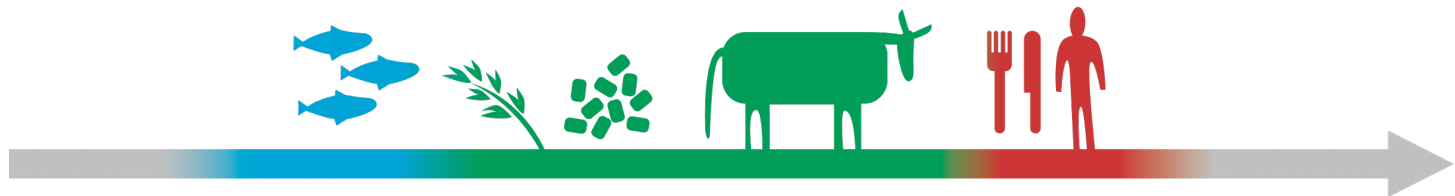




Veterinærinstituttet
Norwegian Veterinary Institute

Two outbreaks of STEC associated with hamburgers in Norway 2023

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Investigation of foodborne outbreaks in Norway

- Close collaboration between the National Institute of Public Health (NIPH), the Norwegian Food Safety Authority (NFSA) and the Norwegian Veterinary Institute (NVI)



The outbreaks

- STEC O26:H11 (stx_{2a} , *eae*, ST 21), 24 cases, 9 HUS, July -October 2023, traced to hamburgers produced by a specific producer
- STEC O157:H7 (stx_{2a} , *eae*, ST 11), in total 12 cases spread out over 1 year, no HUS, associated with hamburgers or minced meat products



Analyses of product samples

- 25 g sample in 225 ml BPW, 37° C, 18-24 hrs
- DNA extraction: 1 ml enrichment broth Blood & Tissue kit
- PCR screening for *stx*₁, *stx*₂, *eae* and O26/O157
- Isolation from samples positive for *stx*₂, *eae* and O26/O157
- Plating of dilutions on TBX, SMAC and Chrom O157
- Pick and pool 50 colonies for pool PCR followed by colony PCR
- Maldi TOF for confirmation of *E. coli*
- WGS of selected isolates



STEC O26:H11

- Samples:
 - Frozen hamburgers with specific production days and best-before days from retail or producer
 - Hamburgers collected at patients' homes
 - Raw material used for production
- Analysed 95 samples; approx half were hamburgers and the second half were composite samples of raw materials



STEC 026 results

- Isolated STEC 026:H11 (stx_{2a} , *eae*, ST 21) from 4 samples (in total 7 isolates); 2 samples of frozen hamburgers from patients' homes and 2 unopened packages from 2 different batches from the producer
- WGS data shared with NIPH for comparison with patient isolates (cgMLST)



Some details STEC O26

Unopened packages - batch A

- Initial screening: 1/10 samples positive (Cq values 20-22)
- Colony pools: 3 of five pools positive
- 30 colonies tested: 6 positive for all three markers

Unopened packages - batch B

- Initial screening: 9/17 samples positive - variable Cq values
- Selected 4 samples with lowest Cq values for plating, picking and pooling
- One pool from one sample positive for all 3 markers
- One colony was positive for *stx*₂, *eae* and O26



Conclusions O26:H11

- Isolated STEC O26:H11 from hamburgers produced from one FBO over a short period of time in the beginning of July 2023
- Several batches of different raw material was used for the hamburgers
- Received samples from some raw material batches, but negative for STEC O26

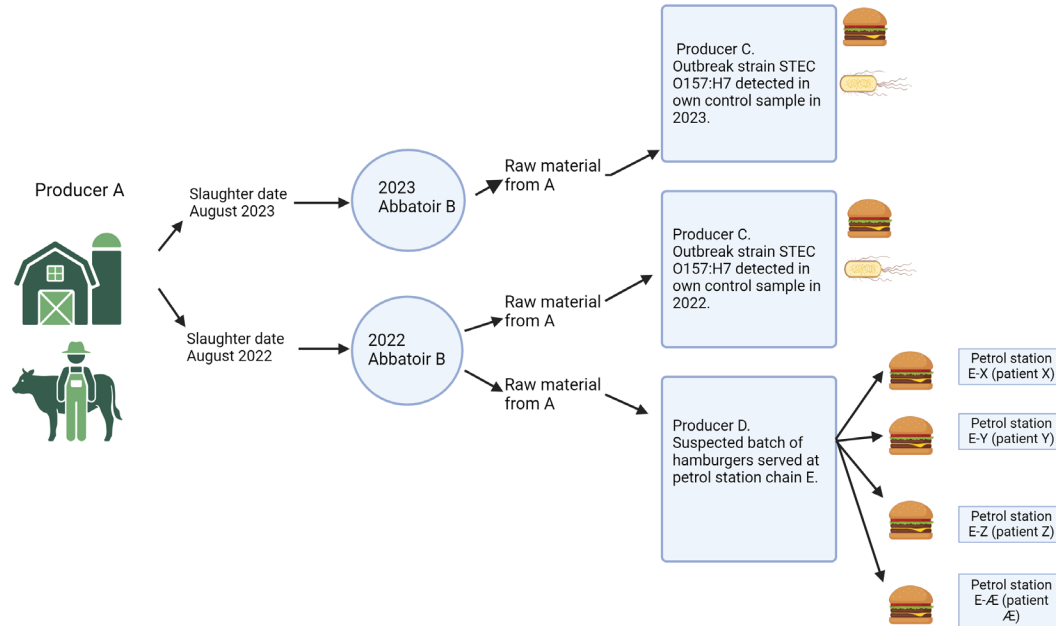


STEC 0157:H7

- Outbreak went on for approx. 1 year
- Analysed a few samples - all negative
- Two isolates from one FBO's own control submitted to NRL in August/September 2022 and 2023 sequenced and shared with NIPH



Conclusions STEC 0157:H7





General observations

- Frozen hamburgers were the source of both outbreaks, but different producers. Some of the patients (STEC O26) had consumed fresh burgers produced by the same raw material, but not possible to obtain samples
- From the positive batches of hamburgers, heterogenous contamination - some parts were «more» contaminated than others
- NFSA initiated a survey of STEC in cattle (focussing on the serogroups causing serious infections i Norway)
- Got a lot of information and useful advice from Swedish colleagues - highly appreciated

*Faglig ambisiøs, fremtidsrettet og
samspillende - for Én helse!*



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