

INFO SHEET

Veterinary Services

United States
Department of
Agriculture
Animal and
Plant Health
Inspection
Service
October 2001

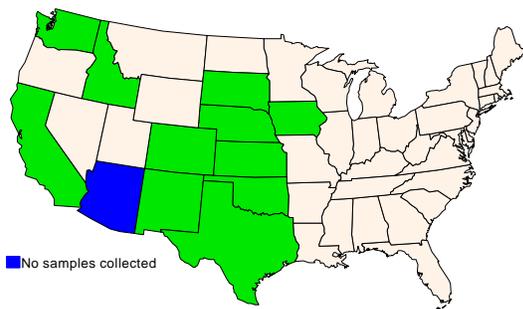
Salmonella in United States Feedlots

Salmonella is a significant cause of foodborne illness in the U.S., resulting in an estimated 1.3 million human cases, 15,600 hospitalizations, and 550 deaths each year¹.

The beef industry has implemented many intervention strategies in harvest facilities to reduce the likelihood of carcass contamination with *Salmonella* and other potential foodborne pathogens.

In addition to these post-harvest strategies, there continues to be interest in pre-harvest strategies for reducing the pathogen loads in the gastrointestinal tracts of animals or on the hides of animals presented for harvest. To understand the potential for pre-harvest intervention, it is important to understand the distribution of these pathogens in the feedlot setting.

Figure 1.
Twelve Leading Cattle Feeding States



In 1999, the USDA's National Animal Health Monitoring System (NAHMS) conducted Feedlot '99, a study of feedlots with 1,000-head-or-more capacity within the 12 leading cattle feeding states (Figure 1). These operations represented 84.9 percent of the U.S. feedlots in 1999 and contained 96.1 percent of the U.S. cattle inventory on feedlots with 1,000-head-or-more capacity on January 1, 2000.

As part of this study, 73 feedlots were recruited to collect fecal samples from pen floors throughout a one-year period (October 1999 through September 2000). In each feedlot, 25 fecal samples were collected from the floors of three pens. The pens were selected to represent cattle that had been on feed the shortest time, the longest time, and a randomly selected pen (75 total samples). Sampling occurred in each feedlot twice over the course of the year.

Overall, 6.3 percent of fecal samples were positive for *Salmonella*. There was little difference in the percentage of samples positive for *Salmonella* by type of pen (Table 1).

The percentage of culture-positive samples collected within a pen ranged from 0 to 100. However, the median percentage of samples positive from all pens was 0. For pens that had at least one positive sample, the median percentage of samples positive was 14.

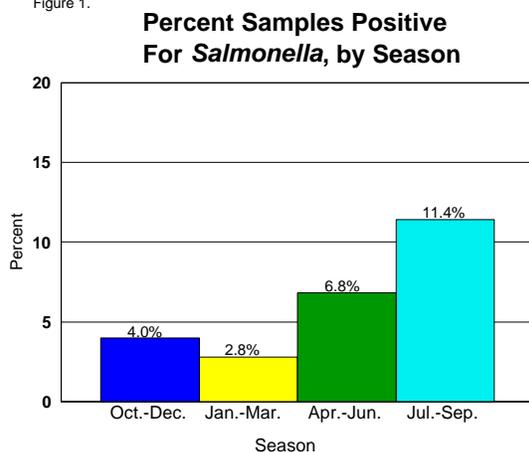
¹ Mead et al., Food-related Illness and Death in the United States. *Emerg. Inf. Dis.* 5:607-625

Table 1. Percent Samples Positive for *Salmonella*, by Pen Type

Pen type	Samples collected	Samples positive	Percent samples positive
Short-fed	3,482	212	6.1
Random	3,400	217	6.4
Long-fed	3,485	224	6.4
Unknown	50	1	2.0
Total	10,417	654	6.3

The largest percentage of samples was positive (11.4 percent) in the fourth sampling period, July through September (Figure 1).

Figure 1.



The percentage of samples positive for *Salmonella* differed by the geographic region² of the feedlot. Samples from Southern operations were more likely to test positive (7.7 percent) than samples from Northern operations (4.8 percent).

Overall, 22.3 percent (94/422) of pens had one or more positive samples. The 94 positive pens were located in 50.7 percent (37/73) of feedlots where samples were collected.

In this study, the most common serotypes of *Salmonella* recovered from samples collected from feedlot pen floors were dissimilar from those most commonly associated with human illness or cattle diagnostic specimens, with the exception of *S. newport* (Table 2).

² **Northern Region:** Idaho, Iowa, Kansas, Nebraska, South Dakota, Washington.
Southern Region: California, Colorado, New Mexico, Oklahoma, Texas.

Table 2. Five Most Common Serotypes of *Salmonella*, from Various Sources

Serotypes from ill humans (1999) ^a	Serotypes from cattle (1999/2000) ^b	Serotypes from cattle feedlots (1999/2000)
Typhimurium	Typhimurium	Anatum
Enteritidis	Anatum	Montevideo
Newport	Dublin	Reading
Heidelberg	Montevideo	Newport
Muenchen	Newport	Kentucky

^a Source: CDC data

^b Source: USDA:APHIS:VS National Veterinary Service Laboratories

Future analyses of these data will focus on animal and nutritional factors associated with samples from pens testing positive and the antimicrobial susceptibility patterns of *Salmonella* isolates.

For more information contact:
Centers for Epidemiology and
Animal Health
USDA:APHIS:VS, attn. NAHMS;
2150 Centre Ave., Bldg. B, MS 2E7
Fort Collins, CO 80526-8117; (970) 494-7000
NAHMSweb@aphis.usda.gov
www.aphis.usda.gov/vs/ceah/cahm

#N346.1001