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# Microbiology Bulletin 102

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## New Food Safety Network created

The Food Standards Agency (FSA) has announced that in partnership with The Biotechnology and Biological Sciences Research Council (BBSRC), they are to invest £1.6m into the creation of a new Food Safety Network which will be hosted by the Quadram Institute.

The FSA has issued a communique in which their Chief Scientific Advisor Professor Robin May stated 'We are excited to partner with BBSRC and Quadram Institute for the creation of the UK Food Safety Network. Foodborne disease is a major cause of illness in the UK population and imposes a significant burden on both infected individuals and the economy. The network directly aligns with the core objectives of the FSA Strategy 2022-2027 to ensure food is safe and food is what it says it is. Importantly, the network will ensure that the FSA is well-placed to tackle the challenges of foodborne illnesses by bringing together experts from government, industry and academia to address current and emerging issues of food safety in the UK.'

The objectives of the network are listed as:

- assemble a community of UK food producers, food policy makers and scientific researchers who collectively can take robust actions toward improving food safety
- identify areas of research need and opportunity that, in the view of food stakeholders and network members, will have meaningful impacts on UK food safety
- coordinate new collaborative research activities that will promote the application of science towards the food safety challenges identified by our food system community
- host training promoting skills development, interoperability and relationship-building between our food system community
- translate the knowledge generated within the Network to food safety stakeholders, and to upcycle existing information and technologies relevant to food safety that have not yet been applied more broadly

For those of you who (like me) have never encountered the word interoperability before, it is the ability of computer systems or software to exchange and make use of information.

The Quadram institute director Professor Ian Charles is quoted as stating 'The safety of our food is threatened by both enduring and emerging threats from microbes that contaminate our food. This threat is exemplified by microbes that spread between the environment, animals and humans - with foodborne exposures being a means for the transmission of pathogens and novel antimicrobial resistance genes from agriculture.'



'The challenge is to take an integrated and unified approach to these problems right through from agriculture and the environment, to food production and human health, in what's termed a 'One Health' approach. To do that we need to collaborate with food and other associated industries to share research and innovation and deliver training activities.'

In the introduction to the press release, the FSA also issued a summary of latest information on foodborne illnesses in the UK, which makes interesting reading.

- in the UK, estimates indicate there are 2.4 million cases of foodborne illness a year
- the estimated annual cost from these illnesses is £9 billion (with £6 billion from unknown causes)
- research shows that the cause of illness is often a microbial pathogen carried over into food from the environment, or from livestock, or even from people
- the microbes which cause the greatest economic impact are *Campylobacter* and *Salmonella*
- *Listeria*-related food poisoning is rare, but has a mortality rate of nearly 13 per cent
- microbes also play a key role in food waste, with *Pseudomonas* accounting for 25 per cent of food spoilage

## Smoked trout fillets recalled

The FSA have issued product recall details of British Hot Smoked Rainbow Trout Fillets due to *Listeria monocytogenes* having been found in the product.

Because of the ubiquitous nature of *Listeria* in these types of products and the very wet processing conditions there has historically been a high incidence of *Listeria* in ready to eat smoked fish. A Swedish survey of 150 smoked fish samples collected from retail supermarkets published as long ago as 1996 described how *L. monocytogenes* was isolated from 12 of 58 gravadlax fish samples, 3 of 26 cold-smoked and one of 66 hot-smoked fish samples. Ten of the 16 positive samples contained *L. monocytogenes* at levels of more than 100 cfu/g, with the highest level (132,000cfu/g) being found in a sample of hot-smoked rainbow trout.

Meanwhile it has now been reported that 2 people have now died in the on-going Listeriosis outbreak linked to the consumption of smoked fish which we reported on in the April bulletin. There is currently no evidence linking the above-mentioned recall with this outbreak.

## Salmonella peanut butter outbreak - update

The integrated nature of food manufacturing has once again been illustrated by the current *Salmonella senftenberg* outbreak in the U.S. which has been linked to the consumption of peanut butter. Just two more illnesses have been recorded since we mentioned the outbreak in last month's bulletin, but it has led to numerous recalls of not only the affected batches of the product but also many recalls of products which incorporated the peanut butter as an ingredient. To date there have been 16 recalls of products in the U.S. alone, with many more anticipated worldwide. The company has revealed that the peanut butter was also distributed to Canada, Dominican Republic, Malaysia, Taiwan, Korea, Thailand, Honduras, Spain, Japan and the UK.



In 2009, the Peanut Corp of America initiated a recall of their peanut butter after a link was discovered between their products and an outbreak caused by *Salmonella typhimurium*. This recall became the most expensive food recall in U.S. history and resulted in nearly 4,000 downstream products being recalled by 361 companies.

