Wrap up and take home messages

Policy

- STEC guidelines developed in 2013-2014 to set harmonised approach for STEC findings in food other than sprouts
- Based on EFSA scientific opinion on STEC in 2013. Two step approach: food profiling and risk management based on the food profile and hazard characterization
- No consensus
- New developments: 2020 EFSA opinion 2018 FAO WHO report
- New round of discussion with MS. Food profile 1 need to be implemented as guidance, Food profile 2 needs to be revised
- Roadmap: End of this year or early next year working group of experts
- Microcriteria sprouts: gonna change? MS wish to keep it as such at the moment
- Pathogenicity assessment is continuously evolving, quite difficult to keep updated revisions of legislation

Surveillance of human disease

ECDC released EpiPulse (TESSy, EPIS)

Update on STEC infections in the EU in 2020

Less cases reported and typed with respect to the previous years

Drop in the determination of the major STEC features.

Brexit and Covid19 impacted the collection

Monitoring, RA & Molecular typing

- EFSA Overwiev of monitoring data in food feed and animals STEC was the third zoonosis in 2019. Food of animal origin (meat, milk, etc…) water and veggies as vehicle of food-borne outbreaks
- WGS collection of STEC data at EFSA is about to start (live in december 2021, operative in June 2022).
- Data provider can use the system to analyse and download typing data
- Data submission is on a voluntary basis, but actors have to be nominated by CA (EC to mandatorily ask nominations to MS)
- FAO Activities on STEC: pathogenicity assessment and source attribution (Several documents available). Global view on the issue (much needed as the dimension exceeds the single states' boundaries. Request for advice from codex in 2019.
- 2020 control of STEC in beef, raw milk and raw milk cheese.
- 2021 leafy greens and sprouts

Network activities human Sector

- WGS-based implemented at ECDC. Working for Listeria. Possible to send WGS STEC data
- EQA on serotyping virulence genes asset and cluster detection based on molecular features Good performance in general (20 countries on 2018-2019) Improvement of serotyping capacity. Good performance of the labs in typing human STEC for all the vir genes
- Some O groups cross react with others and do not react in PCR (O187)
- Stx subtyping: Good performance but improvement is needed as the methodology is tricky for certain subtypes.
- More Stx2 subtypes: A to L (N and O in the pipeline)
- Cluster analysis (PFGE or WGS). About half of the labs participated in this part of EQA and most of them correctly identified the clusters

Network activities: EQA in the EURL *E. coli* network

- PT27 (food matrix). Herbs-Basil
- 23 labs participated from 19 MS and Norway, Russia, Switzerland and UK
- Very good performance of the network regarding the detection of the STEC virulence genes in enrichment broth of basil samples. No serious issues related with the implementation of the methodology
- The serogroup identification is still an issue when outside the top five (or 12?).
- The method confirmed the robustness (100%-96% of Se)

Network activities: EQA in the EURL *E. coli* network

- PT28 (strain characterisation). 28 labs participated from 24 MS and Norway, Russia, Switzerland and UK
- WGS carried out by 21/28 labs.
- Excellent performance of the network regarding the detection of the main virulence genes of STEC (eae and stx1/stx2). The majority of labs performing WGS correctly identified the O80 and the other O groups.
- Stx genes subtyping improved over previous PTs. WGS performed very well.
- Cluster analysis: Generally no technical issue with the methodology, but with the interpretation

Revision of the ISO TS 13136

- Standard in two parts has been consolidated.
- The draft of **part** 1 has been prepared and submitted to CEN.
- Outline of part 2 sketched and a draft in preparation
- Stx genes subtyping
- Colonization factors
- Serogroups
- WGS recommended

145 scientists trained 2011-2019

81 scientists trained 2020-2021

Remote sessions
Provision of materials and reagents to the participants in advance
Use of streaming sessions and films
Hands-on sessions conducted by the participants in their labs and discusses with the class in dedicated sessions
In 2021 we introduced the assessment of the training efficacy (questionnare and 80% compliance threshold to get a certificate of achievement of the training goalas)
Hybrid training events in future

Scientific news from the network and beyond

- **Bacteriophages Stx**. Large variability and large pleiotropic effects on the bacterium and the eukaryotic host Complex biology of the interaction between phage and hosts. Presence of **Stx phages may hinder diagnosis**? Certainly it may **hamper the detection in the vehicles of infections**
- **STEC in dough and batter: Germany.** Commodities associated with outbreaks. Low prevalence. The cooking may not be totally effective in removing the STEC and the **contamination may be stable and long lasting**. MPN quantitation of STEC and EPEC.
- **STEC in wild animal and pork meat: Norway.** STEC circulate in wildlife, particularly ruminants, which may represent an **amplifier for this pathogen**. High prevalence in pork meat at the screening but no isolation. Storage at -80° might have had I impact?
- **Validation of a real time PCR for O80:H2: France.** Important emerging STEC type, usually sharing ExPEC features. Very severe infections. 100% of STEC O80 do not ferment melibiose, while 95% of other STEC do. **70mel is a typical feature of ST301** and a Rt PCR targeting this feature is developed for a targeted search.
- **Internalization of STEC in protozoa. Italy.** Protozoa are everywhere and interact with bacteria including STEC. *E. coli* can **remain alive within Amoebe for at least 25 days**. During this **time it may escape the PCR detection and certainly will not be isolated**.

See you in 2022!!

In person!