Rapport

Outbreak of food poisoning in a canteen, Stavanger, June 2012

Anneke Steens

folkehelseinstituttet

Table of contents

Affiliates

Food safety authorities: (Mattilsynet; Ingfrid Østefjells, Agnieszka Brodowska)
Norwegian institute of public health: (FHI; Anneke Steens, Karin Nygård, Heidi Lange)

Norsk sammendrag

Den 27-06-2012 rapporterte mange å ha blitt syke etter å ha spist i en kantine i Stavanger. Kantina serverer daglig rundt 200 mennesker. Mattilsynet bestemte seg for å utføre en kohortstudie for å kartlegge omfanget av utbruddet og identifisere mulige risikofaktorer. FHI har bistått i analysene av kohortstudien.

Ca. 200 spørreskjemaer ble sendt ut, og totalt 69 mennesker svarte på det (svarprosent=33%). Av disse var det 32 som meldte om symptomer på gastroenteritt i den aktuelle tidsperioden. Resultatene fra kohortundersøkelsen indikerer at pastasalat med kylling som ble den servert 20-06-2012, var årsaken til utbruddet. Siden det ikke forelå noen etiologisk diagnose hos noen av de syke valgte vi å bruke en ganske bred kasus-definisjon i kohortundersøkelsen, noe som kan medføre at personer med symptomer knyttet til andre smittekilder ble inkludert. Vi har derfor gjort analysene med utgangspunkt i to forskjellige kasus-definisjoner; en med alle som hadde symptomer på gastroenteritt i hele perioden 15 - 26 juni, og en mer snever definisjon som kun inkluderer de som ble syke 21-22-juni, da det var en tydelig topp i antall tilfeller som kan forklares med en mulig punkt-kilde. Begge disse analysene peker mot pastakylling, mens også noen andre matvarer kom ut i en av de andre analysene.

Den mest sannsynlige årsak til dette utbruddet er pastasalat med kylling servert i kantina den 20. juni. De fleste av de syke har spist denne retten, og den ble servert dagen før flertallet ble syke – og passer derfor godt tidsmessig med utbruddet. Den var produsert dagen før servering, og ble lagret i kjøleskapet over natten. Man kunne også se at det var litt forskjell mellom symptomer mellom de som oppga å ha spist kylling pasta salat og de som ikke hadde spist dette, noe som kan tilsi at det kan ha vært andre årsaker til sykdom hos noen av de andre som oppga å ha vært syke i perioden. Det var dessverre nesten ingen prøver fra de syke eller fra de aktuelle matrettene, slik at det ikke kan konkluderes med hva som var det aktuelle etiologiske agens ved dette utbruddet.

Mattilsynet besøkte kantinen og funnet noen avvik til protokoller; blant annet viste temperaturkontroll-logg at temperaturen i varemottakskjølen hadde vært for høyt ved enkelte anledninger.

Summary

On 27-06-2012, several people reported to be ill after having eaten in a canteen in Stavanger that daily serves 200 people. The food safety authorities decided to conduct a cohort study to assess the extent of the outbreak and to identify possible risk factors. The Norwegian institute of public health assisted with the analyses of the study.

200 questionnaires were sent and 69 people responded to it (response rate=33%). 32 of the respondent reported gastrointestinal disease in specific time period. The results of the cohort study indicated that the pasta salad with chicken served on the buffet on 20-06-2012, was the cause of the outbreak. Because there was no laboratory-confirmed diagnosis, we chose to use a broad case definition and performed multivariate analyses based on two different case definitions: one with all the cases who had gastroenteritis between 15 and 26 June, and one with only cases who reported to be ill on 21/22-06-2012 (days with highest

number of cases). Both analyses indicated that the pasta salad with chicken was the cause of the outbreak, while in the second analysis pepper mackerel also came out of the analysis.

The most likely product causing the outbreak was the pasta salad with chicken. Most cases ate the salad, and it was served one day before most became sick, thereby fitting well the time of onset of the outbreak. It was produced the day before serving, and was stored in the fridge overnight. We also observed a small difference in reported symptoms of the cases that ate chicken pasta salad and those who didn't, which indicates that there may have been other causes of the symptoms of those who were ill but did not eat the chicken pasta salad. Unfortunately there were almost no stool samples from cases or from the appropriate dishes, so that we cannot conclude on the etiological agent of this outbreak.

