FSAI Information Note No. 4 - Hepatitis A Virus in Imported Frozen Berries

The Food Safety Authority of Ireland (FSAI) in collaboration with the Health Protection Surveillance Centre (HPSC), the Health Service Executive (HSE), the National Virus Reference Laboratory (NVRL) and the Department of Agriculture, Food and the Marine (DAFM) is investigating a national foodborne outbreak of Hepatitis A virus (genotype IA). The strain of the virus in Ireland is the same as that causing an outbreak in Italy which has been linked to mixed frozen imported berries. Recently, the Netherlands and France have reported cases of the same strain.

A separate outbreak, caused by a different strain of Hepatitis A virus (genotype IB), was reported in four Nordic countries earlier this year and was also linked to frozen imported berries.

Hepatitis A virus
Hepatitis A is a human virus. It does not come from animals. In recent years Hepatitis A infection has become very uncommon in Ireland and has been seen mostly in people who travel to parts of the world where sanitation is not well developed. The virus is shed in faeces from the gut of people who are infected. The virus spreads to other people through swallowing virus in traces of faeces from hands, food or water.

Infection with Hepatitis A virus can cause illness so mild that it is hardly noticed (especially in young children) but it can also cause very severe and sometimes life-threatening disease (especially in some adults). Illness usually starts about 28 days after exposure to the virus but it can start anytime between 15 and 50 days after infection. The illness usually starts with fever, loss of appetite, nausea, fatigue and abdominal pain, followed within a few days by jaundice. There are a number of different types of virus (called genotypes) and identifying the particular type of virus involved in infection can be helpful in judging if people have been infected from a common source. More information on transmission of Hepatitis A can be found on the Health Protection Surveillance Centre website.

Illness in Ireland
On the 19 June 2013, the HPSC notified the FSAI of three cases of Hepatitis A, all of which had a similar strain of the virus and having the same genomic sequence as the virus causing the Italian outbreak. The cases became ill in April 2013 and none had travelled to Italy during the exposure period. Since then, a second cluster of cases was identified with onset of illness from mid-June to August. To date, 15 primary cases and four secondary cases have been identified. A secondary case is one that is thought to have contracted illness through contact with a primary case. These 19 cases are all confirmed based on sequence analysis which has been shown to be identical to the Italian outbreak strain. An additional four possible cases have been identified for whom sequence confirmation has not been possible. Cases have been reported in five of the
eight Health Service Executive areas. Given the wide temporal and geographical distribution of cases, a food source was strongly suspected.

**The Irish investigation**
During the investigation cases were interviewed to try to identify a common food source, to look for possible links between cases and to guide the investigation of particular food items. A study called a case control study was conducted by the HPSC to make a comparison between the confirmed cases and a control group, to identify the most likely food source.

The investigation has primarily focused on the imported frozen supply chain, due to the link with the Italian outbreak, where authorities detected Hepatitis A in samples of frozen mixed berry products containing frozen raspberries, redcurrants, blackberries, and blueberries imported from a number of different countries.

Samples of various frozen berries and berry-containing foods have been sent to the Istituto Zooprofilattico Sperimentale in Italy for analysis.

To date, test results of 16 products have been found to be negative for HAV. In Ireland, cases have reported eating a number of different foods made with imported frozen berries such as smoothies, juices, desserts, yoghurts and cheesecakes.

**Results of the investigation**
The date of onset of illness for the most recently reported primary case in Ireland is 9 August 2013; therefore it appears that the Irish outbreak has been controlled.

Although analysis of food samples has not identified contaminated berries, the epidemiological investigation supports the link to frozen berries and the traceability investigation has identified that these berries were imported. A comparison of the results of the traceability investigations in Ireland and Italy has not yet identified any common suppliers that could explain the cases seen in both countries. The European Commission and the European Food Safety Authority are currently working with countries involved in this multi-state outbreak to coordinate the traceability investigation and assist in assessing the strength of evidence of the traceability information.

