

US sheep producers. The objective of this study was to determine the discriminating value of production traits so that measures of production may be used as indicators of reproductive performance. White faced rams consigned to the Wyoming ram test in 2008 (n = 33) and 2009 (n = 41) were tested for expression of sexual behavior while being evaluated for production performance. At the time of behavior testing, rams were 10 mo to 1 yr of age. In 2009, rams were fed using the Grow-Safe feeding system and feeding behavior was correlated to sexual behavior. Sexual performance was evaluated by exposing individual rams to 2 ewes in estrus for 30 min for a maximum of 3 times. Sexual behavior was categorized as: anticipatory (ano-genital sniffs, Flehmen response, fore-leg kicks and nudges) and consummatory (mount attempts, mounts and ejaculations) behavior. Rams exhibiting consummatory behavior were not re-tested. Rams were classified low (LP; n = 18), intermediate (IP; n = 23) or mounting (M; n = 33) according to the level of sexual behaviors exhibited. Rams classified as LP and IP exhibited total anticipatory behaviors  $\leq 9$  (mean =  $4.8 \pm 2.7$ ) or  $\geq 10$  (mean =  $23.7 \pm 10.7$ ), respectively, but did not exhibit mounting behavior. M rams mounted a ewe at least once (anticipatory mean =  $43.5 \pm 24.7$ ; consummatory mean =  $9.5 \pm 7.0$ ). For production traits, each ram was assigned an index ratio based on body weight gain and adjusted for wool characteristics. Data were analyzed using GLM and CORR procedures of SAS. Sexual behavior classification did not influence ( $P \geq 0.5$ ) index ratio, feed consumed per day, or number of feed intake episodes. Although anticipatory and consummatory behaviors ( $r = 0.48$ ;  $P < 0.05$ ) and test index ratio and feed consumption ( $r = 0.50$ ;  $P < 0.05$ ) were highly correlated, sexual behaviors were not significantly correlated with the index ratio ( $r = 0.08$ ;  $P = 0.5$ ). Measures of production performance do not appear to be reliable predictors of sexual behavior in yearling rams.

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**1016 Optimal livestock gross margin for dairy insurance contract design.** M. Valvekar, V. E. Cabrera\*, and B. W. Gould, *University of Wisconsin, Madison*.

Volatility in milk and feed prices are a major source of dairy farm risk. Since August 2008 a new federally reinsured insurance program referred to as Livestock Gross Margin Insurance for Dairy Cattle (LGM-Dairy) has been available to many US dairy farmers to help manage the variability in dairy income over feed costs. In the design of the desired insurance contract, the dairy farmer has to decide on the percentage of monthly milk production to be covered by this insurance contract. The objective of this paper was to develop an algorithm and a user friendly software system to identify the optimal LGM-Dairy contract for a risk neutral dairy farmer in terms of monthly coverage at the lowest premium such that a target guaranteed income over feed cost (TGIOFC) is obtained. We optimize our nonlinear programming model via the use of a generalized reduced gradient method. The premium solver platform, V5.0 (Frontline systems, Incline Village, Nevada) within the Excel software system was used for optimization. The analysis was done for a representative 120 herd size dairy farm producing 8,873 kg milk per cow per yr. Wisconsin statistical data indicated that similar sized dairy farms require an income over feed cost (IOFC) of at least \$110 per Mg milk to be profitable during the coverage period. Using these data for the July 2009 insurance contract to ensure \$110 per Mg milk, the least premium cost contract was found to have a premium of \$1.22 per Mg milk produced insuring approximately 52% of the annual production with variable monthly production covered over the September 2009 to June 2010 period. This premium represented 1.10% of the desired TGIOFC. An alternative non-optimal strategy, defined as a contract insuring the same proportion of milk as the optimal (52%), but with constant percentage coverage each month of the insurance contract

was analyzed. The premium for non-optimal strategy was found to be almost twice the level obtained under the optimal solution representing 1.9% of TGIOFC.

