



UK - FSA recalls raw pastry products

On the 10th January the Food Standards Agency issued a recall of several raw pastry products due to the presence of Salmonella. The products included pizza dough, puff pastry, and short pastry. All are products which would normally undergo further baking and have sufficient heat treatment to kill Salmonella, which highlights the difficult decisions which must be made when assessing the significance of pathogens in products which are sold as ready to cook (RTC).

The outbreak of Salmonella which affected over 500 people in 2020/21 associated with RTC breaded chicken products illustrated that people can often become infected with pathogens such as Salmonella either by handling the product, by cross contaminating utensils or ready to eat items in the kitchen, or by simply not following the cooking instructions.

Whenever a pathogen is detected in a RTC product a Microbiological Risk Assessment should be carried out to determine the actual risk to the consumer. For example, if the product in question is a ready meal in which the contents remain in a sealed container and are heated until piping hot in either a microwave or oven then it may be argued that the risk to the consumer is low. The breaded poultry products however needed to be removed from their bagged packaging and placed on a baking tray in the oven which was typically done by hand. Many of the poultry products implicated in the outbreak such as chicken nuggets, had only been flash fried to give the product a nice golden appearance and to help the breadcrumbs stick to the chicken. This may have led consumers to believe that the product had already been fully cooked and was safe to handle without the need for subsequent hand washing.

The potential dangers of Salmonella in raw flour have been well documented following an outbreak in the US in 2015 which affected at least 46 people. There have also been recalls due to contamination with E coli 0121 in Canada in 2017, an outbreak of Salmonellosis due to *Salmonella typhimurium* in New Zealand in 2008 and an E coli 026 outbreak in 2019 in America.

Good practice when handling raw flour includes the washing of hands, utensils, and work surfaces after contact with flour and raw dough products, not to eat raw cake mix or cookie dough and to be aware that flour (along with any associated pathogens) may spread easily due to its powdery nature.

Another fatality connected with the Hepatitis A outbreak in the USA

In November's bulletin we reported on a Hepatitis A outbreak which was caused by an infected employee at a restaurant chain in America which had affected over 50 people. It has now been reported that a 4th person connected with the outbreak died of liver failure over the Christmas period. The individual was the husband of one of the 3 earlier fatalities.

Additionally, a restaurant in Pennsylvania has been linked to another hepatitis A outbreak in which there have been 9 confirmed cases and 2 possible fatalities.

This has once again prompted renewed calls for Hepatitis A vaccines to be mandatory for all food service workers, especially those who serve vulnerable groups such as the young and elderly.

Danish Enteroinvasive E coli outbreak

Enteroinvasive *E. coli* (EIEC) is normally associated with traveller's diarrhoea, but a recent outbreak in Denmark which has affected 68 people has been linked to the consumption of imported spring onions from Egypt which were used in ready to eat salads sold in several different retail chains.

Also in Denmark, there is a separate investigation into a new *E. coli* 0157 outbreak which has so far affected 13 people. Whole gene sequencing suggests that all the cases have become infected from a common source although no foodstuff has yet been implicated.

EU to increase surveillance on Honduran melons

Following last year's *Salmonella braenderup* outbreak which was associated with imported Galia melons from Honduras, the EU have announced that they are enhancing checks on imported melons from this region as the harvesting season for this year's crop is about to commence.

Milk "use by" changed to "best before"

One of the UK's largest retailers has changed the use by dates on its own label pasteurised milk to best before dates in a bid to reduce food waste.

Milk is the third most wasted food in the UK with approximately 490 million pints being thrown away each year. Whilst it is acknowledging that pasteurised milk is not sterile and will inevitably contain some potential spoilage bacteria, the likelihood of pathogens being present in pasteurised milk is low.

Morrisons are the first UK supermarket to make this change, but it seems likely that other retailers will follow suit.

Seasonal Campylobacter spike linked to fondue meals in Germany

During the recent festivities, some friends of ours decided to replace the traditional Christmas dinner with a fondue meal, but they may have thought twice about this if they had seen an article published in the journal *Scientific Reports* which linked a sharp seasonal increase in *Campylobacter* infections in Germany during the Christmas and New Year holidays with this type of dining.

