Monophasic *Salmonella typhimurium* outbreak linked to cured sausage

Nearly 50 people have been reported as falling ill in France with Salmonella infections after eating a type of imported dry cured sausage from Spain known as fuet. So far, 45 people have been affected and all the people interviewed mentioned eating fuet before the onset of symptoms.

Strains of monophasic *Salmonella typhimurium* sharing the same whole genome sequencing characteristics were identified between June 24 and July 15 by the French National Reference Centre for Salmonella.

Coincidentally, last year 42 people fell sick in France in another monophasic *Salmonella typhimurium* outbreak traced to fuet from Spain that was linked to a company called Embutidos Sola.

Multiple Salmonella outbreaks linked to Tahini and Halva imported from Syria

Five European countries have reported Salmonella infections which may be linked to tahini and halva (a confectionary product which can be made from tahini) which have been imported from Syria.

Up to 80 people may have been affected since 2019 in Germany, Sweden, Norway, Denmark and the Netherlands with several different serotypes of Salmonella being linked to the outbreak.

Based on epidemiological information and whole genome sequencing (WGS) analyses, officials from the Robert Koch Institute (RKI) in Germany have stated that they consider cases with the Salmonella serovars Mbandaka, Havana, Amsterdam, and Orion to be part of the outbreak.

RKI officials said they initially noted an increase in *Salmonella havana* case numbers in 2019 but were unable to identify the source of infection. Those patients have been retrospectively linked to the current outbreak based on WGS results.

Tahini is made from grinding sesame seeds into a paste and is one of the main ingredients in houmous. In the last eighteen months we have reported on several outbreaks of Salmonella related to the consumption of this product.

In our February 2019 bulletin we reported on a Salmonella outbreak caused by Tahini Halva Spread. At the time there was concern that many affected products would still be in consumers kitchens as the products were ambient shelf stable and had long shelf lives with expiry dates well into 2021.

Salmonella braenderup outbreak linked to melons - update

The latest figures from the FSA and PHE in the UK show that 99 people have now been affected and the European Centre for Disease Control have indicated that over 350 people have now become ill across Europe.

Investigations are now focusing on the supply chain of Galia, Cantaloupe and Honeydew melons from Honduras and Costa Rica. As reported in last month's bulletin, the initial advice from the FSA warned about consuming whole melons from Brazil but further investigations including analysis of the food chain and testing has shown that product from Brazil is now unlikely to be involved.

Salmonella outbreak in Finland

Nearly 450 people (mostly children attending pre-school and nursery day centers) have fallen ill in Finland with salad from Sweden suspected to be the source of infection. The incident has been estimated to have affected one in seven of the 2,500 children potentially exposed.

Produce served at lunch on June 18 has preliminarily tested positive for Salmonella. This included imported iceberg lettuce, domestic fresh cucumber and domestic frozen peas. Suspicion has fallen on the iceberg lettuce as this comes to the central kitchen ready to use in bags and does not undergo any further processing. It is thought that potential contamination could have occurred during primary production through contaminated irrigation water or at the Swedish plant where it has been processed and bagged.

Salmonella outbreak also linked to bagged salad in America

A Salmonella outbreak affecting 4 states in America has also been linked to the consumption of bagged salad leaves. Bright Farms have recalled packaged salad greens sold in Illinois, Wisconsin, Iowa, and Indiana. Interview data show that six people ate or bought multiple types of Bright Farms brand salad products before they became ill. Pathogens like Salmonella can contaminate salad leaves from the soil, from animals (both ground-dwelling and birds), and irrigation waters.

There have been several food poisoning outbreaks traced to zoonotic contamination of field crops, either by direct contact from animals or from faecally-contaminated irrigation water that is sprayed onto fresh produce.

Encouraging results in Scottish Minced Beef survey

A study which was carried out in 2019 on the microbiological quality of raw minced beef has been published by Food Standards Scotland. Over 1,000 fresh minced beef samples were analysed and the results showed that only 3 samples tested positive for Salmonella, and Campylobacter was only detected in 1 sample. There were 35 STEC detections but only three were confirmed as E. coli O157:H7.

