

## Wildlife crop damage and STEC in Sweden: a four-year project starting 2024

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### Trends and knowledge gaps









- -Increasing number and diversity of human cases
- -Intimin negative and "hybrid" STEC

-Role of animals other than domestic ruminants and role of environment

-STEC host/niche adaptation



### **Case in point:** STEC in Swedish wheat flour

200 retail bags - 12% stx PCR positive after enrichment

O187:H28	ST200	stx2g	eae neg (x4)
O154:H31	ST1892	stx1d	eae neg (x2)
O8:H28	ST162	stx2e	eae neg
O146:H28	ST738	stx2b	eae neg



ACCESS MICROBIOLOGY an open research platform RESEARCH ARTICLE Söderlund et al., Access Microbiology 2023;5:000577.v3 DOI 10.1099/acmi.0.000577.v3 DATA OACCESS

## Shiga toxin-producing *Escherichia coli* (STEC) and atypical enteropathogenic *E. coli* (aEPEC) in Swedish retail wheat flour

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#### Abstract

Wheat flour has been identified as the source of multiple outbreaks of gastrointestinal disease caused by shiga toxin-producing



### STEC O187:H28 ST200

intimin negative hybrid STEC/ETEC

has been found in deer and wheat flour in multiple countries including Sweden, but not in livestock











Wildlife crop damage 2023 (Board of Agriculture data)

### Winter wheat



12% of area of grown cereals damaged by wildlife

25% of farmers avoid certain crops due to wildlife

Wild boar damage is decreasing, deer and large grazing birds increasing



Wildlife crop damage 2023 (Board of Agriculture data)





# New project funded by Formas (Swedish research council for sustainable development) 2024-2027

- Collect STEC from wildlife associated with crop damage

Wild boar Cervids: roe deer, red deer, fallow deer, elk, reindeer Large grazing birds: geese, cranes, swans

- Collect STEC from retail field-grown produce

Previously unexplored, attractive to wildlife, eaten raw



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- Isolate comparison wildlife/livestock/food/humans
- Genomic and phenotypic (Biolog) characterization to identify traits associated with host bias or survival in food

- Attitudes and risk perception regarding STEC contamination among producers and authorities



### Stage 1: Wildlife sampling

**Challenges**: geographical representation, cost, samples are "low yield" in terms of isolates per effort

**Aim** >200 per category

Cervids: volunteers + hunters (DiScoVER project)
Wild boar: crop damage research projects, surveillance for *Salmonella* Choleraesuis
Large grazing birds: ringing, other projects



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### Stage 1: Exploratory food sampling

Have we missed something else that is 12% stx positive?

- + Field grown in Sweden
- + Subject to crop damage
- + Eaten raw (or used for sprouts etc.)

Candidates: Kale, sugar snaps, dry legumes used for shoots/sprouts, carrots, linseed, flour derivates



### **Project team**

SVA Bioinformatics Robert Söderlund Microbiology Malin Johansson Epidemiology Stefan Widgren

SLU Ecology / Wildlife Damage Centre Johan Månsson, Lovisa Nilsson **Biosystems and technology** Maria Karlsson, Beatrix Alsanius

Clinical sciences/Biomedicine and veterinary public health Lena-Mari Tamminen, Hedvig Gröndal

Stakeholder panel

National Food Agency, Public Health Agency, Federation of Swedish Farmers, Farm & Animal Health, SVA feed safety



## Thank you!

### We are open to collaborations

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