

Biological Risk Management Practices on US Dairy Operations and their Correlation to Production Parameters

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Introduction

Disease introduction is a very real threat to dairy operations. Prevention practices can help minimize the risks. Biological Risk Management (BRM) includes increasing awareness by evaluating livestock operations based on the risk of infectious disease entry and spread. BRM also provides practical management plans to decrease disease risk. Existing scientific data for biological risk management in dairy operations is limited. Correlating disease prevention practices with dairy production parameters is also lacking. Using a dairy assessment tool, the objective was to 1) identify current biological risk management practices on 80 US dairies of different size and location, and 2) identify specific prevention practices that are highly correlated with production parameters.

Materials and Methods

Extension faculty in California and Iowa asked farms with 90 cows or more that utilized a Dairy Herd Improvement (DHI) record service if they would participate in an on-farm assessment of biological risk management practices. Participants represented a convenience sample and did not receive payment. The on-farm assessments consisted of two question sets. The Pre-Assessment Questionnaire included 14 open-ended questions pertaining to herd demographics, production parameters, visitor protocols and isolation facilities. The Assessment Questionnaire consisted of 45 closed-ended questions with yes, no, or maybe as possible responses. Each question was worded so that if the producer was performing the prevention practice, they answered yes. On-farm interviews lasted 30-45 minutes. The assessment questionnaires were de-identified and sent to one technician either in California or Iowa for entry into an online database. The technicians provided the data collectors with a series of three reports to return to the dairy producers. All data was coded and entered into a spreadsheet program (Microsoft Excel™, 2003). Descriptive statistics were calculated for all questions. A hierarchical technique was used to find clusters of the

questions using the software package JMP®. Production parameters (actual herd 305-day mature equivalent and somatic cell count) were collected on all 80 dairy herds based on DHI reports and served as dependent variables to which each prevention practice was compared.

Results

On-farm assessments were conducted on 40 California and 40 midwest dairies from February-June 2006 and February-June 2007, respectively. Assessments were conducted by six University of California, Davis dairy farm advisors in five counties and six Iowa State University extension faculty in 24 midwest counties. Among the 80 dairy operations were 64 Holstein herds, seven Jersey herds, one Guernsey herd and eight mixed breed herds. Herd size ranged from 92 to 3550 head (median 506 head). Milk production (305ME) ranged from 15,564 to 30,586 lb (median 24,313 lb) [7,060 to 13,874 kg (median 11,028 kg)]. Somatic cell count ranged from 110,000 to 954,000 (median 259,000). The number of visitors per week ranged from 0-79. Only 21.5% (17/79) had a visitor protocol in place. Some protocols included posting signs that said "by appointment only," requiring visitors to wear boots, and prohibiting entry into animal pens/corals. Practices that less than 25% of farms were doing included having a veterinarian necropsy animals that died from unknown causes; posting signs restricting access to the farm; requiring clean clothes on everyone entering the operation; and requesting employees avoid contact with livestock outside of the operation.

Significance

This study helped identify specific management practices that correlated with measurable production parameters to guide future research to benefit cow health. Implementation or maintenance of prevention practices that correlate with milk production parameters could economically benefit dairy producers. Risk of disease transmission cannot be completely eliminated, but employing specific biological risk management principles can minimize future disease challenges.