Project: Technical assistance to improve implementation of food safety standards and disease crisis preparedness

Activity 1.1.17: Training on topics relevant to food chain safety including processed food of non-animal origin and composite food

Module: Trainings on food safety risk assessment and contingency arrangements to respond to emergencies. Outbreak investigation;

- Food related emergencies and required contingency arrangements

Lecturers: Dr Lenche Jovanovska

Dr Mina Barova

Date: ……..

Place: Nicosia, Cyprus

"Project funded by the European Union within the scope of the Aid Programme for the Turkish Cypriot community, implemented by NSF Euro Consultants Consortium"

CONTENT

- **Food related emergencies and required contingency arrangements**
- Elements of food - and waterbornedisease (FWD) outbreaks
- 2017 FWD outbreaks summary (EFSA-ECDC report)
- Food-borne and waterborne outbreaks in EU
- Food vehicles, places of exposure, causative agentEU legislation related to HACCP
- **Risk assessment linked to food categories and potential consumers**
- Sumary

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

The “Zoonoses Directive” 2003/99/CE

Monitoring and surveillance of zoonotic agents in animals and food Annex I A, First rank priority

- *Salmonella*
- *Campylobacter*
- *Escherichia coli* VTEC
- *Listeria monocytogenes*
- *Brucella*
- *Mycobacterium bovis*
- *Echinococcus*
- *Trichinella*

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

Image from the Public Health Image Library. CDC
L. monocytogenes
Jennifer Oosthuizen

FOOD-BORNE OUTBREAKS: THE STATE OF THE ART

Results of the zoonoses monitoring activities carried out in 2017 in 37 European countries (28 MS and 9 non-MS)

SCIENTIFIC REPORT

APPROVED: 19 November 2018

doi: 10.2903/j.efsa.2018.5500

The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017

European Food Safety Authority and European Centre for Disease Prevention and Control (EFSA and ECDC)

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

FOOD-BORNE OUTBREAKS: THE STATE OF THE ART

APPROVED: 19 November 2018

doi: 10.2903/j.efsa.2018.5500

The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017

European Food Safety Authority and European Centre for Disease Prevention and Control (EFSA and ECDC)

Abstract

This report of the European Food Safety Authority and the European Centre for Disease Prevention and Control presents the results of zoonoses monitoring activities carried out in 2017 in 37 European countries (28 Member States (MS) and nine non-MS). Campylobacteriosis was the commonest reported zoonosis and its EU trend for confirmed human cases increasing since 2008 stabilised during 2013–2017. The decreasing EU trend for confirmed human salmonellosis cases since 2008 ended during 2013–2017, and the proportion of human *Salmonella* Enteritidis cases increased, mostly due to one MS starting to report serotype data. Sixteen MS met all *Salmonella* reduction targets for poultry, whereas 12 MS failed meeting at least one. The EU flock prevalence of target *Salmonella* serovars in breeding hens, laying hens, broilers and fattening turkeys decreased or remained stable compared to 2016, and slightly increased in breeding turkeys. *Salmonella* results on pig carcases and target *Salmonella* serovar results for poultry from competent authorities tended to be generally higher compared to those from food business operators. The notification rate of human listeriosis further increased in 2017, despite *Listeria* seldom exceeding the EU food safety limit in ready-to-eat food. The

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

FOOD-BORNE OUTBREAKS: THE STATE OF THE ART

The European Union One Health 2020 Zoonoses Report

European Food Safety Authority

European Centre for Disease Prevention and Control

Abstract

This report of the European Food Safety Authority and the European Centre for Disease Prevention and Control presents the results of zoonoses monitoring activities carried out in 2020 in 27 European Union Member States (MS) and nine non-MS. Key statistics on zoonoses and zoonotic agents in humans, food, animals and feed are provided and interpreted historically. Two events impacted 2020 MS data collection and related statistics: the COVID-19 pandemic and the withdrawal of the United Kingdom from the EU. In 2020, the first and second most reported zoonoses in humans were campylobacteriosis and salmonellosis, respectively. The EU trend for confirmed human cases of these two diseases was stable (flat) from 2016 to 2020. Fourteen of the 26 MS reporting data on *Salmonella* control programmes in poultry met the reduction targets for all poultry categories. *Salmonella* results for carcases of various species performed by competent authorities were more frequently positive than own-checks conducted by food business operators. This was also the case for *Campylobacter* quantification results from broiler carcases for the MS-group that submitted data from both samplers, whereas overall at EU-level those percentages were comparable. Yersiniosis was the third most reported zoonosis in humans, with tenfold less cases reported than salmonellosis, followed by Shiga toxin-producing *Escherichia coli* (STEC) and *Listeria monocytogenes* infections. Illnesses caused by *L. monocytogenes* and West Nile virus infections were the most severe zoonotic diseases with the highest case fatality. In 2020, 27 MS reported 3,086 foodborne outbreaks (a 47.0% decrease from 2019) and 20,017 human cases (a 61.3% decrease). *Salmonella* remained the most frequently reported causative agent for foodborne outbreaks. *Salmonella* in 'eggs and egg products', norovirus in 'crustaceans, shellfish, molluscs and products containing them' and *L. monocytogenes* in 'fish and fish products' were the agent/food pairs of most concern. This report also provides updates on tuberculosis due to *Mycobacterium bovis* or *Mycobacterium caprae*, *Brucella*, *Trichinella*, *Echinococcus*, *Toxoplasma*, rabies, *Coxiella burnetii* (Q fever) and tularaemia.

