



### Public Health England to be replaced by new agency

This month marks 40 years since I started work at the Public Health Laboratory Service Board. During that time it has undergone three transformations, becoming first The Health Protection Agency (HPA), and then in 2013 following a restructure when public health was brought under control of the Department of Health and Social Care, Public Health England (PHE). Last week, the Health Secretary Matt Hancock announced the creation of a new agency called the National Institute for Health Protection (NIHP) which will focus on controlling infectious disease, pandemics and health protection, and which will replace PHE.

In a prepared statement Matt Hancock said “To give ourselves the best chance of spotting and being ready to respond to other health threats, now and in the future, we are creating a brand new organization to provide a new approach to public health protection and resilience.”

In addition to the work done during the current pandemic, PHE circulates laboratory data on pathogens, communicable diseases and reports on foodborne outbreaks, incidents and ongoing investigations. PHE Food Water and Environmental Microbiology lab staff are involved in investigating outbreaks of foodborne disease.

PHE is also the United Kingdom’s national reference laboratory (NRL) for food microbiology, and it is as yet unclear how these and other functions will be transferred to NIHP.

The organisation currently employs around 5,500 full-time staff, made up mostly of scientists, researchers, and public health professionals.

It has been reported that it is the intention to model the new agency on Germany’s Robert Koch Institute (RKI). It will start immediately and the transition will be complete in spring 2021.

### FSA recalls several products containing Brazil nuts due to possible *Salmonella* contamination

Contaminated Brazil nuts have been responsible for several product recalls by the Food Standards Agency in the last few days. The recalls have included a dark chocolate muesli bar with Brazils, Fruit and Nut bars containing Brazils, Coco and Hazelnut grain free granola and a brand of Muesli both of which contained Brazil nuts.

It has been reported that several people fell ill after eating the fruit and nut cereal bars.

The water activity of Brazil nuts will vary over the expected shelf life of the product, but it can be as low as 0.6, which is clearly too low for *Salmonella* to grow on the product. *Salmonella* will not actively grow in water activity levels of below 0.92, so this once again this serves as an example of how *Salmonella* can remain viable and potentially infectious in a microbiologically “hostile” environment.

### Peaches recalled in the US and Canada

In another example of the robust ability of this organism, there is currently an outbreak of *Salmonella enteritidis* across 9 states in America which has affected 68 people which incredibly has been linked to the consumption of whole peaches.

Peaches and peach juice has a pH of between 3.4 and 3.6 so once again way below the pH value of 4.2 which is known to inhibit the growth of *Salmonella*.

How the product has become contaminated on such a wide scale has not yet been identified, but the recall notice has now been extended to Peaches distributed to Canada.

### Onions recalled due to the presence of *Salmonella*

To complete this section (if further evidence was needed), there has been news of a recall of onions which have been implicated in an outbreak of *Salmonella newport* which has affected 867 people in the US and Canada.

Onions (and garlic) are well known for their anti-microbial activity due to the presence of various Sulphur compounds, so once again, the survival of *Salmonella* in this product is testament to its remarkable tenacity to remain viable in unexpected food matrices.

## Research published on a universal selective broth

One of the fundamental principles in all microbiological techniques is selectivity.

It is acknowledged that in any food matrix, the target bacterium (*Salmonella*, *Listeria* etc) may not be the predominate organism, so we have to encourage the growth of our target organism so it achieves levels at which it becomes detectable, whilst at the same time suppress the growth of the other competing bacteria which, if left unchecked may hinder our chances of successfully detecting the pathogen.

We normally try to utilise a unique growth characteristic of the target organism and incorporate this into the selective media. For example, *Salmonella* can tolerate very high levels of bile salts, so incorporation of sodium desoxycholate into the selective agars (for example XLD and DCA) helps to promote the growth of *Salmonella* over the other organisms which may be present in the sample.

If we know that our target organism has developed resistance to a particular antibiotic, we can incorporate that into the selective broth or agar in the hope that it will still be effective against, and suppress the growth of other organisms.

We can also incubate our plates and broths at temperatures which we know that the target organism can tolerate, but which are too high for the majority of competing organisms to be able to grow, for example incubation of Rappaport-Vassiliadis broth at 41.5°C.

To date all established selective broths are unique for the individual target organism, but a new research paper published this month in the Journal of Food Safety claims to have developed a "universal" selective broth which is suitable for *Salmonella*, *Listeria*, *Staphylococcus aureus* and *E coli 0157*.

The selective agents include acriflavine, lithium chloride, sodium chlorate and the antibiotic nalidixic acid.

The advantages of having a single enrichment platform for multiple organisms is obvious, but it has to be acknowledged that in food microbiology we are often trying to recover cells which are "stressed" due to the conditions which the bacteria have been subjected to in the manufacturing process, and we have to make sure that the selective agents are not having a detrimental effect on the target, as well as the non-target bacteria.

Although the paper stated that the broth gave a 5 log increase of all 4 target bacteria, and successfully inhibited the growth of the background flora, it did not state how the broth compared to the established individual selective broths for the individual organisms.

## PHE highlights a potential increase in *E coli 0157* cases

Public Health England is investigating a spike in reports of Shiga toxin-producing *E. coli* (STEC) infections (particularly in the midlands) this month. Potential sources of the increase in *E. coli 0157* cases are not yet clear but recent warm weather may have played a role.

The latest available data shows in the week ending Aug. 16, there were 27 *E. coli 0157* notifications, which may be a significant increase on the numbers seen over the past four weeks, which have been 11, 13, 6 and 7 respectively.

## Global warming may lead to a rise in *Campylobacter* in Nordic countries

In last month's bulletin we revisited claims that global warming may be responsible for an increase in the number of *Vibrio parahaemolyticus* outbreaks due to the rise in sea temperatures, and this month, new research published in the journal Scientific Reports has predicted that *Campylobacter* levels in the Nordic countries may rise as a direct result of global warming. Scientists used national surveillance data to analyse the relationship between climate and Campylobacteriosis in Denmark, Finland, Norway, and Sweden and estimated the impact of climate changes on future disease patterns.

Predictions indicate that *Campylobacter* cases in the four Nordic countries combined may increase by 25 percent by the end of the 2040s and 196 percent by the end of the 2080s compared to the predicted baseline of 2000 to 2015.

## Information released on UK *Listeria* outbreaks in 2018

The source of only 1 out of the 4 recorded outbreaks of Listeriosis in 2018 was determined in new information released by Public Health England.

The one which was solved was an international outbreak that involved 12 cases in England from 2015 to 2018 and was traced to frozen sweetcorn and vegetables produced by Greenyard in Hungary. It was found that people had eaten the frozen sweetcorn uncooked, although instructions on the packaging told consumers to cook it. Implicated frozen products were distributed to 116 countries and caused 54 cases in total.

In 2018, 156 cases of listeriosis were reported in England and Wales and 32 people died which was higher than the 135 infections in 2017 but otherwise the lowest total since 2011.

Because of the fact that *Listeria* only seems to be problematic for people who fall into the "vulnerable" category and due to the long incubation period before symptoms appear, tracing outbreaks to find the source of infection can be problematic.