The food authorities visited the canteen and found some deviations to the protocols, among others, the temperature control-logg showed that the temperature of the buffet where food was presented had been too high in some occasions.

Introduction

Overview of the event

The owners of the specific canteen received information on 27.06.2012 on possible food poisoning of 12 persons during June 21-23. They conducted an initial (oral and written) survey among 11 of the cases on the same day. The regional director of the owner of the canteen contacted the food safety authorities at 28.06.2012 to inform them about the possible food poisoning. Later on the same day it was reported that the number of possible cases had increased to 30. During that week (week number 26), the canteen served around 200 persons per day. Generally, the same persons visit the canteen every day.

The food safety authorities had seen the preliminary results of the initial survey, and subsequently started a cohort study on 03.07.2012 to investigate the source of the outbreak. Based on the initial results, the first case occurred at 16.06.2012, and the onset of disease of the last case was at 01.07.2012. The outbreak was considered over. At 06.07.2012 the food safety authorities notified the Norwegian Institute of Public Health (FHI) about the suspected outbreak of food poisoning, and asked for help with the data analysis.

Outbreak investigation

Epidemiological investigations

Patients and possible risk factors

Design

We performed a retrospective cohort study among all employees that have access to the canteen (n=200). Those who handled food in the canteen as well as before delivery of the food to the canteen (n=8) were also asked for fill out the questionnaire because some of them eat in the same canteen as the employees.

Objective

To determine the source of the gastroenteritis outbreak at the specific canteen in June 2012.

Case definition

A case was defined as

- someone working at the specific company or preparing food for its canteen, who has eaten in the canteen between 16.06.2012 and 26.06.2012,

- and suffered from at least 1 of the following gastrointestinal symptoms between 15.06.2012 and 26.06.2012: diarrhoea or thin stool, blood in faeces, nausea, throwing up, stomach ache or unsettled stomach.

The dates of food consumption as defined in the case definition correspond to the dates that were mentioned in the questionnaire.
A second case definition was defined similar to the one described above, but with day of symptom onset on 21.06.2012 or 22.06.2012 (= peak of the epidemiological curve).

Data sampling
The food safety authorities designed a questionnaire that consisted of questions on demographics (name, address, date of birth), symptoms (which symptoms and when did they occur, doctor visits and samples taken), possible 'general' exposures (contact with others who have had symptoms, attendance or meetings at the company or activities like courses, seminars, summer party) and questions on exposures to food in the suspected canteen (days of visiting the canteen, and which food item had been consumed). The company sent out the questionnaire by email on 03.07.2012 to all employees who have access to the canteen. On 06.07.2012 the questionnaires were sent to the food handlers. FHI obtained the answered questionnaires by scan, fax and/or on paper.

Data analyses
Data was entered in Excel and analyses were performed in Excel 2010 and STATA 12. Descriptive analyses, as well as univariable analyses were performed for all variables. We determined the number of people exposed, number of ill people among exposed and unexposed, attack rate (AR) and risk ratios (RR) with 95% confidence intervals (95% C.I.) using the cstable command in STATA.
A multivariable analysis was performed using logistic regression to determine odds ratios (OR). We included all variables which had a p value of <0.2 in the univariable analysis. Variables were taken out of the model based on their significance level, such that the final model only contained variables that were significant at a level of $p<0.05$. Only participants (those with and without symptoms) who had reported to have eaten at the canteen were included in the analysis.

Microbiological investigations

Patient samples

Three cases have delivered faeces to laboratories. The information that was reported included that at least the following tests were performed on faeces of the cases: Case #1: Salmonella, Campylobacter, Yersinia and Shigella. No test was performed for viruses. Case #2: Salmonella, Campylobacter, Yersinia, Shigella, Rotavirus, Adenovirus, Sapovirus and Norovirus. Case #3: Salmonella, Campylobacter, Yersinia, Shigella and Clostridum.

Environmental samples

At 27.06.2012, samples from the garlic dressing and ham were sent in for laboratory analysis because these were the only product still available.

Laboratory methods

The garlic dressing was analysed for *Bacillus cereus*, *Clostridium perfringens*, Aerobe microorganisms 30°C, Coliforme 37°C and *Staphylococcus aureus*. Tests were performed on 29.06.2012.