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

FOOD-BORNE OUTBREAKS: THE STATE OF THE ART

The European Union One Health 2023 Zoonoses report

European Food Safety Authority (EFSA) | European Centre for Disease Prevention and Control (ECDC)

Correspondence: zoonoses@efsa.europa.eu

The declarations of interest of all scientific experts active in EFSA's work are available at https://open.efsa.europa.eu/experts

Abstract

This report by the European Food Safety Authority and the European Centre for Disease Prevention and Control presents the results of zoonoses monitoring and surveillance activities carried out in 2023 in 27 Member States (MSs), the United Kingdom (Northern Ireland) and 10 non-MSs. Key statistics on zoonoses and zoonotic agents in humans, food, animals and feed are provided and interpreted historically. In 2023, the first and second most reported zoonoses in humans were campylobacteriosis and salmonellosis, respectively. For both agents, an increase in the absolute number of cases was observed in comparison with 2022. Fifteen MSs and the United Kingdom (Northern Ireland) reached all the established targets in poultry populations with regard to the reduction in *Salmonella* prevalence for the relevant serovars. *Salmonella* samples from carcases of various animal species, and samples for *Campylobacter* quantification from broiler carcases, were more frequently positive when performed by the competent authorities than when own-checks were conducted. Shiga toxin-producing *Escherichia coli* (STEC) was the third most reported zoonotic agent in humans, followed by *Yersinia enterocolitica* and *Listeria monocytogenes*. *L. monocytogenes* and West Nile virus infections were the most severe zoonotic diseases, with the highest percentage of hospitalisations among cases and the highest case fatality rates. Twenty-seven MSs and the United Kingdom (Northern Ireland) reported a slight decrease in food-borne outbreaks in 2023 overall in comparison with 2022, although the overall number of reported human cases and hospitalisations increased. *Salmonella* Enteritidis remained the most frequently reported causative agent for reported cases and food-borne outbreaks. *Salmonella* in 'eggs and egg products' was the agent/food pair of most concern. In 2023 this combination caused the largest number of outbreaks and cases among all agent/food combination and ranked second in number of hospitalisations. *Salmonella* was also the causative agent associated with the majority of multi-country outbreaks reported in the EU in 2023. This report also provides updates on brucellosis, echinococcosis, Q fever, rabies, toxoplasmosis, trichinellosis, tuberculosis due to *Mycobacterium bovis* or *M. caprae*, and tularaemia.

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

FOOD-BORNE AND WATERBORNE OUTBREAKS IN EU 2017 (27MS 8non-MS)

- 5,079 food-borne outbreaks, including waterborne outbreaks (4,786 in 2016) in 27MS
- 149 outbreaks notified by 8 non-MS
- 43,400 cases of illness (23.8% decrease)
- 4,541 hospitalisations (2.7% increase)
- 33 deaths

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

FOOD-BORNE AND WATERBORNE OUTBREAKS IN EU

- Important variations were observed in the number of outbreaks reported by MS
  - A few MS accounted for the majority (87%) of reported FBOs (France, Belgium, Germany, the Netherlands, Poland, Slovakia, Spain and Sweden)
- Huge variability in the types of causative agents
  - Heterogeneous geography across the EU
- Variations in reporting may be due to differences in the approach and the sensitivity of the surveillance of FBOs

