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Process control to prevent beef contamination with non-O157 Shiga toxigenic Escherichia coli (STEC) in abattoirs in Mexico and Central America

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Purpose: To estimate the prevalence of non-O157 STEC on beef hides and carcasses and to evaluate in-plant strategies for the control of STEC bacteria in abattoirs in Latin America
Methods:Hides and carcasses were paired and followed through production. Sponge samples were collected on the foreshank area on hides, pre-evisceration carcasses, and carcasses after the final decontamination with lactic or peroxyacetic acid. The BAX® PCR platform was used to determine the presence of molecular markers for the target non-O157 STEC.
Results: STEC were present on hide, pre-evisceration and post-intervention samples collected at two non-TIF facilities in Mexico in 97, 74 and 68% (n=195) and in 100, 100, and 75% (n=60), respectively, whereas a TIF plant revealed 100, 50, and 0% prevalence (n=90) during the same period. In Honduras and Nicaragua (n=80), the prevalence of STEC markers ranged from 23 to 90% on hides and from 0 to 7% in pre-eviscerated carcasses. No STEC were found after application of a 2.5% lactic acid carcass spray. Lastly, in three plants in Costa Rica, a seasonal difference was observed for the prevalence of STEC on hides, ranging from 27 to 97% (n=180). Pre-eviscerated carcasses were contaminated at rates between 27 and 77%, and no carcasses were positive after the application of a 180-220 ppm peroxyacetic final acid spray.
Conclusions: The data demonstrate that hides are heavily contaminated and may be a major point of STEC entrance into the meat supply. However, control measures in some facilities prevented significant contamination of dressed carcasses, ensuring a safe product.
Relevance: Our data show that facilities have different capabilities to control STEC on dressed carcasses. High prevalence values estimated on dressed carcasses in non-TIF facilities in Mexico warrant further studies and the implementation of better control strategies to protect public health.