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Salmonella Prevalence in Lymph Nodes of U.S. and Mexican Cattle Presented for Slaughter during 2 Seasons in Texas

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Objectives

Due to the generalized nature of the lymphatic system, lymph nodes (LNs) have been identified as a potential source of *Salmonella* contamination in ground beef products. The objectives of this study were to determine if *Salmonella* prevalence differs (1) between cattle of Mexican and U.S. origins when exposed to the same feedlot environment and (2) between warm and cool seasons.

Materials and Methods

Paired subiliac LNs (n = 800 LNs) were collected from 100 carcasses per origin (Mexico and U.S.), per season (warm and cool). Per animal, left and right LNs were pooled yielding n = 400 total LN samples. The LNs were aseptically trimmed of fat and pulverized before microbiological analysis. *Salmonella* presence/absence was determined by following the USDA-FSIS Microbiological Laboratory Guidebook (MLG) 4.08.

Results

Overall, *Salmonella* prevalence in LN samples was 52.0% (208/400; data not presented in tabular form). No difference (P = 0.4836; Table 1) was seen in *Salmonella* prevalence as a function of country of origin, with 54.0% (108/200) and 50.0% (100/200) *Salmonella*-positive samples from cattle of Mexican and U.S. origin, respectively. *Salmonella* prevalence differed (P = 0.0354) between seasons, with 46.5% (93/200) and 57.5% (115/200) *Salmonella*-positive samples from cool and warm seasons, respectively (data not presented in tabular form). Interestingly, *Salmonella* prevalence in samples of U.S. origin differed by season (P = 0.0160), unlike those of Mexican origin. No difference (P = 0.6705) was

TABLE 1. *Prevalence of* Salmonella*-positive*[a] *lymph nodes*[b] *(LNs) stratified by season*[c] *and origin*

	% (no. positive/no. tested) *Salmonella*-positive LNs	
Season	Mexico	U.S.
Cool	52.0 (52/100) A, X	41.0 (41/100) A, X
Warm	56.0 (56/100) A, X	59.0 (59/100) B, X

A, B: Values within a column lacking a common letter differ ($P < 0.05$).
X, Y: Values within a row lacking a common letter differ ($P < 0.05$).
[a] *Salmonella* was isolated following protocols described by Microbiology Laboratory Guidebook 4.08. Three presumptive positive colonies were selected for confirmation by PCR. One confirmed positive colony for each LN sample was selected for serotyping (n = 208). These colonies were revived in Tryptone Soya Broth and then stored on nutrient agar slants for shipping to NVSL (Ames, IA).
[b] Left and right subiliac LNs (n = 800 LNs) were collected and pooled by animal (n = 400 total LN samples).
[c] Sample collection seasons were defined as: warm (May to August) or cool (December to February).

seen between seasons in samples of Mexican origin, with 52.0% (52/100), and 56.0% (56/100) *Salmonella* prevalence for cool and warm seasons, respectively. For samples from beef carcasses of U.S. origin, *Salmonella* prevalence rates of 41.0% (41/100) and 59.0% (59/100) were seen for cool and warm seasons, respectively (Table 1). Serotyping of PCR-confirmed positive samples resulted in 14 different serovars with Cerro (21.6%), Anatum (19.7%), Muenchen (17.8%), Montevideo (14.4%), and Kentucky (12.0%) comprising the majority.

Conclusion

These findings dispel previous concerns that Mexican cattle have a higher prevalence rate of *Salmonella* than U.S. cattle. These results also suggest that environmental factors may play a large role in the *Salmonella* prevalence rate in bovine LNs, and that additional research is needed to fully understand factors that influence *Salmonella* prevalence in bovine LNs.