Italy, the Netherlands and France have reported cases of the same strain with onset of illness in September. Therefore it is possible that there is still contaminated product on the EU market. As a result, the FSAI's precautionary advice to boil imported frozen berries for one minute before eating them is still in place in Ireland (see below).

**Why is this investigation taking so long to complete?**
The incubation period (the time between a person being exposed to the virus and when the symptoms start) for Hepatitis A is on average 28 days and ranges from 15 to 50 days. This long incubation period means that it is not easy to identify all potentially relevant foods that a person has eaten up to 50 days prior to becoming ill. Plus it means that foods consumed are generally no longer available to test and that the traceability investigation has to focus on supplies over a long period of time, rather than on a specific batch or batches of food. In addition to the challenge for people to remember what they consumed over such a long period of time, frozen berries are often used as ingredients in foods (for example in smoothies, yoghurt, ice cream and desserts) and people are often not aware that the berries used were originally frozen. Finally, the
frozen berry supply is complex (involving food manufacturers, wholesalers, traders, re-packers, processors and in some cases many farmers supplying a processor) and this has made the traceability investigation challenging.

**FSAI RECOMMENDATIONS**

**ADVICE for the Public in Ireland**
Although the Irish outbreak appears to be over, we cannot be sure if this is because contaminated product is no longer on sale in Ireland or because the public is adhering to the boil notice and food businesses are applying appropriate controls. In addition, cases of the outbreak strain have recently been reported in two additional countries; therefore it is possible that there is still contaminated product on the EU market. Therefore, as a precautionary measure we recommend that until further notice the public should boil all imported frozen berries before consumption. Boiling for at least one minute will destroy the virus.

We also remind consumers to wash all fresh berries, and other fruit and vegetables if eating them uncooked.

People who have symptoms suggestive of Hepatitis A, as described above, should consult their doctor for advice.

**ADVICE for Retailers, Caterers and Manufacturers**
Frozen imported berries such as blueberries, raspberries, redcurrants, blackberries and strawberries are widely used in the food industry. In Ireland these are distributed into the food service sector for use in cooked and ready-to-eat dishes. They are also sourced by the manufacturing sector for products like fruit yoghurts, desserts, smoothies and other drinks where they may not receive sufficient heating to kill the virus, if present. They are also sold at retail level as bagged frozen berries or as an ingredient in made-to-order smoothies, shakes and other drinks. Frozen berries are a documented source of viral and bacterial infection and therefore food business operators need to take account of the hazards of viruses like Hepatitis A and Norovirus as well as pathogenic bacteria like *E. coli* O157 and *Salmonella* when developing their food safety management plans (HACCP plans).

Food business operators using frozen imported berries need to ensure that the berries they use are sourced from reputable suppliers with efficient and comprehensive traceability systems and effective food safety management systems. As the food chain can be quite complex, we are recommending that food business operators at each stage of the food chain seek assurances of the effectiveness of the food safety management systems in place from their suppliers. The supplier should be able to demonstrate that their food safety management system is working effectively. Particular care regarding Hepatitis A virus should be taken when berries originate from countries where Hepatitis A virus infection is common (see WHO advice).

Microbiological testing is one means of verifying the effectiveness of a food safety management system. However, it should be noted that a negative result for Hepatitis A or any pathogen does not guarantee the safety of a batch, as only a proportion of a batch is sampled and foodborne viruses and pathogenic bacteria do not tend to be evenly distributed in food. Implementation of effective control measures is the only way to ensure that safe berries are produced. For advice on detection of foodborne viruses,
recommended sampling plans and a list of laboratories, see details from the European Union Reference Laboratory (EURL).

If reassurances of the safety of the frozen imported berries are not available, the berries should be cooked or boiled before being used in foods to eliminate or reduce the risk from foodborne viruses and pathogenic bacteria.

Sourcing frozen berries where strict hygiene is implemented at harvest (as part of good agricultural practices) and during processing (as part of good hygienic practices) and where evidence of the effectiveness of the food safety management system is available, is an essential critical control point for food business operators making foods containing berries that are not sufficiently heated to kill foodborne viruses and pathogenic bacteria.

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