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

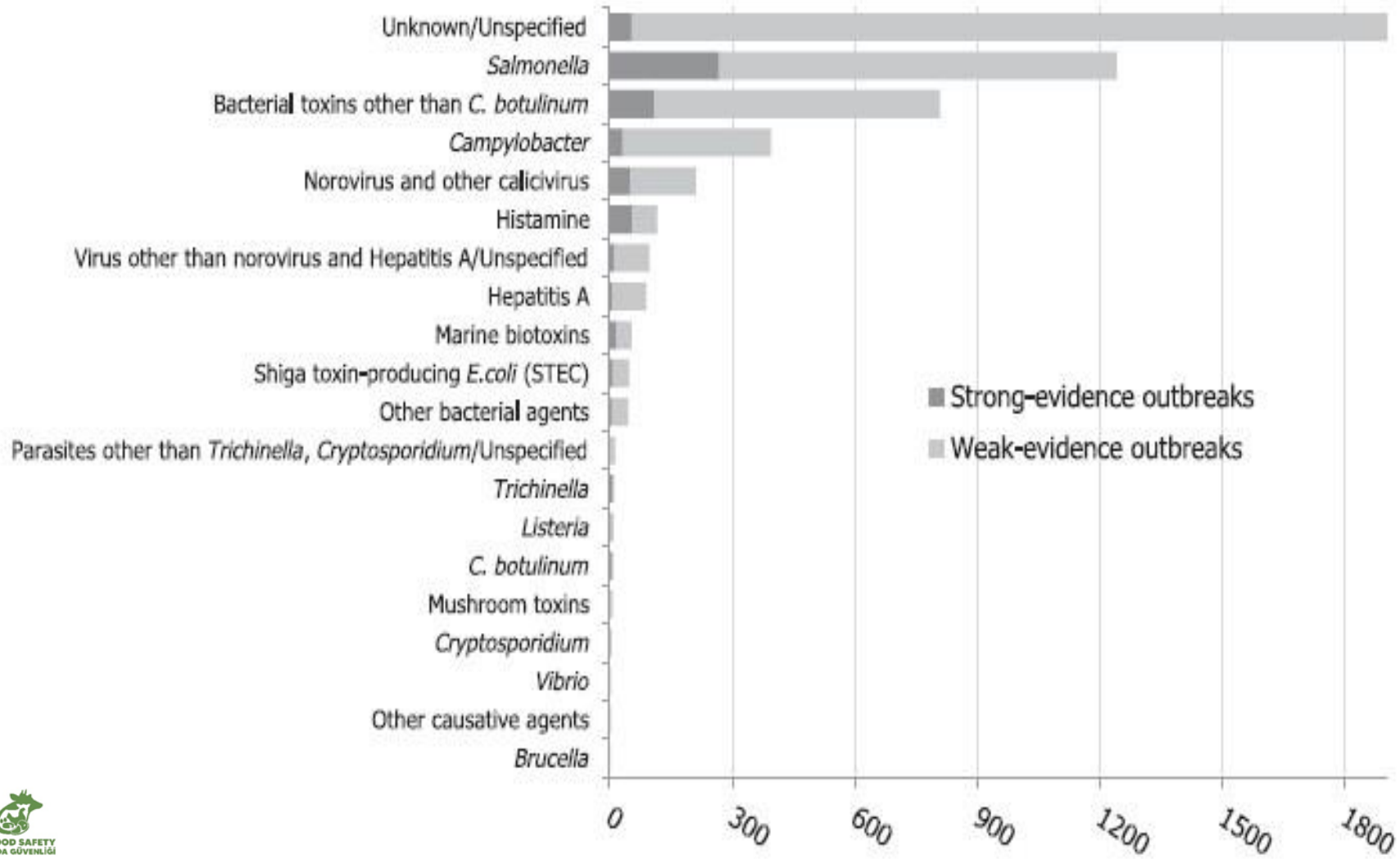
FOOD-BORNE AND WATERBORNE OUTBREAKS IN EU

"The data should be interpreted with caution and take into account data quality issues and differences between MS surveillance systems. The reader should refrain from making direct comparisons between countries without taking into account the limitations in the data, which may differ between countries depending on the characteristics of their surveillance systems "

