Mini Kitchen Project

Brian Whelan Environmental Health Manager (Commercial)

Cherry Stephenson Health Protection Officer

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Background

- Setting up a new inhouse infection control service
- Developing an App based audit tool
- What other kitchens? EHOs traditionally inspected main kitchens

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Traditional kitchen

Historically very good and mostly achieve a hygiene rating of 5

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This document

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The Local Picture

- Population 108,200
- 32 care homes
- Average food hygiene score 5
- 10 premises were due a visit in the next 3 months
- 22 have now been visited

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Project

- Visit all residential care providers to undertake an audit of facilities and conduct environmental swabs. (number of swabs taken varied due to size/facilities).
- Swabs sent to York FWE lab for standard testing.
- Identify issues and feedback.
- Darlington Borough Council have a procurement contract with many of the providers so any issues would be reported to commissioning and/or safeguarding.

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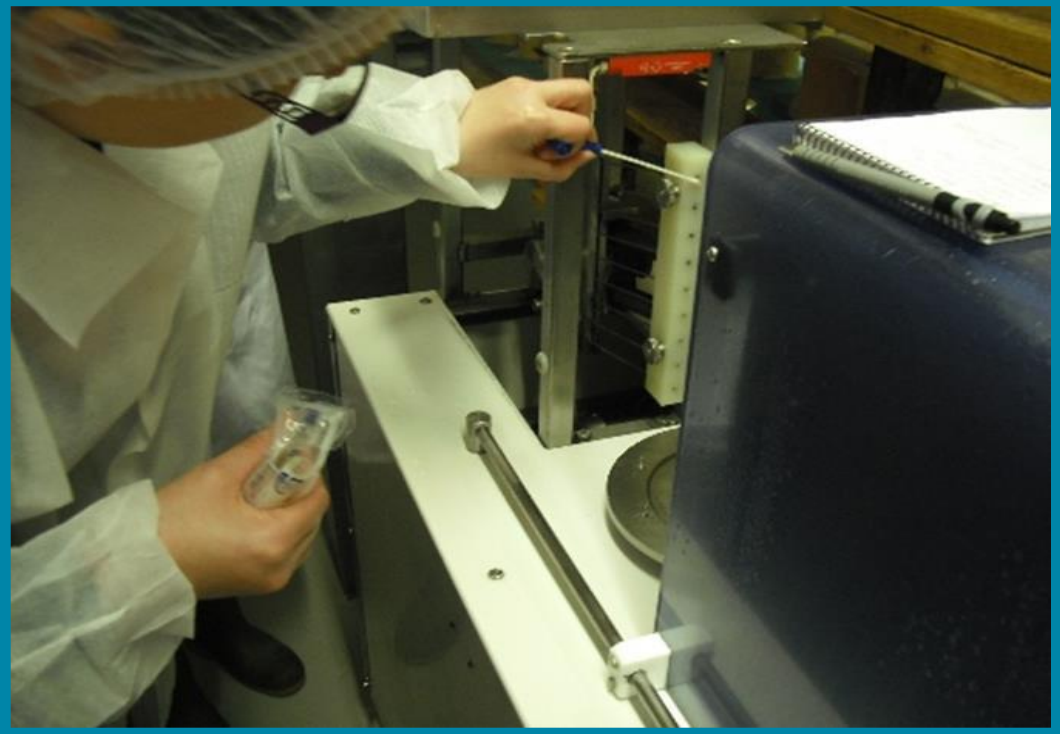

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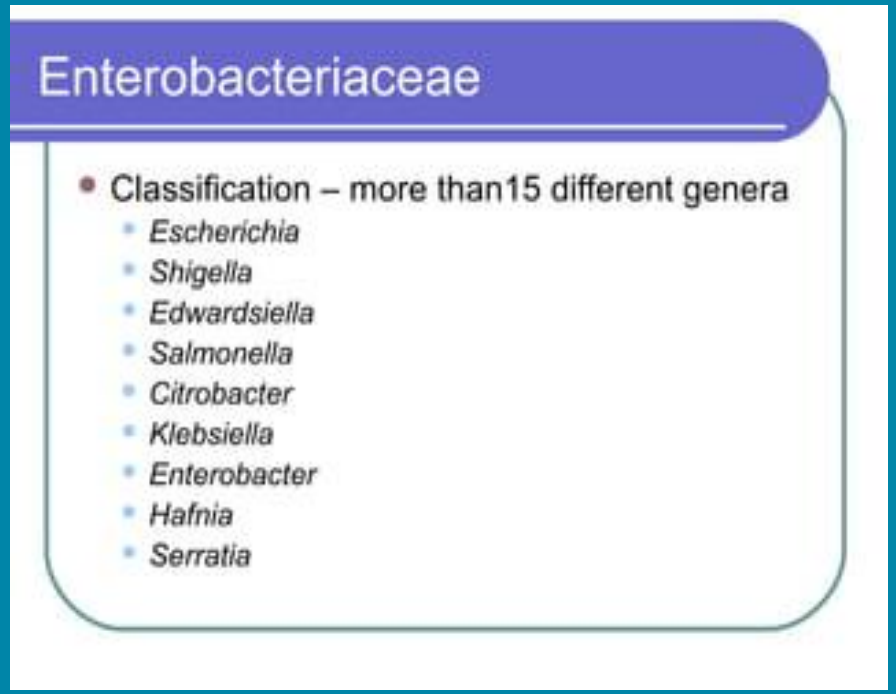
Sampling

- 196 swab samples taken from 22 care providers mini kitchens on the first visits
- 56 failures
- 15 of the 22 homes failed
- *Enterobacteriaceae* unsatisfactory in all



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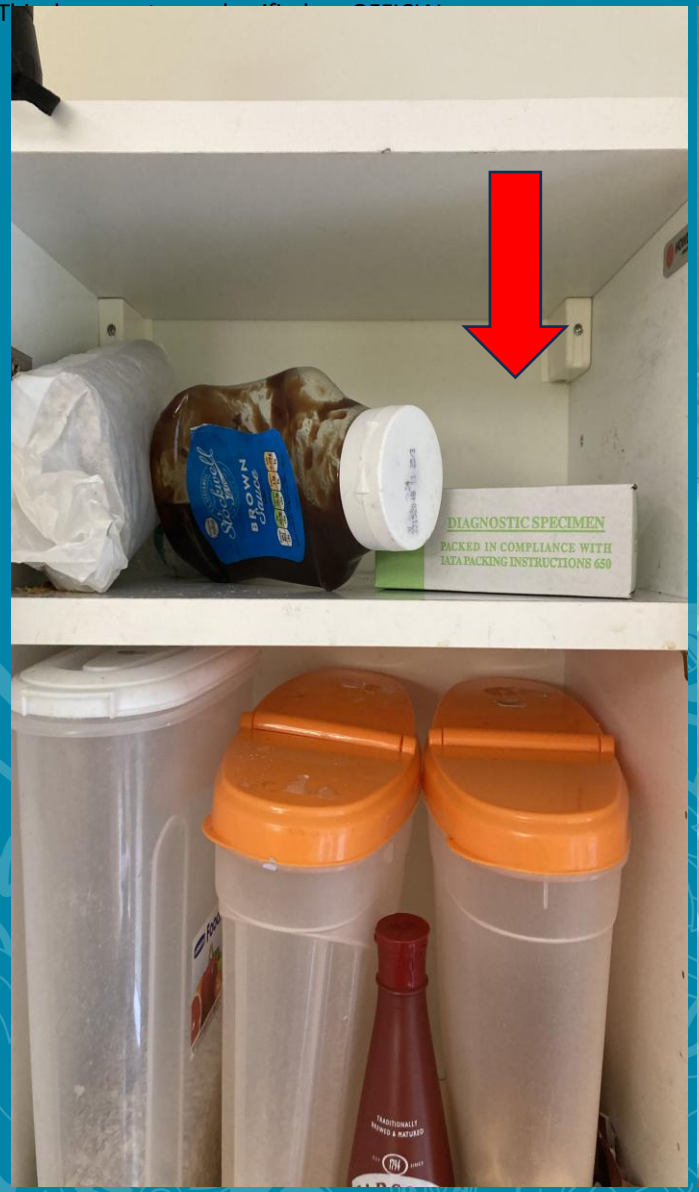
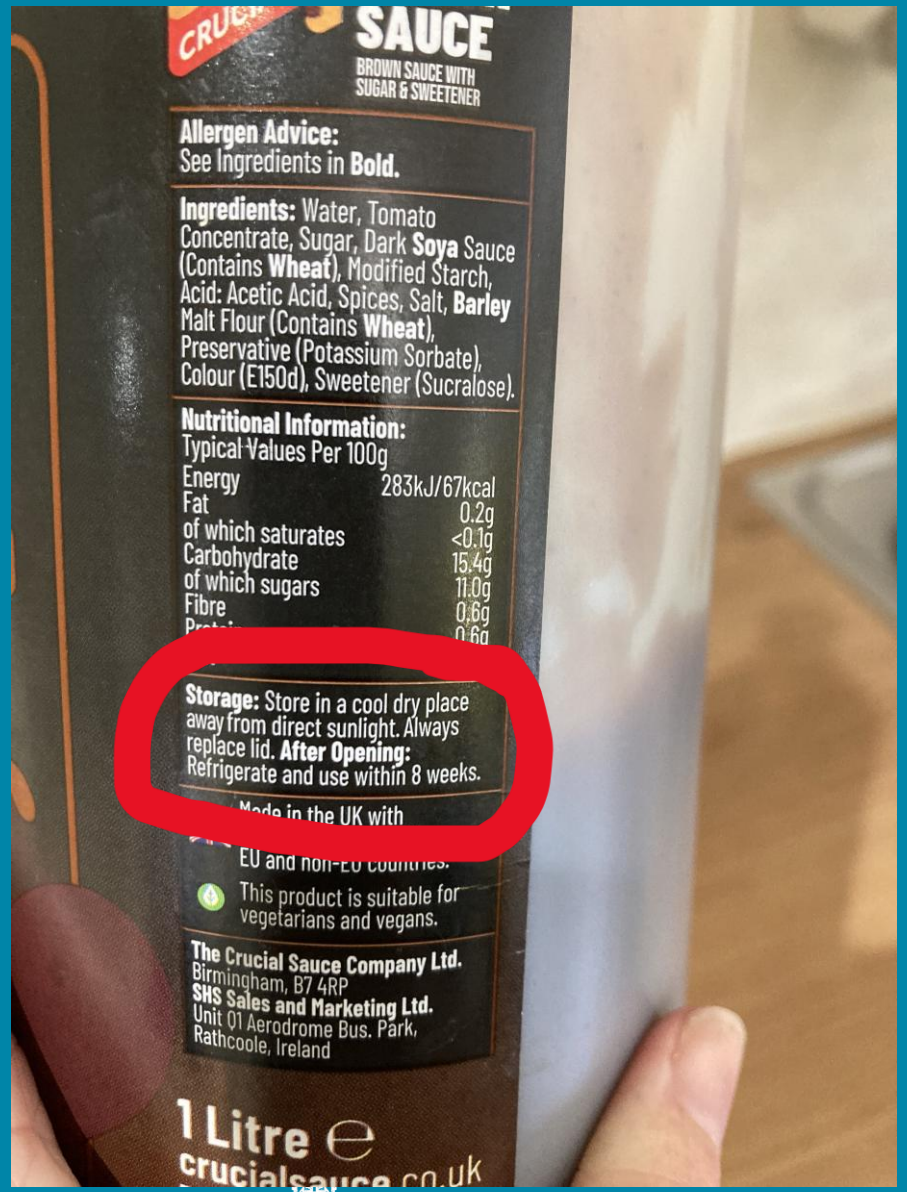
Structure & practices

- Discovered lots of issues with structure & practices particularly with maintenance, hand washing facilities and food storage.
- Mini kitchens not normally used by main kitchen staff and mainly used by care staff.
- Cleaning chemicals differed from main kitchens.
- Equipment/cutlery not routinely returned to main kitchen for washing.





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John
Richardson
Level 6 Diet
Soft and Bite sized
NormalFluids
BUSH


LAMONA

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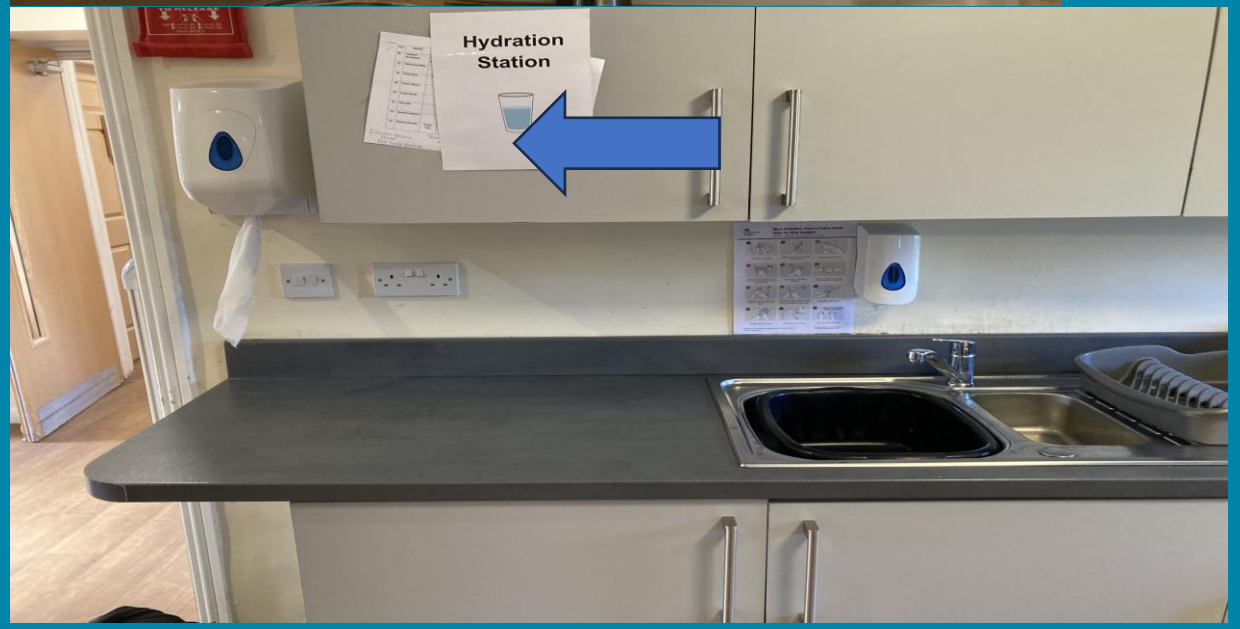
Hydration
Station


WASHING UP LIQUID


Hydration
Station

Emerging Issues after 1st visits

- Wide and varied type of facilities from just a tea trolley to mini kitchen with beverage and food storage / making facilities.
- Poor hand hygiene facilities / misuse of sinks.
- Poor staff practice.
- Cleaning materials / contact times.
- Cleaning schedules.
- Staff perception.
- Anyone can access facilities.
- Allergies.
- Medication management.

