levels within the parameters suggested by the NMC Machine Milking Committee recommendations. Testing can be done at several locations in the milk hose simultaneously to evaluate vacuum drop across specific components between the claw and the milk line.

Physiologic parameters to predict milk yield following clinical mastitis in dairy cattle

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A cohort study was designed to evaluate the physiologic response of cows to naturally occurring coliform mastitis. Measured physiologic parameters were used in a model to predict subsequent mature-equivalent 305-day (ME305) milk production. In particular, the study was directed to determine: 1) the association of coliform (*E. Coli* and *Klebsiella sp.*)and gram positive (coagulase negative *Staphylococcus* and *Streptococcus* non-agalactiae) mastitis and subsequent liver cell damage by measuring serum sorbitol dehydrogenase (SDH), 2) the effect of coliform and gram positive mastitis on peripheral blood white blood cell counts (WBC) and packed cell volume (PCV), and 3) the value of physiologic parameters to predict the production outcome of a case of clinical mastitis. Over a one-year period, complete bacteriologic, production, and physiologic data were collected on 78 cases of clinical mastitis (22 coliform, 22 gram positive, 34 no growth). Using multiple linear regression analysis, predictive parameters from day 5 after clinical case were seen in cows with coliform and gram positive mastitis. These included SDH (increases were associated with higher ME305), WBC (increases were associated with higher ME305), and PCV (increases were associated with decreased ME305). Such a model could be useful to dairymen and veterinary practitioners in estimating a prognosis for a cow's recovery to profitability.

A placebo-controlled trial of an Escherichia coli J5 bacterin and the ribotyping-based assessment of coliform bacteria diversity on a dairy farm.

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To evaluate the efficacy of an experimental *Escherichia coli* J5 bacterin to prevent natural occurring clinical coliform mastitis (CCM) in dairy cows during a whole lactation period, and to determine which of the three proposed immunization schedules was associated with a higher protection against CCM, we conducted a randomized, double-blind, placebo-controlled clinical trial on a commercial dairy in central New York State. Furthermore, bacteria isolated from clinical cases were assessed by automated ribotyping. Holstein cows (n=240) were administered either the bacterin (whole cell of *E. coli* J5 plus metabolizable oil as adjuvant, n=180) or the placebo (saline plus adjuvant, n=60) in the supramammary lymph node region. The immunization or placebo dose administration schedules compared were: **1**, at 7, 8, and 9 month gestation; **2**, at drying off, 4 weeks later during the dry period, and at calving; **3**, at drying off, at calving, and at 90 days in lactation. The period of surveillance for cows in the trial began immediately after calving and continued for the entire lactation (range= 262-305 days). A total of 50 cows, 23 immunized and 27 controls, were diagnosed as

having CCM. Bacteria isolated were 36 *E. coli*, 8 *Klebsiella pneumoniae*, 5 *Enterobacter agglomerans* and 1 *E. aerogenes*. The efficacy of this bacterin was 17%, 93%, and 63% for administration schedules 1, 2, and 3. Eight ribotypes were found among the *E. coli* isolates, 6 of *K. pneumoniae* and 2 of *E. agglomerans*. Results suggest that: 1) the administration of a bacterin dose at calving is required to reduce the incidence of CCM during lactation; 2) considering that more than one ribotype for each coliform bacteria were found, there was an enzootic rather than an epizootic distribution of those bacterial species on the farm.

Characterization of the immune response in calves vaccinated with novel *Salmonella dublin* vaccines

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The purpose of this study is to characterize the humoral, cellular, and mucosal immune responses of dairy calves to a subunit vaccine of *Salmonella dublin*. Through detergent extraction and ion exchange chromatography, the outer membrane protein porin was purified, then complexed to 7 separate adjuvants. Calves were divided into 9 groups of 8 calves each. Seven groups of calves received different porin- adjuvant combinations; one group received the antigen without an adjuvant, and one group of calves served as unvaccinated controls. The vaccines were administered subcutaneously to the calves at 1, 3, and 5 weeks of age.

Serum titers of IgM, IgG1, and IgG2, and nasal secretion titer of IgA to *S. dublin* porin and lipopolysaccharide were measured by ELISA at variable intervals for 5 months. Cellular immune responses were also monitored at variable intervals over a 5-month period. A commercially-available ELISA specific for bovine gamma interferon (G-IFN) was adapted to measure the calves' cellular immune response to the different antigen-adjuvant combinations.

Additional data collection included pre- and post-vaccination complete blood count and physical examination. Reaction at the injection sites were also monitored. Preliminary data from the study will be presented and discussed.

In the future, the porin-adjuvant combination determined to elicit the strongest cellular immune response, as measured by the G-IFN ELISA, will be the first vaccine tested in future *S. dublin* challenge studies in calves. The combination that elicits the highest salivary IgA titer will also be tested in initial challenge studies.

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