**Salmonella** spp. in Lymph Nodes of Fed and Cull Cattle: Relative Assessment of Risk to Ground Beef

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**Abstract**

Ground beef products have been implicated as the vehicle for the transmission of *Salmonella* in a number of outbreaks. Although carcass surface interventions have proven effective, *Salmonella* contamination in ground beef still occurs. Recent studies indicate that deep tissue lymph nodes (DTLN) may be an important source of *Salmonella* contamination in ground beef products. We developed a stochastic simulation model covering the pre-to post-harvest stages to assess the relative contribution of DTLN as compared with carcass surface, to *Salmonella* in ground beef, and the impact of various pre- and post-harvest interventions. The model addressed fed and cull cattle, and in high and low prevalence seasons. Contamination from carcass surfaces and DTLNs was simulated separately. Linear relationships were used to describe the changes of *Salmonella* surface concentration and prevalence at different processing stages. The baseline results indicate that on average over 90% of the *Salmonella* CFU load in a 2000 lb (907 kg) production lot originates from DTLN contamination as compared with carcass surface contamination. The relative contribution of DTLN contamination was fairly robust to changes in model parameters for ground beef from fed cattle, while it was comparatively more sensitive to changes in model parameters for cull cattle. The predicted mean *Salmonella* CFU load from DTLN contamination was considerably greater in ground beef production lots from fed cattle compared with cull cattle. Correspondingly, our scenario analysis suggested that generic pre-harvest interventions which can reduce *Salmonella* contamination in DTLNs would cause a greater total CFU load reduction in ground beef production lots from fed cattle compared with cull cattle. The study provides some valuable information for prioritizing control measures targeted at *Salmonella* contamination from the beef carcass surface or DTLNs based on the current knowledge.

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