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Advice given after sample failures

Cleaning materials / contact times/dilution of chemicals

Hand hygiene

Maintenance

All informed that revisits would be made to resample after advice (ranged from 7-14 days so plenty of time to improve

All unsatisfactory results from the lab were phoned through and relayed to care homes

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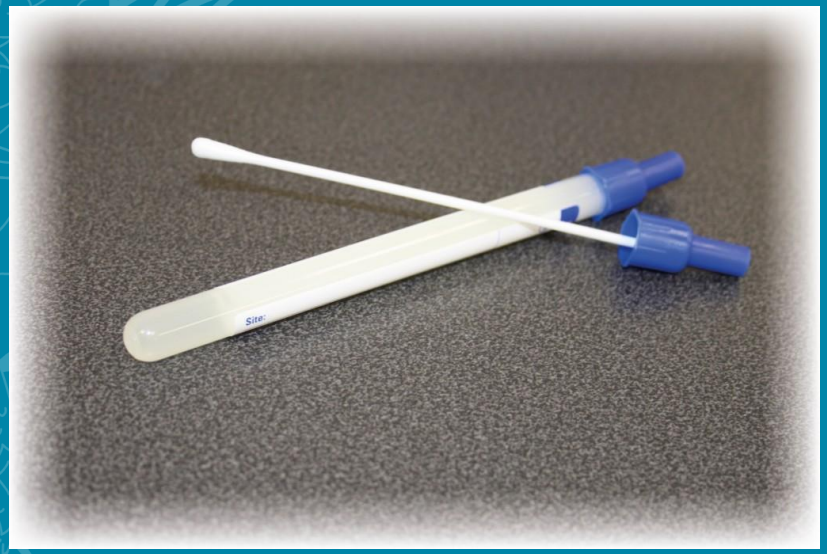
- 10 of the original homes resampled
- 31 samples taken at the 2nd visit
- 6 homes failed again
- 17 samples unsatisfactory
- 16 *Enterobacteriaceae*
- 1 *Escherichia coli*



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Time to get tough

- 6 premises had failures at the 2nd visit
- Food hygiene visits for main kitchens brought forward at the 6 premises
- 2 main kitchens had unsatisfactory conditions similar to the mini kitchens
- Combination of badly maintained equipment and lack of effective cleaning
- Scores reduced considerably to reflect the conditions

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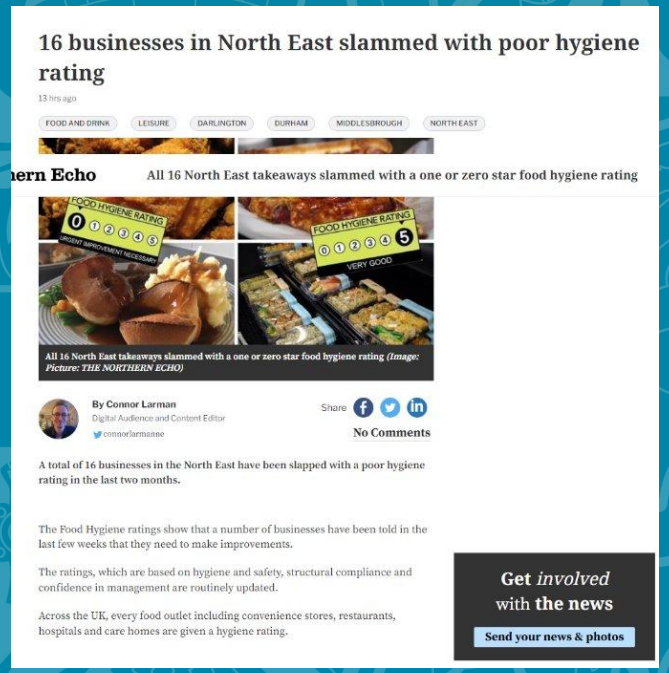
What we don't want

News › Crime

Care home where residents got food poisoning facing criminal investigation

Ashgrove House has a zero-star rating for food hygiene



16 businesses in North East slammed with poor hygiene rating

13 hrs ago

FOOD AND DRINK | LEISURE | DARLINGTON | DURHAM | MIDDLESBROUGH | NORTH EAST

hern Echo — All 16 North East takeaways slammed with a one or zero star food hygiene rating

All 16 North East takeaways slammed with a one or zero star food hygiene rating *(Image: Picture: THE NORTHERN ECHO)*

By Connor Larman
Digital Audience and Content Editor
connorlarmane

Share

No Comments

A total of 16 businesses in the North East have been slapped with a poor hygiene rating in the last two months.

The Food Hygiene ratings show that a number of businesses have been told in the last few weeks that they need to make improvements.

The ratings, which are based on hygiene and safety, structural compliance and confidence in management are routinely updated.

Across the UK, every food outlet including convenience stores, restaurants, hospitals and care homes are given a hygiene rating.

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Send your news & photos

Mirror

Care homes across the country are serving unsafe food (stock image) (Image: Getty)

NEWS | ELECTION 2024 | EUROS | CELEBS | TV | SHOPPING | ROYALS

EXCLUSIVE: Unsafe food hygiene at 125 care homes and six hospitals in damning new figures

EXCLUSIVE: The Food Standards Authority found standards bad enough that they could force the kitchens to close, and 97 universities, colleges, schools and nurseries were also among the public institutions failing to make the grade

By Chris McLaughlin, Political reporter
20:13, 3 Jul 2021 | UPDATED 15:10, 7 JUL 2021

BOOKMARK

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Feedback carried out to all providers- compulsory attendance

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Changes to future inspections & Solutions

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Table 1: Number of gastrointestinal outbreaks in care homes by month* and Local Authority

Year	Month	County Durham	Darlington	All Other North East LA	North East Total
2023	January	10	0	22	32
	February	7	1	21	29
	March	7	1	21	29
	April	3	0	12	15
	May	0	1	7	8
	June	2	0	10	12
	July	2	2	10	14
	August	4	4	12	20
	September	1	0	6	7
	October	4	1	9	14
	November	5	1	10	16
	December	10	4	26	40
	Total	55	15	166	236
2024	January	5	0	23	28
	February	6	0	16	22
	March	4	0	22	26
	April	5	0	37	42
	May	6	1	24	31
	June	2	1	17	20
	July	5	0	13	18
	August	0	0	10	10
	September	6	0	10	16
	October	6	1	24	31
	November	5	0	15	20
	December	7	1	18	26
	Total	57	4	229	290

* Refers to month outbreak started

80 % reduction in outbreaks

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Care Home Mini Kitchen Project

Authors, C. STEPHENSON[1], B. WHELAN[2], J. COLLISHAW[2], T. LATOUSAKI[2], K. ROSS[1]

1Darlington Borough Council Public Health Team, 2Darlington Borough Council Environmental Health Team

INTRODUCTION

In 2022 Darlington Borough Council Public Health Team established a new infection prevention and control service for care homes. Initial visits found variable standards of hygiene and quality of facilities in "mini kitchens" (areas separate from the main kitchen not historically included in food safety inspections) where food and beverages may be prepared by residents, staff and visitors. Concerns were raised with the Environmental Health Team.

AIM

- Review condition of facilities and cleaning practices.
- Ascertain if there was a problem.
- Identify areas for improvement.
- Promote and maintain a homely, safe environment.
- Support care homes to make positive and sustainable improvements.
- Ensure compliance with Food Safety[1] and Health and Social Care Act[2] requirements.

METHOD

- Unannounced joint visits.
- Visual check of facilities.
- Adenosine triphosphate (ATP) monitoring.
- 155 environmental samples sent to Food, Water and Environmental Microbiology Services Laboratory, York.
- Review of cleaning and decontamination products in use, cleaning schedules and techniques.
- Review of type and number of sinks and what they were being used for.
- Initial verbal feedback, follow up visits and repeat sampling for any failures.

RESULTS

20 homes were visited. Sample size per home varied due to size of facilities. 155 samples taken, 36 were "unsatisfactory".

Enterobacteriaceae was the dominant finding, two homes also had E.coli (untyped)

Only 2 homes of the first 10 passed first time. 8 homes required resampling and further advice, 2 of these homes were resampled twice. At this point the project was paused and all care homes were invited to a mandatory briefing for urgent implementation of improvements before the project restarted.

Common themes found:

- Cleaning products did not meet BS EN 1276 / EN 14476[2]
- Cleaning products were not applied correctly
- Cleaning schedules were insufficiently detailed
- Poor provision of dedicated handwash facilities, significant number of multi purpose sinks found including drinking water being taken from handwash basins.
- Poor allergy management

Unexpected findings:

- Breaches of the Health and Social Care Act[2]
- Prescription thickeners and food supplements stored in public areas
- Hatching project chickens housed beside a beverage preparation area
- **Application of food safety advice and inclusion of mini kitchen areas in food hygiene ratings reduced gastrointestinal outbreaks by almost 80% since the project started.**

CONCLUSIONS

Enforcement of food safety regulations in care home "mini kitchens" significantly reduces gastrointestinal illness outbreaks.

Best outcomes are achieved when food inspectors and infection prevention specialists collaborate to ensure compliance with applicable legislation within the care environment.

Low cost and easy for care providers to implement best practice.

REFERENCES

1 *Assimilated Regulation (EC) 852/2004). Available at* Regulation (EC) No 852/2004 of the european parliament and of the council of 29 April 2004 on the hygiene of foodstuffs (Accessed:15 March 2025)

2 *Food Standards Agency, Cleaning effectively in your business.* Available at Cleaning effectively in your business | Food Standards Agency (Accessed:25 March 2025)

2 *Health and Social Care Act 2008 (Regulated Activities) Regulations 2014 Part 3, section 2, Regulation 16. Available at* The Health and Social Care Act 2008 (Regulated Activities) Regulations 2014 (Accessed:15 March

ACKNOWLEDGEMENT

With thanks to our colleagues, care providers and their residents who supported this project.

CONTACT INFORMATION

public.health@darlington.gov.uk

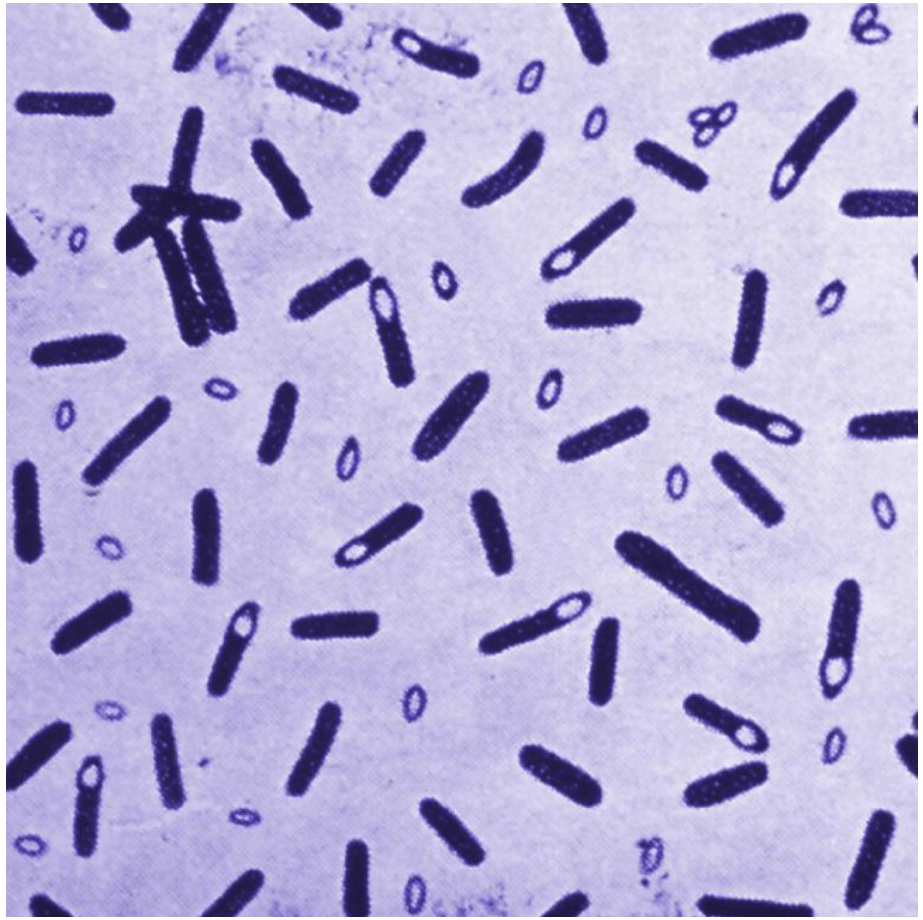
UK Health Security Agency

Clostridium botulinum cattle incident regulators update

Background

- Lincolnshire County Council Trading Standards informed UKHSA East Midlands Health Protection Team (HPT) of cattle die offs following consumption of animal feed thought to be contaminated with clostridium botulinum.
- Review of Feed chain supply carried out see process diagram
- Bakkavor desserts in Newark large manufacturer make desserts for UK high end retail- circa 200 food lines. Full documented HACCP. Primary authority South Holland District Council for food hygiene and Lincolnshire TS for feed hygiene and standards. Food surplus of cakes and raw cooking dough are sold to Enrich and Sons who use PH Hull & Sons who facilitate transaction to Midlands Feeds as cattle feed.
- Food samples from food surplus of cakes and raw dough submitted to UKHSA Gastro reference unit GBRU for clostridium testing.

