Food & Pharmaceutical

Microbiology bulletin 9 April 2014

Draft guidance on *E coli 0157*

A draft document on the application of article 14 of regulation (EC) N°178/2002 where shiga toxin producing *E coli* (STEC) has been detected in food has recently been published.

The document provides guidance for a harmonised application of the regulation across all member states. The focus is on beef, as cattle are considered to be the main reservoir of STEC, but the same structural approach can be used with other food matrices as well.

The guidance offers a decision tree which helps in assessing the significance of positive STEC results when the raw product is likely to be consumed with a mild heat treatment which may not eliminate or reduce the risk to an acceptable level such as minced beef steak consumed rare; such food is given a high risk profile.

Where the food is likely to be consumed with the appropriate treatment to eliminate or reduce the risk of infection and for which clear information is given to the consumer on the avoidance of adverse health effects from a particular category of foods; then such foods are deemed to have a low risk profile.

The document states that the detection of verocytotoxins alone, or the genes encoding for such verocytotoxins is not a sound scientific basis for assessing the disease risk to the consumer and states that there is no single or combination of markers that defines a pathogenic STEC. They have proposed a molecular approach which relies on genes encoding for virulence characteristics additional to the presence of stx genes and have produced a flow chart to summarise the recommended approach.

It is recommended that member states take into consideration both the molecular approach and the risk profile of the food involved when assessing the safety of a particular food in which STEC has been identified.

Situation report: reduction of *Campylobacter* from Poultry

The FSA have issued an interim report of the progress of the renewed strategy to reduce the incidence of *Campylobacter* in poultry which was mentioned in the September 2013 bulletin.

It states that the key technical development in the last 6 months has been the successful trialling of a Rapid Surface Chilling process. These trials have delivered a significant reduction of *Campylobacter* contamination levels (to less than 10% of the original level) whilst operating within the current legislative temperature requirements for fresh poultry meat.

Other key developments are listed as an industry wide commitment to reduce *Campylobacter*, consistent and impactful communication of hygiene messages about *Campylobacter* to customers and changes to poultry meat hygiene regulations.

The FSA is continuing to monitor the levels of *Campylobacter* at the end of the slaughter line (post chill), and recent data shows no evidence of significant change and the number of reported cases of human *Campylobacter* has continued to be close to the high level seen in 2012.

EURL technical guidance document for conducting shelf life studies on Lm

The European Union Reference Laboratory for *Listeria monocytogenes* has published a draft version 3 for guidance in conducting shelf life tests on *Listeria monocytogeges* in ready to eat foods.

Whilst the guidance is very complicated and almost certainly puts the testing beyond the scope of contract testing labs and beyond the budget of most food manufacturers; it does focus the mind on just how complex the factors are which govern the growth of microorganisms in any particular food matrix.

The composition of the food product, the presence of additives or preservatives, the water activity, pH and the presence of other competing organisms all play a role in the potential for growth. Add the packaging conditions of the final product, the possibility of post processing contamination and the characteristics of the food chain and you see how incredibly complex and complicated it is to accurately predict what will grow in a food product and at what rate.

To then try and mimic these conditions and spike food matrices with cultures introduces new variables such as; the strain of organism (EURL recommends 1 reference and 2 wild strains), the method of inoculation (this should mirror the route of any likely contamination), inoculation of modified atmosphere or vac pack products (whilst still maintaining the integrity of the packaging) and product choice (when the challenge test is being used to cover a range of products).

The inevitable conclusion has to be that to conduct shelf life studies in accordance with the guidelines will require a level of expertise which is normally only found in specialist research laboratories.

The 5 second rule

A study performed by final year biology students and led by Anthony Hilton, Professor of Microbiology at Aston University has shown that food contains much less bacteria when picked up right away compared to a longer period of time, apparently confirming the well-known “5 second rule”.

They monitored the transfer of *E. coli* and *Staphylococcus aureus* from several indoor floor types, including carpet, laminate and tiled surfaces, to toast, pasta, biscuit, ham, dried fruit and a sticky dessert, with contact lasting between 3 and 30 seconds.

They found time an extremely important factor in bacterial transfers, with the type of flooring involved also having an effect. For example, bacteria has less chance of making contact with food on carpeting and was more likely to transfer when on laminate or tiled surfaces, especially when food was moist and left on the floor for more than 5 seconds.