

Public Abstract

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Title:Prevalence of Shiga-toxigenic Escherichia coli (STEC) in pre-harvest sheep in Missouri

The epidemiology of foodborne pathogens in poultry, swine, and beef production systems in the United States has been studied extensively. However, there is a paucity of information on the epidemiological characteristics of foodborne bacteria, specifically, Escherichia coli associated with small ruminant food systems. This poses an important problem in food safety and public health, given the increasing popularity of small ruminant meat and milk products in U.S. consumer circuits.

The goal of our study was to quantify the apparent prevalence of and identify virulence genes common to Shiga toxin-producing E.coli (STEC) in sheep raised in Missouri. Five hundred fecal swabs from sheep originating from 63 unique flocks delivered to a sale barn auction were collected and evaluated using standard microbiological techniques for detection of STEC. The number of sheep tested per flock ranged between 1 and 24 and samples were collected over 9 weeks from September to November 2014. In total, 88 (17.6%) sheep had PCR evidence of at least one STEC, as defined by the presence of an STEC O-side chain, the presence of at least one stx gene, and eae. None of the samples were culture positive for E.coli O157:H7.

In summary, this investigation found that a majority of potential STEC shed by Missouri sheep belonged to the non-O157 serogroups (16.4%), with highest prevalence for O145 (6.8%) and O26 (6.2%) side chains. Twenty (4%) out of 500 fecal swabs had multiple STEC serotypes. There is a need for further epidemiological studies to facilitate the development of effective improvements in food safety strategies in the small ruminant industry.