Prevalence of *Escherichia coli* O157:H7 and *Salmonella* spp. in Special-Fed and Bob Veal in the Northeastern United States


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### ABSTRACT

The ilea and carcass surfaces of special-fed and bob veal calves from the Northeastern United States were sampled prior to antemortem intervention from May to July 2001 to determine the prevalence of *Escherichia coli* O157:H7 and *Salmonella* spp. that could contaminate the venal perianal, inside hock and outside hock were pre-enriched and selectively enriched prior to plating upon appropriate selective or differential media. Samples were enriched with immunocapture beads and presumptive colonies confirmed with latex agglutination, a rapid antibody-based test, and pulsed-field gel electrophoresis for the detection of *E. coli* O157:H7. Presumptive *Salmonella* isolates that exhibited agglutination by latex and onmotic O antisera were confirmed by the analysis of colony morphology, biochemical reactions, and serotyping with the specific O serogroup serum. *E. coli* O157:H7 was present in 3% and 8% of special-fed veal ilea and 17% and 6% of bob veal carcasses, respectively. None of the *E. coli* O157:H7 isolates showed a unique restriction pattern that distinguished them from the control strain (ATCC 43895), suggesting that isolates were of diverse origins. Contamination with *Salmonella* spp. was detected on both veal ilea (11.0%; 7/64) and bob veal carcasses (11.5%; 7/61). Five of these seven isolates were serotyped as S. Newport. Based on this indicator study, special-fed and bob veal carcasses can be contaminated with *E. coli* O157:H7 and *Salmonella* spp. Further research may confirm the presence of these pathogens on veal carcasses prior to antemortem intervention and determine prevalence at pre- and other post-harvest levels.

### METHODS

The ilea and carcass surfaces of special-fed and bob veal calves were sampled prior to antemortem intervention from May to July 2001 to determine the prevalence of *Escherichia coli* O157:H7 and *Salmonella* spp. Samples were collected on two different days each from two different plants that process calves from at least six Northeastern states. Ileal contents and sponge swabs of the ventral perineum, inside hock and outside hock were pre-enriched and selectively enriched prior to plating upon appropriate selective or differential media. For the detection of *E. coli* O157:H7, samples were pre-enriched with Hajna gram-negative broth that was supplemented with vancomycin (8 mg/L), cefixime (0.05 mg/L), and cefsulodin (10 mg/L) followed by immunomagnetic separation (Dynal Biotech, Inc., Lake Success, NY) and plating upon MacConkey (supplemented with 0.05 mg/L cefixime and 2.5 mg/L potassium tellurite) agar. Presumptive colonies were confirmed with the *RIM* E. coli O157:H7 latex test (REML, Inc., Lenexa, KS), ImmunoCard® STAT! E. coli O157 Plus (Meridian Diagnostics, Inc., Cincinnati, OH), and pulsed-field gel electrophoresis (Gautam 1997). To detect *Salmonella* spp., samples were pre-enriched with lactose broth, selectively enriched in selenite cysine and tetrathionate broths, and plated on xylose lysine desoxycholate and bismuth sulfite agars. Presumptive isolates of *Salmonella* spp. that exhibited agglutination by latex and onomotic O antisera were confirmed by the analysis of colony morphology, biochemical reactions, and serotyping with the specific O serogroup serum. *E. coli* O157:H7 and *Salmonella* spp. that exhibited agglutination were further confirmed by the analysis of colony morphology, biochemical reactions, and serotyping with the specific O serogroup serum. *E. coli* O157:H7 was present in 3% and 8% of special-fed veal ilea and 17% and 6% of bob veal carcasses, respectively. None of the *E. coli* O157:H7 isolates showed a unique restriction pattern that distinguished them from the control strain (ATCC 43895), suggesting that isolates were of diverse origins. Contamination with *Salmonella* spp. was detected on both veal ilea (11.0%; 7/64) and bob veal carcasses (11.5%; 7/61). Five of these seven isolates were serotyped as S. Newport. Based on this indicator study, special-fed and bob veal carcasses can be contaminated with *E. coli* O157:H7 and *Salmonella* spp. Further research may confirm the presence of these pathogens on veal carcasses prior to antemortem intervention and determine prevalence at pre- and other post-harvest levels.

### ACKNOWLEDGMENTS

Many thanks go to Ashish Sawant and Dr. Narsimha Hegde of the Department of Veterinary Science and to Dr. Brenda Love of the Animal Diagnostic Laboratory at The Pennsylvania State University for their laboratory assistance. Special thanks also go to the Northeastern veal packers for their willingness to participate in this study. Financial support for this study was derived from research funds from the Pennsylvania Department of Agriculture.

### REFERENCES


### IMPLICATIONS AND USE OF DATA

Sponge samples did not strictly adhere to carcass sampling protocols of the Pathogen Reduction Act (U. S. D. A., 1996).

While *E. coli* O157:H7 and *Salmonella* spp. were isolated from ilea and carcass surfaces prior to intervention, one cannot assume that these pathogens are always present on veal carcasses. Further research may determine if veal is contaminated with pathogens of regulatory importance to a degree that is comparable to other meat products.

The veal industry should remain proactive and continue to improve food safety practices to reduce the likelihood of product recall.

Logical extensions of this research could investigate pre-harvest sources of contamination, the application of antimicrobial interventions, and the prevalence of non-O157 enterohemorrhagic *E. coli* to more thoroughly understand the aspects of veal safety.

### OVERVIEW OF THE U. S. VEAL INDUSTRY

In 2001, 980,000 calves were slaughtered under federal inspection of which 170,000 head (17.2%) were processed in Pennsylvania. Major production areas include the Northeast (450,000 head), Upper Midwest (374,000), and California (109,000).

There are three major types of veal in the U. S. Special-fed (50%) Bob (48%) Southern (2%)