Environmental investigations

Investigation of potential sources, food services and manufacturing conditions

The owner of the canteen inspected their registered temperature and wash logs on 27.06.2012, and visual controls were performed. The food safety authorities visited the canteen on 28.06.2012 for additional checks.

Results

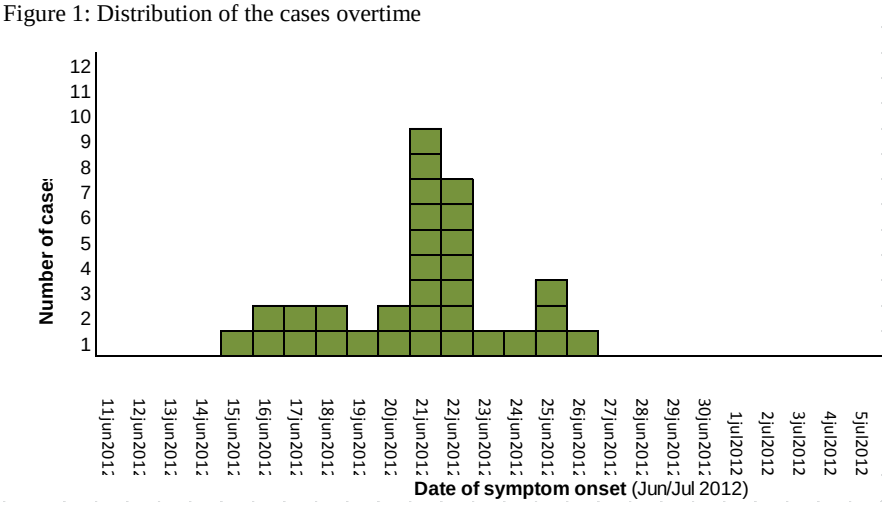
Epidemiological investigation

Patients and possible risk factors

69 individuals (61 employees, 8 food handlers; all having access to the same canteen) filled out and returned the questionnaire (response rate=33%). 46% was male and the mean age was 38 years (range 18-60). From the 69 respondents, 24 reported to have been ill, though, 32 cases met the case definition based on their reported symptoms (attack rate 46% among the respondents). 37 were defined as non-cases. The age of the cases and non-cases did not differ (mean of 36 and 41 years, respectively). 60% of the cases were male. None of the food handlers that answered the questionnaire reported symptoms.

The first case reported illness onset at 15.06.2012; the symptoms of the last case started at 26.07.2012. The outbreak peaked at 21 and 22.06.2012; for 50% of all cases the symptoms started at these days (9 and 7 cases resp.; see Figure 1).

Figure 1: Distribution of the cases overtime



The symptoms that were most often reported included stomach ache (84%), diarrhoea (63%) and nausea (56%) – see Table 1. Less than 50% reported head ache, muscle ache, fever or vomiting. 38% had to stay in bed due to their symptoms. See table 1 for the distribution of all reported symptoms. The cases that reported the onset of symptoms at 21 or 22.06.2012

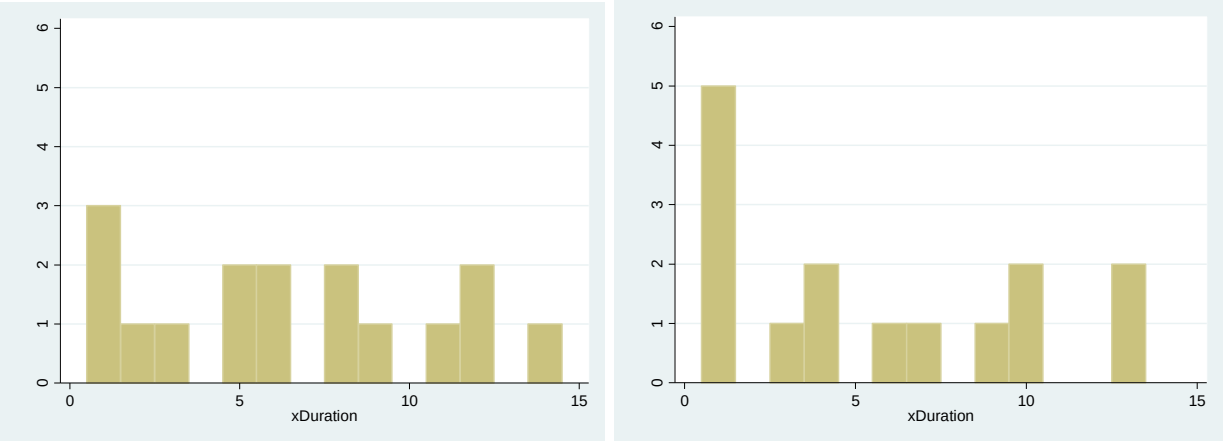
reported more often diarrhoea, nausea and head ache and had to stay in bed more often than those that fell ill before or after these dates (Table 1). One case had been hospitalised (day of symptom onset 21.06.2012; no laboratory tests done). There were no fatal cases.

