Campden BRI
food and drink innovation

# Norovirus in fresh and frozen produce on retail sale

White paper

# Norovirus in fresh and frozen produce on retail sale

Martin D'Agostino
+44(0)1386 842537  martin.dagostino@campdenbri.co.uk

Martin D'Agostino joined Campden BRI in May 2016 as a food virologist, having worked at the Food and Environment Research Agency (DEFRA) since 1994. He is currently undertaking a part-time PhD at the University of Liverpool, the subject "Investigation of the Contribution of Fresh Produce to the Norovirus Burden"

Issued: May 2019



Campden BRI, Station Road, Chipping Campden, Gloucestershire, GL55 6LD. UK
Tel: +44(0)1386 842000
www.campdenbri.co.uk  support@campdenbri.co.uk

# Norovirus in fresh and frozen produce on retail sale

Recently published Food Standards Agency (FSA) research on foodborne viruses included a large retail survey conducted in 2015-16. It showed that 5.3% of lettuce, 2.3 % of fresh raspberries and 3.6% of frozen raspberries, tested positive for Norovirus, a food safety concern. The publication of this data received widespread media attention in December.

It is the first and only prevalence survey of its kind to have been performed in the UK. The survey, which was conducted over the course of a year, analysed produce sold by retailers, including UK supermarkets, wholesalers and other outlets. It sets a useful benchmark for monitoring Norovirus contamination of produce. This benchmark data will be useful for evaluating conformance to industry standards (e.g. Global GAP). Public Health England (PHE) statistics for the year 2015-2016 (when the study was performed) showed that it was a low-incidence year for Norovirus illness in the community.

## Why the lack of prevalence data?

Major prevalence studies like this do not occur often as they can be logistically very challenging and require significant resources / funding. Also, information on positive samples is already available via reports entered on the EU Rapid Alert System for Food and Feed (RASFF) system, which originate mainly from routine monitoring of samples by individual companies or as demanded by local authorities. This EU information suggests that a zero-tolerance stance is usually taken in the event the virus is detected, with actions including withdrawal from the market, detention by operator and recall from consumers.

No routine monitoring of fresh and frozen produce for the presence of Norovirus (or Hepatitis A Virus) is performed in the UK, therefore no prevalence data has been available to help companies and retailers introduce risk mitigation strategies. The FSA study has gone some way to filling the data gap associated with this combination of risks and commodities.

## What can you / should you do if you grow, harvest, distribute and sell these types of food?

Currently, in the UK there are no regulations or microbiological criteria in place for viruses in foods, over and above the general requirement for food to be safe – mainly being due to the lack of prevalence data available.

The new survey data (from a low incidence year) can be used to benchmark where producers / suppliers rank in relation to this new data set. It can also be useful to undertake monitoring at various critical points in the supply chain. If it revealed an issue with produce at harvest, checks would need to be carried out to ensure that all procedures were being rigorously adhered to (for example, good agricultural practices and good hygienic practices), in addition to ensuring that irrigation water quality was monitored regularly. Critical points can include where produce is processed, such as for berries which are frozen, or at point-of-sale, where additional handling may take place.

## What is the value of testing for viruses?

One of the main issues the food industry has had with virus testing, is the inability to determine whether or not a positive result comes from an intact infectious virus or from harmless genomic material. No readily available culture system currently exists for Norovirus – to determine whether the virus is infectious or not. This lack of availability is widely acknowledged as a hindrance – not least for determining the extent of the hazard it poses, but also for determining physical and chemical control strategies. However, in the absence of a cell culture method which could provide this information, the presence of genomic material may cause concern.

Detection of the genomic material could suggest contamination by human sources, as Norovirus originates with humans. It can be spread by ingestion of tiny amounts of faeces and vomit and can survive the sewage treatment process. It may be present in contaminated irrigation water, on handlers' hands and on food preparation surfaces. Therefore, if viral genomic material is found, it could mean that there has been a challenge to good practice somewhere in the supply chain. This may raise an alert within a supply chain which does not contain any chemical or heat processing stages before sale and consumption – that is, treatments that can inactivate the virus. It may also trigger the producer, processor or retailer to investigate practices, such as records of staff illness and cleaning regimes. As with the detection of any other pathogen it would be prudent to investigate positive results and err on the side of caution (i.e. assume any virus detected to be infectious and capable of causing disease).

## How can Campden BRI help you?

Norovirus (as well as Hepatitis A virus and Hepatitis E virus in pork products) is a recognised food safety hazard by FSA, EFSA*, ACMSF*, ILSI*and other bodies. Criteria may well be set for viruses in foods in the future. However, investigative work now, with the help of expert interpretation of results, will help companies establish their own benchmark information to inform and reassure their customers and clients on the safety of their products.

Campden BRI is experienced in the methods used for detection of Norovirus and Hepatitis A virus. We are  the first and currently only lab in the UK which has UKAS accreditation in the detection method for Norovirus and Hepatitis A virus in soft berry fruits and leafy greens. We also offer environmental monitoring of viruses in key areas in your workspace, so that you can build a profile of potential areas of concern and develop strategies to improve your food safety management plans, and provide confidence that your cleaning regimes are effective.

Member-funded research at Campden BRI, through the use of target virus surrogates, is helping to build data profiles for the food industry – for example, on the susceptibility of viruses to specific processes or control measures. This can help members to develop control strategies to help reduce the risks associated with foodborne viruses.

## Acknowledgement:

The survey work was funded by the United Kingdom Food Standards Agency under FSA project FS101040: “Assessing the contribution made by the food chain to the burden of UK-acquired Norovirus infection (NoVAS)“.

The NoVAS Consortium comprised Fera Science Ltd (Nigel Cook and Martin D’Agostino), the University of Liverpool (Sarah O'Brien (Principal Investigator), Miren Iturriza-Gomara, Steven Williams and Natasha Lamb), the University of East Anglia (Paul Hunter, Jim Maas),
Public Health England (David James Allen, Nicola Elviss, Andrew Fox), Leatherhead Food Research (Angus Knight) and Cefas (David Lees, James Lowther).

## *Glossary

EFSA – European Food Standards Agency

ACMSF - Advisory Committee on the Microbiological Safety of Food

ILSI - International Life Sciences Institute

**Note:** The opinions expressed in this document are the author’s and do not necessarily reflect the opinion of the UK Food Standards Agency.

## Please contact:

Martin D’Agostino
Virologist
Campden BRI

Tel. +44(1386) 842537
E-mail: martin.dagostino@campdenbri.co.uk



# About Campden BRI

## Campden BRI helps food and drink businesses succeed

We do this through practical scientific, technical and knowledge support

We work closely with industry to ensure the absolute relevance of all our activities - from analysis and testing, process validation and safety assurance to product innovation, consumer studies and training, events, databases and publications

All our activities are underpinned by a strong programme of research - steered by industry for maximum relevance

Membership-based, we provide services to companies all along the supply chain

### Vision

To be the partner of choice for the development and application of technical knowledge and commercially relevant solutions for the food and drink chain

### Mission

Practical application of technical excellence for the food and drink chain

Campden BRI, Station Road, Chipping Campden, Gloucestershire, GL55 6LD, UK
+44(0)1386 842000

support@campdenbri.co.uk
www.campdenbri.co.uk