Evidence for Anti-Microbial Resistance was only identified in less than 10% of all the isolates tested, and no isolates were resistant to any critically important antimicrobials.

Another visitor farm implicated in E coli 0157 outbreak

Once again, a so called “petting farm” has been associated with confirmed cases of E coli 0157. It has been reported that Acton Scott Historic Working Farm in Shropshire has been temporarily closed to take precautionary measures to reduce the risk of visitors becoming infected. The steps include providing more handwashing facilities and improving safety information about feeding and touching animals.

Unseasonal rise in Norovirus infections and large outbreak linked to raw Oysters

Public Health England (PHE) has released surveillance data which shows that the number of outbreaks caused by Norovirus has increased in recent weeks, particularly in early year educational settings, and that cases are returning to pre-pandemic levels across all age groups and settings in England.

Although it has a foodborne association (particularly with shellfish), Norovirus is highly infectious and is easily transmitted through contact with infected individuals or contaminated surfaces. The increase in outbreaks has been mostly in educational settings, particularly in nursery and childcare facilities, with far more incidents reported to PHE than would be expected in the summer months. In the last 5 weeks, 154 outbreaks have been reported, compared to an average of 53 outbreaks reported over the same period in the previous 5 years.

There has also been reports of an outbreak of Norovirus in the UK and Hong Kong linked to the consumption of Oysters in late May and early June. Reports suggest at least 100 people were ill in the UK with 12 cases in Hong Kong due to the consumption of raw oysters produced by Whitstable Oyster Company in the UK.

Risk factors for shellfish-related norovirus include cold weather leading to low water temperatures, high prevalence of norovirus in the community, and high rainfall potentially leading to sewage system overflows. All of which were recorded in May and early June.

The intracellular survival strategies of Salmonella

New research carried out by the European Molecular Biology Laboratory (EMBL) has shown how Salmonella can produce so called “effector proteins” which can protect the organism once it is inside host cells.

Salmonella is known to release more than 30 effector proteins into infected cells to hijack nutrients and protect itself. However, the functions of many of these proteins, and which host cell proteins they interact with, has up until now been largely unknown.

Using genetically modified strains of Salmonella with tagged effector protein the researchers at the EMBL were able to demonstrate over 400 interactions between Salmonella proteins and host cell proteins. They found that multiple Salmonella effectors physically interacted with several proteins that the host cell uses to transport cholesterol. The report states that Salmonella uses cholesterol to modify the composition of the membrane sacs that surround it, potentially making the membrane more rigid and reinforcing the barrier that separates Salmonella from cellular detection systems, which are present in the host cell’s cytoplasm.

The scientists also found new clues to how two other survival strategies work. One of these strategies is to remodel the network of protein fibres that are used to transport material within the cell. Another strategy involves interfering with the function of a host cell protein that mediates contacts between membranes to facilitate the exchange of lipids and small molecules. Both strategies may help Salmonella to strengthen its protective membrane shield and avoid detection by the host cell’s defence systems.

Flying Tiger Copenhagen recalls banana chips due to Salmonella contamination

There have been recalls in several European countries this month because of potential Salmonella contamination of dried banana chips and muesli mix produced by the Flying Tiger company in Copenhagen. This once again serves as a reminder (if one were needed) of the ability of Salmonella to survive and remain viable in products which have an exceedingly low water activity.

Black urine or Haff disease case reported in Brazil

Health officials in Brazil have issued a warning after a woman became sick from a rare disease after eating fish.

She had gastrointestinal symptoms on June 24 and was admitted to hospital two days later with loss of muscle strength, body pain, and dark coloured urine. Haff disease, or black urine disease, is caused by a toxin found in fish. The symptoms (which occur within 2-24 hours) include sudden extreme muscle stiffness, muscle pain, chest pain, difficulty breathing, numbness, loss of strength throughout the body, and dark brown urine.

It is not known if the odourless and tasteless toxin, which cannot be destroyed by cooking, is caused by the fish or shellfish not being properly stored and packaged (as with histamine toxin) or by what they eat (as with ciguatera poisoning).

Only 29 cases of Haff disease were reported in the United States from 1984 to 2014. They have been linked to carp, buffalo fish, crawfish, or Atlantic salmon.