



ICELAND (ICE)

Population: 275 000 (1998)

Area: 103 000 km²



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1. General information

In Iceland it is The Environmental and Food Agency that is the Contact Point to the WHO Surveillance Programme for Control of Foodborne Infections and Intoxications in Europe. From the beginning of 1987, certain guidelines have been used for the investigation and reporting of foodborne illnesses. These guidelines are used by official health inspectors, general practitioners and the laboratories involved. All information concerning the investigation of foodborne illnesses is sent to State Epidemiologist, Section for Infectious Disease Control, Directorate of Health in Iceland.

Almost all samples of food and drinking water that are analysed in the investigation of a possible foodborne illness are sent to the Environmental and Food Agency. The number of incidents investigated every year is usually 20 - 40, but only few of these are confirmed by laboratory analysis or epidemiological investigation. Most incidents consist of 2 - 4 cases that are usually not investigated further if analysis of the suspected food or samples from persons involved are negative.

In the case of a possible foodborne illness, the local hygiene inspectors and the physicians concerned will contact the Environmental and Food Agency and The Department of Microbiology at The University Hospital as well as the State Epidemiologist. If necessary these institutes will send experts to help out with the epidemiological investigation.

According to the legislation on Communicable Diseases (No.97/1997) and the by law No. 129/1999 the following foodborne intestinal diseases are notifiable in Iceland:

1. Salmonellosis (including Typhoid fever and Paratyphoid fever)

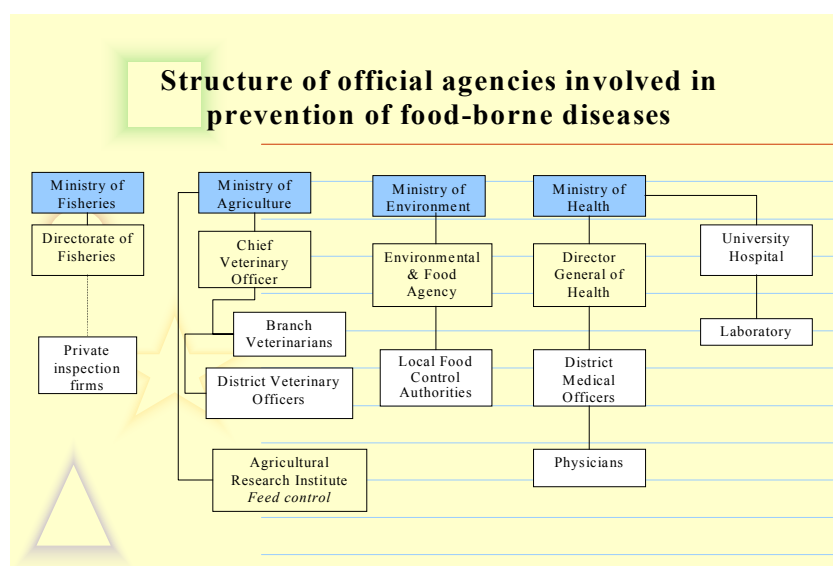
2. Shigellosis
3. Amoebiasis
4. Campylobacter infection
5. Enterohaemorrhagic E. coli infection
6. Cholera
7. Listeriosis
8. Hepatitis A
9. Poliomyelitis
10. Botulism
11. Creutzfeldt-Jakob Disease, new variant

Disease reported by number of cases:

1. Acute diarrhea presumably of infectious origin
2. Intoxication due to infections or toxins produced by infectious organisms

The physician consulted or the medical establishment must report these notifiable diseases to The Government Medical Officer in Iceland. The numbers are published annually in reports on public health statistics in Iceland.

