USDA, Ames, IA*.

The objective of this study was to determine if there is a relationship between predation by rumen protozoa and the enhancement of virulence in *Salmonella*. Previous research indicates that intracellular bacterial pathogens can become more pathogenic after engulfment, survival and release from free-living eukaryotic micro-organisms such as amoeba. In order to investigate if such relationships exist within the rumen microbiota, we determined the virulence of *Salmonella* strains after recovery from lysed preparations of mixed rumen protozoa. Virulence was determined using a tissue culture invasion assay (HEp-2 human carcinoma cells) and by monitoring disease progression after oral inoculation of *Salmonella* into calves. Laboratory cultured *Salmonella* isostrains not exposed to protozoa served as controls. Of the strains of *Salmonella* investigated (n=30), only those possessing the DT104 gene cluster encoding antibiotic resistance were found to be hyperinvasive (5-10 x greater than controls) after recovery from lysed rumen protozoa. The hyperinvasive strains included *S. typhimurium* DT104, U302 and multiple antibiotic resistant *S. infantis* and *S. agona*. When inoculated into calves, *S. typhimurium* DT104 recovered from rumen protozoa caused a more rapid disease progression, including pyrexia (increased body temperature spikes), greater recovery of the bacteria from lymph nodes and spleen, and a more unfavorable prognosis resulting in earlier euthanasia. We conclude that intracellular bacterial/protozoal interactions in the rumen can enhance *Salmonella* virulence. The molecular mechanisms (and their relationship to antibiotic resistance) which contribute to intracellular survival and subsequent bacterial release from protozoa merit further investigation. These observations have implications for mechanisms of disease pathogenesis, rumen microbial ecology, fecal shedding of food borne pathogens from ruminants, and pathogen reservoir status of the rumen.

Key Words: Salmonella, Rumen Protozoa, Virulence

T10 More than grass: Organizing the emerging grass-fed beef market. L. Gwin*, *University of California, Berkeley*.

The U.S. market for grass-fed beef has gradually increased over the last decade, most recently spurred by public concern about food safety and the environmental impacts of conventional beef. Numerous challenges exist to the further expansion of grass-fed beef production, yet research on overcoming those challenges is scant. While many producers wish to remain small and sell via direct marketing methods (farmers markets, e.g.), others are attempting to bring grass-fed beef to larger, more mainstream markets. A major challenge is creating the economies of scale and consistency in supply and quality to meet the needs of large buyers such as retail stores, hotels, restaurants, and similar institutions. Managing pasture quality and forage availability though the year, and matching breeds to that forage, are other key challenges. In response, many grass-fed beef producers around the country have formed new programs. Interviews with program participants and review of documents from six such programs, each in a different region of the country, reveal similarities and differences in history, organizational structures, motivations and goals, and basic characteristics. Goals are often similar, yet models vary widely, from vertical integration to producer cooperatives. Programs are also typically rooted in their regions. While conventional commodity markets tend to create standardized products, often erasing regional variation, these programs take advantage of regional assets, both physical and socioeconomic. Yet balancing regional variation with market demand for consistency is addressed in different ways. One program sources nationally and favors the development of national standards for grass-fed, while another has partnered with county government to develop local certification. Consideration of regional assets is critical not only to program design and evolution but also to their future prospects. Understanding which strategies are being used to develop what is currently a niche market into a more mainstream sector will aid in the further development of grass-fed beef into a more widespread production scheme.

Key Words: Grass-Fed Beef, Business Organization

T11 Meat carcass inspection using fluorescence of dietary porphyrins. M. A. Rasmussen*[1], T. A. Casey[1], and J. W. Petrich[2], [1]*National Animal Disease Center, ARS,USDA, Ames, IA,* [2]*Iowa State University, Ames*.