Table 1: Description of symptoms

Symptom	**Nr of cases (n=32)**	**% of cases**	**% of cases 21-22 June (n=16)**	**% of cases NOT 21-22 June (n=16)**
Stomach ache	27	84	81	86
Diarrhoea	20	63	75	38
Nausea	18	56	69	33
Stay at bed	12	38	56	14
Head ache	11	34	44	19
Muscle ache	7	22	19	19
Fever	6	19	19	14
Vomiting	5	16	16	10
Other	4	13	13	10
Diarrhoea with blood	2	6	6	5

The duration of symptoms reported by the cases varied between 1 day (n=8; 23%) to 2 weeks (see figure 2). The duration of those who fell ill on 21 or 22.06.2012 were slightly longer (difference not significant; p=0.54) than the cases who had a date of onset before or after 21 or 22.06.2012 (median 6 (1-14) vs. median 4 (1-13) respectively).

Figure 2: Distribution of duration of illness (left) for cases whose symptom onset was on 21/22 June (right) for the other cases



Analytical study

Univariable analysis

Based on the univariable analysis, people who consumed mineral water / milk / juice, chicken pasta salad, or pepper mackerel had a higher risk of becoming ill than those who did not consume these products. The variables that had a p-value of less than 0.2 in the univariable analysis are presented in Table A of the appendix 'Vedlegg 3'.

A second analysis was done by using the second more narrow case-definition (illness onset on 21 or 22.06.2012). Based on the univariable analysis with the second case-definition, people who consumed green salad during one of the days, chicken pasta salad on Wednesday or pepper mackerel at Thursday had a higher risk of becoming ill than those who did not consume these products (see Table B of the appendix 'Vedlegg 3').

Multivariable analysis

Results of the multivariable analysis using the 1st (broad) case definition and the 2nd case definition (restricted to illness onset on 21 or 22.06.2012) are presented in table 2 and 3 respectively. Only chicken pasta salad served on Wednesday was significant in both the analyses.

Table 2: Results of the multivariable analysis using the 1st case definition

	OR	95% CI	P value	% of cases exposed
Chicken pasta salad	3.84	1.25-11.8	0.02	55
Mineral water / milk / juice	3.53	1.02-12.23	0.05	78

Table 3: Results of the multivariable analysis using the 2nd case definition

	OR	95% CI	P value	% of cases exposed
Pepper mackerel	7.84	1.64-37.4	0.01	38
Chicken pasta salad	4.39	1.09-17.7	0.04	67

Post hoc analysis

We determined whether or not the clinical picture differed among those who ate chicken pasta salad and those who didn't as 8 of the 32 cases reported that symptoms started already before the day that chicken pasta salad was served and only 55% of the cases reported to have eaten chicken pasta salad. The median duration of illness among the cases that ate chicken pasta salad was significantly longer (8.5 versus 2.5 days) than among the cases that did not eat chicken pasta salad. Furthermore, more reported to have had diarrhoea (52% versus 17%), nausea (41% versus 17%), stomach ache (59% versus 33%), had to stay in bed (30% versus 8%) or visited a doctor (31% versus 9%). The proportion of cases with vomiting (7% versus 6%), and more unspecific symptoms like head ache (22% versus 17%), muscle ache (11% versus 14%) or other symptoms (7% versus 8%) was similar.

Microbiological investigation

Patient samples

Only 7 cases visited a doctor and 4 cases had a stool sample taken. In 3 other cases, no bacterium or virusses were found so far. No further results were obtained.

