



United States  
Department of  
Agriculture

Animal and  
Plant Health  
Inspection  
Service

Veterinary  
Services

# Salmonella in Dairy Calves

National Animal Health Monitoring System

Salmonella infection occurs in dairy calves throughout the United States at levels that vary by region, season, and herd size.

In cattle, Salmonella may cause disease in older animals, although most cases occur in the young calf. Of critical importance to the dairy producer is that treatment or therapy is usually unsuccessful. Prevention is the key.

In 1991-92, the U.S. Department of Agriculture conducted a study called the National Dairy Heifer Evaluation Project (NDHEP) which determined Salmonella prevalence rates across the nation. Dairy producers from 28 states (shown below) were selected to represent herds of 30 or more cows and also represent 78 percent of the National dairy cow population. Participating producers could elect to have fecal samples from a number of preweaned calves tested for Salmonella.

The National Veterinary Services Laboratories (USDA:APHIS:VS) tested 6,862 calf fecal samples and found 145 (2.1 percent) positive for Salmonella. Figure 1 shows that the serotype found most often was S. typhimurium (40 samples or 27.6 percent of the positive samples) followed by S. dublin (10.3 percent of the positive samples).

The NDHEP results indicate *shedding* of bacteria rather than *cases* of disease. Shedding means that the organism is found in the animal's feces, but the animal may or may not become sick. During the NDHEP,

Figure 1. Number of Dairy Calves Positive for Salmonella Serotypes (145 of 6,862 Tested)

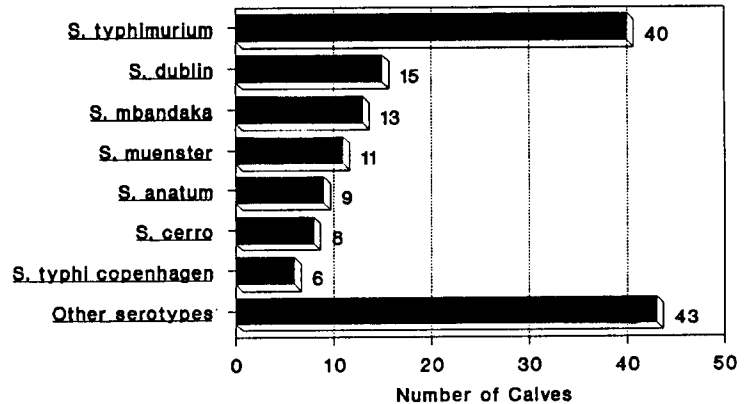
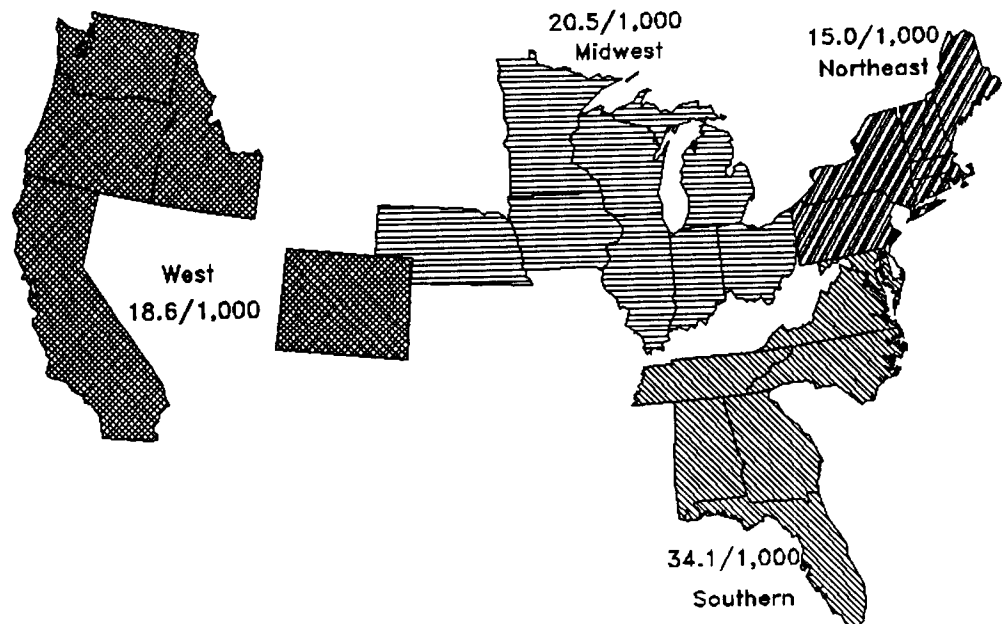


Figure 2. Regional Prevalence of Salmonella per 1,000 Dairy Calves



fecal specimens were collected and examined for Salmonella regardless of existence of disease.

