Implication of the novel SARS-CoV-2 Coronavirus on Food Processing

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The current Coronavirus Disease 2019 (Covid-19) outbreak is caused by the Covid-19 virus, also called SARS-CoV-2. Management of the crisis is heavily focussed on medical intervention, and rightly so. Containing the outbreak and preventing further spread is the highest priority. It should also be noted that there are still many unknowns about this virus.

There are, however, also some things known by now including that it may transmit from human to human before symptoms occur, that it is largely genetically similar to the SARS-CoV (Severe Acute Respiratory Syndrome coronavirus) and that it may survive in human faecal matter and be transmitted through aerosols.

From a food safety point of view, this leads to a number of considerations regarding the potential risks to raw materials and foods associated with the Covid-19 virus.

1. The survival of the SARS-CoV-2 virus in human specimens is still being researched, but it appears to survive in faecal samples. Research on SARS-CoV indicates that this virus is relatively hardy and survives in serum, sputum and faeces for at least 96 hours. In urine, it could remain alive at least 72 hours with a low level of infectivity. (Duan et al., Stability of SARS coronavirus in human specimens and environment and its sensitivity to heating and UV irradiation. Biomed Environ Sci. 2003 Sep;16(3):246-55.)

2. Therefore, excellent personal hygiene practices are required to limit the risks of food and raw materials to human pathogens including viruses. This is extensively addressed in modern food safety systems and includes focus on handwashing, suitable toileting facilities, personal protective equipment (PPE), exclusion of food handlers with symptoms of illness including sore throats, coughs and fever above 37.8 °C (US Centre for Disease Control and Prevention, https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/guidance-business-response.html, accessed 25/02/2020), return to work sign off by a qualified doctor and so on.

3. There is indication that simple surgical face masks will not stop the transmission of the Novel Coronavirus (Covid-19 virus) as they are too thin and not well fitting. (Geggel L., https://www.livescience.com/face-mask-new-coronavirus.html, accessed 10/02/2020.) In addition, infection can also occur through the eye or if contaminated hands are used to touch the face. Face masks may contain a sneeze to some degree, but to deal with aerosols, sufficient air changes are required to remove the aerosols rapidly from the environment. Minimum air changes in a food processing environment should be 6 air changes per hour.

4. If alcohol-based sanitisers are used following hand washing, 'ethanol, the most common alcohol ingredient, appears to be the most effective against viruses', with 95% ethanol being more effective than 80% for hardy viruses such as Hepatitis A. WHO formulations I and II (ethanol-based and isopropanol-based respectively) were effective against SARS-CoV, and Middle East respiratory syndrome coronavirus (MERS-CoV). (Gold N.A. and Usha A., Alcohol Sanitizer, updated December 16, 2019, https://www.ncbi.nlm.nih.gov/books/NBK513254/ accessed 3/02/2020.) The US CDC recommends hand sanitisers with at least 60-95% ethanol to control SARS-CoV-2 (US Centre for Disease Control and Prevention, https://www.cdc.gov/coronavirus/2019-ncov/specific-groups/guidance-business-response.html, accessed 25/02/2020.)

5. Research on SARS-CoV showed that these viruses stayed stable at 4 °C and at room temperature (20 °C) for at least 2 hours on a range of surfaces and in water. (Duan et al., Stability of SARS coronavirus in human specimens and environment and its sensitivity to heating and UV irradiation. Biomed Environ Sci. 2003 Sep; 16(3):246-55.) Preliminary information on SARS-CoV-2 shows that it may persist on surfaces for a few hours or up to

several days (WHO, https://www.who.int/emergencies/diseases/novel-coronavirus-2019 accessed 25/02/2020.)

6. SARS-CoV were inactivated by heat treatments of 90 minutes at 56 °C, 60 minutes at 67 °C or 30 minutes 75 °C. UV irradiation for 60 min of the virus in culture inactivated it. (Duan et al., Stability of SARS coronavirus in human specimens and environment and its sensitivity to heating and UV irradiation. Biomed Environ Sci. 2003 Sep; 16(3):246-55.)

The data points at some food industries that may be more exposed to this threat than others. Any foods that are not cooked to a significant degree are more at risk; this is even the case for foods processed with a '*Listeria*-cook' of 72 °C for 2 minutes. Also, chilling and most likely freezing is not readily going to destroy this virus and therefore chilled and frozen foods sourced from major outbreak zones should be risk assessed.

Risk assessment should include the regional source, personal hygiene practices at source, production date pre or post December 2019 when Covid-19 was first detected and further or prior heat processing of the raw material. Also, there is a risk that regional output of raw materials disappears due to illness in the wider population leading to plant closures. Alternative sources will need to be identified in these cases.

The above information gives us an indication of how SARS-CoV-2 may behave in human hosts and the environment and specific interventions that could be taken. Much of these are already considered and implemented in modern food safety systems.

However, if you would like a professional review of your food safety systems in light of this emerging issue, QAPartners can assist you through an independent, confidential review of your business' preparedness.

Disclaimer: Please note that the considerations in this paper are of a general nature only and should not be seen as a recommendation to act in specific ways.

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