Herd Stratification to Reduce the Spread of Johne’s Disease

M. Pence, DVM MS PAS Diplomate, ABVP (Beef Cattle), D. Ensley, DVM, MS
1Department of Population Health College of Veterinary Medicine University of Georgia Tifton, GA
2Department of Population Health College of Veterinary Medicine University of Georgia Athens, GA

Introduction

Johne’s disease (JD) is a chronic, progressive enteric disease of ruminants caused by infection with Mycobacterium avium subspecies Paratuberculosis (MAP). Johne’s disease causes major economic losses to the cattle industry. There is an age susceptibility to JD with younger cattle being more susceptible. Calves are generally infected as neonates. After a prolonged incubation period of two to ten years, initial clinical signs may develop, including severe progressive diarrhea and gradual weight loss, despite the persistence of a normal appetite. Typically, the infection develops in the ileum and gradually spreads to regional lymph nodes and other viscera. Over time, cattle become lethargic, emaciated and, in the terminal stages of disease, exhibit cachexia and severe watery diarrhea. MAP survives in the soil and the cattle environment for extended periods of time. Environmental contamination contributes to the pathogen load and infection rate of neonatal calves. In an attempt to reduce the pathogen load that neonatal calves are exposed to, these two cow herds were stratified by age and stage of production.

Materials and Methods

Cattle flow through the production units and drainage were analyzed. The calving area and calf flow was altered to reduce contamination of the calving area by MAP.

Results

Culture results of the calving area and cow herd demonstrated reduced MAP contamination of the environment. It will be several years before a determination of any reduction in herd prevalence of MAP infection can be determined due to the extended incubation time of this disease.

Significance

Management of cattle flow and calving areas offer tools to reduce the herd prevalence of MAP infection.

Systematic Review of Johne’s Disease Vaccination

S. Robbe-Austerman, DVM, MS1, J.R. Stabel, PhD2
1Veterinary Diagnostic and Production Animal Medicine, Iowa State University, Ames, IA
2National Animal Disease Center, Ames, IA

Introduction

Johne’s disease (JD) is a major health concern for the cattle and small ruminant industries world wide. Vaccination against JD has been in use since 1926, but has been controversial. Our objective was to conduct a systematic review of JD vaccination and do a meta-analysis of the data.

Materials and Methods

Criteria for inclusion in the systematic review included: must be a randomized clinical trial, have a minimum of 10 animals, last for more than 30 days and had an outcome of at least one of the following: clinical disease, fecal shedding, or tissue culture or histology. Search methodology included using The History of Paratubercu-
crosis, Medline, reference lists and hand searching pro-
ceedings. A total of 66 research trials were identified,
and 20 met the criteria for inclusion in the systematic
review.

Results
The JD vaccine reduced the occurrence of clinical
disease by 92% (95% CI 90-96%), with a heterogeneity
chi square of p=.96. The vaccine reduced fecal shedding
by 57% (95% CI 41-69%), there was heterogeneity (p
value =.001), but all trials were able to reduce fecal shed-
ding. The JD vaccine reduced the numbers of animals
with positive tissues by 56% (95% CI 49- 62%). Again,
there was heterogeneity (p value =.000), but all trials
had a reduction in positive tissues.

Significance
These data would suggest that the Johne's disease
vaccine is effective at reducing clinical disease, fecal
shedding and tissue infection.

Effect of Sub-Clinical Manifestations of Bovine Paratuberculosis in Beef Cattle

Mario A. Villarino, DVM, PhD1, S.E. Wikse, DVM, ACVP2 and E.R. Jordan, PhD1
1Texas Cooperative Extension, The Texas A&M University System, Dallas, TX 75252
2College of Veterinary Medicine, Texas A&M University, College Station, TX 77843

Introduction
Bovine paratuberculosis (Johne's disease) is a
chronic, debilitating disease of cattle. Although widely
known in the dairy industry, the effect of the disease in
extensive ranch operations is unknown. Currently, test-
ing techniques for bovine paratuberculosis in beef cattle
are few, costly and somewhat inaccurate. We conducted
the study of a beef herd located in Texas with the objec-
tive of evaluating the effect of subclinical manifestations
of bovine paratuberculosis in beef cattle.

Materials and Methods
We conducted serial testing using ELISA for se-
rum samples collected during three consecutive years
(2003-2004-2005) of 685 Bos taurus x Bos indicus cows
from a ranch known to have clinical cases of the disease
with fecal culture positive samples. Animals were con-
sidered positive when an ELISA S/P value of 0.25 or
more was detected in at least one of the tested years.
Weaning weight and age of wean of the offspring (fe-
males, males and steers) of seropositive and seronega-
tive dams were compared using One-Way ANOVA, all
pairwise multiple comparison (Tukey test), Dunns'
method of multiple comparison and Kruskal-Wallis one-
way analysis of variance in non-parametric comparisons.

Results
The most important finding was that the weaning
weights of female offspring of seropositive dams were
significantly different than the weaning weights of fe-
male offspring of seronegative dams (P=0.035). We also
found statistically significant differences in weaning
weights between females, males and steers in each se-opositive and seronegative group (the male offspring
of seronegative dam were considerably heavier). No sta-
tistically significant differences were found in age at
weaning.

Significance
Our results indicate that subclinical cases of bo-
vine paratuberculosis can cause significant differences
in herd performance (in our study, weaning weights) on
beef herds. Due to the chronicity of the disease and lim-
ited performance of the currently available tests, serial
testing is required to provide an estimate of disease
prevalence.