Figure IS 1



There are 3 ministries responsible for food control in Iceland. Ministry of Fisheries has established the Directorate of Fisheries for the enforcement of the laws regarding the handling and inspection of marine products. Ministry of Agriculture provides for the veterinary services and has feed control established at the Agricultural Research Institute. The Chief Veterinary Officer is in charge of the veterinary services and has District Veterinary Officers employed for control activities at the farm level and in slaughterhouses. Ministry for the Environment is ultimately responsible for the food control in Iceland. The Environmental and Food Agency co-ordinates the activities of the Local Food Control Authorities, which are run by the municipalities. Among the roles of these bodies is food control, water quality and import control of non-animal foodstuffs.

Ministry of Health and Social Security has mainly two subsidiary bodies established for surveillance and prevention of food- and waterborne diseases. At the Directorate of Health, the state epidemiologist has recently been employed. His role is to supervise the prevention and control of communicable disease. The Laboratory at the University Hospital receives the majority of the human faecal samples analysed in Iceland and manages the epidemiological information concerning foodborne gastro-enteritis.

2. Statutory notification

2.1 Number of cases and incidence rate

Table IS 1

**Number of laboratory-confirmed single cases and incidence rate
of food-borne intestinal diseases
ICELAND 1993- 1998**

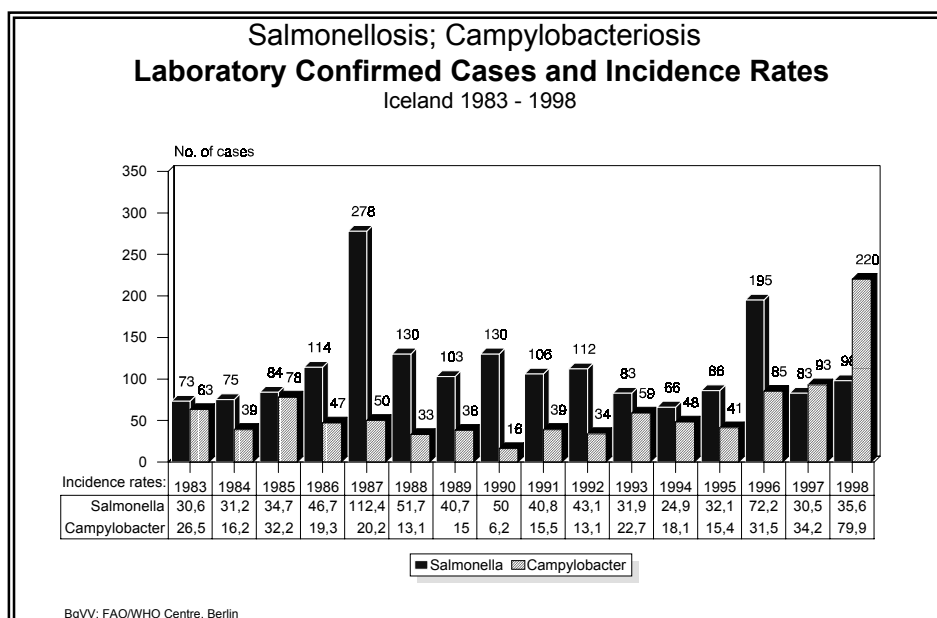
Agent	Year					
	1993	1994	1995	1996	1997	1998
<u>Salmonella spp.</u>						
Number of cases	83	66	86	195	83	98
Incidence rate	31.9	24.9	32.1	72.2	30.5	35.6
<u>Campylobacter jejuni/coli</u>						
Number of cases	59	48	41	85	93	220
Incidence rate	22.7	18.1	15.4	31.5	34.2	79.9
<u>Shigella</u>						
Number of cases	1	3	5	1	6	1
Incidence rate	0.4	1.1	1.9	0.4	2.2	0.4
<u>Listeria</u>						
Number of cases	3	6	4	1	2	0
Incidence rate	1.2	2.2	1.5	0.4	0.7	0.0
<u>E. coli / EHEC</u>						
Number of cases	-	-	2	0	1	0
Incidence rate	-	-	0.7	0.0	0.4	0.0

The number of registered *Salmonella* cases is usually around 100 each year with the majority of the cases acquired abroad (Table IS 1 and Figure IS 1). The big peaks in 1987 and 1996 are caused by domestic outbreaks. From 1993 – 1998, 60.9% of *Salmonella* serotypes isolated from humans are *S. Enteritidis* and 12.5% *S. Typhimurium* (Table IS 2).