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

FOODBORNE OUTBREAKS 2017 CAUSATIVE AGENTS



EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

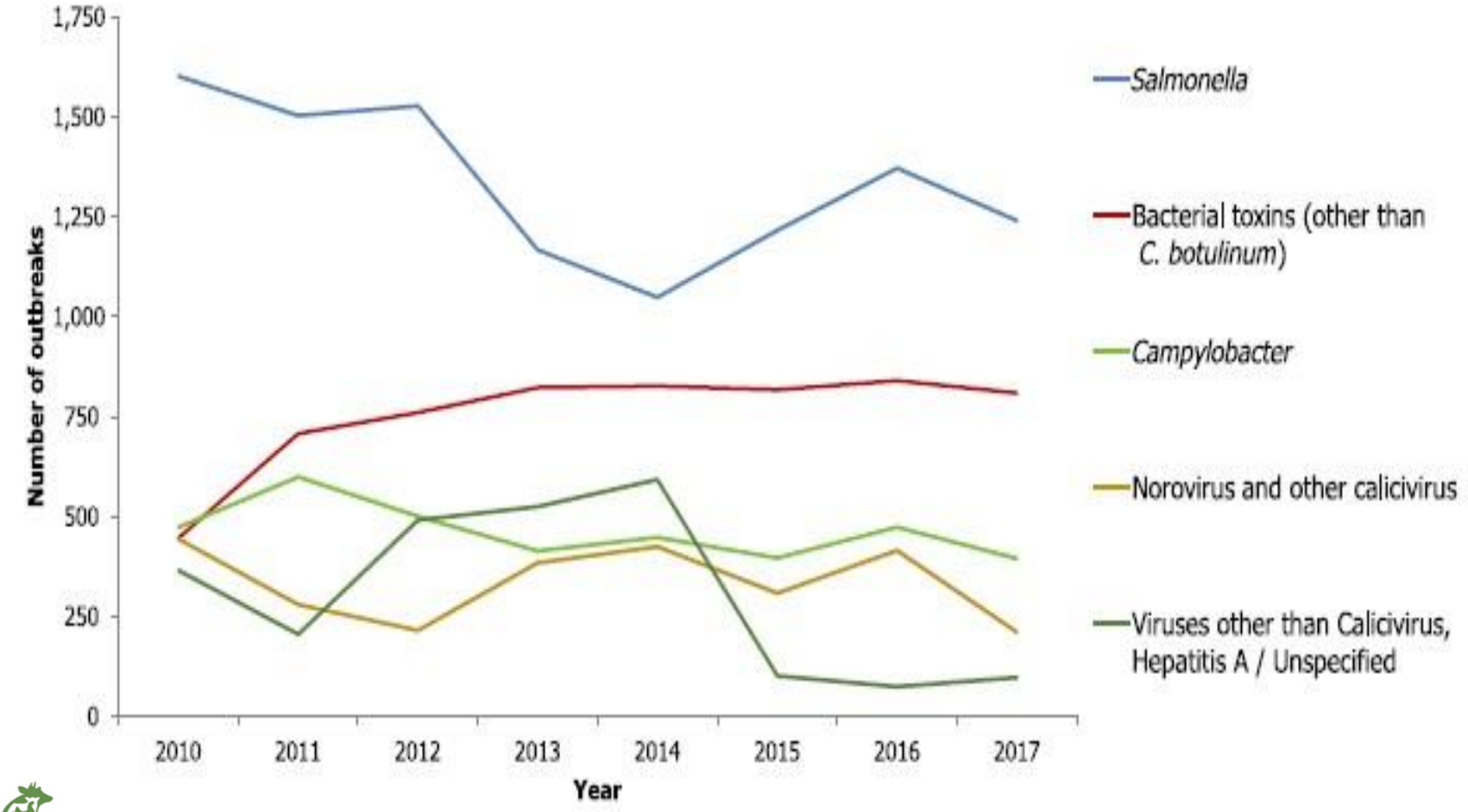
CAUSATIVE AGENTS IN FOOD-BORNE INCLUDING WATERBORNE OUTBREAKS IN 2017

- Bacteria were the most commonly implicated causative agents (34%), followed by bacterial toxins(16%), viruses(8%), other causative agents(4%) and parasites(<1%)
  - The causative agent remained unknown in 36% of all outbreaks
  - *Salmonella* was the most frequently detected causative agent (24%) with S.Enteritidis detected in 15% of all FBOs.
  - *Campylobacter* was the second most frequently detected bacterial causative agent (8%)
  - Outbreaks by bacterial toxins (16%) were mainly toxins by *Clostridium perfringens, Staphyloccus* and *Bacillius cereus*

