



Non-O157 STEC: What We Know and What's Next

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Where we left off:

- Public Meeting, October 17, 2007
- Co-sponsored by FSIS, FDA, and CDC
- Data presented on epidemiology, prevalence in food animals, detection and surveillance challenges, and processing interventions



What we learned:

- Non-O157 illness spectrum: diarrhea, bloody diarrhea, HUS, and death
- 6 serogroups cause $\frac{3}{4}$ of illnesses:
 - O26, O111, O103, O121, O45, O145
- Reported illnesses increasing
 - Increasing prevalence vs. improved surveillance



- FoodNet, 2000 – 2006, 575 non-O157 isolates
 - 35 in 2002; 209 in 2006
- Studies in some non-FoodNet states show % of non-O157 \geq O157:H7 (VA, ID)
- Non-O157's predominate in other countries



- True incidence of non-O157 human illness difficult to define
 - Limited awareness in clinical community
 - Non-uniform surveillance
 - Detection challenges



- Many outbreaks worldwide, varied food and non-food vehicles, including meat
- 23 in U.S. since 1990¹
 - None attributed to meat products

¹CDC Data



- Cattle prevalence data varies:
 - 0-19%, dairy cattle^{1,2,3,4}
 - 19.4 – 56.3%⁵, beef cattle feces/hides
- Food prevalence data very limited:
 - Pre-evisceration beef carcasses >50%^{5,6}
 - Retail ground beef, 2.3%⁷
- Limited validated detection/identification methodologies

¹Wachsmuth *et al.*, 1991 ²Wells *et al.*, 1991 ³Cray *et al.*, 1996 ⁴Thran *et al.*, 2001

⁵Barkocy-Gallagher, *et al.*, 2003 ⁶Arthur *et al.*, 2002 ⁷Samadpour *et al.*, 2006



Summary: why FSIS is moving forward:

- Increasing reported incidence of human disease
- Cattle primary animal reservoir
- Share virulence factors with *E.coli* O157:H7; can cause equal severity of disease



FSIS Plans:

- FSIS will begin testing ground beef and ground beef components for the presence of non-O157 STEC's
 - Determine to what extent non-O157 STEC's are present in various products
 - If needed, implement a regulatory program



Methodology development underway:

- In collaboration with ARS scientists
- Focus on 6 serogroups of greatest public health concern
- Two step PCR screening, followed by IMS, isolation, and further characterization



- First step: 2-step PCR on regulatory O157:H7 positives
 - Next step, O157:H7 negatives
- Continue development of cultural confirmation methodology
- Results = study data only during this phase



- There are challenges to gathering and applying data on non-O157 STEC's in a regulatory setting.

United States Department of Agriculture
Food Safety and Inspection Service