## Finland updates numbers in 2021 *Salmonella* outbreak

In the July bulletin last year we reported on a *Salmonella* outbreak in Finland which had affected 450 people (mainly children) and was linked to contaminated salad containing iceberg lettuce, cucumber and peas which had been served to children in pre-school and nursery centres.

In their annual review, the Finnish Food Authority have now revealed that over 700 people were affected. This outbreak skewed the 2021 annual figures which detailed 46 foodborne outbreaks affecting almost 1,400 people, which was a sharp increase on the 2020 figures, in which there were 34 reported outbreaks which affected just 543 people. Seven *Salmonella* outbreaks sickened 824 people compared to three outbreaks which only affected 21 people in 2020.

## Ferrero chocolate *Salmonella* outbreak - update

Both the UK and France have issued updates on the number of people affected by the *Salmonella* outbreak linked to the consumption of kinder chocolate products produced at the Ferrero factory in Belgium.

The UK has now revealed that 122 people have been affected whilst France has reported that 118 people have been ill due to the outbreak.

The European Centre for Disease Control and Prevention (ECDC) reported 445 cases as of June 3, with cases being found in the US, Canada as well as 13 European countries.

It has been reported this week that the Arlon plant in Belgium has now been allowed to reopen and that the authorities have granted conditional approval for the plant to resume production.

## Numerous recalls in France of confectionary products

In January's bulletin we looked at product recalls of raw flour in the UK, and in France this month there have been numerous recalls of various types of strawberry and raspberry tartlets because *Salmonella* had been detected in the pastry base.

As we discussed in January, one would assume that the temperatures required to bake the base of the tarts would be sufficient to kill *Salmonella* but presumably a risk assessment of the production process has concluded that there is a potential food safety risk to the public.

## Strawberries and raspberries contaminated with viruses

Although the above-mentioned recall of the fruit tartlets was due to the base, there have been several recalls in Canada of various products containing frozen raspberries due to the presence of *Norovirus*.

Additionally, it was reported earlier this month that an outbreak of *Hepatitis A* in the USA and Canada was linked to the consumption of organic strawberries.



## Tahini products once more recalled due to the presence of *Salmonella*

In Germany there have been at least three different product recalls due to the presence of *Salmonella* in Halva/Tahini/Sesame seed products, and there has been an additional recall of this product due to *Salmonella* contamination in Iceland. We have discussed the reason as to why *Salmonella* is detected so frequently in these products before (whether it is the incidence of the organism in the raw material/the production process/or increased surveillance of a troublesome product), but for whatever the reason, barely a month seems to go by without these products being recalled in some part of the world due to the presence of *Salmonella*.

## Battered chicken recalled in Northern Ireland

In Northern Ireland a batch of battered chicken goujons has been recalled due to the presence of *Salmonella*. Once again this is an example of a ready to cook product which will undoubtedly have a validated cooking process which will be sufficient to kill *Salmonella* being recalled due to a perceived food safety risk.

The recall brought back memories of the 2020/21 *Salmonella* outbreak which was associated with the handling and consumption of breaded chicken products which affected over 500 people.

## Giant bacteria discovered in the Caribbean

And finally for this month, the term microorganism is definitely a misnomer when it comes to a bacterium whose existence has been revealed last week in an article in the journal Nature.

Detected on rotting leaves submerged in the mangroves of Guadeloupe in the Caribbean these filament-like organisms, up to a centimeter in length, are the biggest single-cell bacteria yet to be found. Named *Thiomargarita magnifica*, they live by oxidizing sulfur, and are 50 times bigger than any other known bacteria.

Although the organism was first discovered in 2008, research which has been recently carried out at the Lawrence Berkeley National Laboratory in California which looked at the bacteria more closely using a range of methods, including transmission electron microscopy has established that it is indeed a single celled organism.

The discovery challenges conventional wisdom about the size limit of bacteria. The article authors suggest that the remarkable size is due in part to the possession of a large vacuole, around which are membrane-bound structures, which the authors call pepins and describe as being like the organelles found mostly in eukaryotic cells. In other (conventional) bacteria, the genetic material floats freely inside the cell, usually in the form of just one circular chromosome. In *T. magnifica*, the researchers at the Berkeley laboratory saw that the genetic information was stored in hundreds of thousands of the above mentioned pepins, each of which contained DNA and ribosomes.

As the presenter used to say at the end of every Crimewatch episode "Don't have nightmares" and remember that these centimeter long bacteria which are clearly visible with the naked eye are non-pathogenic and have to date only been found in the Sulphur rich environments of the mangrove swamps, so it looks like we won't be getting rid of our microscopes just yet.