Clostridium

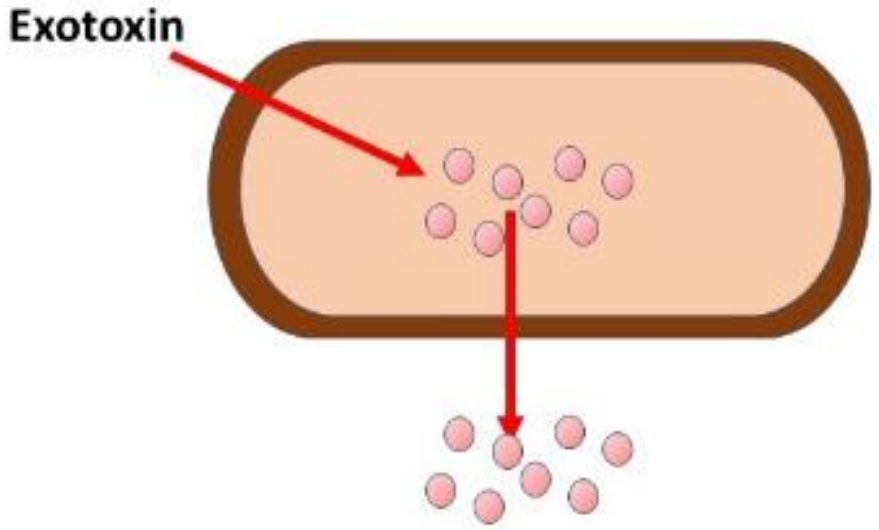


- *Clostridium botulinum* is a spore-forming anaerobic bacterium that produces a potent neurotoxin. An anaerobic bacterium survives in low-oxygen environments, such as home-canned foods. There are seven types of recognized botulism–serotypes A through G. Toxins A, B, E, and F–cause foodborne illness in humans. C and D cause illness in animals

Exotoxins

Exotoxins are toxic substances released outside the cell

- Enterotoxins act on the intestine
  - Either causing vomiting (emetic toxin) or diarrhoea
- Neurotoxins interfere with normal nervous transmission (e.g. botulism)



Clostridium botulinum

- Spore-former - resistant to heat
- Anaerobic – grows in absence of oxygen
- Found in environment (soil, marine and freshwater sediment)
- Most commonly found in improperly processed canned or bottled products, or vegetables in oil
- Produces extremely potent pre-formed toxin in food
  - causes descending paralysis after consumption
- Cannot grow below pH 4.6 so acidic foods are low risk
- Cannot test for this organism in FW&E labs
- Laboratory test for human toxins is still a bioassay– undertaken at Reference Lab

The Investigation

- Define roles and responsibilities
- Identify the feed process
- Look at HACCP controls
- Review the human food chain
- Risk assess
- Sample

Roles and Responsibility

- Food Hygiene and safety – EH
- Feed Hygiene – TS
- Animal Health – APHA
- Food and feed risk assessment -FSA
- Public health risk assessment - UKHSA

Legislation

- **Regulation 183/2005 laying down requirements for feed hygiene**
- Regulation 183/2005 (Opens in a new window) requires most businesses involved in the use, manufacture or marketing of feeds to be approved or registered with their competent authority.
- It sets down standards relating to the transport and storage of feed, maintenance of equipment, the training of personnel, and the keeping of records
- **Regulation 767/2009 on placing animal feed on the market and use of animal feed**
- Regulation 767/2009 (Opens in a new window) sets out the requirements for the marketing, labelling and composition of animal feeding stuffs and includes provisions intended to safeguard both animal and human health. It requires that feed may be placed on the market and used only if it is safe and does not have a direct adverse effect on the environment or animal welfare.

Legislation

- **The Animal Feed Regulations (Composition, marketing and use) (England) Regulations**
- **The Animal Feed (Hygiene, sampling etc, and enforcement) (England) Regulations**
- These regulations (Opens in a new window) provide for the enforcement and implementation of Regulations.

Botulism in farmed animals

- Botulism in farmed ruminants - GOV.UK

- **Sources of the bacterium, Clostridium botulinum**
- In UK ruminants the disease is often caused by animals coming into contact with the litter of broiler chickens especially if it contains any carcase material. There are also more sporadic but very large outbreaks due to feeding forage that has been contaminated with carcase material, including carcases that have been ensiled during grass cutting. If there are outbreaks of diseases in wildlife on a farm, for example myxomatosis in rabbits, the risk of botulism in livestock may be increased because dead wildlife carcases may be present in the grass fields that are to be cut for silage. There is also a risk if game shoots leave carcases behind on farms. The increased popularity of feeding livestock a wide array of materials considered unfit for the human food chain in a bid to reduce costs and waste, also poses a risk if not suitably stored.

Botulism in cows

- **Clinical signs in affected animals**
- The clinical signs in affected animals vary from sudden deaths, to animals becoming stiff, wobbly, and going down before dying. Some animals have slowly become weaker developing flaccid paralysis and are unable to eat or drink, necessitating euthanasia on welfare grounds. Very few animals survive once they develop the disease. The onset of clinical signs is variable and can be within 24 hours of exposure but can be delayed by up to two to three weeks, with the majority affected within the first seven days.
- Figure 3. Holstein-Friesian heifer in sternal recumbency (warning: image of a diseased cow)
- Figure 4. Botulism affected ewe in sternal recumbency (warning: image of a diseased sheep)

Literature review 2019

- A Case Report of a Botulism Outbreak in Beef Cattle Due to the Contamination of Wheat by a Roaming Cat Carcass: From the Suspicion to the Management of the Outbreak – PubMed
- Foodborne botulism: A brief review of cases transmitted by cheese products (Review) – PMC *Clostridium botulinum* in foods Any food that facilitates spore germination and botulinum toxin production allows spores to survive through food preparation, if not subjected to heat treatment before consumption (43). Almost every type of food lacking sufficient acidity (pH >4.6) can lead to the development and production of bacterial toxins. The toxins are typically sensitive and can be destroyed by heating to 85°C for 5 min (5). Spores are destroyed in conditions of wet sterilization at 120°C for 5 min (9). Spore germination and toxin production are achieved when foods are exposed to conditions of an anaerobic environment, pH >4.6, low salt and sugar concentration and temperatures from 4-12°C (21).

Food and Feed Supply Chain

Bakkavor Food factory in Newark and Sherwood produce cakes for human food chain. They have full HACCP compliance and CCP controls of PH and Aw and temp control in place. Primary Authority with South Holland Bakkavor also have Primary Authority with Lincolnshire Trading Standards, this coves food standards and feed hygiene.

Surplus food of cakes and un used raw dough from Bakkavor are stored in dohlavs and collected by Haulage company Hudson and White

Cakes and raw dough classed as feed for animals is collected by Hudson and White in 2 skips for cake waste and 1 skip for raw dough and taken to Midland Feeds in Lincs. Daily collection of cakes and 2 weekly collection of raw dough- Monday and Thursday

Midlands Feeds store cake and raw dough and mix together to form an animal feed product. There is NO TEMPERATURE CONTROL OR HEATING OF THIS PRODUCT . This product is then supplied direct to farms and to W Rigby & Son in Derbyshire and AB Nutrition in Cheshire. W.Rigby supply other feed producers. This product can be mixed with sileage on farm or served to cows directly without any further heat processing

This product is heat treated by AB Nutrition to 300 degrees c

Food and Feed Process

- Bakkavor collect surplus cake waste and raw dough off cuts and store in separate dolavs to be sold for animal feed.
- Dolavs are emptied into a covered skip for collection by Haulage company Hudson and White. Cake surplus collected daily and raw dough collected twice a week on a Monday and Thursday.
- The full skips of cake waste are collected from Bakkavor on a daily basis and taken directly to the Midland Feeds Claypole site. The empty skip is then taken back to the Hudson White site and stored inside (sheeted) overnight before being taken back to Bakkavors the next day, and swapped with the full skip.
- The dough skip is collected twice a week and taken directly to Claypole before being returned to Bakkavors.
- There is a cleaning protocol and schedule and the skips are cleaned every 6 weeks (staggered).

Covered skip full of cake waste being collected to be taken to Claypole.

Sampling by Newark and Sherwood EH

- Surplus food samples of cakes and raw dough at end of production collected by Newark and Sherwood EH and submitted to UKHSA reference lab in Colindale

Cake waste in the skip, and clean skip from Claypole returned to Bakkavor for filling,

The end cooked waste from the factory into doulavs to be emptied into the skip

Raw waste in the skip to be collected to go to claypole

Raw pastry waste in the dovlav to be placed into the above skip

Feed Process

- Food surplus from Bakkavor is transported via haulage company Hudson and white to Midlands Feeds in Claypole who then transport to W Rigby & son and to AB Nutrition in Derbyshire
- Feed is stored in warehouse in Midlands Feed
- Feed does not undergo any further heat processing at Midlands Feed.
- AB Nutrition heat feed to 300 degrees
- Feed leaves Midlands Feeds to go to farms

HACCP Controls at Bakkavor

- Full documented HACCP
- Inhouse sampling for B.cerius, staph and listeria and Enterobacteriaceae.
- Temperature monitoring
- Raw dough does not enter the human food chain

Public Health Risk Assessment

- UKHSA led the public health risk assessment review.
- The information that had to be gathered included:
- Was there any food in human food chain that could contain botulism?
- Did the products from cows(milk,meat, cheese) pose a risk ?
- Was the C.botulinium toxin a human disease toxin or an animal toxin?

Public Health Risks

- **Food safety**
- With botulism outbreaks no clinically affected animals or their produce should enter the food chain. This means that meat and milk from clinically affected animals may not be used for human consumption. If there are any recovering animals these should be restricted for 18 days following withdrawal from the suspected source and cessation of clinical signs.

Public Health Risk Assessment

- The food samples taken from Bakkavor were negative for C.botulinium

Acknowledgements

- **Victoria Marshall -Senior Environmental Health Officer – Business Compliance (Food Safety, Health and Safety, Animal Licensing and Beauty Licensing) Public Protection Newark and Sherwood District Council**

- **Barbara Ward –Team lead Feed Team Lincolnshire Trading Standards**

- **Matthew Tuft -Trading Standards Officer -Public Health and Communities Nottinghamshire County Council**

UK Health Security Agency

Public Health Scotland

GIG CYMRU NHS WALES
Iechyd Cyhoeddus Cymru
Public Health Wales

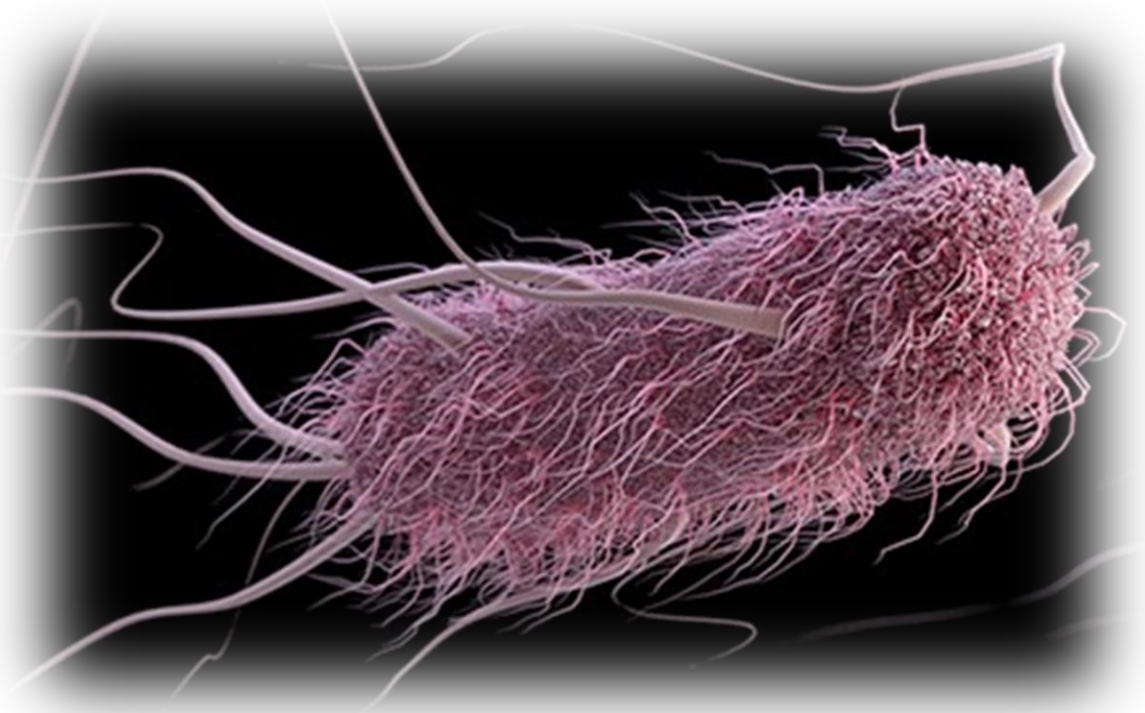
HSC Public Health Agency

Shiga toxin–producing *Escherichia coli* (STEC) O145:H28 outbreak linked to pre-packaged sandwiches in the UK, 2024

Amy Douglas, Lead Epidemiologist
Gastrointestinal Infections, Food Safety and One Health Division, UKHSA
13th November 2025

Overview

1. STEC and surveillance in England
2. Recent STEC epidemiology
3. Detection of the outbreak
4. Investigation of the outbreak
   - Epidemiological
   - Food chain and microbiological
5. Control measures and prevention
6. Conclusion



Shiga-toxin producing *Escherichia coli* (STEC)

- **Possesses Shiga toxin genes** (*Stx*) and other virulence factors
- Different combinations of *Stx* associated with variable severity(1)
  - → *Stx2a is most strongly associated with severe illness*

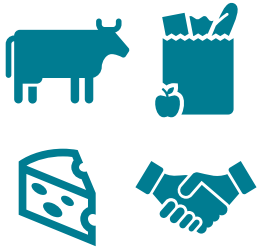
› Emerg Infect Dis. 2020 Oct;26(10):2394-2400. doi: 10.3201/eid2610.200319.

Association between Shiga Toxin-Producing Escherichia coli O157:H7 stx Gene Subtype and Disease Severity, England, 2009-2019

Lisa Byrne, Natalie Adams, Claire Jenkins

PMID: 32946720 PMCID: PMC7510717 DOI: 10.3201/eid2610.200319

- Range from mild (diarrhoea, abdominal pain) to severe (bloody diarrhoea), complications such as **haemolytic uraemic syndrome** (HUS)
- Vulnerable groups (<5 years, >65 years and immunocompromised) have increased risk of severe illness
- In 2024 ~1/3 of cases hospitalised, ~2% develop HUS and 7 deaths (0.3%)(2)



- **Multiple transmission routes:**
  - Contaminated food, e.g. undercooked meat, raw fruits/vegetables, unpasteurised dairy- national foodborne outbreaks
  - Person-to-person, e.g. secondary cases in same household- nursery outbreaks
  - Contact with animals, e.g. cattle and sheep- petting farm outbreaks
  - Environmental exposure, e.g. animal faeces and their environment- recreational land use

STEC trends in England[2]

Figure 1: Number of laboratory confirmed STEC O157 and non-O157 cases by year, 2015 to 2024