Feces on animal carcasses are an important source of food borne pathogens. Imaging devices that could assess the general level of carcass contamination would help to provide high quality meat products to consumers. Inspection procedures have relied upon unaided visual examination of carcasses but it is difficult to thoroughly inspect all carcasses in high speed processing plants using visual means. Imaging technology with real time capabilities and automated inspection would improve current procedures. In our research we have examined several fluorescent markers that could be used to optically detect fecal material. Excitation and emission spectra and fluorescent lifetime measurements were obtained for a variety of ingesta and fecal samples from cattle and other livestock species. Our analysis found that the most useful markers for fecal detection were the highly fluorescent metabolites of chlorophyll (pheophorbide and pyropheophorbide). These metabolites have peak excitation and emission wavelengths near 420 nm and 675 nm respectively. These metabolites are normally present in the G.I. tract of herbivorous animals consuming green plant material. These markers are particularly useful because the background fluorescence of meat is low in the far-red region of the visible spectrum. We have exploited the fluorescent properties of these chemical markers in the development of instruments,

which can detect fecal contamination on meat animal carcasses. Although diet can influence the fluorescent signal obtained, instruments have been designed with adequate sensitivity for the detection of feces from animals consuming a variety of commercial feedlot rations. This imaging technology has been developed through intellectual property protection and technology transfer into commercially produced instruments, which are currently being manufactured and used by the meat processing industry. These instruments augment more time consuming microbiological testing methods and can assist slaughter plant operators and meat inspectors in their efforts to minimize contamination on meat.

Key Words: Feces, Fluorescence, Carcass Inspection

PSA - Nutrition 1

T12 Consequence of meeting non-phytin phosphorus (nPP) requirements with or without feed additives on broiler performance, litter P concentration and processing losses. A. S. Dhandu*[1], R. Angel[1], and W. W. Saylor[2], [1]*Department of Animal and Avian Sciences, University of Maryland, College Park,* [2]*Department of Animal and Food Sciences, University of Delaware, Newark.*

Male Ross 308 broilers (56 birds/pen) were raised from hatch to 49 d of age in floor pens containing built up litter from two previous trials of identical design and dietary treatment (DT) allocation. Four feed phases were followed: starter, 1 to 18 d; grower, 18 to 32 d; finisher, 32 to 42 d; and withdrawal, 42 to 49 d. Six DT were tested (9 or 10 pens/DT). The nPP levels of DT 1 were in accordance with NRC (1994) recommendations: 0.45, 0.35, 0.35 and 0.30% nPP in the four feed phases. Following Univ. of Maryland recommendations, the nPP levels for DT 2 were 0.45, 0.31, 0.23 and 0.18%. In DT 3 and 4, nPP levels in the four phases were DT 2 levels reduced by 0.064 and 0.09%, respectively. For DT 5, the DT 1 nPP levels were lowered by 0.1%. The negative control was DT 6 and contained $\leq$90% of DT 2 nPP levels. All diets in DT 3, 4 and 5 contained 600 U of phytase/kg diet. In addition, DT 4 contained 70mg of 25-hydroxycholecalciferol/kg diet. Pine shavings were weighed into pens before the first trial and litter was weighed out after the third trial. At 49 d of age, 22 birds per pen were selected at random, caught and transported by a commercial catching crew and then processed at a commercial plant following existing plant protocols. Tibiae and femurs of processed birds were analyzed for dry-defatted ash. The 49 d BW of birds fed DT 1, 2, 3 and 5 were greater ($P \leq 0.05$) than those fed DT 6. The total P excreted (per bird) by broilers fed DT 3 (12.73 g) and DT 4 (11.37 g) was lower ($P \leq 0.05$) than that of birds fed either DT 1 (19.53 g) or DT 5 (14.68 g). There was no effect ($P > 0.05$) of reducing dietary nPP on carcass yield, incidence of broken wings and legs or bruised back, breast, wings and legs. Tibia and femur ash of birds fed DT 1 was greater ($P \leq 0.05$) than that of those fed DT 6. Lowering dietary nPP concomitant with supplementation of feed additives achieved maximum reduction in litter total P without any negative impact on performance or on processing losses.

Key Words: Broilers, Phosphorus, Processing Loss

T13 The use of low-phytate soybean meal to reduce phosphorus excretion from poults raised to 18 days of age. J. L. Godwin*, J. L. Grimes, A. G. Gernat, and M. J. Wineland, *North Carolina State University, Raleigh.*