There is a big increase in registered *Campylobacter* cases from 1996 (Table IS 1 and Figure IS 1). Before 1996 the average number of cases each year was under 50. Before 1996 only sale of frozen poultry products was allowed in Iceland. The big and continuing increase in domestic cases is linked mainly to high increase in marketing and consumption of fresh poultry products with much higher contamination level of *Campylobacter* than frozen products.

The number of confirmed cases of *Shigella*, *Listeria* and *EHEC* is very low and no outbreaks have been registered.

Figure IS 1



2.2 Frequency of various Salmonella serotypes

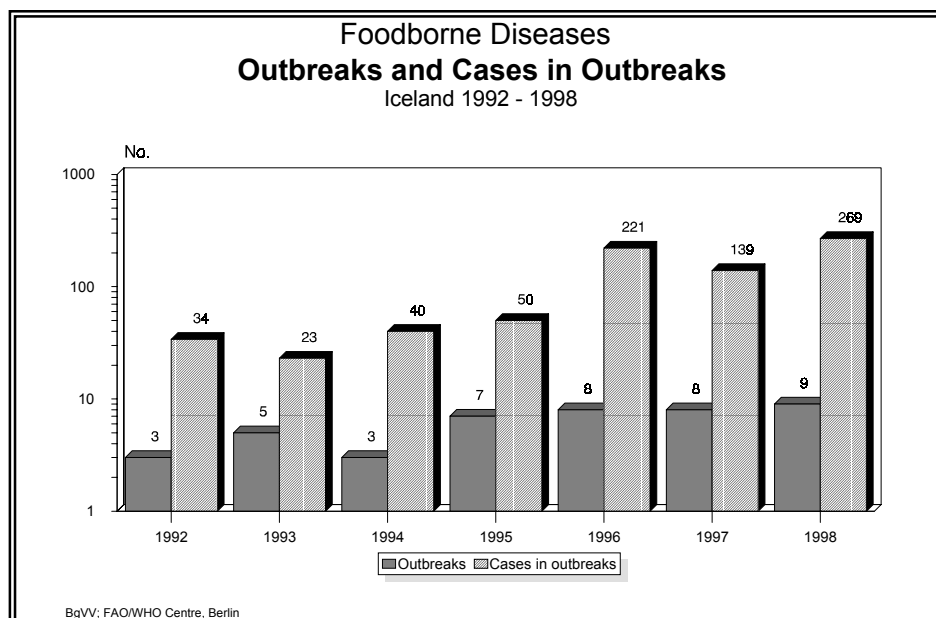
Table IS 2

Frequency of Salmonella serotypes isolated from humans ICELAND 1993 - 1998

Serotype	1993		1994		1995		1996		1997		1998	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
<i>S. Enteritidis</i>	33	38	29	44	36	41	163	84	59	71	56	58
<i>S. Typhimurium</i>	23	26	10	15	20	23	5	2	6	7	13	13
<i>S. Blockley</i>	-	-	-	-	-	-	2	1	-	-	-	-
<i>S. Virchow</i>	3	3	3	5	1	1	1	1	-	-	1	1
<i>S. Agona</i>	2	2	1	1	2	2	1	1	-	-	-	-
<i>S. Infantis</i>	2	2	-	-	-	-	-	-	1	1	1	1
<i>S. Hadar</i>	-	-	-	-	-	-	1	1	-	-	1	1
<i>S. Heidelberg</i>	1	1	1	1	-	-	-	-	1	1	8	8
<i>S. Thompson</i>	2	2	-	-	5	6	4	2	-	-	-	-
<i>S. Branderup</i>	-	-	-	-	-	-	1	-	-	-	1	1
<i>S. Newport</i>	-	-	-	-	-	-	-	-	2	3	1	1
Other	20	23	18	28	20	23	17	6	11	13	14	14
Not known	2	3	4	6	3	4	5	2	3	4	2	2
Total	88	100	66	100	87	100	195	100	83	100	98	100