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

Number of food-borne and waterborne outbreaks by causative agent 2010-2017



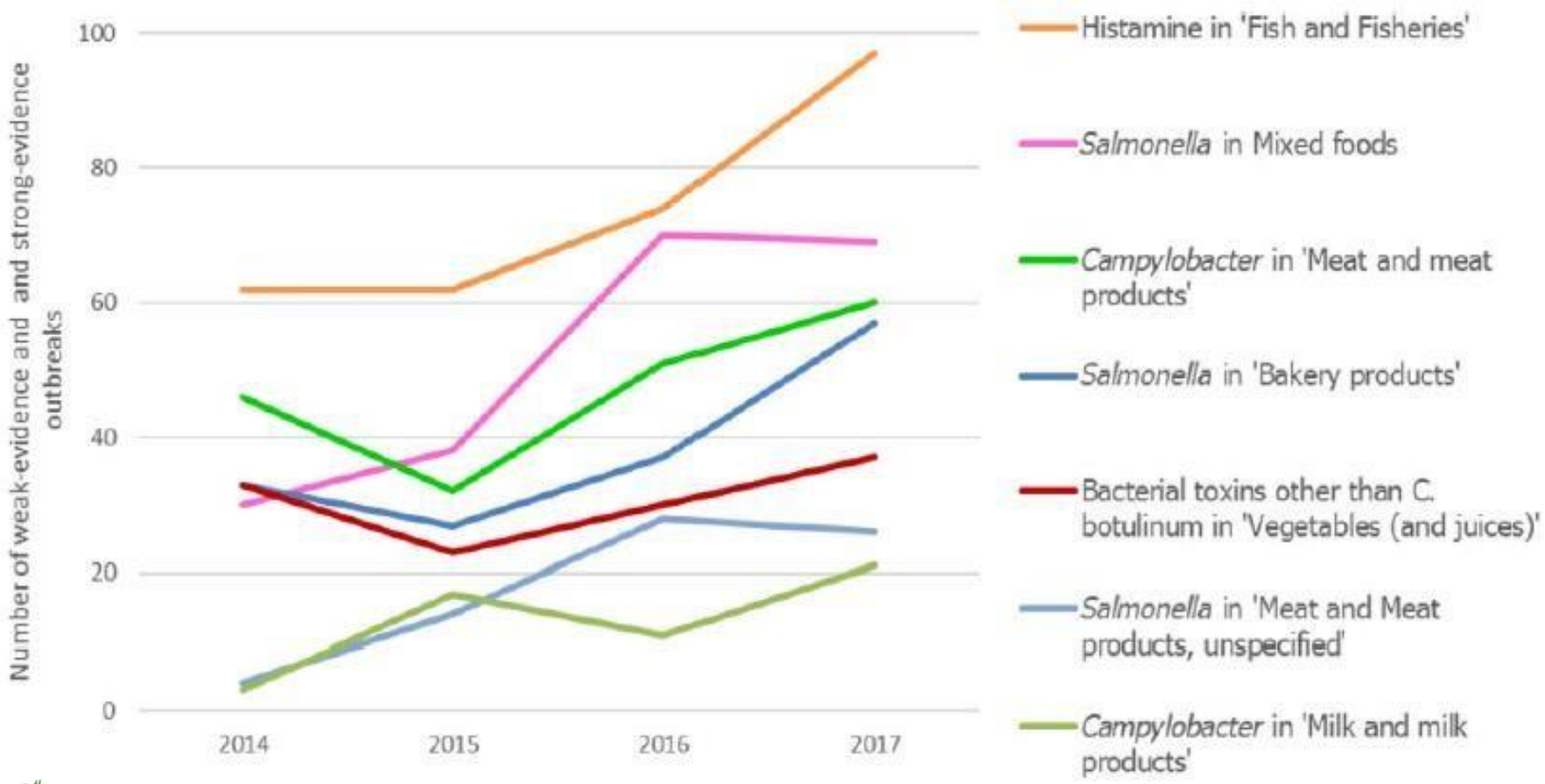
FOOD-BORNE AND WATERBORNE OUTBREAKS IN EU 2017

- Marked decrease in the number of outbreaks by viruses to 398 (8%)
  - 50% decrease in norovirus
- Increase in hepatitis A outbreaks from 17 to 90 (reporting by Poland)
- First time reporting of hepatitis E outbreaks (6)

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

Causative agent and food vehicle evidence food-borne and waterborne outbreaks, 2014-2017



