# Surveys and sequencing: adding value to food-borne pathogen surveillance and outbreak control

https://www.foodsandards.gov.scot/publications-and-research/publications/a-microbiological-survey-of-minced-beef-at-retail-in-scotland

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#### **1. Why?**













Food safety controls

Food business operators and food production processes are regulated by food safety and hygiene legislation – so that the consumer can trust that the food they buy is safe to eat.

The need to establish the microbiological status of fresh beef mince was identified.



**Consumer behaviour** 

Food labelling provides consumers with advice on appropriate storage and preparation.

However, consumer behaviours are influenced by many external factors.



Salmonella Mbandaka = 2 isolates Commonly associated with cattle Clustered with Scottish cattle isolates (Figure 1)

Salmonella Dublin = 1 isolates Rare in Reference Laboratory's<sup>4a</sup> human submissions and not identified as belonging to any existing cluster (data not shown)

## 2. How?

A microbiological survey of fresh minced beef on retail sale in Scotland during 2019

**STEC isolates** = 35, with 25 most 'closest' from the Reference Laboratory<sup>4b</sup> genomic database





Two stage sampling design accounting for variation in population density & retail outlet-type market share



Two process hygiene indicators



5. Take home messages



British outbreak and 1

from 4 months earlier\*

Handle retail fresh beef mince properly

Cook it thoroughly. It is not intended to be eaten raw or



Figure 2



3. What foodborne pathogens did we find in 1009 fresh beef mince samples?

<i>Campylobacter</i>	<b>3</b> Salmonella	2226 Presumptive STEC (0157 & non-0157)	<b>35</b> Confirmed STEC (0157 & non-0157)
95% C.I. 0 – 0.7%	95% C.I. 0 – 1.0%	95% C.I. 20 – 25%	95% C.I. 2 – 5%

inadequately cooked

## For science/policy

Sequencing adds value, providing:

Context

Connection – outbreak evidence of microbiological link\*

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