
The objective of the research was to evaluate the cost of *S. uberis* mastitis and the profitability of vaccination protocols. Literature data were reviewed to determine the average incidence and effects of clinical and subclinical *S. uberis* mastitis and the impact of vaccination on the incidence and effects. A stochastic dairy herd simulation program (www.dairyfarm.es) was used to simulated different scenarios. The modeled farm was a 300 adult cows producing 11,500L/cow/year with an SCC of 200 × 10^3 cells/mL. Milk price was 0.35€/L with 0.02€/L penalty if somatic cell count were above 300 × 10^3/mL. The behavior of *S. uberis* mastitis is variable and may become chronic in some cases. However, average values of literature were used. Control scenario was tested with an average incidence of 12.5%, where 4% were clinical and 8.4% subclinical mastitis. In all cases, the incidence in primiparous cows was 25% of that of multiparous cows, culling risk was 36% and the risk of recurrence increased 35% after the first case. Clinical cases lasted 13 d where milk production was reduced 5% daily, conception rate was reduced by 26% during 42 d after the infection, and somatic cell count was multiplied by 4. Treatment cost was 30€/case including antibiotics and labor, with a recovery rate of 90%, and milk had to be withdrawn for 10 d. Subclinical cases lasted 45 d with a 7% daily reduction in milk yield and somatic cell count was multiplied by 4, but with no effects on reproduction. The vaccine (UBAC, Laboratorios Hipra SA, Spain) was applied 3x/year at 4.7€/dose including vaccine cost and labor, and reduced the incidence of clinical and subclinical diseases by 50%. In cows vaccinated but infected, the effects were reduced by 50%. All simulations were conducted for 5 years and were repeated 66 times. The cost of a case of mastitis by *S. uberis* was on average 88.80€. With an average incidence of 12.5%, vaccination increased the gross margin by 47€/cow/yr. The sensitivity analysis indicates that the breakeven point for the application of the vaccine is for an incidence of 3.4%

Key Words: subclinical mastitis, dairy goats, methicillin-resistant *Staphylococcus aureus*

355 Molecular characterization of methicillin-resistant *Staphylococcus aureus* (MRSA) and associated risk factors with the occurrence of mastitis goats. M. Ijaz*, M. Altaf, M. Kashif Iqbal, A. Rehman, M. Avais, and A. Ghaffar, University of Veterinary & Animal Sciences, Lahore, Punjab, Pakistan.

The current study was designed to determine the prevalence of *Staphylococcus aureus* (S. aureus) related subclinical mastitis (SCM) and detection of methicillin-resistant *Staphylococcus aureus* (MRSA) in dairy goats in Pakistan. A total of 385 milk samples were collected from Mianwali (n = 192) and Narowal (n = 193) districts and initially screened for high SCC by using Surf Field Mastitis Test (SFMT). SFMT based positive samples were subjected to disc diffusion test using oxacillin discs and further confirmed through amplification of mecA gene to detect resistance against Methicillin in *S. aureus* isolates. Hypothesized risk factors for the occurrence of SCM were recorded and analyzed through logistic regression model in SPSS version 20.0. Initially variables were analyzed by univariable analysis. At significance level of P < 0.2, the variables were tested. Then these variables were included in multivariable logistic regression model. The study revealed 39.2% (151/385) prevalence of SCM by SFMT which was mainly 80.8% (122/151) caused by *S. aureus*. MRSA prevalence through disc diffusion test was 18.8% (23/122) while PCR based prevalence was 6.5% (8/122). All the study isolates showed 99% homology with MRSA isolates of India, Turkey and Japan with accession numbers MH798869, EU790488 and NG047938 respectively, available in NCBI database.

Milkers' care and hygienic measures during milking, milk yield, use of teat dips, presence of ticks, mixed type of grazing and services by professional were key risk factors associated with the occurrence of SCM in goats. This is the first report regarding the molecular characterization of MRSA isolated from dairy goats in Pakistan and the study will be helpful to provide information for developing control strategies against mastitis in goats.

