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Paper impregnated with Nanoparticles used to filter water

In the February bulletin we looked into the potential antimicrobial uses of nanotechnology, and further research has recently described how a book with pages impregnated with nanoparticles can be used in water purification. The "drinkable book" combines treated paper with printed information on how and why water should be filtered. Its pages contain nanoparticles of silver or copper, which kill bacteria in the water as it passes through.

In trials at 25 contaminated water sources in South Africa, Ghana and Bangladesh, the paper successfully removed more than 99% of bacteria. The researchers stated that the resulting levels of contamination were similar to US tap water. Small amounts of silver or copper also leached into the water, but these were well below safety limits.

The applications are directed towards communities in developing countries as it is estimated that 663 million people around the world do not have access to clean drinking water.

The ions of silver or copper come off the surface of the nanoparticles as the water percolates through the impregnated paper which are then absorbed by the bacteria. According to the researcher's field tests, one page can clean up to 100 litres of water so one book could filter one person's water supply for four years.

Although there are many other filtration techniques available the researchers state that this concept has the advantage of being affordable and is a catchy idea that people can easily understand.

VTEC infections in Scotland

Health Protection Scotland (HPS) has recently announced that is has established an enhanced surveillance of *E. coli* O157 in close collaboration with the Scottish *E. coli* O157/VTEC Reference Laboratory (SERL). This surveillance was extended in 2003 to include non-O157 VTEC.

There are consistently high rates of VTEC infection reported in Scotland compared to other UK countries, and there has been an increase in outbreak cases observed in 2014. The HPS state that this underlines the need for the continued and comprehensive application of the wide range of existing control measures embedded in food safety and other guidance in Scotland. In addition it highlights the importance of a comprehensive multi-agency approach to tackling VTEC in Scotland, as set out in the VTEC Action Plan for Scotland.

Salmonella and Listeria recalls

The Food Standards Agency have announced a recall of four cream products following the discovery of low levels of *Listeria monocytogenes* in batches of pasteurised double cream which were sold by three major retailers. The manufacturers of the cream stated that the contamination was due to an isolated incident linked to a dairy in East Kilbride, Scotland.

Four different types of milk chocolate wafers (Bakers Delight, Kelkin, Atkins Endulge and Tesco Free from

Belgium Chocolate Wafers) have all been recalled due to the possible presence of Salmonella. As well as the products sold in the UK, it is thought that the chocolate wafers, which were manufactured in the Netherlands, have been distributed across Europe to at least 14 countries. Numerous brands have been affected, but to date, no illnesses have been reported.

FSA re-evaluate advice on serving rare burgers

Despite previous advice to the contrary (as outlined in the Dec 2013 bulletin), the Food Standards Agency have now announced details of a proposed new approach to the preparation and service of rare burgers in food outlets.

The increased popularity of burgers served rare has prompted the FSA to look at how businesses can meet this consumer demand while ensuring public health remains protected. The FSA's long-standing advice has been that burgers should be cooked thoroughly as external contamination can become spread throughout the meat during mincing, such as in the preparation of burgers.

When the FSA Board meets in September, they will consider the range of controls businesses should take into account when they are considering serving rare burgers.

Food borne infections in Denmark

A report published in Denmark showed that foreign travel was the largest source of Salmonella infections, causing 48% of the illnesses. Salmonella infections accounted for 19.9 illnesses for every 100,000 inhabitants in Denmark in 2014.

The annual report also found that Campylobacter caused the most foodborne bacterial illnesses, totaling 3,782 cases.

Denmark recorded 92 Listeria infections during 2014, an 84% increase over the previous year. A single Listeria outbreak involving a Danish spiced meat roll was responsible for 41 of the cases.

With a population of just over 5.6 million, Denmark experienced 60 outbreaks of foodborne illnesses during 2014, down from 74 during the previous year. About 40% of these were Norovirus outbreaks connected to restaurants.

Lactic Acid Bacteria can help supress Listeria

As well as their applications in fermented products whereby they increase the shelf life of the product by their ability to reduce the pH of the food, Lactic Acid Bacteria (LAB) have been shown to reduce the likelihood of growth of pathogenic bacteria due to the formation of Bacteriocins.

Bacteriocins are antibacterial peptides, which can inhibit the growth of related bacteria in their near environment. Bacteria capable of producing these Bacteriocins therefore have a competitive advantage when growing in mixed cultures. A recent study has demonstrated that strains of *Listeria monocytogenes* responsible for recent outbreaks in Denmark and Sweden have been shown to be susceptible to bacteriocins produced by LAB.

Most ready to eat foodstuffs employ a number of hurdles such as pH, water activity, packaging conditions and atmospheres to prevent the growth of either pathogenic or spoilage bacteria, and the authors of this recent study suggest that the addition of the LAB to "at risk" products may introduce another effective hurdle.

Back to School – Warnings about the safety of lunch boxes

With the new school year about to start, there have been reminders about the potential for bacterial food poisoning in children's lunch boxes.

The USDA's Food Safety and Inspection Service has identified temperature abuse as a major concern and has recently published advice for keeping lunches out of the Danger Zone.