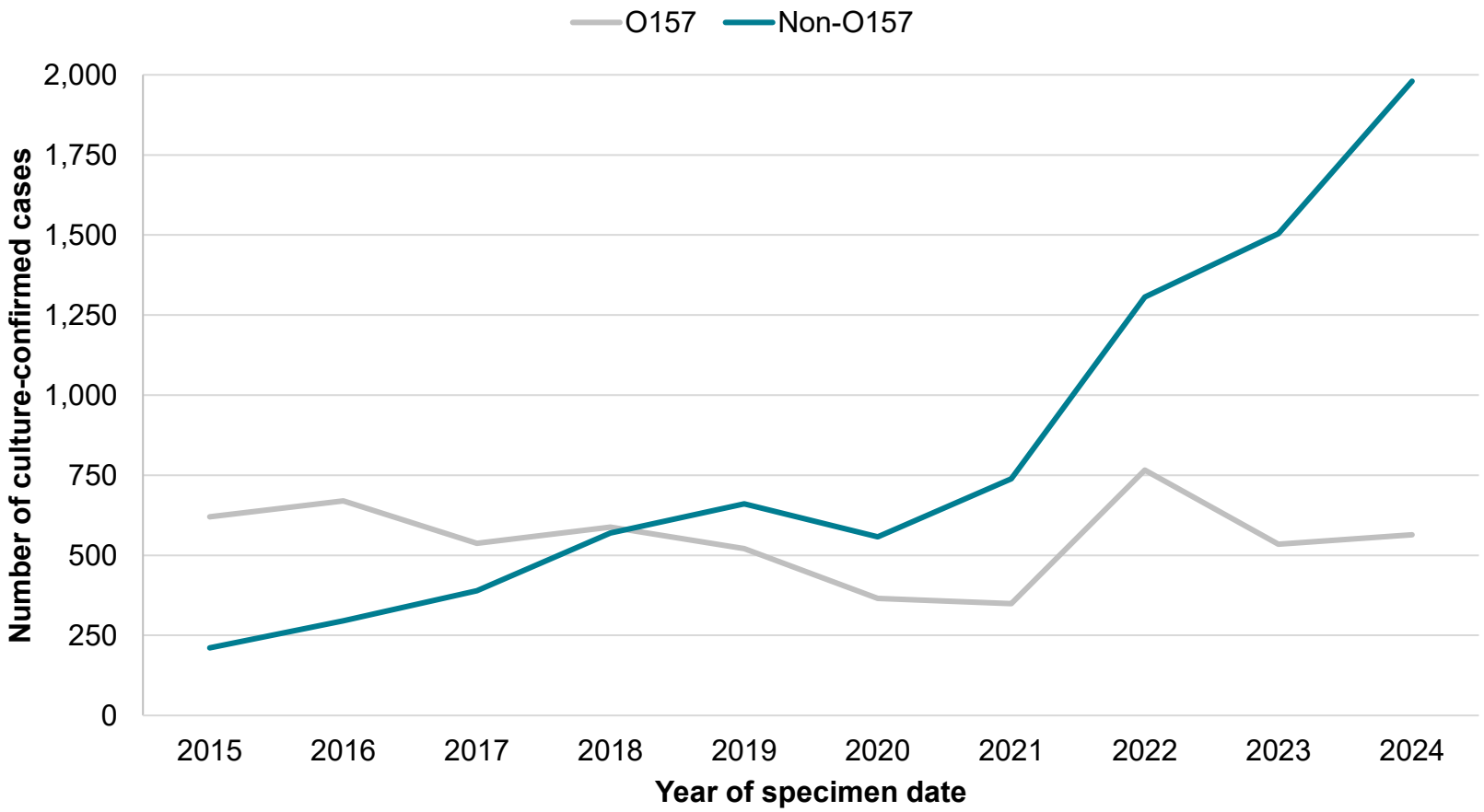


Photo illustration

Infections pass 250 in UK E. coli outbreak

By News Desk on June 22, 2024

BBC For you Home News Sport Weathe

NEWS

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Health

One dead after E. coli outbreak linked to cheese

29 December 2023

Officials probe raisins link in UK E. coli outbreak

By Joe Whitworth on July 13, 2024

STEC surveillance in England

Patient seeks healthcare & submits a sample

STEC/Stx detected at a hospital laboratory

Second Generation Surveillance System

Case notification in CIMS

Enhanced Surveillance Questionnaires

Typing (WGS) at GBRU

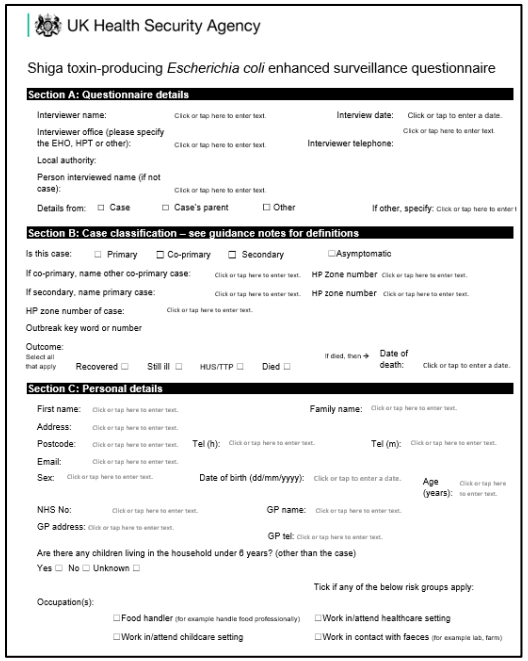
Results in GDW2

Surveillance and outbreak detection/ investigation

Public Health Scotland | GIG CYMRU NHS WALES – Iechyd Cyhoeddus Cymru Public Health Wales | HSC Public Health Agency | Animal & Plant Health Agency | Food Standards Agency | Chartered Institute of Environmental Health | Department for Environment Food & Rural Affairs | Food Standards Scotland

Enhanced Surveillance questionnaires (ESQs) and Operational guidelines for public health follow up pf cases[3, 4]

- Demographic details
  - Age, sex, DOB, NHS number, residence, occupation
- Clinical information
  - Onset date, symptoms, hospitalisation
- Travel history
  - Trips within UK and to other countries
- Food exposures
  - Eating out and at home, supermarkets and retailers
- Environmental exposures
  - Water use, recreational land use, animal contact…



UK Health Security Agency

Shiga toxin-producing *Escherichia coli* enhanced surveillance questionnaire

Section A: Questionnaire details

Interviewer name: Click or tap here to enter text. Interview date: Click or tap to enter a date.

Interviewer office (please specify the EHO, HPT or other): Click or tap here to enter text. Interviewer telephone: Click or tap here to enter text.

Local authority:

Person interviewed name (if not case): Click or tap here to enter text.

Details from: ☐ Case ☐ Case's parent ☐ Other If other, specify: Click or tap here to enter t

Section B: Case classification – see guidance notes for definitions

Is this case: ☐ Primary ☐ Co-primary ☐ Secondary ☐Asymptomatic

If co-primary, name other co-primary case: Click or tap here to enter text. HP Zone number Click or tap here to enter text.

If secondary, name primary case: Click or tap here to enter text. HP zone number Click or tap here to enter text.

HP zone number of case: Click or tap here to enter text.

Outbreak key word or number

Outcome: Select all that apply Recovered ☐ Still ill ☐ HUS/TTP ☐ Died ☐ If died, then → Date of death: Click or tap to enter a date.

Section C: Personal details

First name: Click or tap here to enter text. Family name: Click or tap here to enter text.

Address: Click or tap here to enter text.

Postcode: Click or tap here to enter text. Tel (h): Click or tap here to enter text. Tel (m): Click or tap here to enter text.

Email: Click or tap here to enter text.

Sex: Click or tap here to enter text. Date of birth (dd/mm/yyyy): Click or tap to enter a date. Age (years): Click or tap here to enter text.

NHS No: Click or tap here to enter text. GP name: Click or tap here to enter text.

GP address: Click or tap here to enter text. GP tel: Click or tap here to enter text.

Are there any children living in the household under 6 years? (other than the case)

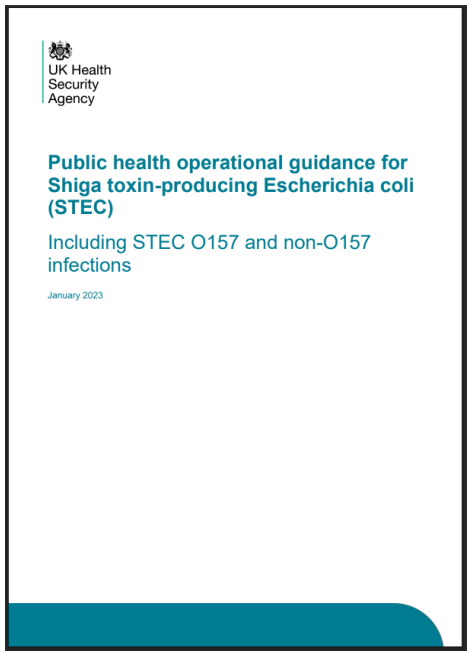
Yes ☐ No ☐ Unknown ☐

Tick if any of the below risk groups apply:

Occupation(s):

☐Food handler (for example handle food professionally) ☐Work in/attend healthcare setting

☐Work in/attend childcare setting ☐Work in contact with faeces (for example lab, farm)



UK Health Security Agency

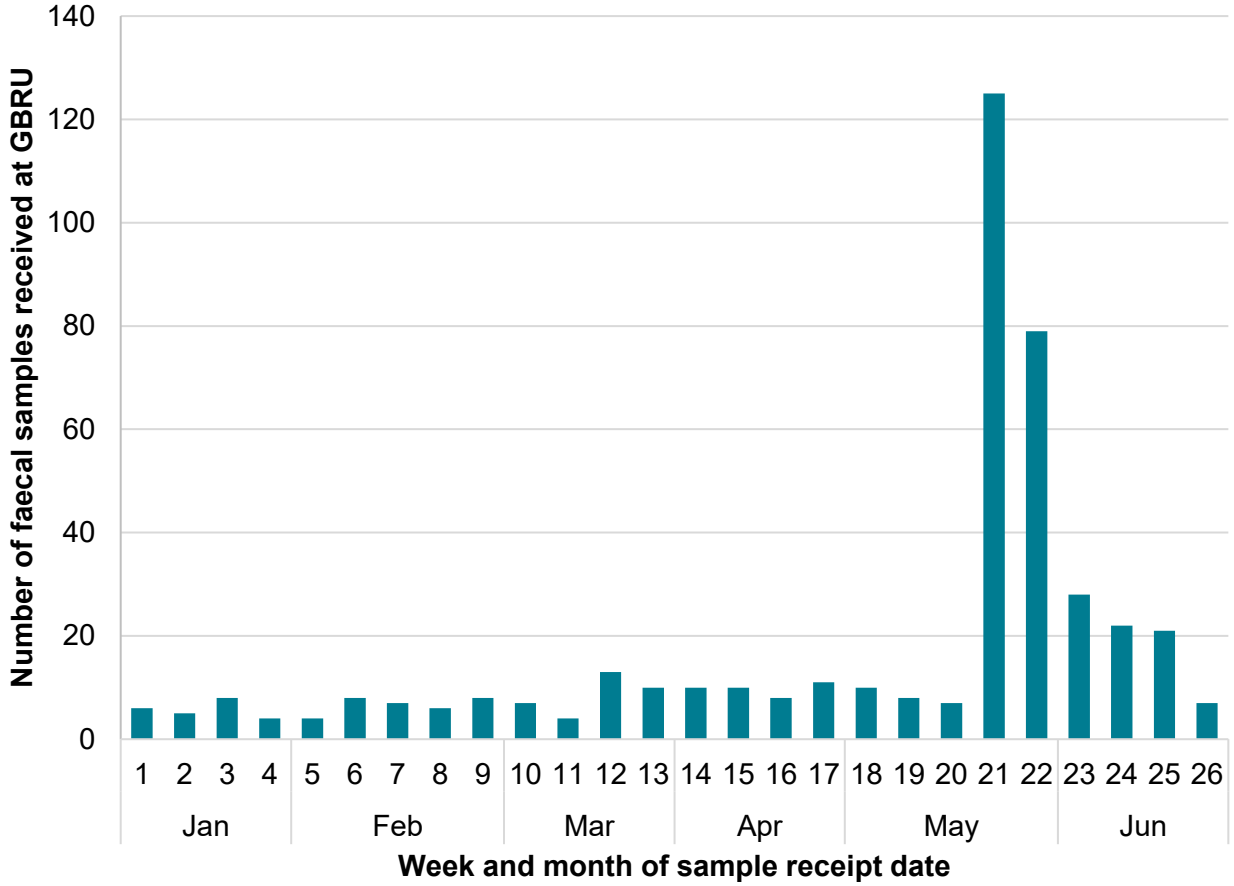
Public health operational guidance for Shiga toxin-producing Escherichia coli (STEC)

Including STEC O157 and non-O157 infections

January 2023

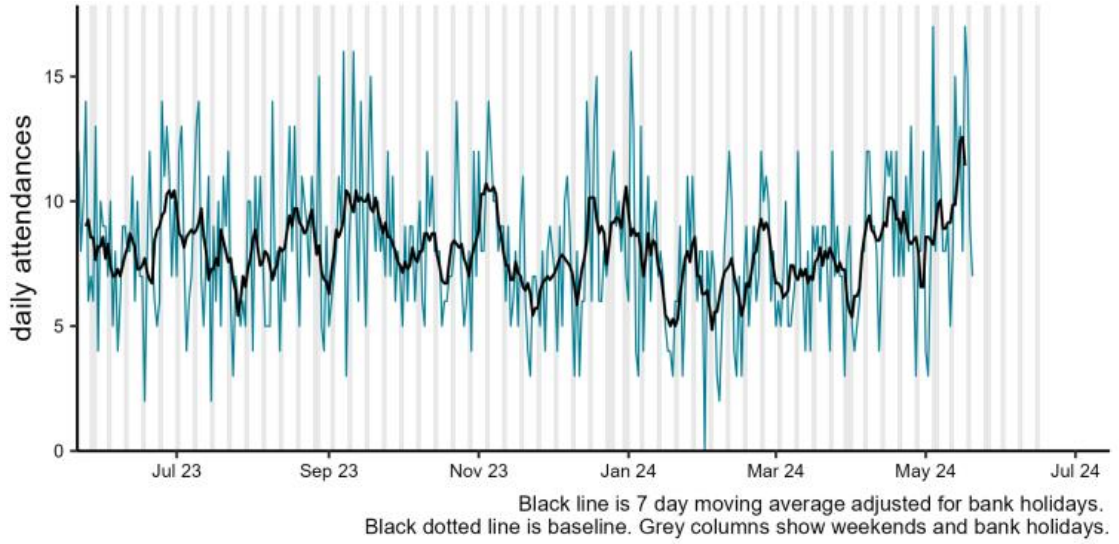
Detection of the emerging outbreak

Figure 2: Trends of non-O157 STEC PCR+, Culture +, *eae*+, *stx2* only+ faecal sample referrals to national reference laboratory, 2024 (GDW2)



- Non-O157 STEC increase
- Virulence profile: *stx*2, *eae*+
- Increase in ESQ submissions

Figure 3: Daily emergency department Haemolytic Uraemic Syndrome-like attendances, May 2023- May 2024 (EDSSS)