Environmental samples

From all food items served, only the garlic dressing and ham were sent in for laboratory analysis. The ham sample was too small to analyse. The following results were obtained for the garlic dressing: *Bacillus cereus* <100 cfu/g, *Clostridium perfringens* <100 cfu/g, *Staphylococcus aureus* <100cfu/g, aerobe microorganisms 5000 cfu/g, coliform bacteria 37°C <10 cfu/g. The laboratory reported that these results indicate that the garlic dressing is unlikely the source of the food poisoning.

Environmental investigations

Inspection of food services and manufacturing conditions

Information provided by the owners of the canteen at the company, showed that the chicken pasta salad was made with ready-made salad-chicken which is stored cool, but not canned/sealed. The pasta salad was produced the day before serving, and was stored in the fridge overnight. It was only served on Wednesday of the appropriate week (20.06.2012). The pepper mackerel was ready-made and vacuum packet in packages of 250 gr, and was kept in the fridge until serving on Thursdays (14.08.2012 and 21.06.2012).

The registered temperature and wash logs that were checked by the owner of the canteen on 27.06.2012 were all within the limits. No problems were encountered during their visual controls and all procedures had been followed based on the loggs. The food authorities visited the canteen on 28.06.2012. They found some deviations to the protocols, partly because the building of the canteen is still under construction. The ceiling tiles were not in place yet and the shelf space for work clothes in the locker room was not present yet. The temperature control-logg showed that the temperature of the place where food was presented had been too high in some occasions (4.7 to 7°C); these abnormalities had not been registered in the appropriate forms. However, it was reported that some deviations to the protocol had occurred. Overall, nothing was found that clearly could provide answers on what might be the cause of the outbreak.

Interpretation

Conclusions

Based on the results from the cohort study, the percentage of cases that were exposed, as well as the day of serving (most cases became ill at 21 and 22.06.2012), we suspect the chicken pasta salad served on 20.06.2012 to be the most likely source of the outbreak that occurred in the canteen in the end of June 2012. As pasta salad with chili-sausage was served the same day, and was not associated with the outcome, the chicken used in the salad may have been contaminated. The suspicion for the chicken pasta salad is further enhanced by difference in reported symptoms of the cases that ate chicken pasta salad and those who didn't. Compared to those who had not eaten chicken pasta salad, for cases who had eaten chicken pasta salad, the duration of illness was longer and more cases reported diarrhoea, nausea, stomach ache, had to stay in bed or visited a doctor. Another indication enhancing the suspicion of chicken pasta salad is the fact that 3 participants (all cases) reported that they were not satisfied with the chicken pasta salad; 1 had reported that the chicken pasta salad tasted a bit strange and had a strange consistency.

Although the pepper mackerel was also identified as associated with illness in the cohort study when using the narrow case-definition, the pepper mackerel is less likely the cause of the outbreak. Because the pepper mackerel was pre-packed vacuum until use, and served on Thursday 21.06.2012, the same day that most cases became ill. Although we do not have information on the time that they became ill or that they could had eaten the pepper mackerel, we expect that the time between possible consumption and onset of illness might be too short.

We have no conclusion on the infectious agent. As less than 50% of the cases reported vomiting, norovirus is unlikely the infectious agent, following the Kaplan criteria [1].

For this analysis we had to use an unspecific case-definition (i.e., did not include laboratory information). Therefore, some people who have been defined to be a case, actually could have suffered from symptoms that were not related to this outbreak. Misclassification due to the lack of laboratory confirmation might also explain the very broad epidemiological curve and the fact that some cases suffered already from symptoms before the food was served.

The fact that not all cases reported to have eaten chicken pasta salad might be due to misclassification of the cases as mentioned above or due to the delay between the exposure period asked for in the questionnaire and the time of filling out the questionnaire. People

might therefore have forgotten some products that they had eaten. Nevertheless, the low response rate may have introduced some response bias.

Implemented measures to stop the outbreak

Because the outbreak is over, these results cannot contribute to additional measures for the control of this outbreak.

Recommendations for preventing similar situations in the future

Based on the environmental investigation of the food safety authorities, the temperature of the place (varemottaket) where the food was kept should be improved. The measured temperatures were too high. Furthermore, the buffet should be cooled down before food is placed in order to prevent the temperature of the food to rise. Additionally, when deviations to the protocol are noticed, immediate action should be taken. Such information, together with the fact that the chicken pasta salad was prepared one day before serving and was stored in the fridge, indicates that improved food storage is needed. The food safety authorities ordered the company to ensure that deviations are also reported on the deviation form. This should ensure that corrective measures are carried out to prevent the same circumstances arise again.

