

American Horse Council requesting that horses be counted in the same manner as feedlot cattle, however EPA chose to continue counting each horse as two animal units. Thus, any operation that has 150 or more horses in confinement (including stalls or dry lots) for a total of 45 days or more in any 12-month period or is otherwise designated as a CAFO has a duty to seek coverage under an NPDES permit. Many stables, breeding farms, and exhibition facilities that have not previously been

affected may now have to meet the requirements of the new regulations, including a provision to be able to contain all of the runoff from a 25-year, 24-hour storm event. The economic cost could be devastating to the industry.

Key Words: Equine industry, CAFO regulation, Environmental regulations

Southern Branch ADSA Symposium: How can we best work together to serve tomorrow's dairy industry?

332 How best can we work together to serve tomorrow's dairy industry: university extension faculty perspective. L. O. Ely*, *University of Georgia*.

The Cooperative Extension Service was created with the Smith-Lever Act of May 8, 1914. Extension work was to "consist of giving instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications and otherwise". At this time the population of the US was rural and education for most was finished at the eighth grade level. Basic information in animal and human nutrition was being discovered. Today extension work has the same objective but the audience is much different. Only a small percent of the US population is rural and engaged in agriculture. The education level is post high school. The need is not for basic information but for fine tuning management decision-making. Producers are looking for ways

to handle the overload of information and records that are available to them. Extension can provide resources that will aid in utilization of record keeping systems and decision-making programs that analyze these records. These programs may be web based for independent use by producers instead of one on one or group meetings between producers and extension specialists. Society has demanded impact and accountability statements that have left agriculture with low scores because of small clientele numbers. Evaluation of quality is not part of these scores, as it is not easily quantified. Other countries have privatized their extension services. In the US there has been an increase in private companies developing their sales force into an extension service that competes with the land grant system. The new objective may be that extension service and industry must cooperate to provide programs and resources to the dairy industry. How does the leadership in college administration evaluate this paradigm shift?

Key Words: Dairy industry, Extension service, Function

Animal Health: Diseases and mammary health

333 Changes in the mechanical properties and the lesion score of the sole horn in first lactation dairy heifers. B. Winkler and J. K. Margerison*, *University of Plymouth, Seale Hayne*.

This experiment compares mechanical tests of the sole horn toughness with the pattern of lesion formation, in the pre- and postpartum heifers. Mechanical tests were completed on samples of sole hoof horn taken from 20 heifers at 2 months before parturition (p1) and 100 days postpartum (p2). Simultaneously, all claws were assessed for the lesions score levels (LS) of sole horn. Heifers were kept at pasture prepartum and housed loose in a straw-bedded yard postpartum. Hoof samples were collected from all claws and analysed for elastic modulus (ELM) and puncture resistance (PR). Each measurement was replicated five times on the same area of each claw. PR force required fracture sole horn was significantly greater in front claws (FC) when compared to hind claws (HC) ($P < 0.05$) (FC 9.7, HC 8.8N), but there was no significant difference between the inner and outer claws. PR force, ELM and LS significantly increased postpartum compared with prepartum ($P < 0.01$) (p1- 7.8N, 86.9N/mm² and 73.1; p2- 10.7N, 118.0N/mm² and 186.5). LS was significantly greater in the HC compared with the FC during the postpartum period ($p < 0.001$) (HC 223.7, FC149.3). In the HC the outer claws presented a significantly ($p < 0.05$) greater LS when compared to the inner claws in both periods. In the FC the LS was significantly higher in the inner claws ($P < 0.01$) postpartum. Prepartum ELM and PR force were not correlated with lesion score either pre or postpartum. However, postpartum ELM and PR force were significantly negatively correlated ($p < 0.01$) to the increase in lesion score between periods ($R = 0.65$). Differences of EML and PR between FC and HC may be related to the different pressure distribution in these claws. Mechanical tests reflected increases in sole lesions and LS following

Key Words: Lameness, Sole tissue, Mechanical testing

334 Muscle protein tyrosine nitration patterns during chronic subclinical intramuscular parasitism: Co-localization to fiber type and ubiquitin. T. H. Elsasser*¹, S. Kahl¹, J.L. Sartin², R. Fayer¹, A. Martinez³, F. Cuttitta³, and J. Hinson⁴, ¹USDA-ARS, Beltsville, MD, ²Auburn University, Auburn, AL, ³NIH-NCI, Bethesda, MD, ⁴University of Arkansas, Little Rock, AR.

The present study was conducted to determine whether the inflammatory oxidative response to chronic intramuscular parasitism, as modeled

with the protozoan parasite *Sarcocystis cruzi*, results in protein nitration damage and whether a pattern to its localization can be characterized. Holstein steer calves (n=10; av.wt.= 124 kg) were assigned equally to control (C) and infected (I, 25,000 Sarco sporocysts) groups. Calves were slaughtered on d56 postinfection and samples of rectus femoris (RF) and psoas major (PM) harvested. Xanthine oxidase (XO) was measured in muscle homogenates by fluorescence (resorufin, 587 nm). Frozen sections (9 μ) were immunostained (IHC; horseradish peroxidase/DAB) for nitrotyrosine (NT) or ubiquitin (UBI) or co-localization of NT with fibertype (staining v nonstaining with mouse anti-myosin fast twitch), or NT with UBI via confocal immunofluorescence. Extracted muscle proteins were extracted, separated on 4-20% SDS PAGE gels, transferred to nitrocellulose, and probed for nitrated proteins using an anti-NT or antibovine-UBI. XO activity, a source of superoxide, was 2.3 times greater in I than C ($P < 0.01$). Western blot demonstrated that >80% of the increase in NT was associated with an increased number of protein bands ($P < 0.04$, I v C) with Mr >75 kD. IHC demonstrated very low levels of both NT and UBI staining in RF and PM of C but increased NT (42% more NT+ fibers, $P < 0.05$) in both RF and PM of I. NT immunostaining could be categorized into three distinct forms: a) peripheral fiber (I and C), b) dispersed intrafiber (I), and c) cyst-specific (I). Both fast and slow fibers displayed the peripheral localization of NT and UBI. Only slow twitch oxidative fibers displayed extensive co-localized intrafiber NT staining regardless of muscle source. The sarcocyst itself was highly nitrated and muscle proteins in the immediate vicinity of the cyst displayed increased NT co-localized with UBI. The data suggest that the oxidative inflammatory response to chronic low-level muscle-resident parasitism generates nitrated muscle proteins. The nitration appears to be more pronounced in slow oxidative fibers and supports prior observations of more severe impact of this parasitism on muscles with higher percentages of slow twitch fibers.

Key Words: Stress, Health, Muscle

335 A relative comparison of diagnostic tests for Johne's disease. T. Duffield¹, D. Kelton¹, K. Leslie¹, K. Lissimore¹, and M. Archambault², ¹Department of Population Medicine, University of Guelph, ²Animal Health Laboratory, University of Guelph.

Prevention and control of Johne's disease (JD) could be improved if diagnostic tests were reliable, rapid and economical. The objective of this study is to evaluate a commercial milk ELISA test relative to other diagnostic tests. 32 dairy herds in Ontario with a suspected high prevalence of JD had fecal and serum samples collected from all milking and dry