

Food safety considerations using SMART devices in domestic kitchens

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The domestic kitchen is considered a high-risk area in which consumers are likely exposed to a broad diversity of microbes. Foodborne illness is a public health issue, the Food Standards Agency (FSA) reports that up to 64% of foodborne illness in the EU originates from the home environment⁽¹⁾. Despite studies emphasising the correlation between food poisoning and the home environment, many consumers consider the home as an unlikely source of food poisoning⁽²⁾. Increasing consumer reliance on technology is undeniable, with the recent COVID-19 pandemic catalysing a surge in the utilisation of digital technologies for daily activities, including cooking². Cross-contamination within the kitchen is a major vehicle for the spread of pathogenic bacteria, common offenders include hands, sponges, dishcloths, and utensils¹. With the increased usage of smart devices during meal preparation, it is possible that these devices could further contribute to cross-contamination. A critical review to ascertain consumers' use of smart devices in the domestic kitchen and assess the possibility of bacterial contamination and the potential food safety risks introduced by smart devices in the domestic kitchen. A critical review in accordance with the PRISMA guidelines across four electronic databases MEDLINE, PyscINFO, Scopus, and Web of Science was conducted. Initially, 23,882 articles were retrieved from data base searches. As a result of the systematic screening process, a total of 62 articles were retained for the review. The majority of the research investigating the microbial contamination on personal electronic devices was conducted in a clinical setting. Overall, a high incidence of bacterial isolation and diverse microbial community on personal electronic devices was reported. With the understanding that personal electronic devices are reservoirs for microorganisms, it is also important to acknowledge that regular cleaning can significantly reduce the microbial load and community present on these devices. Poor hygiene practices persisted despite participants displaying an awareness of the risks of cross-contamination from these devices and understood that regular cleaning would alleviate contamination. Therefore, there is indisputable evidence that personal electronic devices harbour microorganisms and have the ability to significantly contribute the ability to contribute to cross-contamination. However, there is limited insights into the food safety risk that personal smart devices contribute to cross-contamination in the domestic kitchen. In clinical settings, studies indicate that mobile devices are a potential vehicle for the cross-contamination of pathogenic bacteria. Therefore, it stands to reason that the increased utilisation of technologies in the kitchen increases the potential of contamination, with cross-contamination increasing the risk of foodborne illness.

Future research should capture consumers' behaviours of smart devices and identify the potential food safety risk of these devices.

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References

1. Redmond E, Curnin A, Day C, *et al.* (2018) *Systematic review of the relative proportion of foodborne disease associated with food preparation or handling practices in the home.*
2. Lando AM, Bazaco MC & Chen Y (2018) *J Food Protection* **81**, 437–443.