The Epidemiology of Vesicular Stomatitis in Dairy Sentinel Herds of El Salvador

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Objectives-- The objectives of this study were to investigate the persistence of Vesicular Stomatitis (VS) in animals on known infected premises; serologically follow a cohort of animals on these premises to determine disease pattern and possible modes of transmission; and identify potential factors associated with the reoccurrence of VS on these premises.

Design-- Cohort study.

Animals-- 661 dairy cows on 14 sentinel farms were selected as cohorts.

Methods-- The 14 sentinel farms were selected based on confirmed VS-positive cattle (on premises or neighboring premises) in one or more outbreaks during the last three years. The selection of cohorts was based on the population of cows on the farm; all heifers from small dairies were sampled, and 30 heifers plus 15% of the other cattle were sampled on larger dairies. Producers were asked to commit to a two-year minimum participation in the study and complete a questionnaire detailing their operation. For each cow, serum and oral swab samples were collected and a physical exam was conducted on a monthly basis from January 1998 through January 2000. The serum samples were screened by the competitive enzyme-linked immunosorbent assay (cELISA) to detect the presence of IgG antibody for each serotype of the virus -- New Jersey (NJ) and Indiana (IN). The percent reduction was then used to determine the positive and negative classifications, with 50% serving as the cut-off value for the threshold of positive reactions. Statistical analyses were performed at cow and farm levels. Overall and farm-level prevalence for each serotype were calculated. The dates of seroconversion for each positive animal were analyzed. The serotype by age for each farm was calculated.

Descriptive Analysis-- The overall frequencies for VS-NJ and VS-IN were 28.64 percent and 10.14 percent, respectively. Also, on each farm the seroprevalence of VS-NJ tended to be higher than that of VS-IN. Four of the farms reported zero cases of vesicular disease and produced no positive serologic tests for either VS-NJ or VS-IN during this investigation. Seroprevalence of both NJ and IN increased slightly in February of 1998 and 1999, again in June of 1998, and has been increasing slowly since March of 1999. The highest seroprevalence was observed in the >16 months age group for both serotypes (65.2% for VS-NJ and 33.7% for VS-IN).
Conclusions-- The higher overall and individual farm seroprevalence of VS-NJ is a similar finding to previous studies in Costa Rica and the United States. The discrepancy in seroprevalences can possibly be attributed to vector differences between the two serotypes. The specific VS-NJ vector may be more abundant or more efficient in transmitting the virus than that of VS-IN. The identification of 4 farms without any seroconversions is a significant finding, in that it suggests that the environment and ecologies of these farms are not suitable for maintenance and transmission of VSV. The slow increase in seroprevalence over time is expected when following a sentinel population that will retain high titers for long periods of time in response to this virus. The high seroprevalence in the older age group is not surprising either, because these animals have had a greater opportunity for exposure to VSV. These findings emphasize the need for more detailed investigations of vector populations and sentinel site ecology in order to understand the seroprevalence differences.