In summary:

- The temperature of the buffet should be improved
- The buffet should be cooled down before food is placed
- When deviations to the protocol are noticed, immediate action should be taken
- Corrective measures should be carried out if deviations to the protocol are noticed

References

1. Kaplan JE, Feldman R, Campbell DS, Lookabaugh C, Gary GW: **The frequency of a Norwalk-like pattern of illness in outbreaks of acute gastroenteritis.** *Am J Public Health* 1982, **72:**1329-1332.

Appendix 1: Questionnaire (in Norwegian)

TIL ANSATTE og KANTINEPERSONELL.
SPØRRESKJEMA – MELDING OM MATBÅREN SYKDOM 16.6.- 26.6.2012

Generelle opplysninger

Mattilsynet har fått melding om flere syke - mulig i forbindelse med felles bespisning.
I denne forbindelse ønsker vi opplysninger om de ansattes felles aktiviteter og bespisning i perioden 16.-26.6. For å kunne finne årsaken til sykdom, er det viktig at **både de syke og så mange friske som mulig** svarer på skjemaet. (Bruk eventuelt ekstra ark hvis dårlig plass)

Personlige opplysninger

Navn:……..Født:…… mobil:……

Adresse:……Postnr. og sted:……..

Sykdom og symptomer hos deg selv

	Ja	Nei	Varighet (fra dato – til dato)
Har du vært syk			
Hadde du diaré			
Hadde du blodig diaré			
Hadde du oppkast			
Hadde du kvalme			
Hadde du magesmerter			
Hadde du feber			
Hadde du hodepine			
Hadde du muskelsmerter			
Måtte du holde senga			
Annet			

Oppfølging av eventuelt legebesøk

	Ja	Nei	Dato
Oppsøkte du lege?			
Ble det tatt avføringsprøve?			

Eventuell liknende sykdom hos andre som du kjenner til og kan ha vært i kontakt med

	Ja	Dato	Nei	Vet ikke
Har noen i din omgangskrets utenfor Jåttåvågen vært syke i samme periode?				
Har forretningsforbindelser eller andre som har besøkt dere i den aktuelle perioden vært syke?				

Hvilke felles interne møter/aktiviteter har du deltatt i sammen med dine kollegaer den 16.6.-26.6.?
Hvilke og hvem:
…….

Har du vært med på firmatur/sommerfest/eksternt kurs/seminar/eksternt møte eller lignende den siste måneden?.....I tilfelle når og hvor?
…….

Hvilke aktiviteter var inkludert i dette?

……

Hva ble eventuelt servert på arrangementet?.....

……

……

……

Spist du i kantinen (kryss av):

☐ Mandag18.6 ☐ Tirsdag 19.6 ☐ Onsdag 20.6 ☐ Torsdag 21.6 ☐ Fredag 22.6

HVA HAR DU SPIST I KANTINEN I PERIODEN 16.-26? (notér hvilken dag: m,t,o,t,f)

	Ja	Nei	Vet ikke	Var du fornøyd med maten da du spiste den?
Salatbar				
Salat (grønn)				
Tomat				
Agurk				
Paprika				
Bønner/linser				
Mais				
Annanas				
Tunfisk				
Bromkål/broccoli m/ravigotte				
Coscous				
Dressing				
Servering i disk:				
Reker (mandag)				
Skinke				
Roastbiff (tirsdag)				
Peppermakrell				
Rekesalat (fredag)				
Pastasalat m/kylling (onsdag)				
Pastasalat m/chilipølser (onsdag)				
Egg				
Annet_____				
Suppe (mandag)				
Brød/påleggsvarer				
Kjøttpålegg ferskt:_____				
Kjøttpålegg saltet/røkt (salami etc.)				
Fiskepålegg fra boks				
Egg				
Annet_____				
Varm rett på fredagen				
Svinestek				

Blomkålblanding				
Surkål				
Brun saus				
Sousvide poteter				
Drikke				
Vann fra mugge				
Mineralvann/melk/juice				
Kaffe/te				

*Har du spist sjømat/skalldyr hjemme eller hos andre denne perioden?*_____

Annet……
……
……..

