



Microbiology bulletin 49

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South African Listeriosis outbreak – The worst documented Listeriosis outbreak in history

An update on the Listeriosis outbreak in South Africa reported in last month's bulletin. The outbreak is now being widely reported as being the worst documented Listeriosis outbreak in global history. The number of affected people is being updated on a daily basis but as of January 16th, the figure had risen to 767. The National Institute of Communicable Diseases (NICD) now puts the death toll at 81. The source is currently unidentified and the outbreak strain (sequence type 6) has not been isolated in any food source which has been tested so far.

Salmonella outbreaks/recalls.

January has seen a number of outbreaks and recalls associated with Salmonella.

An outbreak of Salmonella in America has been linked to the consumption of raw sprouted seeds. Eight people across three states have been affected with the source of the Salmonella montevideo outbreak being a popular restaurant chain which served the raw sprouted seeds. Interestingly there is an increasing trend (especially in the states) whereby epidemiological information on outbreaks is being gathered via social media sites. Information on this outbreak was shared via a site called iwaspoisoned.com which helped the authorities to quickly identify the source of the outbreak as the Jimmy John's restaurant chain.

A separate outbreak of Salmonella newport which affected twenty five people across nine different states dating back to June 2017, has been linked to the consumption of frozen shredded coconut. The same brand of shredded coconut has now also been recalled in Canada although no illnesses have yet been reported.

The Salmonella agona outbreak associated with the French baby milk formula maker Lactalis (reported in last month's bulletin) continues to make the news with reports that the plant in Craon in North West France was given a clean bill of health by officials from the food safety department just three months before the company initiated a major product recall. The fall out has also spread to several French retailers who have admitted to inadvertently selling affected batches of the infant formula after the recall notice was announced, and it has been reported that criminal investigations are ongoing over the recall process which involved 12 million products in 83 countries. In another recent development, the European Centre for Disease Prevention and Control and the European Food Safety Authority have issued a communique stating that as most batches have not passed their expiry date and may still be being used by consumers, then further cases cannot be ruled out. Spain and Greece are the latest countries which have reported cases of Salmonella linked to the outbreak. The current number of infants reported to have contracted Salmonella from the infant formula milk is 37.

Meanwhile it has just been revealed in Ireland, that products potentially contaminated with Salmonella which were put on hold awaiting destruction last year by Mars were inadvertently released into the market by a third party logistics partner, prompting a product recall. The affected products were Galaxy Smooth Milk bars and Maltesers Fun Size bags. There have been no reports of any illnesses associated with the consumption of these products.

Antimicrobial Resistance in Campylobacter isolated from UK retail chickens

Public Health England have issued interim results as part of the Food Standards Agency project into the antimicrobial resistance of Campylobacter isolated from retail chicken in the UK. The report covers the period from 2015-16

Multidrug resistance (defined as reduced susceptibility to at least three different antimicrobial classes) was found in 1.5 % of all isolates examined. The proportion of multi-resistant isolates was significantly higher for *Campylobacter coli* compared to *Campylobacter jejuni*.

Overall, no significant changes to the trends previously reported have been identified but the report urges further monitoring.

Bacteriocins can reduce the level of Listeria in fish

A Canadian company has developed a bacteriocin which is claimed to reduce the levels of *Listeria monocytogenes* in fish. The company claim that the product (derived from a bacterial culture naturally present in marine environments) is an alternative to traditional barriers for microbiological growth such as chemicals and salt. The company claim that the bacteriocin (Bac M 35) prevents the growth of *Listeria* over 21 days at 4°C without affecting the taste or nutritional content of the product.

Bacteriosins are toxins produced by bacteria which are designed to inhibit the growth of closely related bacterial species. The ability to produce bacteriocins confers a significant competitive advantage for bacterial strains when growing in mixed bacterial populations in a nutrient depleted environment.

In a similar way to how research into Bacteriophages is being examined as an alternative to conventional antimicrobial therapies, it would appear that bacteriocins may prove to be a natural alternative and traditional forms of food preservation.

EFSA publish findings of Listeria survey

The European Food Safety Authority have published a scientific opinion document on *Listeria monocytogenes* and the risks to public health from the consumption of contaminated ready to eat food. The work came after the 2015 zoonotic diseases report which identified an increasing trend of listeriosis during 2009-2013.

Consumer actions such as cross contamination and storing RTE food at elevated temperatures and exceeding shelf life times were cited as possible reasons as to why the incidence of listeriosis is increasing, especially in the >75 age group. The number of cases in the EU increased from 1,381 in 2008 to 2,206 in 2015 when also 270 deaths were reported which was the highest number since 2008.

Strains of just 3 serotypes (1/2a, 1/2b and 4b) have been associated with 98% of all human listeriosis.

The report stated that the persistence of *Listeria* in food processing environments is still the major cause of contamination in RTE foods. This is as a result of improper hygiene conditions and the high adaptive capacity of the organism against physical and chemical factors such as the ability to form protective biofilms.

Other bacteria may be able to produce botulinum toxin

Newly published research has identified the gene cluster which is responsible for the production of the neurotoxin produced by *Clostridium botulinum* in other intestinal bacteria. Researchers found that Enterococci which normally reside in bovine intestines carry the gene cluster raising the possibility that the commercial production of the toxin (which has increasing uses both medically and within the cosmetic industry) may not be restricted to *Clostridium botulinum* alone.

Was Salmonella responsible for the collapse of the Aztec empire?

In 1545, people in the Mexican highlands starting dying in enormous numbers. People infected with the disease bled and vomited before they died. Many had red spots on their skin. It was one of the most devastating epidemics in human history. The 1545 outbreak, and a second wave in 1576, killed an estimated 7 to 17 million people and contributed to the destruction of the Aztec Empire. Identifying the pathogen responsible has been difficult for scientists because infectious diseases leave behind very little archaeological evidence. However new research has used algorithms to match the DNA extracted from bones and other tissues of the victims to try and match DNA sequences to pathogenic bacteria. The researchers found that the most likely cause of the illnesses was *Salmonella para-typhi C*.

Burns night Haggis recall

As tonight is Burn's Night it seems appropriate to end with news that for the second time in 6 months a manufacturer of haggis has had to initiate a product recall due to inadequate botulinum controls. If a product is vacuum or modified atmosphere packed and does not have any controls to prevent the growth of non-proteolytic *Clostridium botulinum*, then a shelf life of less than 10 days must be applied.