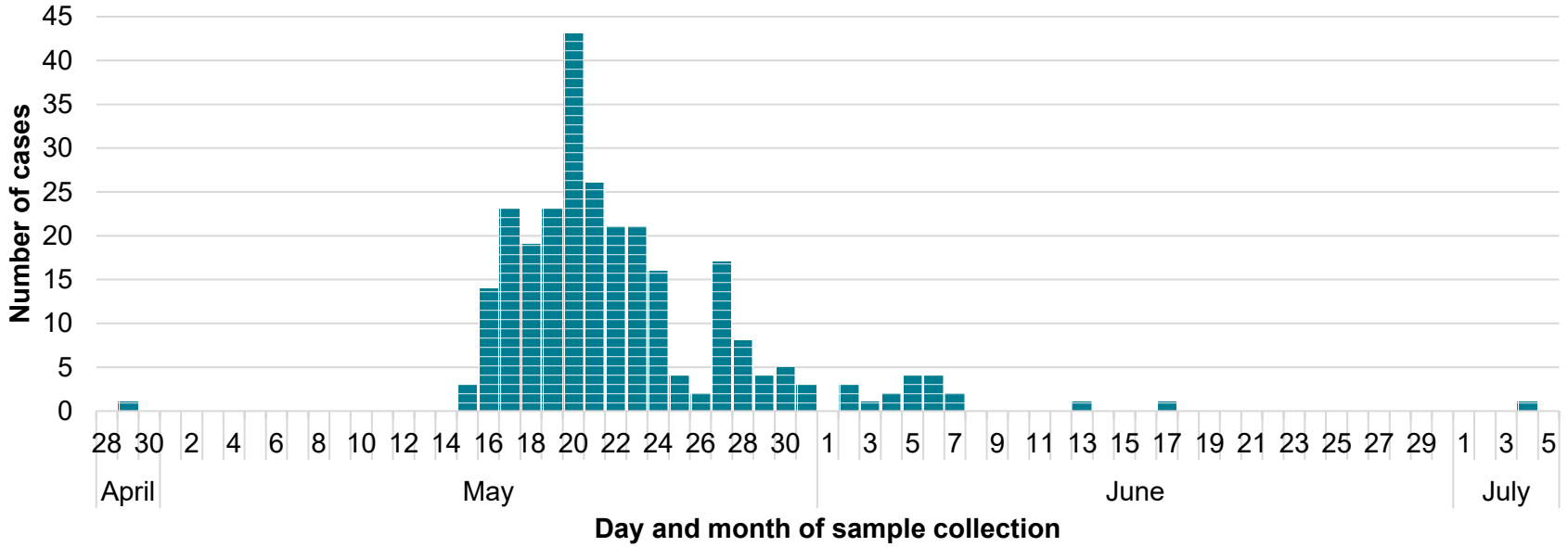


STEC O145:H28 outbreak- summary

Case definitions:

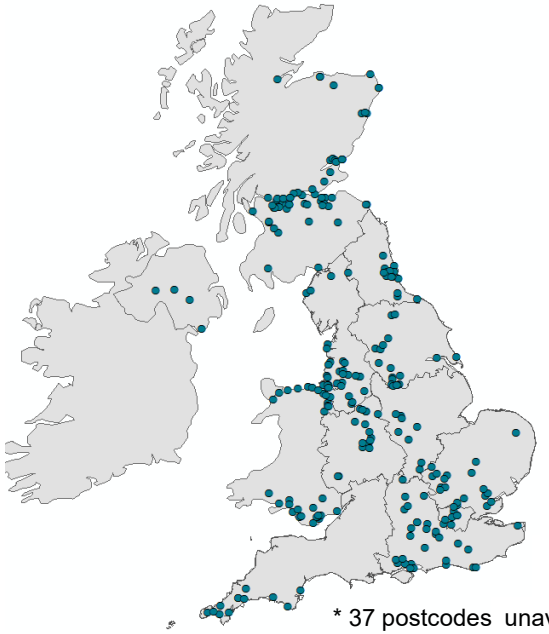
- **Confirmed (n=293):** STEC O145:H28 case resident in the UK, belonging to the outbreak strain WGS 5-SNP cluster reported since 1 April 2024 (inc. asymptomatic)
- **Probable (n=9):** UK resident who tested PCR+ for STEC locally, and culture+ for *stx2*/*eae*, not O157 or O26 and awaiting WGS; or locally PCR+ but culture negative at reference lab, with an epidemiological link to a confirmed case.

Figure 4:Temporal distribution of confirmed cases based on sample date (n=272*)



* 20 sample dates not included or unavailable

Figure 5: Geographical distribution (n=255*)



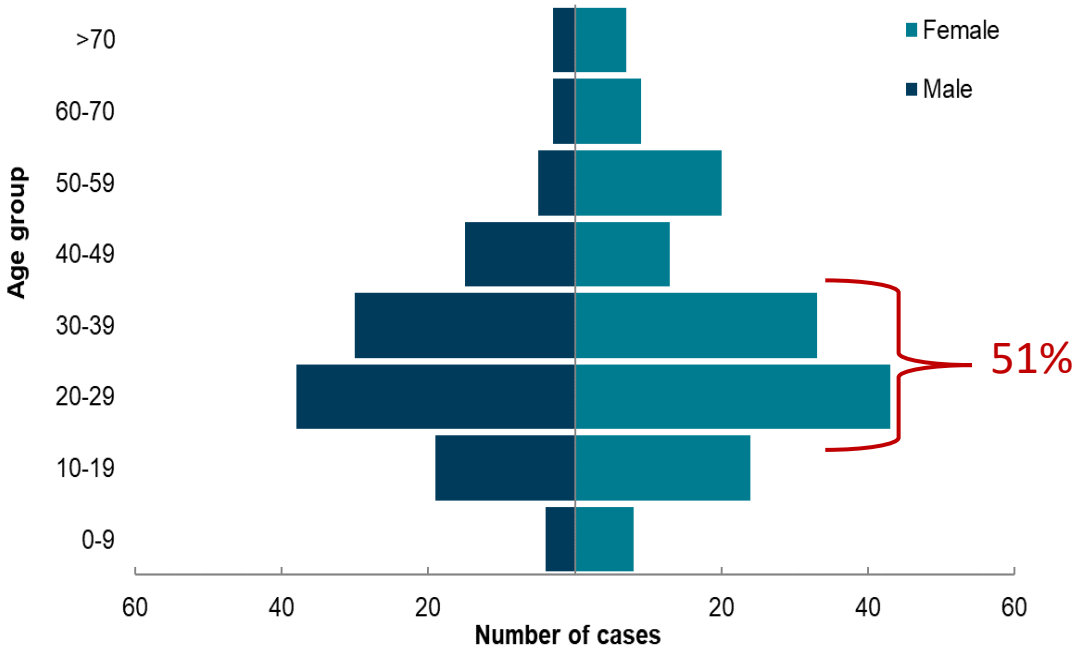
* 37 postcodes unavailable

STEC O145:H28 outbreak- summary

Age-sex distribution:

- 57% female
- median age 29 (1-89 years)

Figure 6: Age-sex distribution (n=290)



Clinically severe illness:

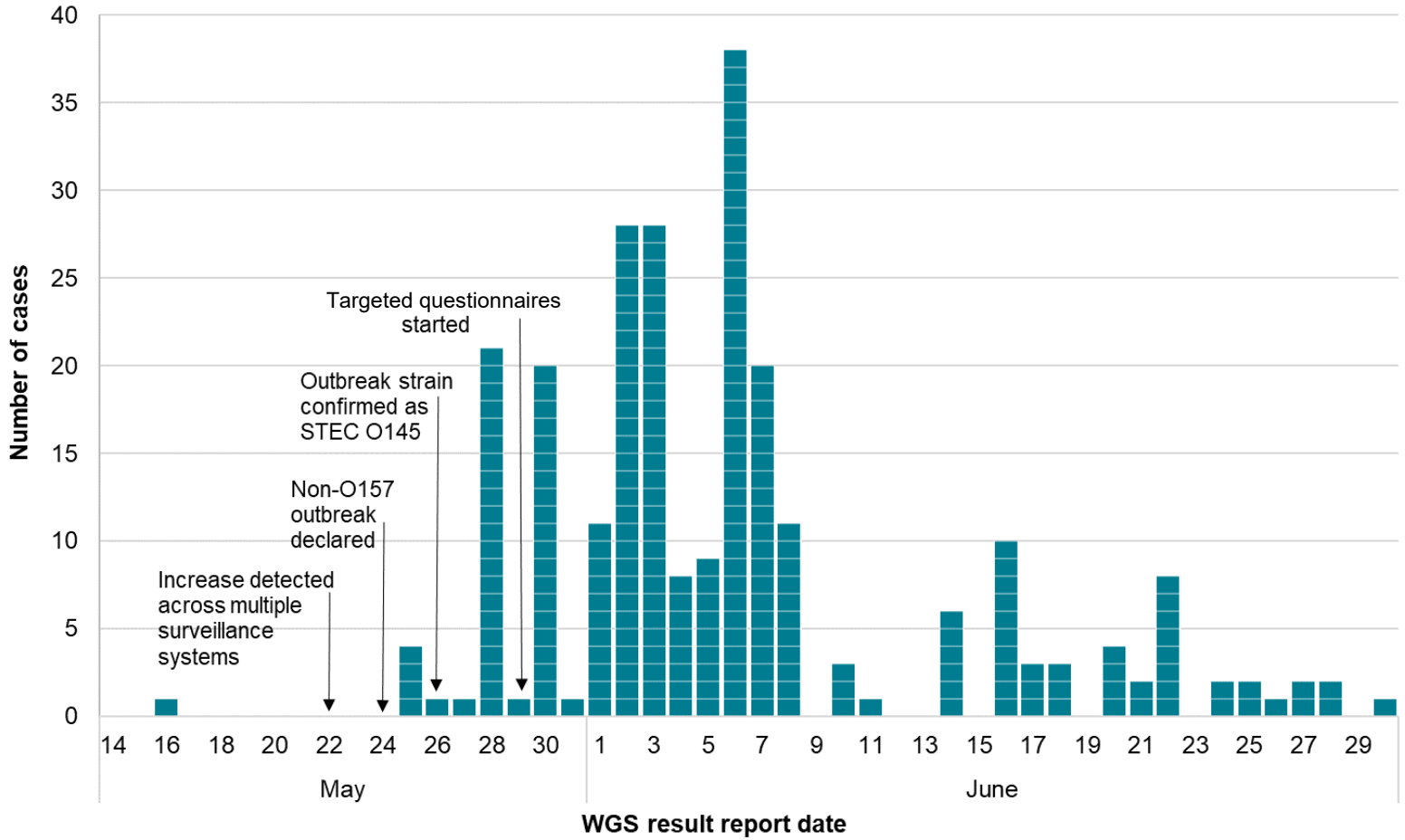
- 77% bloody diarrhoea
- 46% hospitalised
- 13% attended ED but not admitted
- 4% Haemolytic Uraemic Syndrome:
  - 9 confirmed cases
  - 2 probable cases
- 2 confirmed cases died (1%)

Initial epidemiological investigations

Initial epidemiological signals:

- Nationally distributed food product, likely fresh produce or ready-to-eat product
- Local outbreak in SW England, 6 O145 cases
- Phylogeny: likely domestic source
- EpiPulse- likely UK only

Figure 6:Temporal distribution of confirmed cases by report data (GDW2, n=253*)



* 39 cases dates not included

Initial epidemiological investigations

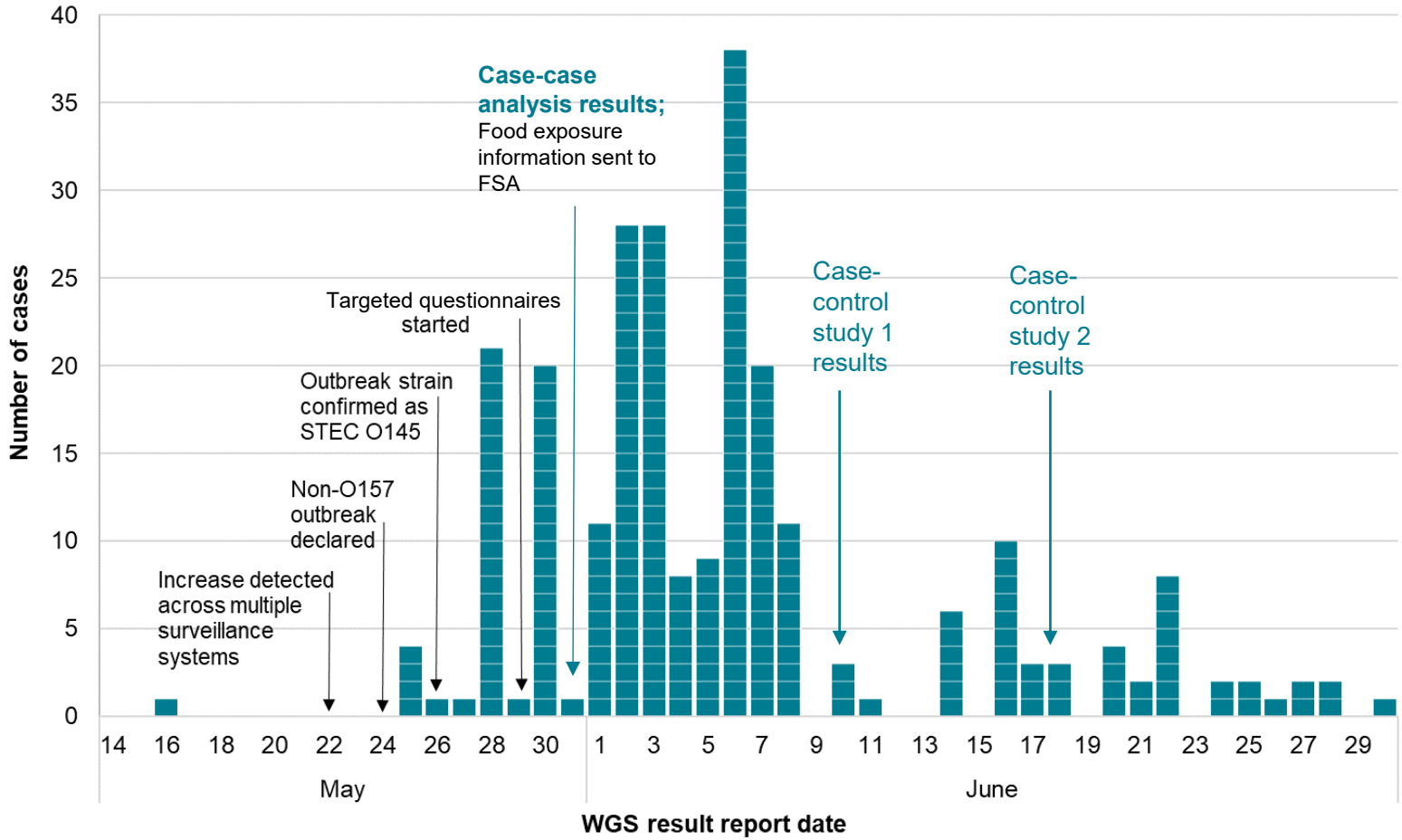
Initial epidemiological signals:

- Nationally distributed food product, likely fresh produce or ready-to-eat product
- Local outbreak in SW England, 6 O145 cases
- Phylogeny: likely domestic source
- EpiPulse- likely UK only

Case-case analysis:

