Food & Pharmaceutical

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## UK outbreak of E coli 0157 linked to salad leaves

Public Health England (PHE) is investigating an outbreak of E. coli O157, which may be associated with eating mixed salad leaves. To date, 109 cases (figure correct as at 4 July 2016) of this strain of E. coli have been identified (102 in England, 6 in Wales and 1 in Scotland) with the South West of England particularly affected.

PHE has been working to establish the cause of the outbreak and has now identified that several of the affected individuals ate mixed salad leaves including rocket leaves prior to becoming unwell. Currently, the source of the outbreak is not confirmed and remains under investigation. Dr Isabel Oliver, director of PHE's field epidemiology service, said: "At this stage, we are not ruling out other food items as a potential source."

The particular strain involved in the outbreak has been identified as phage type (PT) 34.

## Bacteriophages – Topic of the Month

We have considered the potential use and benefits of bacteriophages many times in our monthly bulletins and now the Food Standards Agency has published the results of a project aimed to assess the available information on the current and potential uses of bacteriophages in food production to reduce the level of microbiological contamination thus increasing consumer protection and increasing the shelf life of food. The study was carried out on behalf of the FSA by Campden BRI.

The key conclusions from the review are summarised:

- Some bacteriophages are already approved outside the EU for use on foods to reduce microbiological contamination by food pathogens such as *Listeria, Salmonella* and *E Coli O157*.
- Additional work is required to establish the effectiveness of using bacteriophages against food spoilage bacteria as there is a lack of published studies in this area.
- Further work is needed to confirm if bacteriophages provide a one off 'kill' or whether they have an ongoing effect and so could protect against recontamination of food by the bacteria. This is important as the mechanism of action of a bacteriophage will determine whether they should be regulated as food additives or as processing aids. Additionally, if they only act as a one off 'kill' then food could be susceptible to being re-contaminated by the bacteria and so there could be an increase in the level of the food pathogen following the use of the bacteriophage.
- If bacteriophages have an ongoing effect and continue to reduce the level of bacterial contamination of food (i.e. protect against recontamination) they would be regarded as food additives, which require approval prior to use under EU food additives legislation. If they act as a one off 'kill' they may be considered to be processing aids and so would only require approval under EU food hygiene legislation if used to decontaminate the surfaces of meat or fish.
- Optimisation of the treatment process (i.e. contact time and temperature) is required to obtain the optimum results as the effectiveness of the treatment varies significantly with the type of food.
- It was considered unlikely that a single bacteriophage would be effective against all strains of a particular bacterial species. Therefore the use of a 'cocktail' of bacteriophages may be

necessary to reduce bacteria levels. The use of a bacteriophage with other antimicrobial treatments (e.g. nisin) often resulted in an improved 'kill' of the target bacteria.

The impact of bacteriophages on toxin-producing bacteria and on how they may influence the human gut microflora should be investigated further.

In addition to this review, there has been recently published articles surrounding the use of bacteriophages in reducing Salmonella in poultry flocks (carried out by scientists at the University of Nevada) and the use of bacteriophages to treat human Vibrio infections (published in the journal Frontiers in Microbiology).

## Don't be afraid of using your freezer

Misconceptions about how to freeze food safely are contributing to food waste in the UK, according to new research by the Food Standards Agency.

The research – released as part of Food Safety Week (4-10 July) – identified a number of freezing 'myths' that are preventing people from using their freezers to make food go further. 43% of those interviewed think that food should only be frozen on the day of purchase to be safe; 38% incorrectly said it is dangerous to refreeze meat after it has been cooked; and 36% wrongly believe that food can become unsafe to eat while in the freezer.

Steve Wearne, Director of Policy at the FSA, said 'The freezer is like a pause button, so you can freeze foods right up to the 'use by' date. While food is kept safe in the freezer, it's the quality that deteriorates over time, so we recommend eating it within three to six months and checking for any freezing instructions on the packaging. Once defrosted, the pause button is off, so defrost food as and when you need it and eat it within 24 hours of it being fully defrosted.'

It is worth remembering that all microorganisms require water to be able to grow, but can only utilise water when it is in its liquid state, so growth will not occur when frozen. Things are further complicated however on thawing as the damage caused by ice crystals to the cells of the animal or plant material which has been frozen can increase the likelihood of bacterial or fungal growth as this can cause leakage of intracellular nutrients, so the rate of spoilage after thawing may be greater than in the pre-frozen state.

Occasionally we get requests to perform shelf life studies on frozen products, so the advice to the clients should always be that although there may be merit in obtaining shelf life data for establishing the life after defrost, establishing the shelf life in microbiological terms of a frozen product is a waste of time and money.

## Annual Report of Food Incidents Published

The Food Standards Agency has published its latest Annual Report of Food Incidents. It shows that in 2015, the FSA and Food Standards Scotland were notified of, investigated and managed 1,514 food, feed and environmental contamination incidents in the UK.

Most of the pathogenic micro-organisms incidents were related to either Salmonella or E. coli. In common with previous years, many of the Salmonella incidents in this period were associated with contaminated paan leaves from the Indian subcontinent, with 46 such incidents in 2013, falling to 18 and 22 respectively in 2014 and 2015.

However the number of other Salmonella-related incidents increased from 56 and 50 in 2013 and 2014 to 88 incidents in 2015. These 2015 incidents do not appear to be related to any particular cause, country of origin or foodstuff.

Reporting of shellfish monitoring accounts for most of the incidents related to E. coli. In this context, high indicator E. coli counts are used to identify poor hygienic conditions in harvesting areas, and are not necessarily pathogenic. The report states that there are many different types of E. coli. Some live harmlessly in the intestines of humans and animals, whereas pathogenic strains can cause illness if contaminated food is consumed. High counts of E. coli can signify a risk that faecal pathogens are present and are used as an indicator of poor hygiene conditions, but are not necessarily harmful.

## Implications of Brexit to Food Microbiology

As many of the food safety regulations are enshrined in EU legislation watch this space over the coming months…. or years!!!