While positive results were found all over the U.S., the prevalence was highest in the south (Figure 2). In the Southern region, 34.1 out of 1,000 calf fecal samples

cultured had evidence of Salmonella. The Northeast had the lowest prevalence at 15.0 positive per 1,000 samples. Reasons for these differences are not clear, but may involve regional management or environmental factors.

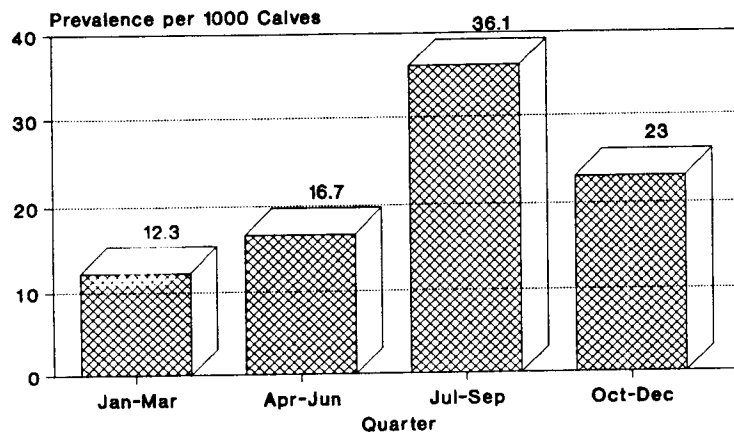
More Salmonella-positive calves were found in late summer with 36.1 of every 1,000 samples testing positive (Figure 3). This finding may be attributed to a warmer, moister environment which can aid in the survival and dissemination of Salmonella. The prevalence was lowest (12.3) in the winter, January through March.

Positive samples were more common in herds of more than 100 cows (25.0 per 1,000 samples), while herds of 51 to 100 cows had a low prevalence of 11.9 positive samples per 1,000 tested (Figure 4). Variations in herd management practices, partly based on herd size, may account for the differences in prevalence. It should be noted that since samples were collected at a single visit, more calves were sampled from larger herds. Therefore, the likelihood of finding positive samples in larger herds was increased.

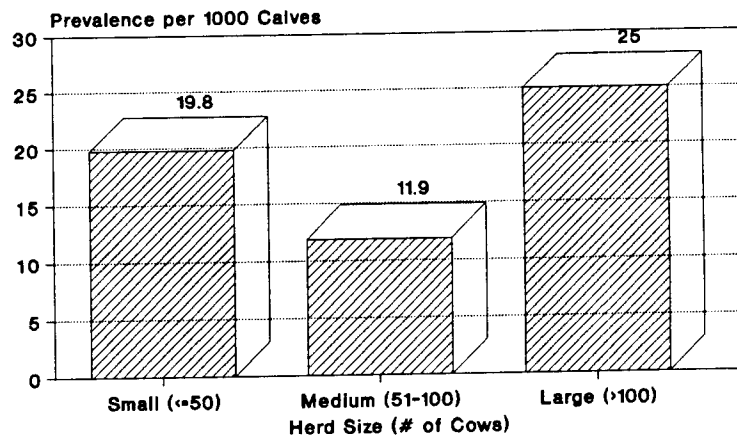
Primary sources of infection are feedstuffs and other infected farm animals. Other routes of infection include contaminated bedding or buckets for feeding and drinking. Newborns, older animals, and animals with other infections are most susceptible to the disease salmonellosis. Animals undergoing the physiologic stresses of transportation, exercise, malnutrition, feed changes, pregnancy, or surgery are also more susceptible to disease.

In calves, infection and disease can lead to salmonellosis epidemics, often with high death losses. The most effective means of eliminating losses due to salmonellosis is prevention. Prevention goals are to identify infected animals, isolate them, and disinfect contaminated premises. A producer's best actions are sound management and sanitation practices and consultation with the herd veterinarian to determine the best course for the herd and situation. 🐄

**Figure 3. Prevalence of Salmonella in Dairy Calves by Season**



**Figure 4. Prevalence of Salmonella in Dairy Calves by Herd Size**



Participants in the NDHEP included the USDA's National Agricultural Statistics Service, State and Federal Veterinary Medical Officers, and National Veterinary Services Laboratories. The Cooperative Extension Service provided editorial assistance. For more information on National Dairy Heifer Evaluation Project and other NAHMS programs, please contact:

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