- ESQ data
- Other STEC cases as controls, age and date frequency matched
- England: Pre-packaged sandwiches aOR: 4.9, 95%CI [1.5- 15.1] p<0.001
- Wales identified same hypothesis, aOR 3.9 [1.7-9.6] p= 0.002

Figure 6:Temporal distribution of confirmed cases by report data (GDW2, n=253*)



* 39 cases dates not included

Epidemiological investigations: case-control studies[5]

Case-control analysis 1:

- Targeted questionnaire data
- Age frequency matched
- Controls: *Salmonella* sp (1.5 per case)
- No travel in 7 days prior

- Cases most strongly associated with consumption of lettuce as part of a pre-packaged sandwich

Table 1: MVA model 1

Exposure	aOR	95% CI	p-value
Age (ref: 11 – 18 year olds)			
Age : 19-29 year olds	**4.4**	[0.9 – 21.3]	0.063
Age: 30 – 70 year old	**2.3**	[0.5 – 10.8]	0.3
Sex (ref: female)			
Male	**1.2**	[0.4 – 3.1]	0.28
Any lettuce leaf in a pre-packaged sandwich	**7.1**	[2.3 - 21.5]	0.001
BLT/bacon containing sandwich	**6.7**	[1.03 – 43.4]	0.047

Epidemiological investigations: case-control studies[5]

Case-control analysis 1:

- Targeted questionnaire data
- Age frequency matched
- Controls: *Salmonella* sp (1.5 per case)
- No travel in 7 days prior

- Cases most strongly associated with consumption of lettuce as part of a pre-packaged sandwich

- No evidence of an association between eating lettuce leaf products as part of other meals out

Table 1: MVA model 1

Exposure	aOR	95% CI	p-value
Age (ref: 11 – 18 year olds)			
Age : 19-29 year olds	**4.4**	[0.9 – 21.3]	0.063
Age: 30 – 70 year old	**2.3**	[0.5 – 10.8]	0.3
Sex (ref: female)			
Male	**1.2**	[0.4 – 3.1]	0.28
Any lettuce leaf in a pre-packaged sandwich	**7.1**	[2.3 - 21.5]	0.001
BLT/bacon containing sandwich	**6.7**	[1.03 – 43.4]	0.047

Table 2: MVA model 2

Exposure	aOR	95% CI	p-value
Age (ref: 11 – 18 year olds)			
Age : 19-29 year olds	**4.2**	0.9 - 18.9	0.06
Age: 30 – 70 year old	**2.3**	0.5 - 9.9	0.264
Sex (ref: female)			
Male	**1.2**	0.5 - 33.1	0.7
Lettuce when dining out (ref: no sandwich or no sandwich with lettuce, no dining out)			
Lettuce in a pre-packaged sandwich	**11.8**	4 - 35.2	p<0.001
Eaten lettuce as part of a meal out (no sandwich)	**1.3**	0.32 - 5	0.73

Epidemiological investigations: case-control studies[5]

Case-control analysis 2:

- Targeted questionnaire data
- Age frequency matched
- Controls: Market research panel (2.2 per case)
- No GI illness or travel in 7 days prior

- Same associations found as study 1

Table 3: MVA model 3

Exposure	aOR	95% CI	p-value
Age (ref: 11 – 18 year olds)			
Age : 19 - 29 year olds	**4.0**	[1.0 – 15.7]	0.045
Age: 30 – 70 year old	**0.8**	[0.2 – 2.8]	0.775
Sex (ref: female)			
Male	**1.4**	[0.6 – 3.4]	0.497
Lettuce when dining out (ref: no sandwich or no sandwich with lettuce, no dining out)			
Lettuce in a pre-packaged sandwich	**8.7**	[3.5 – 22.0]	P<0.001
Eaten lettuce as part of a meal out (no sandwich)*	**2.0**	[0.5 – 8.0]	0.335

Food chain investigations

- Cases reported 26 types of sandwiches and wraps, most common were:
  - Chicken with lettuce
  - Bacon, lettuce and tomato

→ 3 UK sandwich manufacturers

- Food chain analysis identified >120 raw ingredients, most common were:
  - Tomatoes → sourced from outside UK
  - Mayonnaise → distributed outside UK
  - Apollo lettuce → grown in England, common across the 3 sandwich manufacturers

Despite extensive investigations in collaboration with the growers, local authorities, the Animal and Plant Health Agency, and the Environment Agency it was not possible to determine root-cause of the contamination

Control measures: proactive public health messaging[6]

GOV·UK

Home > Health and social care > Public health > Health protection > Infectious diseases

Press release

E. coli advice issued amid rise in cases

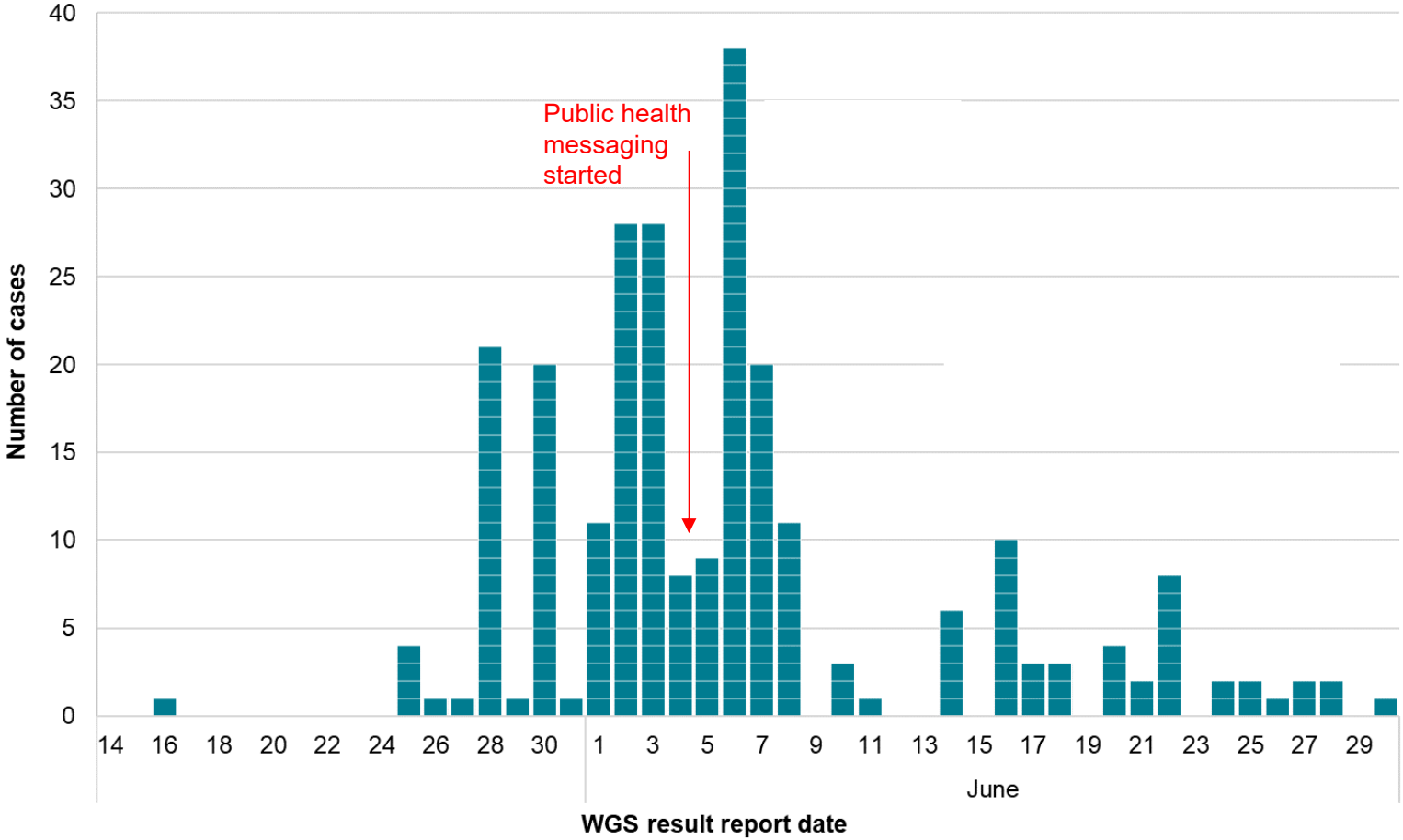
UKHSA is working with partners to investigate a Shiga toxin-producing E. coli (STEC) outbreak.

From: UK Health Security Agency

Published 6 June 2024

"Washing your hands with soap and warm water and using disinfectants to clean surfaces will help stop infections from spreading. If you are unwell with diarrhoea and vomiting, you should not prepare food for others and avoid visiting people in hospitals or care homes to avoid passing on the infection in these settings. Do not return to work, school or nursery until 48 hours after your symptoms have stopped."

Figure 9:Temporal distribution of confirmed cases by report data (GDW2, n=253*)

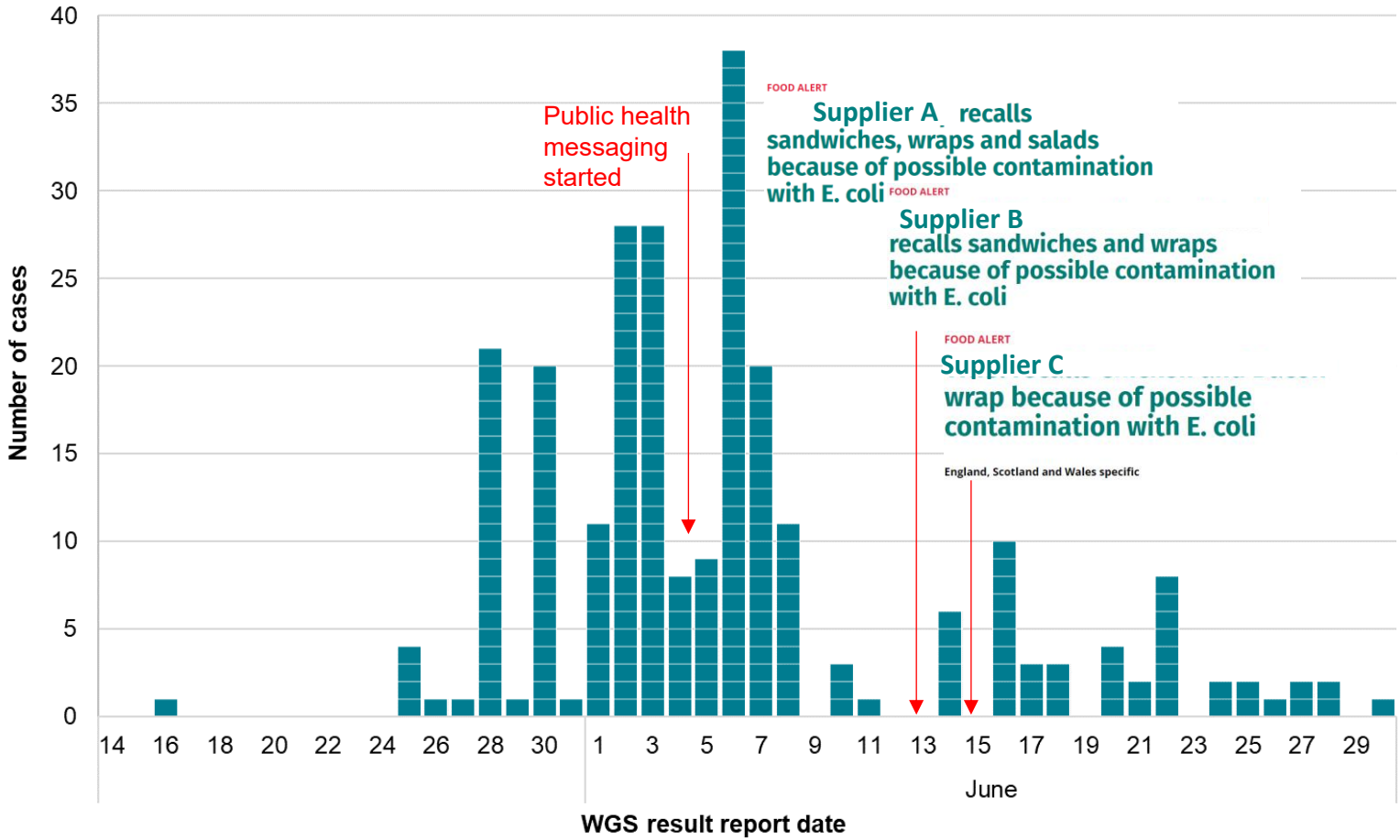


* 39 cases not included

Control measures: voluntary product recalls

- Sandwich manufacturers implemented enhanced routine testing during and at the end of production
- Low level detections of generic *E. coli* in Appollo leaf and 3 different sandwiches
- **Voluntary recalls due to possible *E. coli* contamination:**
  - 13/06/24: supplier A[7] and B[8]
  - 15/06/24: supplier C[9]

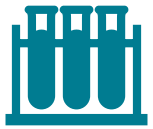
Figure 9:Temporal distribution of confirmed cases by report data (GDW2, n=253*)



* 39 cases not included

Control measures: prevention

FSA visited integrated growing sites and identified **further opportunities to strengthen food hygiene and biosecurity controls**, which were taken on board



Sandwich manufacturers implemented **enhanced routine testing** for both raw materials and final product until end of 2024 UK lettuce growing season

In early 2025 FSA convened a series of meetings with industry, trade associations, growers, local authorities and other government departments focused on **improving understanding of salad production risks and how to reduce the risk of STEC contamination**:

- Chilled Food Association re-issued their guidance for fresh produce suppliers to chilled food manufacturers
- British Leafy Salads Association delivered training for their growers and their Local Authorities on field risk management approaches

Conclusions

- Rapid escalation, size and clinical severity observed highlights the importance of a **swift, collaborative, multi-agency response** and **robust national surveillance systems** utilising multiple information/intelligence sources for early detection of non-O157 outbreaks

- We demonstrate the value of using **more than one analytical epidemiological study** to add to the weight of evidence **early sharing of information on food items of interest** with food safety authorities to enable concurrent food chain investigations

- Despite identifying the vehicle of infection, **it was not possible to determine the root-cause of the contamination**, even with the extensive collaborative efforts of the IMT

- Outbreaks associated with fresh produce are very challenging to investigate, particularly non-O157 outbreaks, and the limited action the public can take to mitigate risk highlights the importance of **effective control measures during manufacturing processes**