Researchers from the Robert Koch Institute analysed cases notified in Germany between 2013-2020 and survey data from more than 400 participants who had a *Campylobacter* infection was evaluated. The survey revealed that about 180 people fell ill in the seven days following the festive holidays. A large proportion of participants stated that they had consumed meat fondue meals prior to becoming ill and that they had touched the raw meat with their bare fingers, and 30 percent said raw and cooked meat had been placed on the same plate. The association of winter peak *Campylobacter* with meat fondue involving chicken was slightly stronger than with raclette grill meals with chicken. The authors of the study suggested that this is because raw chicken is handled more during fondue meals than during raclette grill meals.

The report concludes by stating that consumers should be made aware each year before the Christmas and New Year holidays about the infection risks which they may encounter when participating in meat fondue or raclette grill meals, especially if chicken meat is offered at these meals.

New biodegradable food packaging containing natural antimicrobials

Research carried out at the Nanyang University in Singapore has combined a biodegradable plastic alternative packaging with natural antimicrobial compounds. The newly developed plastic-like food packaging is made from a corn protein called zein, starch and other naturally derived biopolymers, and is infused with a cocktail of natural antimicrobial compounds, including oil from thyme and citric acid.

The packaging is designed to release the optimal levels of antimicrobial compounds in response to the presence of additional humidity and bacterial growth. This ensures that the packaging can endure several exposures and potentially last for months. The researchers claim that the packaging can increase the shelf life of products such as ready-to-eat foods, raw meat, fruits and vegetables, and as traditional food containers and packaging make up a major portion of municipal solid waste, the biodegradable alternative affords the dual benefit of reducing waste.

Silk Fibroin/Cinnamon/Nisin/Chitosan all used as edible food coatings

Three separate articles published this month have highlighted research done on food preservation using edible food coatings, suggesting that this may be a new and novel way to increase food safety and quality.

In an article published in *Applied Physics Reviews* the authors describe research whereby an edible coating was applied to strawberries and bananas by dipping the fruits in a silk fibroin suspension. They claim that the coating was able to extend the shelf life of both kinds of fruit, decreasing the respiration rate, weight loss, water vapor and oxygen diffusion in the products whilst preserving firmness and colour, and delaying ripening of bananas compared to uncoated controls.

Along similar lines, an article in the *Journal of Food Protection* describes the effects of a Sodium alginate coating incorporated with cinnamon essential oil nano capsules and Nisin as an edible coating used in the preservation of sliced beef. The results suggest that the combined coating treatment had improved the antibacterial and antioxidant properties, and that the formulation could be regarded as a potential material to preserve beef slices.

And finally, an article published in the *Journal of Food safety* claims to show that when a mixture of chitosan (a sugar which is derived from the outer skeletons of shellfish)), vanillin (a sugar derived from the vanilla bean), and geraniol (a compound obtained from citronella oil) coatings were applied in combination on apple cubes, a 2-log reduction in organisms such as *E coli* was observed, suggesting that this too could be utilised as a method of food preservation.

FDA publish finding of report into bagged salad Salmonella outbreak

The US Food and Drug Administration have issued a report into a *Salmonella typhimurium* outbreak which was associated with bagged salad leaves which were grown in an indoor hydroponic operation between June and August last year. The investigation looked the high density hydroponic growing techniques whereby the salad leaves are grown on production ponds located within large scale greenhouses where they remain afloat throughout the growing process until removed for harvesting.

The FDA investigation revealed that the outbreak strain was detected from a rainwater retention basin which was adjacent to the greenhouse and a different serotype (*Salmonella liverpool*) was detected from a water sample taken from an indoor production pond. They also found that growth media used in the hydroponic growing operations (which can support the growth of human pathogens when wet), was not properly stored. They also noted deficiencies in the design and operation of the plant, including procedures for cleaning and sanitizing equipment, maintaining the production ponds, and preventing potential sources of contamination such as condensation from pipes above growing and packing operations.

The report concluded by recommending that growers develop an understanding of potential sources and routes of contamination throughout the operation. It also recommended that when employing tools such as pre-harvest and post-harvest sampling and testing of food, water, and the physical environment, the growers should seek to identify sampling plans, limits of detection, and mitigation measures that control the potential sources and routes of bacterial contamination in the growing and harvesting environment.