from inoculation and to first visible green-metallic sheen was recorded. Isolates were identified using (API 20E) biochemical test strips.

Results and Conclusions

Isolates and milk samples totaled 129. Nine species of gram-negative bacteria were identified using biochemical test strips. Of 63 *E. coli* isolates, 61 were EMB-positive, and of 66 non-*E. coli* gram-negative isolates, 64 were EMB-negative, for an intermethod agreement of 96.9% and a K-value of 93.7%. This indicates excellent agreement, beyond chance, between identification of *E. coli* with biochemical test strips and EMB agar.

Minimum time to first visible sheen was 3.3 hours and maximum time was 10 hours, for a mean (standard deviation) of 5.7 (1.5) hours and a median of 5.2 hours.

Rapid differentiation of *E. coli* from other gram-negative mastitis pathogens is important for initiation of an appropriate treatment plan. Cows with mild to moderate *E. coli* mastitis usually self-cure within a few days without intramammary antibiotic therapy, while mild to moderate cases of *Klebsiella spp.* mastitis tend to evolve into chronic infections and may warrant intramammary antibiotic therapy. Intramammary antibiotic therapy in most cases of mild clinical mastitis can be safely delayed until bacterial culture results are obtained. Severe cases can be treated systemically with supportive therapy (fluids, anti-inflammatories, systemic antibiotics, calcium), regardless of the causative agent, until milk culture results are obtained.

Eosin methylene blue agar is a reliable, simple and rapid method to differentiate *E. coli* from other gram-negative mastitis pathogens.

Accurate Diagnosis of the *Mycobacterium paratuberculosis* Status of Cattle Herds

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Introduction

Programs to classify cattle herds by *M. paratuberculosis* infection status must satisfy buyer's concerns that cattle from tested herds are unlikely to be infected (high negative predictive value), and seller's concerns that their herds will not be erroneously, classified as infected (high positive predictive value). Veterinarians recommending these programs need confidence that a high percentage of herds will be classified correctly. Probablistic models were used to evaluate 3 diagnostic strategies that use tests of individuals to classify cattle herds by *M. paratuberculosis* infection status: 1) enzyme-linked immunosorbent assay (ELISA) serology; 2) culture of feces; 3) ELISA serology in series with confirmatory culture of feces.

Materials and Methods

Sensitivities of the tests for individuals were empirically estimated to be, 25% for ELISA serology, 40% for culture of feces, and 20% for ELISA serology in series with culture of feces. Specificities were 99% for ELISA serology, 99.99% for culture of feces and 99.99% for ELISA serology in series with feces culture. One reactor was used to classify the herd as infected. Herd-level sensitivity and specificity was calculated for each herd-testing strategy, assuming sampling without replacement (hypergeometric probability distribution). The outcomes used to evaluate the herd-testing strategies were: 1) predictive value of a positive herd classification, 2) predictive value of a negative herd classification, and 3) percent of herds classified correctly. Each outcome was calculated for ranges of sample size (40-400), expected within-herd prevalence (1-10%), prevalence of infected herds (5-50%), and herd size (50-3200).

Results and Conclusions

The models predicted that, by ELISA serology alone, false-positive herd classifications would prevent

the majority of herds from being classified correctly. By culturing feces or serial testing >95% of herds could be correctly classified (with sufficient sample size). Incorrect classification using those strategies is more likely, due to false-negative classifications in populations where the prevalence of infected herds is high and within-herd prevalence is low. Low within-herd prevalence cannot be detected as well in smaller herds. For the same accuracy, the proportion of the herd to sample decreases as herd size increases.

Milk Quality Premiums Received by Wisconsin Dairy Farms Participating in Veterinary-directed Milk Quality Programs

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Introduction

High quality milk is generally defined as adulterant free milk that meets specific quality criteria relating to the level of somatic cells (SCC) and bacteria. In the U.S., production of high quality milk is encouraged by legislating maximum limits of SCC and bacteria, and by financial rewards offered by processors (premiums). This study describes the relationship between measures of milk quality, dairy management practices and financial incentives offered by milk processors on selected Wisconsin dairy farms.

Materials and Methods

Data was obtained from a subset of dairy herds (n=54) that were participating in a milk quality pilot program. Data collected included financial information, health information and herd management practices. Herds were classified based on milk quality adjustment made to their base milk price in the month prior to beginning the milk quality program. Premium categories were defined as: Deduct (D) (-$0.30 to $0.00 per 45 kg milk; n=12); Small Premium (SP) ($0.06 to $0.30 per 45 kg milk; n=22), or Large Premium (LP) ($0.32 to $0.93 per 45 kg milk; n=20). Data was analyzed using Statistix.

Results and Conclusions

Among premium categories there was no significant difference in number of cows per herd (141 cows in D, 155 cows in SP and 178 cows in LP) or rolling herd average: 9,692 kg (21,322 lb) in D, 10,036 kg (22,079 lb) in SP and 10,441 kg (22,970 lb) in LP. However, herds participating in this study were larger and more productive than typical Wisconsin dairy farms.

SCC values are used to define premium levels and as expected, bulk tank SCC was higher for D (452,667 cells/ml) as compared to SP (285,667 cells/ml) or LP (220,125 cells/ml). Premiums received (RecPrem) approximated a normal distribution, with a mean of 23 cents per 45 kg (99 lb).[a]

Average RecPrem per 45 kg were 11 cents for D, 17 cents for SP and 50 cents for LP. Maximum premium offered by the processor was lower for SP at 66 cents, compared to D at 69 cents and LP at 85 cents.

The following equation accounted for 77 percent of the variation in received premium:

$$RecPrem=0.24-.0000018(BTSCC)+0.41(MaxPrem)+.001(DIM)$$

Prevalence of subclinical mastitis was lower for LP and SP herds, with 24% of the LP herd showing linear somatic cell scores >4, and 28% of the SP herd. This compared to 36% of scores in the D herd. Incidence of subclinical mastitis, defined as cows with new linear somatic