References

1. Byrne L, Adams N, Jenkins C. Association between Shiga Toxin-Producing Escherichia coli O157:H7 stx Gene Subtype and Disease Severity, England, 2009-2019. Emerg Infect Dis. 2020 Oct;26(10):2394-2400. doi: 10.3201/eid2610.200319. PMID: 32946720; PMCID: PMC7510717.
2. UKHSA, Shiga toxin-producing Escherichia coli (STEC) data: 2024. Available here: https://www.gov.uk/government/publications/escherichia-coli-e-coli-o157-annual-totals/shiga-toxin-producing-escherichia-coli-stec-data-2024
3. UKHSA, Shiga toxin-producing Escherichia coli: questionnaire. Available here: https://www.gov.uk/government/publications/vero-cytotoxin-producing-escherichia-coli-questionnaire
4. UKHSA, Shiga toxin-producing Escherichia coli: public health management. Available here: https://assets.publishing.service.gov.uk/media/63b84426d3bf7f26359c13b2/health-guidance-shiga-toxin-producing-escherichia-coli.pdf
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6. UKHSA,. Available here: https://www.gov.uk/government/news/e-coli-advice-issued-amid-rise-in-cases
7. Food Standards Agency, Food Alert. Available here: https://www.food.gov.uk/news-alerts/alert/fsa-prin-30-2024
8. Food Standards Agency, Food Alert. Available here: https://www.food.gov.uk/news-alerts/alert/fsa-prin-31-2024
9. Food Standards Agency, Food Alert. Available here: https://www.food.gov.uk/news-alerts/alert/fsa-prin-32-2024

Acknowledgements

Incident Management Team members from all organisations,

UKHSA Gastrointestinal Infections, Food Safety and One Health Division,

UKHSA Gastrointestinal Bacteria Reference Unit, UKHSA Field Services,

UKHSA Food, Water and Environment Microbiology Laboratories,

UKHSA Health Protection Teams,

UKHSA Central Sequencing Laboratories,

UKHSA Syndromic Surveillance Team,

UKHSA National Response Centre,

UKHSA Communications Teams,

Local Authority colleagues … and more…

UK Health Security Agency

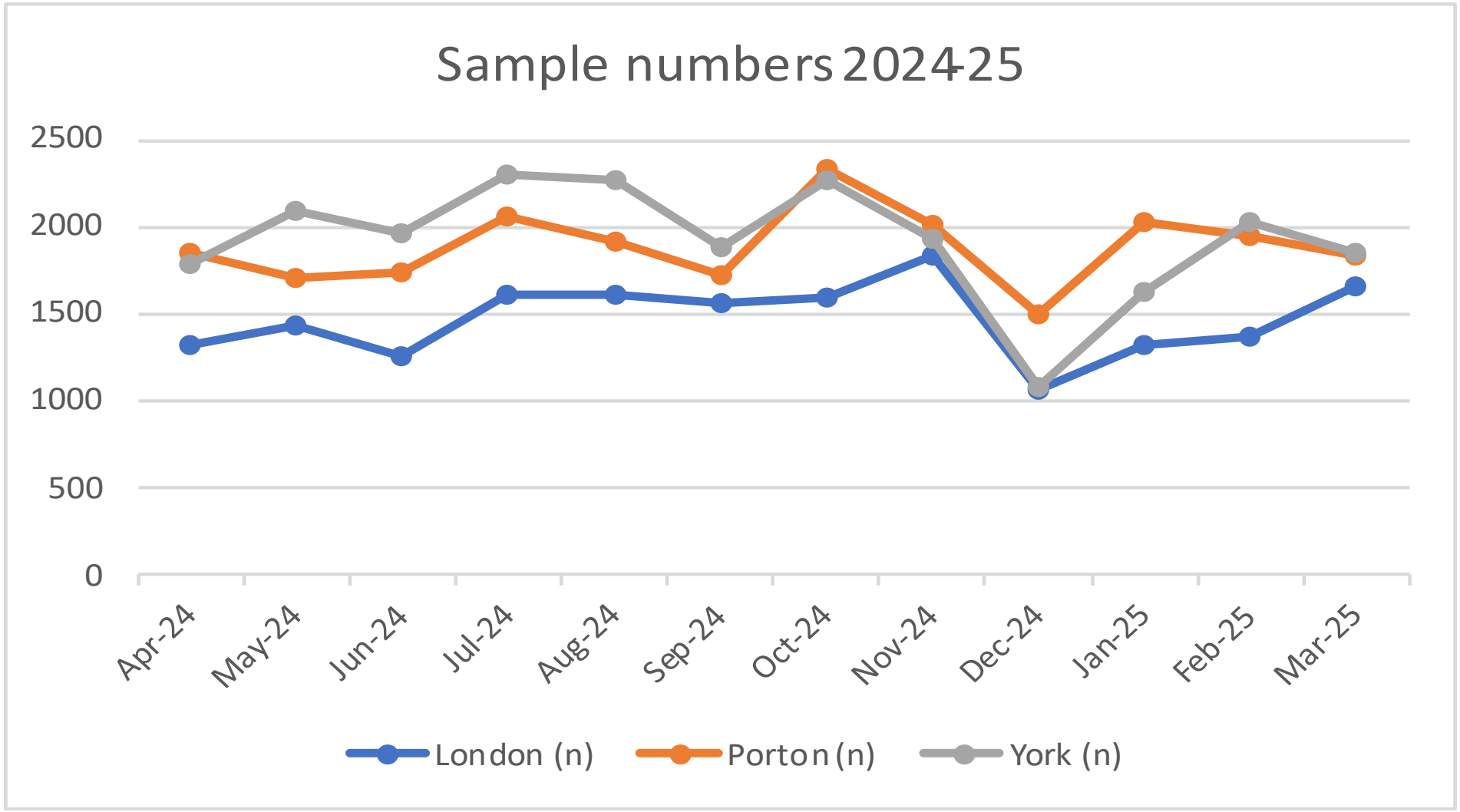
UKHSA and FW&E Sampling Activities - Overview 2025

Rob Johnston
Out-posted Scientist UKHSA FW&E Microbiology Laboratories

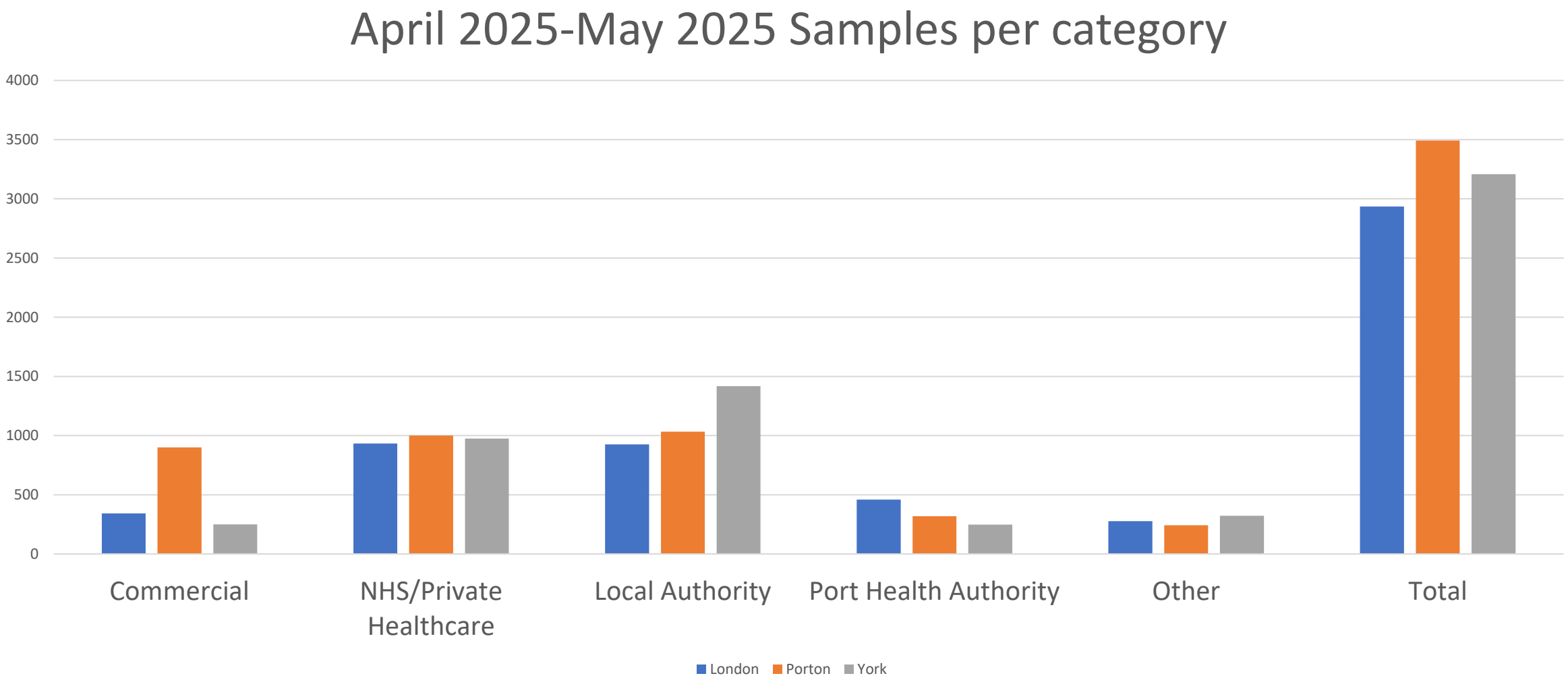
UKHSA and FW&E Sampling Activities - Overview 2025

- Overview and workload of FW&E
- Pathogens detected in 2024/25
- UKHSA annual surveys/studies
- Pasteurised and unpasteurised cheese (Study 80)
- Tattoo hygiene (Study 81)
- Raw egg (Study 82)
- Current studies

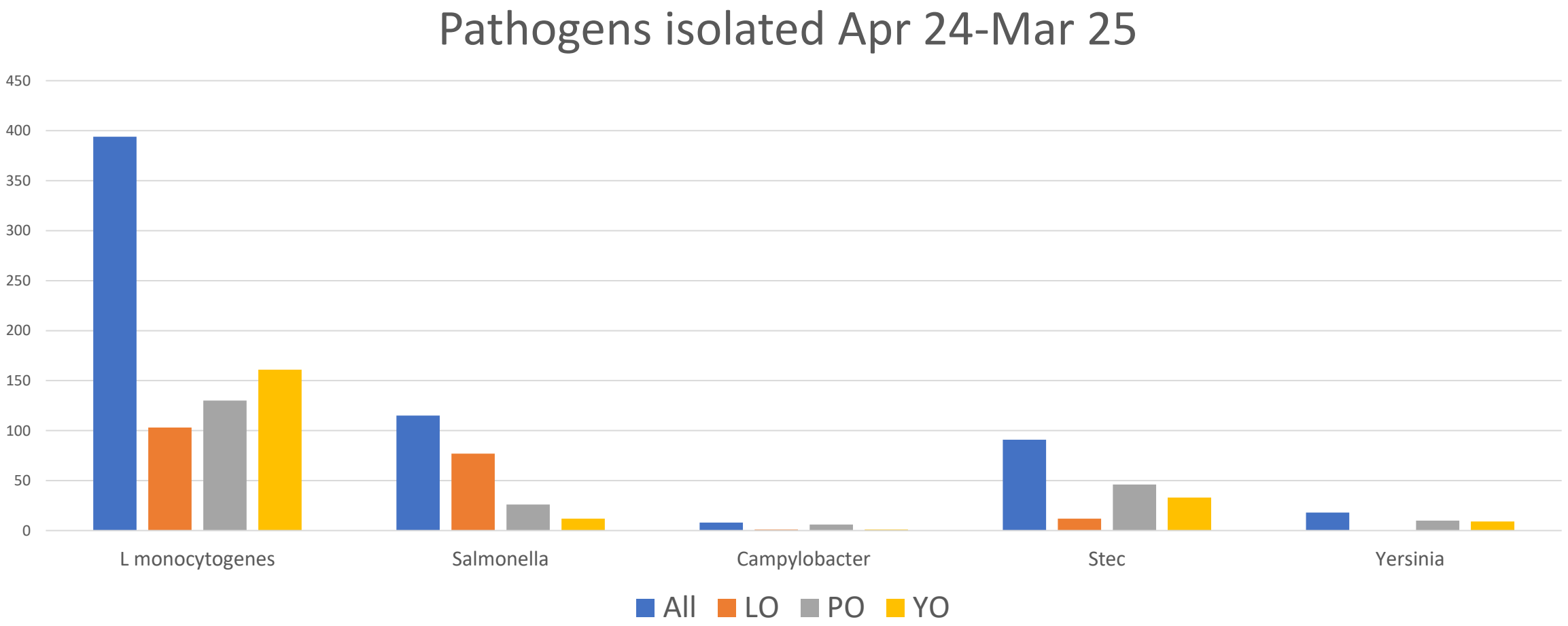
Overview of FW&E Work Activity



FW&E Workload



FW&E Overview of Pathogens Isolated; (Not including the recent surveys 2025/2026)



Overview FW&E Pathogens Detected - Salmonella

Salmonella serotype	Food	Country	Time	Human cases
Typhimurium	Pet foods (e.g. dog chews, goat ears; 7 lots)	Turkey	Oct/Nov	Y
Anatum				N
Montevideo				N
Newport				N
Agona				N
Senftenberg				Y
Uganda				N
Kentucky				N
Minnesota	Raw chicken	Brazil	Oct	N
Dublin	Raw beef patty	UK	Nov	N
Livingstone	Pet food (fish meat)	Chile	Dec/Jan/Mar	(N)
Ohio	Raw poultry meal (for pet food?)	Czech Republic	Dec	N
Kentucky				
SaintPaul	Curry leaves	India	Jan	N
Rubislaw	Morning glory	Thailand	Jan	(N)
Typhimurium (mono)	Raw frozen pork sausages	Hungary	Feb/Mar	N
Enteritidis Infantis	Various fresh and frozen raw chicken	Poland	Mar	Y

UKHSA annual programme of food and environmental studies / surveys

National studies

- All Local Authorities requested to participate
- Pre-planned topics of interest and reactive studies
- Questionnaires used to gather details relating to samples
- Aim to publish results wherever possible

Consultation on short-list of suggestions

- **Circulated to stakeholders in November / December each year**
- **Top two options selected, plus a reactive study dependent on current issues**