Takk for hjelpen!

Opplysningene behandles fortrolig og vil bli makulert ved saksavslutning.

Appendix 2: Tables

Table A: Results of univariable analysis for the first (broad) case definition. AR% = attack rate, RR= risk ratio. Note that it was not possible to distinguish between which week in the period between 16.06.2012 and 26.06.2012 a food product was eaten.

	Exposed			Unexposed						
	Total	Cases	AR%	Total	Cases	AR%	RR	(95% RR)	P value	% cases exposed
Served every day										
Eaten from salad bar	8	4	50	61	28	46	1.09	[0.52-2.29]	0.827	13
Green salad	47	23	49	20	7	35	1.40	[0.72-2.72]	0.294	77
Tomato	40	19	48	28	12	43	1.11	[0.65-1.90]	0.705	61
Cucumber	48	25	52	21	7	33	1.56	[0.81-3.03]	0.151	78
Paprika	46	21	46	23	11	48	0.95	[0.56-1.62]	0.864	66
Beans / lentils	17	9	53	52	23	44	1.20	[0.70-2.06]	0.532	28
Mais	30	13	43	38	18	47	0.91	[0.54-1.55]	0.74	42
Pineapple	24	9	38	43	21	49	0.77	[0.42-1.40]	0.371	30
Tuna fish	9	5	56	60	27	45	1.23	[0.65-2.36]	0.554	16
Cauliflower/broccoli	18	11	61	51	21	41	1.48	[0.91-2.43]	0.145	34
Couscous	8	3	38	60	29	48	0.78	[0.31-1.97]	0.564	9
Salad dressing	28	11	39	39	19	49	0.81	[0.46-1.41]	0.444	37
Food from buffet	1	0	0.0	68	32	47	0.00	[.-.]	0.349	0
Ham	34	17	50	34	14	41	1.21	[0.72-2.05]	0.465	55
Egg from buffet	40	19	48	29	13	45	1.06	[0.63-1.78]	0.826	59
Other from buffet	4	0	0.0	63	31	49	0.00	[.-.]	0.056	0
Bread toppings	12	5	42	57	27	47	0.88	[0.43-1.81]	0.719	16
Egg	35	16	46	34	16	47	0.97	[0.58-1.61]	0.911	50
Fish from a can	17	8	47	51	23	45	1.04	[0.58-1.88]	0.888	26
Fresh meat	21	10	48	47	21	45	1.07	[0.61-1.85]	0.822	32
Salted/smoked meat	15	7	47	53	24	45	1.03	[0.56-1.91]	0.924	23
Other spreads	7	5	71	61	26	43	1.68	[0.97-2.91]	0.147	16
Drinks	3	1	33	66	31	47	0.71	[0.14-3.59]	0.643	3
Water from the jug	23	10	43	46	22	48	0.91	[0.52-1.58]	0.733	31
Mineral water / milk / juice	45	25	56	24	7	29	1.90	[0.97-3.74]	0.036	78
Monday										
Shrimps from buffet	35	17	49	34	15	44	1.10	[0.66-1.83]	0.711	53
Soup	10	4	40	57	27	47	0.84	[0.38-1.89]	0.666	13
Tuesday										
Roasted beef	14	5	36	55	27	49	0.73	[0.34-1.54]	0.37	16
Wednesday										
Chili-sausage pasta salad	15	7	47	53	24	45	1.03	[0.56-1.91]	0.924	23
Chicken pasta salad	27	17	63	41	14	34	1.84	[1.10-3.08]	0.02	55
Thursday										
Pepper mackerel	10	8	80	59	24	41	1.97	[1.27-3.04]	0.021	25
Friday										
Warm meal	5	2	40	64	30	47	0.85	[0.28-2.58]	0.767	6
Potatoes	31	14	45	38	18	47	0.95	[0.57-1.59]	0.855	44
Roasted pork	36	18	50	33	14	42	1.18	[0.70-1.97]	0.528	56
Brown sauce	29	13	45	40	19	48	0.94	[0.56-1.59]	0.826	41
Saurkraut	13	4	31	56	28	50	0.62	[0.26-1.45]	0.21	13
Cauliflower	20	9	45	49	23	47	0.96	[0.54-1.69]	0.884	28
Shrimp salad	11	6	55	57	25	44	1.24	[0.67-2.30]	0.515	19

Table B: Results of univariable analysis for the 2nd case definition (symptoms at 21-22-06-2012). AR% = attack rate, RR= risk ratio. Note that it was not possible to distinguish between which week in the period between 16.06.2012 and 26.06.2012 a food product was eaten.