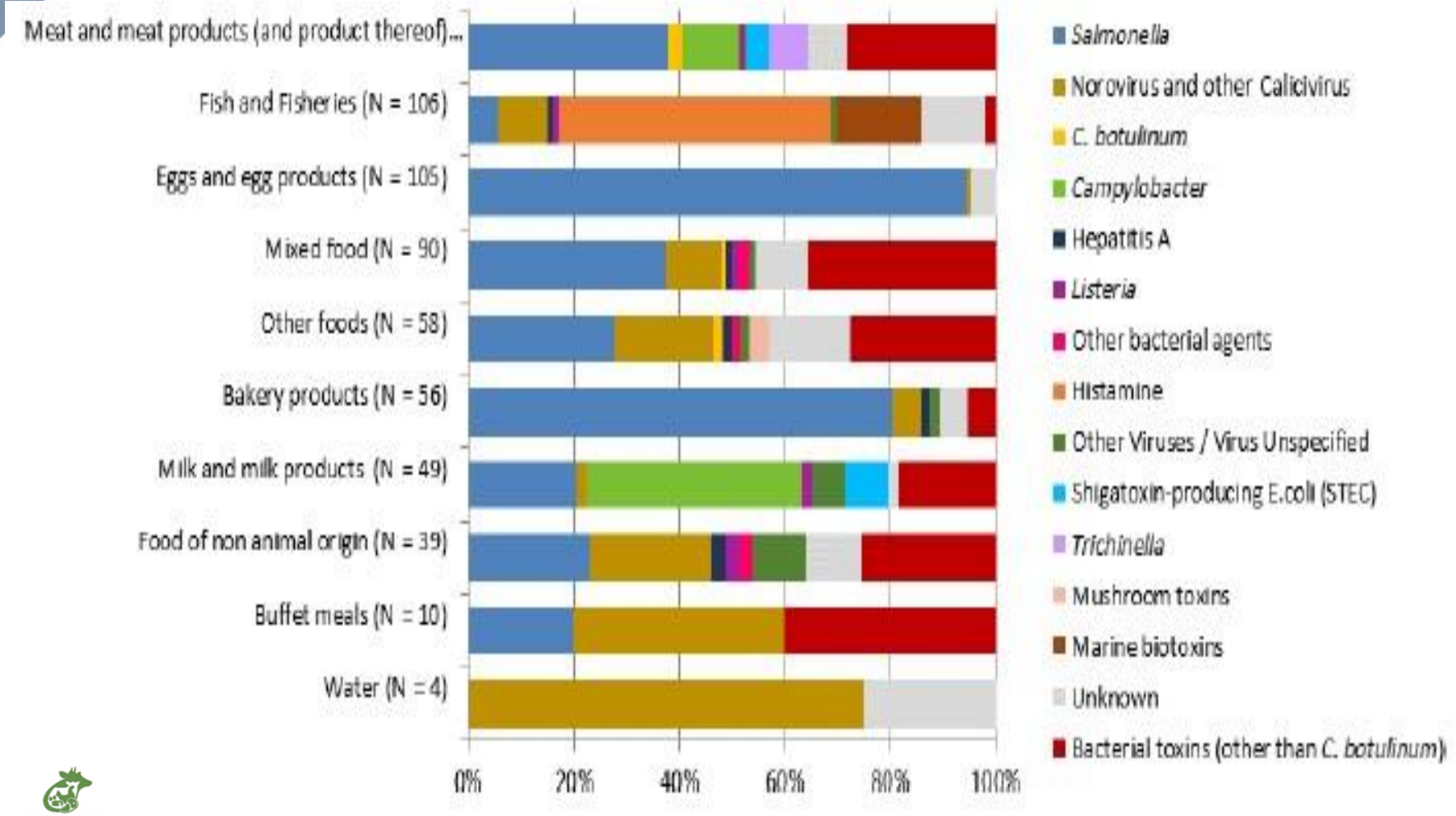
FOOD VEHICLE

- Reported strong-evidence outbreaks were mostly associated with food of animal origin (60%):
  - ✓meat and meat products:
  - ✓eggs and egg products:
  - ✓Fish and fishery products
  - ✓milk, cheese and dairy products:
- Mixed food, buffet meals and other foods: 25%

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

CAUSATIVE AGENT OF FOOD-BORNE OUTBREAKS BY FOOD VEHICLE



EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

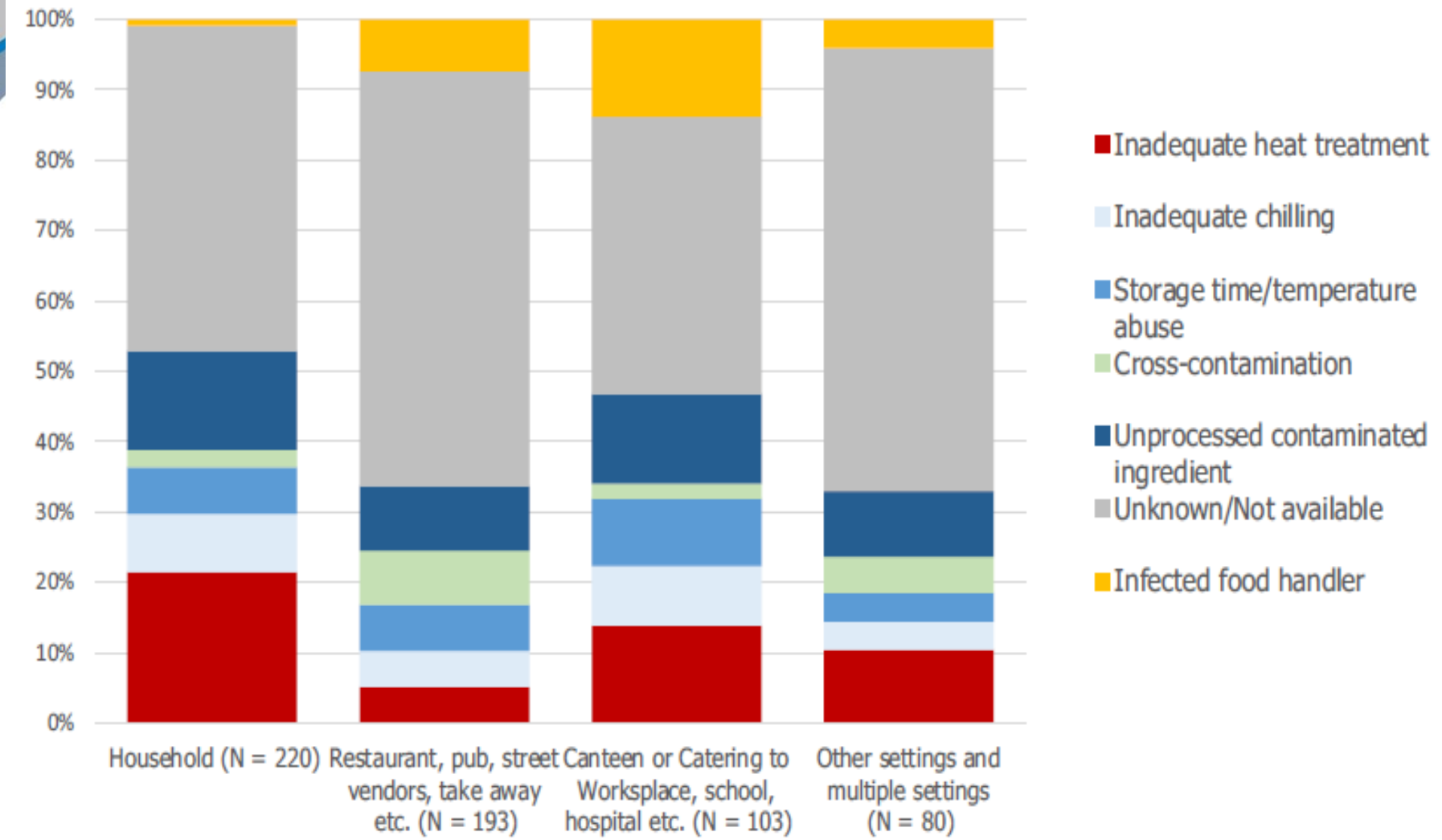
CAUSATIVE AGENT OF FOOD-BORNE OUTBREAKS AND PLACE OF EXPOSURE