Regional studies may be organised by each lab based on local concerns – may be useful for local understanding or as pilot studies for future national focus

eg Manchester are looking at pools in hotels etc

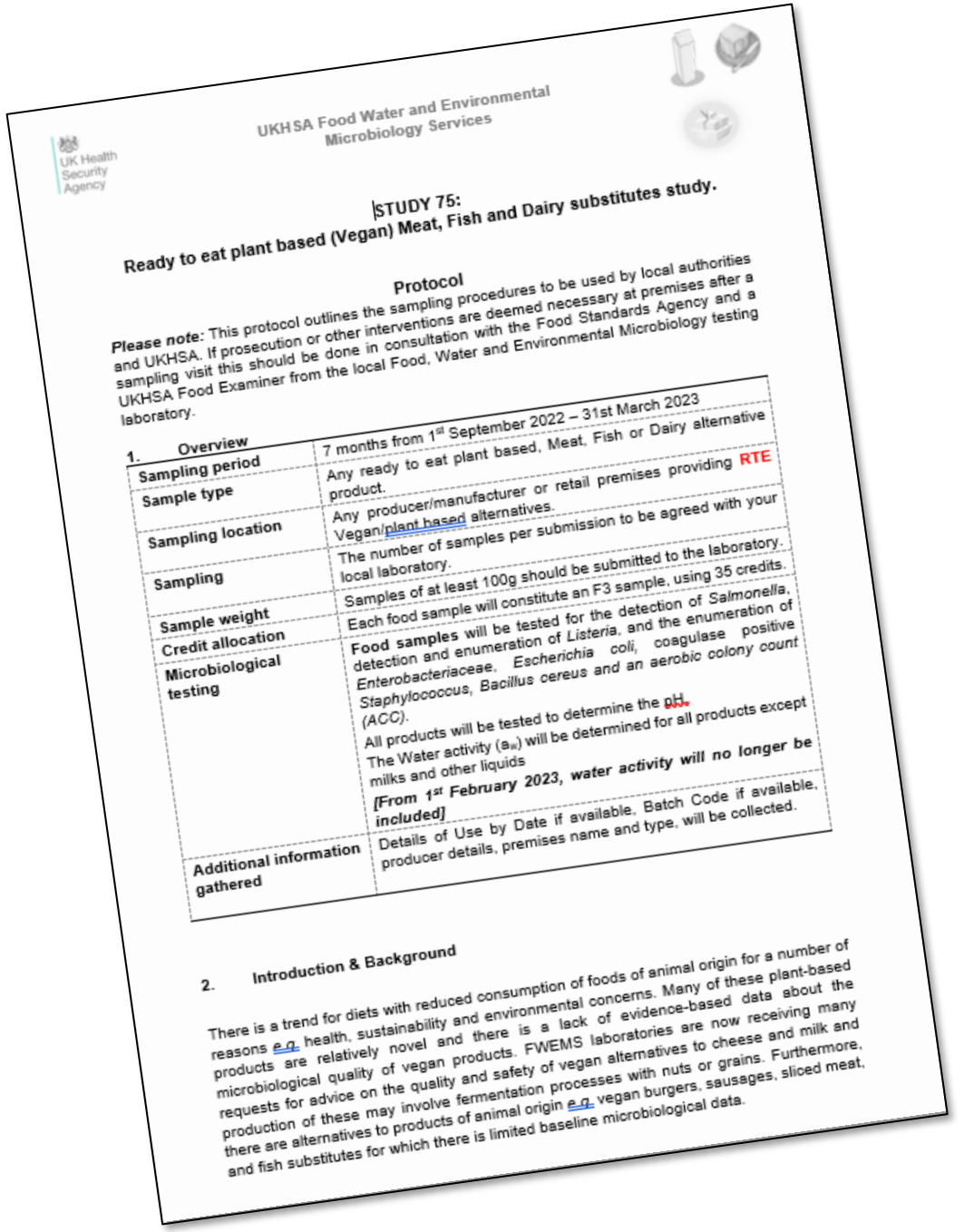
Survey Protocols

- Specifies study period, types of premises etc
- Sample types included and excluded
- Tests to be performed
- Interpretation of results

- Does not prescribe numbers of samples of each type (i.e. not based on market share etc)

Surveys generally focus on higher risk products but raw foods are of interest

Please complete all relevant details including production codes/provenance



UKHSA Food Water and Environmental Microbiology Services

UK Health Security Agency

STUDY 75:
Ready to eat plant based (Vegan) Meat, Fish and Dairy substitutes study.

Protocol

Please note: This protocol outlines the sampling procedures to be used by local authorities and UKHSA. If prosecution or other interventions are deemed necessary at premises after a sampling visit this should be done in consultation with the Food Standards Agency and a UKHSA Food Examiner from the local Food, Water and Environmental Microbiology testing laboratory.

1. Overview	
Sampling period	7 months from 1st September 2022 – 31st March 2023
Sample type	Any ready to eat plant based, Meat, Fish or Dairy alternative product.
Sampling location	Any producer/manufacturer or retail premises providing RTE Vegan/plant based alternatives.
Sampling	The number of samples per submission to be agreed with your local laboratory.
Sample weight	Samples of at least 100g should be submitted to the laboratory.
Credit allocation	Each food sample will constitute an F3 sample, using 35 credits.
Microbiological testing	**Food samples** will be tested for the detection of *Salmonella*, detection and enumeration of *Listeria*, and the enumeration of *Enterobacteriaceae*, *Escherichia coli*, coagulase positive *Staphylococcus*, *Bacillus cereus* and an aerobic colony count (ACC). All products will be tested to determine the ~~pH.~~ The Water activity (a_w) will be determined for all products except milks and other liquids ***[From 1st February 2023, water activity will no longer be included]***
Additional information gathered	Details of Use by Date if available, Batch Code if available, producer details, premises name and type, will be collected.

2. Introduction & Background

There is a trend for diets with reduced consumption of foods of animal origin for a number of reasons *e.g.* health, sustainability and environmental concerns. Many of these plant-based products are relatively novel and there is a lack of evidence-based data about the microbiological quality of vegan products. FWEMS laboratories are now receiving many requests for advice on the quality and safety of vegan alternatives to cheese and milk and production of these may involve fermentation processes with nuts or grains. Furthermore, there are alternatives to products of animal origin *e.g.* vegan burgers, sausages, sliced meat, and fish substitutes for which there is limited baseline microbiological data.

Recent Studies and Peer Reviewed Publications

Microbiological Quality of Ready-to-Eat Salad Products Collected from Retail and Catering Settings in England during 2020 to 2021

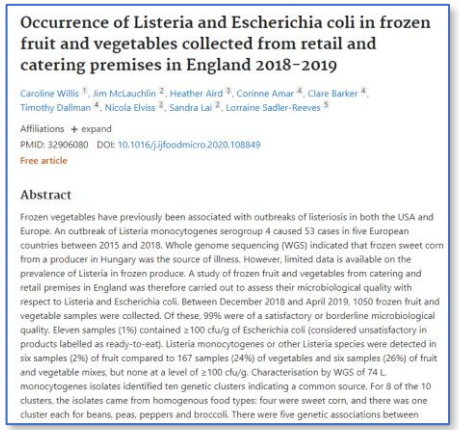
https://www.sciencedirect.com/science/article/pii/S0362028X22110604

Research Paper

Microbiological Quality of Ready-to-Eat Salad Products Collected from Retail and Catering Settings in England during 2020 to 2021

Occurrence of *Listeria* and *Escherichia coli* in frozen fruit and vegetables collected from retail and catering premises in England 2018–2019

https://www.sciencedirect.com/science/article/pii/S016816052030343 3



Occurrence of Listeria and Escherichia coli in frozen fruit and vegetables collected from retail and catering premises in England 2018–2019

Abstract

Frozen vegetables have previously been associated with outbreaks of listeriosis in both the USA and Europe. An outbreak of Listeria monocytogenes serogroup 4 caused 53 cases in five European countries between 2015 and 2018. Whole genome sequencing (WGS) indicated that frozen sweet corn from a producer in Hungary was the source of illness. However, limited data is available on the prevalence of Listeria in frozen produce. A study of frozen fruit and vegetables from catering and retail premises in England was therefore carried out to assess their microbiological quality with respect to Listeria and Escherichia coli. Between December 2018 and April 2019, 1050 frozen fruit and vegetable samples were collected. Of these, 99% were of a satisfactory or borderline microbiological quality. Eleven samples (1%) contained ≥100 cfu/g of Escherichia coli (considered unsatisfactory in products labelled as ready-to-eat). Listeria monocytogenes or other Listeria species were detected in six samples (2%) of fruit compared to 167 samples (24%) of vegetables and six samples (26%) of fruit and vegetable mixes, but none at a level of ≥100 cfu/g. Characterisation by WGS of 74 L. monocytogenes isolates identified ten genetic clusters indicating a common source. For 8 of the 10 clusters, the isolates came from homogenous food types: four were sweet corn, and there was one cluster each for beans, peas, peppers and broccoli. There were five genetic associations between

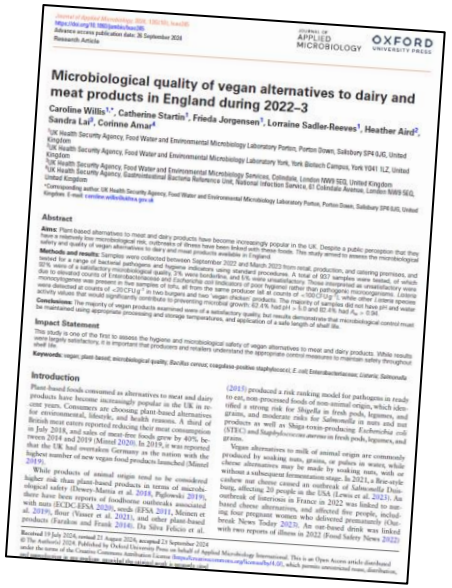
Assessment of the Microbiological Quality and Safety of Unpasteurized Milk Cheese for Sale in England between 2019 and 2020

https://www.sciencedirect.com/science/article/pii/S0362028X22061403

Research Paper

Assessment of the Microbiological Quality and Safety of Unpasteurized Milk Cheese for Sale in England between 2019 and 2020

Recent Studies and Peer Reviewed Publications



Microbiological quality of vegan alternatives to dairy and meat products in England during 2022–3

Vegan foods:

Willis et al (2024) Journal of Applied Microbiology 135: lxae245

https://academic.oup.com/jambio/article/135/10/lxae245/7778270

Flour:

Kesby et al (2024) Journal of Applied Microbiology 135: lxae183

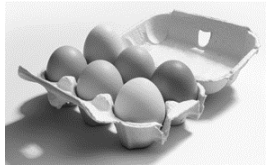
https://academic.oup.com/jambio/article/135/7/lxae183/7716717

Smoked fish:

Jorgensen et al (2025) Journal of Applied Microbiology 136: lxaf192

https://academic.oup.com/jambio/article-abstract/136/8/lxaf192/8213871?redirectedFrom=fulltext

2024-2025 studies



Pasteurised and unpasteurised Cheese:

- April 2024 – March 2025
- >2039 samples collected and tested
- 70% pasteurised cheese and 30% unpasteurised.
- *L. mono* detected in 0.6% of pasteurised and 1% of unpasteurised cheese
- Stx DNA detected in 0.6% of pasteurised and 1% of unpasteurised cheese

STEC isolated from 2 samples: Unpasteurised Manchego and unpasteurised Romanian sheep's milk cheese

Eggs:

- July 2024 – March 2025
- 494 samples received
- 21% in Lion brand or Laid in Britain scheme
- Salmonella detected in one sample, free
- eggs from Spain

Larger numbers required to fully assess risk

Only 1 sample positive for Salmonella!

2024-2025 studies

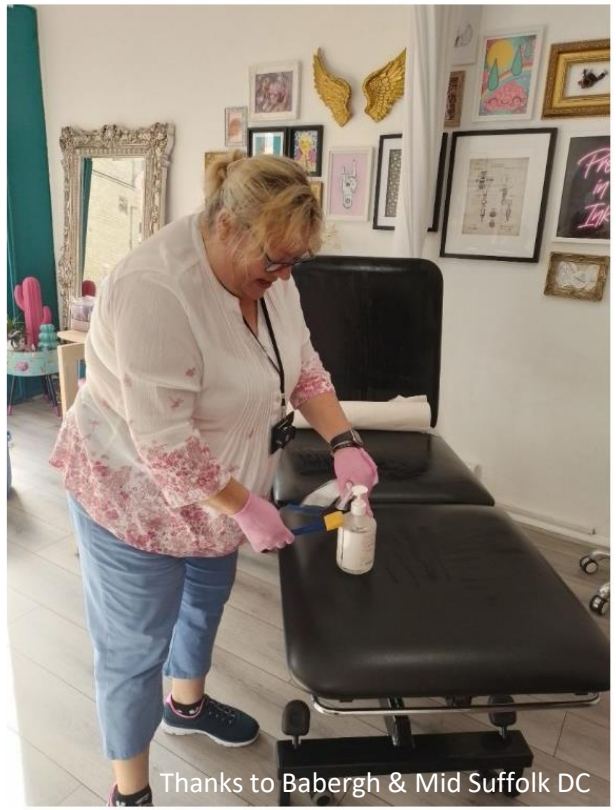
Tattoo and ear-piercing premises:

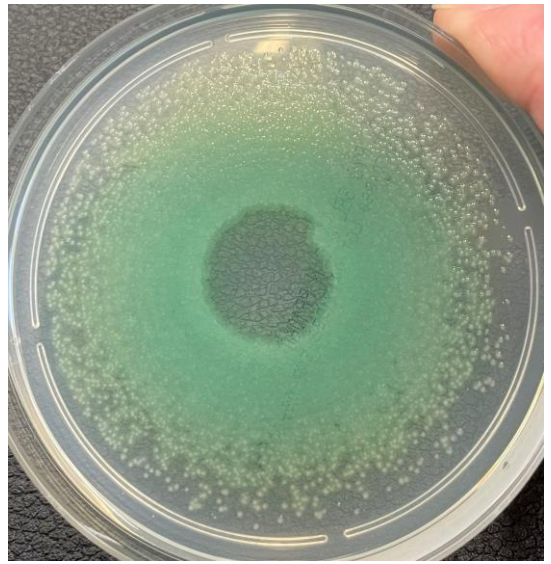
- June 2024 – March 2025 (extended from November)
- 5345 samples including swabs, water, green soap and other disinfectants

Overall, 13% of samples received were unsatisfactory

- Many findings of Enterobacteriaceae and *Pseudomonas aeruginosa* in water and green soap
- Unsatisfactory Enterobacteriaceae and *S. aureus* in swabs

Aim for local interventions and to contribute findings to update of Chartered Institute of Environmental Health (CIEH) Toolkit for tattooing and body piercing





2025-2026 studies

Dried nuts, seeds and fruit

- RTE dried fruit, nuts and seeds from retail and distributor/supplier premises including UK Ports
- *Listeria monocytogenes*, *Escherichia coli, Staphylococcus aureus,* moulds, *Salmonella* and *STEC*

Root vegetables

- This study aims to determine the prevalence of STEC, *Yersinia, Salmonella and Listeria* in root vegetables available in the UK
- Identify any association between microbiological quality, packaging, country of origin etc

Reactive study – Raw chicken

- Any none-RTE chicken, fresh or frozen, with or without a coating/marinade
- Testing for Salmonella and Campylobacter

Conclusions

- Programme of studies is designed to **investigate key areas of public health** interest including food, water and environmental risks
- Findings from recent studies have supported outbreak investigations and led to and evidence base for **updated guidance** in addition to **local interventions**
- Success of the survey programme is based on the **relationships** with Local Authorities, Port Health and other organisations throughout England and the UK, including FSA, FSS, HSE, APHA and others
- Work is carried out regionally, nationally and internationally, on investigations, and typing through UKHSA Reference Laboratories, epidemiology services and Health Protection Teams interventions to protect public health

UK Health Security Agency

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