3. Epidemiologically investigated incidents

Figure IS 2



3.1 Causative agents

Table IS 3

Foodborne disease outbreaks by causative agents
ICELAND 1993 - 1998

Causative agent	O.*	C.*	O.*	C.*	O.*	C.*	O.*	C.*	O.*	C.*	O.*	C.*	O.*	C.*
	1993	1994	1995	1996	1997	1998	Total							
ETEC	-	-	-	-	-	-	-	-	-	-	1	144	1	144
B. cereus	-	-	1	3	1	1	-	-	2	4	1	2	5	10
Cl. perfringens	1	1	1	30	1	2	-	-	2	6	1	14	6	53
Salmonella	3	12	-	-	3	22	2	130	-	-	-	-	8	164
Staph. aureus	-	-	1	7	1	3	1	5	-	-	1	12	4	27
Campylobacter	1	10	-	-	-	-	-	-	-	-	1	4	2	14
Unknown	-	-	-	-	1	22	5	86	4	129	4	93	14	330
Total	5	23	3	40	7	50	8	221	8	139	9	269	40	742

* Outbreaks

** Cases in outbreaks

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Country Reports: *ICELAND 1993 – 1998*

3.2 Incriminated foods

Table IS 4

Foodborne disease outbreaks by implicated foods and causative agent
ICELAND 1998

Food	Causative agent						Total
	<i>Bac. cereus</i>	ETEC	<i>Clostr. perfr.</i>	<i>Staph. aureus</i>	<i>Campylobacter</i>	Unknown	
Meat & products	-	-	1	1	-	-	2
Water	-	-	-	-	1	-	1
Pasta salad	1	-	-	-	-	-	1
Unknown	-	1	-	-	-	4	5
Total	1	1	1	1	1	4	9

3.3 Places where food was acquired or eaten

Table IS 5

Foodborne disease outbreaks by place where food was eaten or acquired
ICELAND 1993- 1998

Place	Year						Total	
	1993	1994	1995	1996	1997	1998	1993- 1998	
	No.						No.	%
Private home	4	1	4	3	-	4	16	40
Restaurant	-	-	-	1	5	-	6	15
Canteens	-	1	-	-	-	1	2	5
School/kinder-garden	-	-	-	1	-	1	2	5
Medical care facility	-	-	2	1	1	-	4	10
Take-away food	-	-	-	-	2	1	3	7.5
Mass catering for								
Specific groups	-	1	1	1	-	1	4	10
Various places	1	-	-	-	-	1	2	5
Ship	-	-	-	1	-	-	1	2.5
TOTAL	5	3	7	8	8	9	40	100

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3.4 Contributing factors

Table IS 6

Food borne disease outbreaks Contributing factors
ICELAND 1993- 1998

Factor	Year						Total	
	1993	1994	1995	1996	1997	1998	1993-1998	
	No.	No.	No.	No.	No.	No.	No.	%
Inadequate hot holding	-	-	-	-	2	1	3	7.5
Inadequate refrigeration	-	-	-	1		2	3	7.5
Inadequate cooking/ re-heating	-	-	1	-	-	1	2	5
Contaminated equipment	-	-	-	1	-	1	2	5
More than one factor		2	2	1	1		6	15
Total factors known	-	2	3	3	3	5	16	40
Total outbreaks where factors were not known	-	1	4	5	5	4	19	47.5
TOTAL OUTBREAKS	5	3	7	8	8	9	40	100