



### CFA criticise proposed change to EU 2073/2005

The Chilled Food Association (CFA) has criticised proposed changes to the *Listeria monocytogenes* legislation in the EU document 2073/2005, which are expected to require challenge testing to set a product shelf life, rather than the established Day of production (DOP)/End of Life (EOL) shelf life trials.

The CFA stated that the expected changes will particularly affect chilled foods made on the continent, where shelf lives are substantially longer than those in the UK's tightly controlled local market, but the changes will also impact UK manufacturers who export to the EU. They claim that the changes will result in increased waste due to reduced shelf lives, increased prices from highly specialised testing and have questionable food safety benefits.

Karin Goodburn from the CFA stated "The systems the UK chilled food sector has in place to detect and control *Listeria* have worked extremely well for the last 16 years since the current EU Regulations came into force. The EU's approach is also flawed in that it only covers the testing of food and does not address the critical hygienic control of the food production environment. We can see no obvious public health or sustainability benefit to the changes and will continue to lobby the EC to retain the DOP/EOL and storage trial approach as it is demonstrably highly effective".

Challenge testing involves inoculating a product with a known level of the target organism and monitoring the levels throughout the shelf life to see if the normal storage conditions support its growth or not. There are strict guidelines which need to be followed including the types of strains used (a mixture of known control and wild strains), how the organism is introduced into the product (surface or core inoculations) and how the product is stored so that we mimic the normal routes of contamination and storage of the product.

It is rarely possible to accurately replicate the way in which pathogens gain entry and grow under the normal storage conditions, and we are using cultures (wild and control) which have been grown in the lab, so there is no guarantee that they will behave in the same way as they do in the natural environment.

Challenge testing can be a useful tool, but it has its limitations (as detailed above) so ideally shelf life determination should not just rely on challenge testing but also incorporate data sets from the more traditional methods of analysis.

### Salmonella outbreak linked to Tahini and Halva – EFSA update

In July's bulletin we reported on a European wide multi-strain *Salmonella* outbreak associated with the consumption of Tahini and Halva imported from Syria. The European Food Safety Authority has issued a recent update which suggest that the number of affected people has now risen from 80 to 120.

Based on epidemiological information and Whole Gene Sequencing analyses, the EFSA stated that patients with the *Salmonella* serovars *Mbandaka*, *Havana*, *Orion*, *Amsterdam*, *Senftenberg* and *Kintambo* are all potentially included in the outbreak. The affected countries include Germany, Sweden, Norway, Denmark and the Netherlands.

The products are sealed and ready to be consumed, which suggests that contamination occurred before they reached the European market. Control measures on the involved batches have been implemented since August 2020. However, cases were still being reported as recently as September 2021 and the EFSA has suggested that this could be because the products have a long shelf life and have been stored in people's homes.

### US *Salmonella oranienburg* outbreak - update

The Centre for Disease Control (CDC) has confirmed that imported red, yellow and white whole onions from Mexico are the cause of the outbreak which now has 650 confirmed cases across 37 US states with 129 hospitalisations.

The CDC stated "Epidemiologic and traceback data show that illnesses in this outbreak are linked to whole red, white and yellow onions distributed by ProSource Inc. that were imported from Chihuahua, Mexico. Investigators are working to determine if other onions or suppliers are linked to this outbreak."

Although the affected batch of onions were last imported in August, because they can last up to three months in storage, the CDC stated that they may still be in homes and businesses. This has led to numerous recalls of onions and products containing the affected batches in the last week.

As stated last month's bulletin, initial investigations had identified the outbreak strain of *Salmonella oranienburg* in a condiment container containing leftover lime and coriander. At the time it was noted that the condiment cup had also contained onions, although none were left when the condiment contents were tested.

## More cold plasma applications identified

Just over a year ago in the September 2020 bulletin we reported on an innovative cold plasma wash water treatment which it was claimed could be beneficial in washing delicate fresh produce, and this is just one of several food safety applications which have now been identified for this technique. Other studies have now shown cold plasma techniques to be effective in reducing *Listeria* on the surfaces of apples, and Norovirus, Salmonella and *E. coli* on blueberries.

A spokesperson for the United States Department of Agriculture stated that “cold plasma (which is created by breaking apart gas molecules and making a plume of charged electrons and ions), is becoming an emerging non-thermal technology that offers the advantage of being chemical and water free, whilst being able to operate openly and continuously at normal atmospheric pressure”.

## 2018 data for European Cryptosporidiosis cases released by the ECDC

Frustratingly, analysis of large amounts of data inevitably takes a long time to compile, and a report highlighting European infections caused by the waterborne *Cryptosporidium* parasite in 2018 have only just been published this month by the European Centre for Disease Prevention and Control (ECDC).

In 2018, 20 countries reported 14,299 cryptosporidiosis cases compared to 11,435 in 2017) and was the highest number of confirmed cases reported in 4 years. Germany, Netherlands, Spain and the UK accounted for 76 percent of all confirmed cases, with the UK alone making up 41 percent with 5,820 infections.

As in previous years, most of the cases were reported in autumn (peak in September), but in 2018 a smaller peak was also observed in spring (April). Children aged 0–4 years had the highest notification rate of 15.8 cases per 100,000 population.

The ECDC report concludes that “despite a relatively low notification rate in the EU/EEA, cryptosporidiosis is an important enteric disease that needs to be monitored and controlled. A better understanding of the epidemiology of cryptosporidiosis in Europe, in terms of species and subtype distribution and trends, is also needed. This requires increased laboratory testing for parasites, pathogen isolation, speciation and subtyping, as well as more complete reporting”.

## WGS enables a better insight into complex microbial interactions

The advent of Whole Genomic Sequencing (WGS) has transformed our understanding of the way in which microorganisms interact with each other and has enabled us to gain a better insight into the complex synergistic and antagonistic interactions which are constantly happening in any environment whether it be a food matrix, an environmental surface such as a biofilm, or our own microbiome within our intestines.

Traditional microbiological cultural techniques are typically targeted, which means we either look for a specific organism, or we incubate non-selective plates at a specific temperature, for a defined time under specific atmospheric conditions. This method of analysis not surprisingly only enables us to demonstrate the presence of a relatively small amount of the total number of microorganisms which may be present in any sample at any given time.

What we don't often appreciate (because we are not always even aware of their existence) is the role that the viable but not culturable organisms play in the growth of the target organisms which our analysis is designed to detect.

We are often quick to consider the intrinsic and extrinsic properties of a food matrix which may influence the potential for growth of pathogenic and spoilage bacteria such as the pH and  $A_w$ , or storage temperatures and atmospheres, but the advent of WGS methodologies has highlighted the role in which bacteria affect the growth of other bacteria through the production of bacteriosins which are chemicals produced by some species of bacteria to inhibit the growth of others when they are competing for essential nutrients.

The interaction between bacteriophages (viruses which infect specific strains of bacteria) is also a significant growth limiting factor for potential pathogens. Add to this competitive inhibition, where some bacteria can simply outcompete others for a limited or finite food availability, and it is clear that perhaps the most important growth limiting factor for organisms which can impact on food safety and quality is not the intrinsic or extrinsic properties of the food itself, but the presence and quantity of the other microorganisms which may be present in the food.

It may be that the food testing lab of the future not only looks for indicator organisms, pathogens and spoilage organisms as we do now, but also looks for these so called “biomarker organisms”, which will give an indication of the food safety, spoilage potential and benefit to the hosts microbiome of any given food.