	Exposed			Unexposed						
	Total	Cases	AR%	Total	Cases	AR%	RR	(95% RR)	P value	% cases exposed
Served every day										
Eaten from saladbar	8	3	38	61	13	21	1.76	[0.64-4.86]	0.308	19
Green salad	47	13	28	20	1	5	5.53	[0.77-39.49]	0.037	93
Tomato	40	11	28	28	4	14	1.93	[0.68-5.43]	0.196	73
Cucumber	48	10	20	21	6	29	0.73	[0.30-1.74]	0.483	63
Paprika	46	10	22	23	6	26	0.83	[0.35-2.01]	0.687	63
Beans / lentils	17	4	24	52	12	23	1.02	[0.38-2.74]	0.969	25
Mais	30	7	23	38	9	24	0.99	[0.42-2.34]	0.973	44
Pineapple	24	4	17	43	11	26	0.65	[0.23-1.82]	0.401	27
Tuna fish	9	2	22	60	14	23	0.95	[0.26-3.51]	0.941	13
Cauliflower/broccoli	18	5	28	51	11	22	1.29	[0.52-3.20]	0.592	31
Couscous	8	1	13	60	15	25	0.50	[0.08-3.29]	0.434	6
Salad dressing	28	5	18	39	10	26	0.70	[0.27-1.81]	0.451	33
Food from buffet	1	0	0.0	68	16	24	0.00	[.-.]	0.580	0
Ham	34	8	24	34	7	21	1.14	[0.47-2.80]	0.770	53
Egg from buffet	40	11	28	29	5	17	1.60	[0.62-4.09]	0.319	69
Other from buffet	4	0	0.0	63	15	24	0.00	[.-.]	0.268	0
Bread toppings	12	1	8	57	15	26	0.32	[0.05-2.17]	0.180	6
Egg	35	9	26	34	7	21	1.25	[0.52-2.97]	0.614	56
Fish from a can	17	4	24	51	12	24	1.00	[0.37-2.69]	1.000	25
Fresh meat	21	5	24	47	10	21	1.12	[0.44-2.87]	0.816	33
Salted/smoked meat	15	3	20	53	12	23	0.88	[0.29-2.73]	0.828	20
Other spreads	7	3	43	61	12	20	2.18	[0.81-5.89]	0.161	20
Drinks	3	0	0.0	66	16	24	0.00	[.-.]	0.331	0
Water from the jug	23	8	35	46	8	17	2.00	[0.86-4.64]	0.107	50
Mineral water / milk / juice	45	11	24	24	5	21	1.17	[0.46-2.99]	0.735	69
Monday										
Shrimps from buffet	35	8	23	34	8	24	0.97	[0.41-2.29]	0.947	50
Soup	10	1	10	57	15	26	0.38	[0.06-2.56]	0.268	6
Tuesday										
Roasted beef	14	4	29	55	12	22	1.31	[0.50-3.45]	0.593	25
Wednesday										
Chili-sausage pasta salad	15	3	20	53	12	23	0.88	[0.29-2.73]	0.828	20
Chicken pasta salad	27	10	37	41	5	12	3.04	[1.17-7.91]	0.016	67
Thursday										
Pepper mackerel	10	6	60	59	10	1	3.54	[1.66-7.56]	0.003	38
Friday										
Warm meal	5	0	0.0	64	16	25	0.00	[.-.]	0.202	0
Potatoes	31	7	23	38	9	2	0.95	[0.40-2.27]	0.914	44
Roasted pork	36	10	28	33	6	18	1.53	[0.62-3.74]	0.345	63
Brown sauce	29	6	21	40	10	25	0.83	[0.34-2.02]	0.675	38
Saurkraut	13	3	23	56	13	23	0.99	[0.33-2.99]	0.992	19
Cauliflower	20	4	20	49	12	24	0.82	[0.30-2.23]	0.688	25
Shrimp salad	11	2	18	57	13	23	0.80	[0.21-3.05]	0.735	13