**Key Words:** risk management, price risk, revenue insurance

**1017 Do hyphenated techniques permit the speciation of metal glycinate complexes?** C. Ionescu\*<sup>1</sup>, V. Vacchina<sup>2</sup>, R. Lobinski<sup>3</sup>, S. Oguey<sup>1</sup>, and D. Bravo<sup>1</sup>, <sup>1</sup>Pancosma, Geneva, Switzerland, <sup>2</sup>UT2A, Pau, France, <sup>3</sup>CNRS, Pau, France.

Trace elements inclusion as feed additives is based on their metal content. This is mainly due to the unavailability of analytical methods differentiating trace element sources. The objective was to develop a method allowing specific determination of Zn, Cu, Mn and Fe glycinate complexes (BT) from sulfate (SU), citrate (CI) or histidinate (HI), preserving BT molecular integrity. A mixture of the 4 BT standards was used to optimize the analytical conditions. Five couplings were tested: size exclusion liquid chromatography with coupled to inductively coupled plasma spectrometry (SE HPLC-ICP-MS); hydrophilic interaction liquid chromatography (HILIC) with ICP-MS; Zwitterionic (ZIC)-HILIC with ICP-MS and capillary electrophoresis (CE) coupled either with electrospray mass spectrometry (ESI MS/MS) or ICP-MS. The SE HPLC-ICP-MS, HILIC-ICP-MS or ZIC-HILIC-ICP-MS coupling did not permit separation of BT from SU. Coupling of CE with ICP-MS gave the best results. All BT electropherograms contained a single peak. The 4 BT injected simultaneously were separated suggesting an efficient electrophoretic separation. The ICP-MS signal specificity was proven comparing experimental vs. theoretic trace elements isotopic ratios and peak absence in the blank. BT Cu was well separated from SU, CI and HI. BT Zn was well separated from SU and HI but not from CI. BT Mn was well separated from SU but there was an overlapping with CI and HI. BT Fe was well separated from SU or CI but not from HI. However, CI and HI were reconstructed complexes and not standards. BT molecular integrity was checked using CE ESI-MS(/MS) coupling. BT polymers were destroyed explaining the single peak in CE-ICP-MS electropherograms. BT sulfate ligand was lost but metal-glycine link was preserved. These results make capillary electrophoresis a promising tool for the quantification of BT. Providing validation of the method, the coupling CE-ICP-MS may allow the quantitative speciation of BT in feedstuffs.

**Key Words:** traceability, glycine complex, chelate

**1018 Determination of metal glycinate in premixes using capillary electrophoresis coupled with an inductively coupled plasma mass spectrometry detector (CE-ICP-MS).** C. Ionescu\*<sup>1</sup>, V. Vacchina<sup>2</sup>, S. Oguey<sup>2</sup>, R. Lobinski<sup>3</sup>, and D. Bravo<sup>1</sup>, <sup>1</sup>Pancosma, Geneva, Switzerland, <sup>2</sup>UT2A, Pau, France, <sup>3</sup>CNRS, Pau, France.

Previous results have shown that capillary electrophoresis coupled to inductively coupled plasma mass spectrometry (CE-ICP-MS) was a promising tool for metal glycinate (BT) speciation. The objective was to validate this method and to use it to determine BT concentration in mixes. The analytical conditions developed included an electrolyte made of 20 mM ammonium acetate (pH 7.4), a voltage of 30 kV and a hydrodynamic injection of 1 s. Specificity of the method was previously discussed. The analytical figures of merit of the approach were then determined. The calibration curve, made of 6 points, was linear ( $R^2 > 0.995$ ). The repeatability (n = 10 for concentrations in the middle range of the calibration curve) was below 12%. In the absence of Certified Reference Material, accuracy was evaluated by analyzing quality control samples in the lower, medium and upper range of the calibration curve