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Project Title: Distribution of *Salmonella* of Lymph Node Origin Throughout Ground Beef

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Objective: The current study was conducted to investigate the distribution of *Salmonella*, introduced via lymph nodes, throughout coarse ground beef.

Experimental Design & Analysis:

Peripheral lymph nodes were collected from steers challenged with *Salmonella* via a transdermal method. Six PLN (i.e. pre-scapular, subiliac and popliteal lymph nodes collected from both sides of the animal) were mixed into 10 kilograms of 85/15 beef trim and ground using a 3/8-inch grinder plate to simulate a coarse grind. The ground product passed through a loafing attachment and onto wax paper. The continuous ground beef loaf was portioned into approximately 100-gram samples and kept in sequential order. Ground beef samples were individually placed into filtered bags. Each sample was subjected to culture and quantification procedures.

Key Results:

The distribution of qualitative and quantitative *Salmonella* recovery from coarse GB is presented in Figure 1. For each of the 6 reps the adipose tissue surrounding the lymph node was left to better reflect how lymph nodes are incorporated into trim for ground beef production. The six reps of the initial grinding study (labeled REP 1-6) yielded very different results. The charts show the distribution of positive samples. The percentage of *Salmonella* positive samples in reps 1 – 6 were 87.4%, 56.7%, 50.9%, 28.4%, 68.6%, and 49.5%, respectively. Enumeration analysis of each sample resulted in a mean concentration of 2.28 log₁₀ CFU per 100-g ground beef sample (GB).

Industry Application:

As lymph nodes are often encased in fat, current interventions do not have an effect on *Salmonella* present within the lymph node. Further investigation of the inclusion of *Salmonella* positive lymph nodes into ground beef can lead to the development of practical interventions to reduce *Salmonella* contamination in ground beef. For example, it may be possible to apply an intervention prior to regrinding of coarse ground beef to fine ground beef product.

Figure 1. Distribution of *Salmonella* in continuous grinds of beef. Blue bars represent positives in sequence (left to right) and red indicates those sample with quantifiable concentrations.