- Household outbreaks
  - Had the largest variety of causative agents
  - was the most frequent place of exposure
    - one in three outbreaks in the home setting
- Outbreaks by bacterial toxins (other than *Clostridium botulinum)* and norovirus
  - more frequently reported in food service settings

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

FACTORS CAUSING THE OUTBREAKS - 2017



EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

TOP COMBINATION AGENT – VEHICLE / NUMBER OF OUTBREAKS

			2010–2016				
Rank	Causative agent[(a)]	Food vehicle[(b)]	Number of outbreaks	Number of reporting MS	Rank	Number of outbreaks (mean/year)	Number of reporting MS
1	*Salmonella*	Eggs and egg products	**99**	13	1	98.9	18
2	*Histamine*	Fish and fishery products	**55**	8	5	31.0	12
3	*Salmonella*	Meat and meat products	**46**	12	2	56.3	21
4	*Salmonella*	Bakery products	**45**	5	8	21.6	11
5	Bacterial toxins other than *Clostridium botulinum*	Meat and meat products	**34**	9	3	33.0	14
6	Bacterial toxins other than *Clostridium botulinum*	Mixed food	**32**	10	4	31.9	17
7	*Campylobacter*	Milk and milk products	**20**	4	22	7.1	9
8	Marine biotoxins	Fish and fishery products	**17**	3	17	11.1	5
9	Bacterial toxins other than *Clostridium botulinum*	Other foods	**16**	6	9	19.1	13
10	*Campylobacter*	Meat and meat products	**13**	5	10	18.1	12

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

TOP COMBINATION AGENT – VEHICLE / NUMBER OF CASES

2017					2010–2016		
Rank	Causative agent[a]	Food vehicle[b]	Number of human cases	Number of reporting MS	Rank	Number of human cases (mean/year)	Number of reporting MS
1	*Salmonella*	Meat and meat products	1365	12	4	1053.1	21
2	*Salmonella*	Eggs and egg products	964	13	3	1067.6	18
3	Norovirus and other caliciviruses	Other Foods	943	3	16	712.9	8
4	Bacterial toxins other than *Clostridium botulinum*	Meat and meat products	870	9	5	979.9	14
5	Bacterial toxins other than *Clostridium botulinum*	Mixed foods	719	10	7	864.3	17
6	*Salmonella*	Bakery products	621	5	18	267.3	11
7	Bacterial toxins other than *Clostridium botulinum*	Milk and milk products	487	5	34	96.9	11
8	*Salmonella*	Mixed foods	411	9	12	452.7	20
9	Norovirus and other caliciviruses	Food of non-animal origin	392	7	2	2155.7	13
10	*Salmonella*	Other Foods	391	6	14	337.1	14

