

Monitoring of *stx2f* in food in the Netherlands

Menno van der Voort – Wageningen Food Safety Research



Background

APPLIED AND ENVIRONMENTAL MICROBIOLOGY, Mar. 2000, p. 1205–1208
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ORIGIN,



International Journal of Medical



Home / Eurosurveillance / Volume 19, Issue 17, 01/May/2014 / Article

Hoek et al. BMC Genomics (2019) 20:271
<https://doi.org/10.1186/s12864-019-5635-z>

BMC Genomics

Research articles

Emergence of *Escherichia coli* O157:H7
human Shiga toxin-producing
Netherlands, January 2008 to

I Friesema¹, K van der Zwaluw¹, T Schuurman², M K

Rita Prager  , Angelika

RESEARCH ARTICLE

Open Access

Comparative genomics reveals a lack of
evidence for pigeons as a main source of
*stx*_{2f}-carrying *Escherichia coli* causing
disease in humans and the common
existence of hybrid Shiga toxin-producing
and enteropathogenic *E. coli* pathotypes



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Indra L. Bergval¹ and Eelco Franz¹

Background – The Netherlands

- 2015 – farm animal project – layers (chicken)
 - why not include *stx2f* screening?
 - and why not include *stx2f* in general monitoring
- Set-up method for *stx2f* (singleplex)
 - 2015 – for farm animal project
 - 2015 – for chicken meat monitoring
- Integrated multiplex *stx* screening
 - End of 2015 – general monitoring inclusive *stx2f*



A quantitative PCR assay for the detection and quantification of Shiga toxin-producing *Escherichia coli* (STEC) in minced beef and dairy products

S. Derzelle ^a, A. Grine ^a, J. Madic ^{a,b}, C. Peytavin de Garam ^a, N. Vingadassalon ^{a,b}, F. Dilasser ^a, E. Jamet ^b, F. Auvray ^{a,*}

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- Derzelle - Multiplex PCR for detection of *stx1* and *stx2* – specific probe for *stx2f*
- Set-up (optimisation/validation/accreditation):
 - *stx2f* specific PCR based on primers and probe Derzelle
 - followed by: integrating in multiplex by substituting *eae* detection for *stx2f*

Screening *stx2f*

- 2015 May till October – 1479 screened – 14 positive (all poultry meat) – no isolates
- 2015 October till end – 1798 screened – no positive
- 2016 - 5625 screened – 27 positive – 2 isolates
 - 6 live stock (small ruminant), 10 fresh herbs, 1 ready to eat vegetable, 5 meat (bovine)
- 2017 – 5329 screened – 21 positive – 2 isolates
 - 3 fresh herbs, 9 ready to eat vegetables, 8 live stock (bovine), 1 exotic meat
- 2018 – 7212 screened – 9 positive – 2 isolates
 - 1 fresh herb, 5 ready to eat vegetables, 3 meat (bovine)

Isolates

Date of sampling	Sample description	Serotype	stx gene	eae presence
14-10-2016	Sweet basil	Oont:H23		
4-11-2016	Live stock (goat)	O128:H2		
3-7-2017	Andive	O45:H2	stx2f	eae
31-8-2017	Spinach	O63:H6	stx2f	eae
16-5-2018	Mint	O128:H2	stx2f	
19-9-2018	Andive	O179:H8	stx2f	

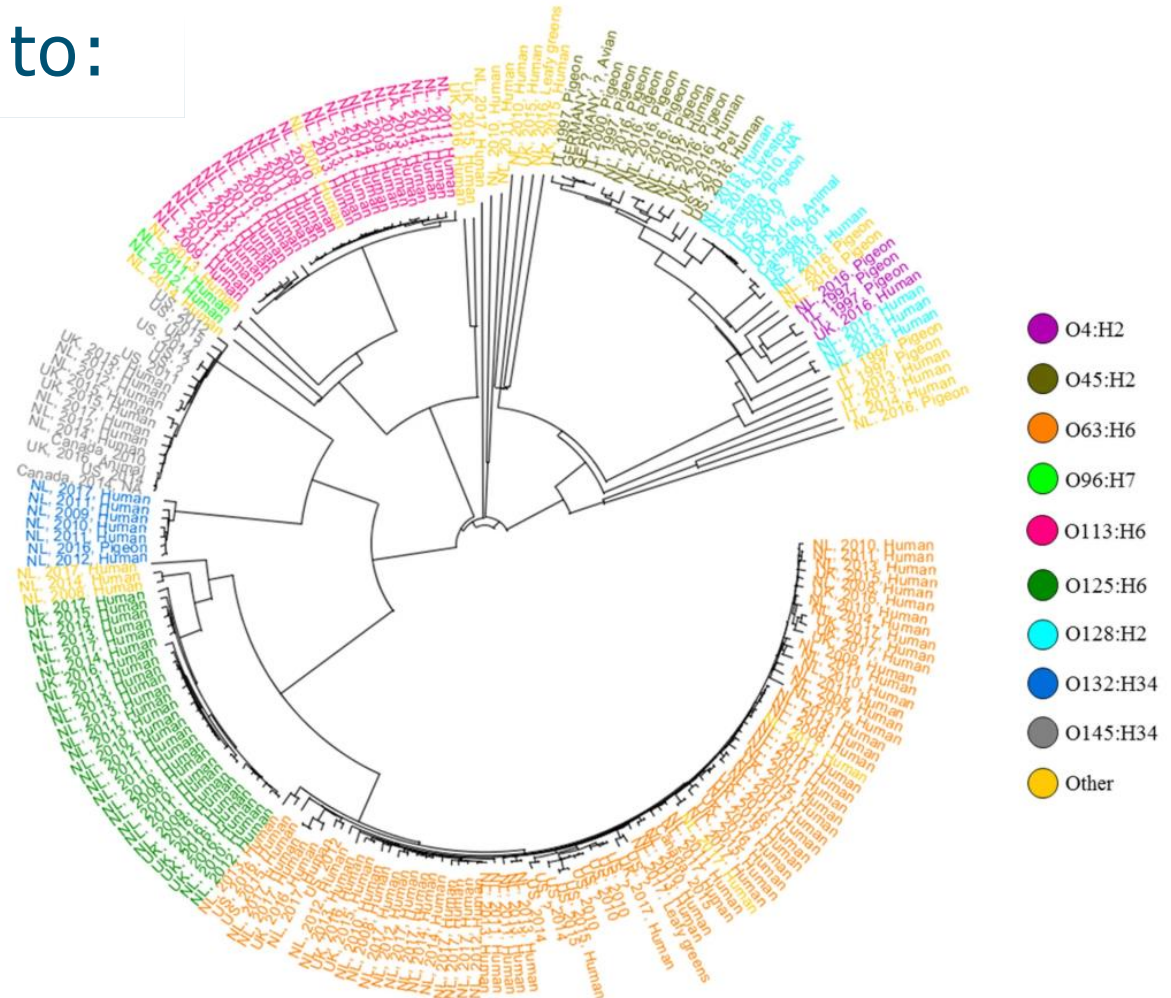
Total STEC positive samples 0.03%

In 2017 – total STEC ~200 → ~ 3.5% of samples

In 2018 – total STEC ~280 → ~ 4 % of samples

Isolates related to:

- Van Hoek et al 2019



Conclusions

- Low prevalence of *stx2f* in food in the Netherlands
 - Highest for ready to eat vegetables and herbs
 - No clear link to biggest human isolate clades
- Screenings PCR from *stx1-stx2-eae* to *stx1-stx2-stx2f* to *stx1-stx2-eae* to *stx1-stx2-???*