The Society of Food Hygiene and Technology,Yorkshire & North East Branch

**Emerging Cleaning and Disinfection Technologies**
23rd March 2010, Asda House, Leeds

Time is moving on and new technologies are developing to address economic and environmental concerns. This was the message given by Steve Bagshaw, Technical Director of Holchem Laboratories Ltd at the SOFHT meeting in March at Asda House. The meeting was attended by representatives from three of the largest supermarket chains, DEFRA, cleaning companies, trainers, food producers and enforcement officers from four local authorities in the region.

Initially attention was drawn to the importance of equipment design in facilitating effective cleaning. In addition appropriate training in relevant cleaning procedures and a simple list of cleaning instructions were considered essential to ensure good cleaning; a workforce with low motivation can be a problem in some food sectors hence well thought out, clear and simple cleaning instructions using relevant products are a necessity if good standards are to be achieved.

Emphasis was given to the actual cleaning process in reducing microbial load; disinfection, although encouraged, was considered to be 'the icing on the cake'. A typical bacterial load can be reduced from $10^7$ to $10^3$ by cleaning alone, whereas subsequent disinfection is likely to reduce this by only two further log reductions i.e.$10^3$ to $10^1$; still beneficial, but only after the major load has been reduced by cleaning.

Steve provided an overview of common cleaning and disinfection methods, many of which have been in use for some time. Some of the more innovative cleaning technologies were discussed including the use of dry ice, now used in the bakery environment to remove dirt by high impact energy. Ventilation and monitoring of the atmosphere are essential controls to eliminate the hazards from the resultant gases. These technologies are gaining popularity in the food industry by reducing the risk of pathogens, mainly by limiting the use of water, thus creating less favourable conditions for bacterial growth.

Wet cleaning is still considered the most effective cleaning process; foams and gels are included in wet cleaning techniques, they aid contact time and can be easily applied to high vertical surfaces. Combined detergent/disinfectant products are now available although it is generally recommended that separate products are used in this type of process.

Other innovations such as microfibre cloths, providing electrostatic attraction, and capillary action if damp, can be as effective as wet cleaning although laundering is a more difficult process than with conventional cloths.

Cleaning-in-Place (CIP) systems continue to be popular. 'Pigging' is now a feature of some CIP systems; a novel product, a slug of ice, similar to the texture of a slush puppy, can be used to force out the food product or cleaning products in pipework; it has the advantage of fluid properties i.e. it can pass through valves and reform. Heat exchangers can use this technique in product recovery and to aid the cleaning process.

Common biocides, in particular salad, fruit and vegetable washes - essential products for caterers and fresh food producers, featured as a topic for discussion. Steve advised that there is still only a small selection of products on the market; some are weak organic acids such as hypochlorous acid and peracetic acid. Other products such as chlorine dioxide and ozonated water are available, however, sodium hypochlorite continues to be the most commonly used product to achieve a 2 log reduction in bacterial load. For organic products fruit acids such as Dry White and Fit are available but the cost can be discouraging; fresh water is commonly used as an alternative but this lacks the surfactants in the fruit acid products which aid wetting and also remove debris from the surface

Cleaning to remove allergens is an on-going challenge; emphasis is on appropriate cleaning procedures based on relevant standards; cleaning methods must be validated and the cleaning achieved must be verified. Separation of the food products and management of the environment must always be given consideration prior to implementing a cleaning regime as allergens cannot be "made safe" by using the cleaning chemicals in routine use.

Steve concluded the evening by highlighting the emerging problem of Clostridium estertheticum, a spore forming spoilage organism causing gas production in vacuum packed red meat products. Extended storage times at low temperature are considered partly responsible. To minimise the presence of this organism it was recommended that cleaning controls during slaughterhouse production (including the use of a disinfectant that is effective against the spore) are combined with temperature control during maturation and control of re-work / re-packing.

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