An experiment was conducted to determine if feeding genetically modified low-phytate (LP) soybean meal (SBM) to turkey poults would support growth performance equal to or better than those fed diets containing normal SBM and reduce phosphorus (P) excretion from poults raised to 18d. A phytase enzyme (E) (Alltech; Kentucky) was also incorporated into the trial. One hundred and eighty eight Nicholas male turkey poults were housed in Petersime batteries with 30 pens (6 birds per pen) at day of hatch with 5 pens per treatment. Five starter rations were fed to poults in mash form. Treatments consisted of normal SBM+Ca and P at 100% of recommended NRC values (SBM100), LP+Ca and P at 100, 85, and 70% of recommended NRC (LP100, LP85, LP70, respectively) and LP70+enzyme (LP70E). Feed and water were provided ad libitium for 18d. The following parameters were measured; growth performance, AMEn, and apparent nitrogen retention (ANR). Feed consumption and feed to gain, by pen, and individual BW where determined at 6 day intervals to 18d. Also measured at 18d: percent toe and tibia ash, tibia breaking strength, and P levels in fecal samples. Neither mean BW, feed conversion, cumulative feed conversion, toe ash nor tibia ash were significantly affected by treatment. There was a significant linear decrease in tibia breaking strength and increase in AMEn as diets containing LP decreased from 100 to 70%. Tibia breaking strength for LP70E was not different from LP100. ANR and fecal P were significantly affected by treatment. Fecal P decreased as NRC Ca and P level decreased in LP diets. Fecal P for SBM100 was higher than for LP100 while fecal P for LP70 and LP70E were not different. Using LP resulted in performance equal to SBM while providing reduced fecal P.

Key Words: Low-Phytate SBM, Phosphorus, Turkey Poults

T14 Phytase activity and phytate hydrolysis along the digestive tract of broiler chicks: A comparative study of two phytase sources. E. M. Onyango*[1], M. R. Bedford[2], and O. Adeola[1], [1]*Purdue University, West Lafayette, IN,* [2]*Zymetrics Inc., Marlborough, Wiltshire, UK.*

Residual activity of an *Escherichia coli*-derived phytase and a commercially available *Peniophora* phytase along the digestive tract of broiler chicks was compared in order to evaluate their relative resistance to hydrolysis in the digestive tract. Seventy two 7-d-old male broiler chicks were grouped by weight into six blocks of 3 cages with four birds per cage. Three corn-soybean meal-based diets were randomly assigned to cages within each block. The three diets were a low P diet containing 3.9 g P/kg diet; and low P diet plus either *Escherichia coli*-derived phytase or the *Peniophora* phytase at 1000 units/kg of feed. The chicks were fed experimental diets from 8 to 22 d of age. At the end of the study, chicks were killed and contents from the crop, proventriculus and gizzard, jejunum and ileum were collected, freeze-dried, ground and analyzed for phytase activity and phytate content. *Escherichia coli*-derived phytase had more residual activity at the crop ($P < 0.01$), proventriculus and gizzard ($P < 0.05$), jejunum ($P < 0.001$) and ileum ($P < 0.0001$) when compared with the *Peniophora* phytase. Less phytate remained in the digesta collected from the proventriculus and gizzard ($P < 0.05$), jejunum ($P < 0.01$) and ileum ($P < 0.05$) in birds fed *Escherichia coli*-derived phytase compared with those fed *Peniophora* phytase. The *Escherichia coli*-derived phytase may be more resistant to hydrolysis in the digestive tract when compared with the *Peniophora* phytase, and may be related to the superior phytate hydrolysis observed.

Key Words: Broiler Chick, *Escherichia coli* Phytase, Residual Phytase Activity

T15 Requirement of methionine of broilers during finishing period. F. Liu*, Z. Niu, and S. Zhai, *College of Science & Technology, Northwest Sci-Tech University of Agriculture & Forestry.*

The objective of this experiment was to evaluate the requirement of broilers during four to six weeks of age. Five hundred male broiler chicks from Arbor Acres commercial strains were divided into five groups ,each of five replicates.The diets were based on corn-soybean meal which the level of methionine was 0.25%,0.30%,0.35%,0.40%,0.45% respectively. Each group of birds was fed one kind of the five diets above for two weeks. The results showed that there were significant effects of different levels of dietary methionine on growth performance and plasma uric acid content. BW and FC were significantly decreased at lower methionine(0.25% 0.30%),but uric acid level of plasma increased singnificantly. The BW and FC were not increased signifcantly at higher dietary level,but uric acid content was greatly increased. This study indicated that the requirement of methionine of broilers during finishing stage was 0.35% 0.40% in the diet.

Key Words: Methionine, Growth Performance, Broiler