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

TOP COMBINATION AGENT – VEHICLE / NUMBER OF DEATHS

2017					2010–2016		
Rank	Causative agent	Food vehicle[a]	Number of deaths	Number of reporting MS	Rank	Number of deaths (mean/year)	Number of reporting MS
1	*Salmonella*	Eggs and egg products	3	13	13	1.6	18
2	Unknown	Fish and fishery products	3	2	2	0	7
3	*Clostridium botulinum*	Other foods	2	1	1	0.1	11
4	*Salmonella*	Meat and Meat products	1	12	12	1.9	21
4	*Salmonella*	Mixed foods	1	9	9	1.4	20
4	Unknown	Mixed foods	1	5	5	0	15
4	Shiga toxin-producing *E. coli* (STEC)	Meat and meat products	1	5	5	0	8
4	Shiga toxin-producing *E. coli* (STEC)	Milk and milk products	1	4	4	0.1	7
4	*Listeria*	Meat and Meat products	1	1	1	1.4	7
4	Hepatitis A	Food of non-animal origin	1	1	1	0	7
4	*Listeria*	Food of non-animal origin	1	1	1	0.1	2

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

FOOD-BORNE AND WATERBORNE OUTBREAKS IN EU 2017

- *Salmonella* caused the highest number of outbreaks, cases, hospitalisations and deaths
- *Listeria* and *Clostridium botulinum* were associated with the highest case fatality

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

MULTICOUNTRY OUTBREAKS BY SALMONELLA IN THE EU 2017

- Several large prolonged muliticountry outbreaks by *Salmonella* Enteritidis were reported
- Epidemiological, microbiological, environmental and tracing investigations identified eggs or poultry meat and products as the implicated food vehicle
- The characterisation of the *S*. Enteritidis clinical isolates by WGS made it possible to establish a link in the scattered cases

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

EFSA and ECDC, 2018. The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2017. EFSA Journal 2018;16(12):5500, 262 pp.

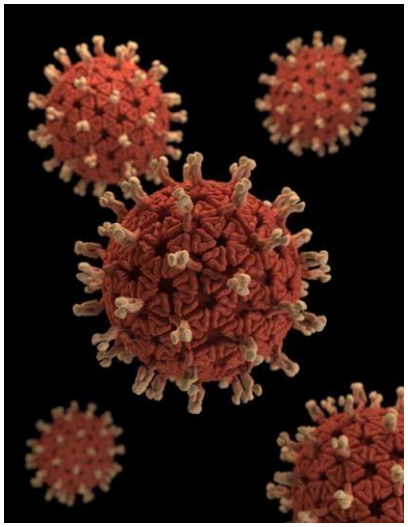
Most frequent causes of Foodborne Diseases

WHO global burden of foodborne disease

- **Foodborne illnesses**: norovirus, *Campylobacter* spp.
- **Foodborne deaths**: non-typhoidal *Salmonella enterica*, *Salmonella* Typhi, *Taenia solium*, hepatitis A virus, aflatoxin
- **Foodborne DALYs or Disability-Adjusted Life Years**: non-typhoidal *Salmonella enterica*, enteropathogenic and enterotoxigenic *Escherichia coli*; *Taenia solium*, norovirus, *Campylobacter* spp.
- Each year, an estimated 600 million people **fall ill** and 420 000 people **die from unsafe food**, resulting in the loss of 33 million healthy life years (DALYs).

Children under 5 years of age are at particularly high risk, with 125 000 children dying from foodborne diseases every year.

FOOD-BORNE VIRUSES



Rotavirus. Image from the Public Health Image Library. CDC

astrovirus, rotavirus, adenovirus, caliciviruses: norovirus, sapovirus	→	gastroenteritis
hepatitis A virus hepatitis E virus	→	Hepatitis
Enteroviruses and other	→	Meningitis, respiratory disease Poliomyelitis...

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

FOOD-BORNE VIRUSES

Transmission routes: person-to-person, food, water, surfaces

Do not replicate or spoil in food

Low Inf. dose: <100 particles

High Shedding: in stool (>10^6/g) or in vomit

Tissue and maturity specific

Asymptomatic infections occur. Shedding with or without symptoms

Can persist for months in food or environment

More R than bacteria to control measures

Freezing and refrigeration: preserve viruses

Heating and drying: ≠ R viruses

Hand-washing > sanitizers

Disinfectants: limited effect

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

CONCLUSIONS

- Important differences are observed in the number of outbreaks reported by MS
- EU-level trends and statistics should be interpreted with caution
- The causative agent remained unknown in 36% of all outbreaks
- Most of the outbreaks were caused by bacterial agents (32%): *Salmonella*: 24%, *Campylobacter*: 8%
- 60% strong evidence outbreaks were associated with food of animal origin

EU FOOD SAFETY
AB GIDA GÜVENLİĞİ

CONTACT

Project e-mail: foodsafetyprojectTCc@gmail.com

THANK YOU FOR YOUR ATTENTION

"Project funded by the European Union within the scope of the Aid Programme for the Turkish Cypriot community, implemented by NSF Euro Consultants Consortium"