Key Words: subclinical mastitis, dairy goats, methicillin-resistant *Staphylococcus aureus*
ed for variables expected to have minimal variation on US dairies and appropriate distributions were used for components that were assumed to vary. Costs for fixed or variable inputs and distribution types were derived from previously published models, current industry databases, or from professional experience. For culture-guided SDCT, on average, producers could expect to save $2.14 per cow-dry-off as compared with BDCT. For algorithm-guided SDCT, the mean net impact was $7.85. Seventy-six and 100% of iterations had a net impact ≥ $0 for culture- and algorithm-guided SDCT, respectively, indicating that the strategies were profitable in most of the herd conditions evaluated. The largest contributors to variance (~75% and ~25%) in both models were the percent of quarters treated at dry-off and the cost of antibiotics. Next, we investigated the economic impact in situations where SDCT increased mastitis cases during the next lactation. For this sensitivity analysis, subclinical and clinical mastitis were both set to increase by 1%, 2%, or 5% and net economic impacts were determined at fixed values of 20, 40, 60 and 80% antibiotic use at dry-off. Analysis indicated that if a 1% or 2% increase in mastitis resulted, in many situations SDCT continued to have net benefits over BDCT, particularly when use of these strategies resulted in lower levels of antibiotic use for the herds. At each level of evaluated antibiotic use, when mastitis was increased by 5%, mean economic impacts were negative for 95% of iterations. This partial budget analysis found that in the majority of situations, 2 SDCT strategies produce a positive net economic impact over BDCT.

358 Effect of treatment at dry-off with intramammary antibiotics, internal teat sealants, or both on milk production in dairy cows. W. R. ElAshmawy1,2, E. Okello1,3, D. R. Anderson1, B. Karle2, T. W. Lehenbauer1,3, and S. S. Aly1,3, 1Veterinary Medicine Teaching and Research Center, School of Veterinary Medicine, University of California-Davis, Tulare, CA, 2Department of Internal Medicine and Infectious Diseases, Faculty of Veterinary Medicine, Cairo University, Giza, Egypt, 3Department of Population Health & Reproduction, School of Veterinary Medicine, University of California-Davis, Davis, CA, 4Animal Health Branch, California Department of Food Agriculture, Sacramento, CA, 5Cooperative Extension, Division of Agriculture and Natural Resources, University of California, Orland, CA.

Milk production is the main source of income to the dairy industry and mastitis remains the greatest challenge for dairy producers. Among the approaches implemented to control and prevent mastitis on dairies are vaccination, pre and post milking teat dip and treatments at dry off including intramammary antibiotics and teat sealants. The objectives of our study were to evaluate the effect of different treatments at dry off on milk production and somatic cell count (SCC) in the subsequent lactation. A block randomized trial was conducted between December 2016 and February 2018 on 8 herds from 4 of the top 10 milk producing counties in California: Tulare, Kings, Stanislaus, and San Joaquin. Cows were enrolled during winter and summer seasons to account for the seasonal variability and eligible cows were treated at dry off with either intramammary antibiotics (AB), internal teat sealant (ITS), both or none and followed through 150 d in milk (DIM) post calving. Milk production and SCC data were extracted from monthly milk test day records (Dairy Comp305, Valley Ag Software, Tulare, CA). Two-piece spline linear mixed models were used to model the milk production (kg) and log10 of SCC (cells/mL). After accounting for parity, breed, season and dry period duration, the milk model showed a significant increase in milk production (1.88 kg/d) in cows treated with both AB and ITS at dry off in comparison to the controls; while there was a numerical increase in milk produced by cows that received either AB or ITS. Different dry cow treatments were associated with a significant reduction in the log10 SCC during the first 150 d following calving. The greatest reduction was associated with administration of both AB and ITS (~0.41; P < 0.01), followed by AB (~0.30; P < 0.01), and finally ITS (~0.19; P = 0.03) in comparison to controls. Dry cow treatments can be used selectively to address specific herd production and milk quality goals. Dairies with high SCC may benefit from treating cows at dry off with both AB and ITS.

Key Words: dry cow treatment, somatic cell count, clinical trial