257 Are there high and low Salmonella prevalence farms? M. H. Rostagno1, H. S. Hurd2, and J. D. McKean2, USDA, ARS, Livestock Behavior Research Unit, West Lafayette, IN, Iowa State University, Ames.

The objective of this study was to evaluate the stability of Salmonella prevalence in cohorts of finishing pig lots. Six finishing production sites were visited six times each. At each visit, 30 individual fecal samples were randomly collected directly from the rectum. At slaughter, 50 individual meat samples were randomly collected per lot. Fecal samples were selectively enriched, and analyzed for the presence of Salmonella. Meat samples were frozen, thawed, and the resulting liquid (meat juice) was analyzed for the presence of antibodies against Salmonella. All finishing production sites were positive for Salmonella in at least two fecal and four meat samplings. The overall Salmonella bacteriological prevalence was 12.9% (95% C.I. 8.0 to 17.8%), whereas the serological prevalence was 35.4% (95% C.I. 24.5 to 46.4%; P < 0.05). A wide variation in Salmonella prevalence (bacteriological and serological) of different finishing pig lots within individual production sites was found. The wide variation found did not allow the categorization of the sites (statistically) as high or low prevalence systems. Possible reasons for the variation found within production sites include: 1) occurrence of intermittent shedding and clusters, and 2) evolution and resolution of Salmonella infection epidemics. The results showed both, bacteriological and serological estimates of Salmonella prevalence in swine production systems to be inconsistent among cohorts over time. The results suggested that reporting high or low prevalence of Salmonella in swine farms is a matter of timing.

Key Words: Swine, Salmonella, Food safety

258 Programming grazing, irrigation and fertilization cycles based on physiological and environmental data for tropical grasses. J. Rodriguez-Absi1 and E. Gutierrez-Ornelas2, Raesa Mexico, Queretaro, Queretaro, Mexico, Universidad Autonova de Nuevo Leon, Marin, Nuevo Leon, Mexico.

An integrated system for intensive grazing management was developed using “Agroclimatic clocks” which are calculated from environmental data (mean, minimum and maximum monthly temperatures, and photoperiod) and physiological characteristics (upper and lower developmental temperature threshold for C-4 grasses). The system makes use of three types of “Clocks”: a) Plant Development Clock (PDC) calculated from growing degree days b) Plant Growth Clock (PGC) calculated from optimum day and night temperatures for corn plant growth and c) Reference Evapotranspiration Clock (RETC). Actual field growing studies show that a specific corn variety required, depending on the planting date, from 55 to 120 calendar days to reach the kernel milk stage (silage making stage); however, when using the PDC the angular thermal time required for the plant to reach the same stage was 74°C regardless of planting date (angular thermal time is directly proportional to degree days). However PGC, is closely related with the quality of the daily heat received by the plant, (i.e. number of optimal growth days which occur during the plant cycle), that explains why yields are 1.3 to 1.4 times higher for the fall/winter than for the spring/summer growing seasons. Planting date for maximum yield can be established using PDC and PGC. Irrigation program requires also the RETC, FAO crop growth coefficients and soil textural analysis. Fertilization program requires soil fertility analysis and nutrient removal per unit yield. A year round rotational grazing system for perennial grasses can be set by gathering information of at least one growing and resting cycle, including data on stocking rate, forage yield and grass recovery period (50% forage removal). The system allows that grazing begins when the amount of nutrients in forage is maximum. An example of 11 grazing-fertilization cycles marked in the PDC clock for Bermuda grass in Culiacan is presented. Specific “Agroclimatic clocks” can be used for designing an efficient management plan for increase forage yield and quality improvements in harvesting or grazing systems.

Key Words: Growing Degree Days, Bermudagrass, Rotational Grazing


Livestock production has been questioned for a long time because its association with deforestation, subsequent environmental degradation and a decline in productivity. Distinct patterns of deforestation are found within and between countries but most of these forests are converted to unsustainable pastures. Recently, agroforestry systems for sustainable animal production have been developed. Trees and shrubs have long been considered as important sources of nutrition for grazing animals for both the quantity and quality of pastures. Among the diverse types of agroforestry systems under study, protein banks and multiple association of tree/grass systems have contributed much to the development of sustainable dairy and meat production and could be considered as systems that can be extended to farmers. There is a diverse literature on the effects of fodder trees on the productivity of cattle, sheep and goats. The main results obtained are: average daily LW gain of 20-26% higher with browsing fodder trees than animals on only grass systems in young bulls for fattering, daily milk production of 7-10 kg/cow without supplementation with 60-65% more milk/cow, milk productivity (l/ha/year) for the associated tree/grass system 75% more than the traditional grass system, daily live weight gains between 400-525 g in growing replacement heifers which allows a live weight for reproduction of 290-300 kg, growing goats with daily live weight gain of 56% more than grass systems and daily LW gain between 85-100 g in sheep with minimal use of external inputs to the systems. The renovation and introduction of appropriate pastures, adapted to local edaphoclimatic conditions, together with the strategic incorporation of tree plants and shrubs in the grazing areas, seems to be a technological alternative that would contribute to improved livestock production diminish the impact of the ecosystems where they are developed. This could constitute an economically viable solution that does not produce environmental damages and is socially accepted and whose short term benefits would be observed in a sustained increment of the animal production.

Key Words: Agroforestry, Animal Production
Horse Species: Recent Advances in Understanding Metabolic Disorders in Horses

262 The impact of variability in pasture forages on horse metabolism. B. McIntosh1,2, D. Kronfeld1, R. Geor1, W. Stanier1, P. Harris3, and D. Ward4. 1Virginia Polytechnic Institute and State University, Blacksburg, 2Blue Seal Feeds Inc., Londonderry, NH, 3WALTHAM Centre for Pet Nutrition, Melton Mowbray, United Kingdom, 4Rutgers University, Bridgeton, NJ.

Nonstructural carbohydrates (NSC), which includes sugars, starches and fructans in pasture forages undergo circadian and seasonal variation which have direct effects on metabolism in grazing horses. Increased intake of NSC is implicated in the development of digestive and metabolic disorders, such as laminitis. A series of 36 h studies in Virginia examined circadian and seasonal variability in forage NSC content and circulating plasma glucose and insulin in grazing horses (n=10) compared to control horses fed timothy/alfalfa hay (n=4). The unequal group size was accounted for in the statistical analyses which included two-way repeated measures ANOVA with post tests, linear regression, and correlations. We found that circadian and seasonal patterns in forage NSC content in a 5-ha mixed grass/legume pasture were associated with environmental conditions, and NSC was in turn associated with plasma insulin and glucose in the grazing horses. Forage NSC content was highest in April (20.3±0.4 %DM) (P < 0.001) and was attributed mostly to sugars (18.9±0.4 %DM), including glucose, sucrose and fructose. Circadian patterns in forage NSC were associated with environmental conditions, and NSC was in turn associated with plasma insulin and glucose in the grazing horses.

Key Words: Horse, Forage, Metabolism