

# Impact of 3D food printing on the UK food system

3DFP at its current state of the technology does not at present interact with the food system to any significant extent. As such, it has very limited opportunities to impact consumer health and safety, or other parts of the food system in the UK, mainly because there are not many food printers on the market globally, and sales appear to be in low numbers. However, this can rapidly change as young startups increasingly move towards optimising the technology for specific food types while a number of 3DFP concept startups are testing different business models that may attract consumer interest in the technology.

It is worth identifying the hubs and nodes in the emerging 3DFP ecosystem (see fig. 23) to establish bottlenecks in the system (such as for example preparation of food inks, or operation of printers) that may pose threats to consumer health as well as opportunities to work with the ecosystem and support it in building safety into the further evolution of the technology and process development. This is particularly important for consumer perception of an emerging 3DFP industry as it has its roots in the maker movement experimenting with a universal tool, the 3D printer, using sugar and chocolate for decorative food items which are not consumed in large quantities, hence not being perceived as a 'serious' food production technology.

However, as 3DFP moves now into working with a variety of food ingredients, such as vegetables, meat and fruits, which as whole foods are consumed in larger amounts, understanding food safety issues of 3DFP becomes a key issue. At present 3DFP is not regulated and food safety issues around the technology are not well understood at present, beyond common sense arguments, such as that printer parts need to be easy to inspect and clean and be cleaned regularly etc.

Another issue for consideration are the processes used for preparing food inks and the types, numbers and volumes of necessary additives that are used to make the food paste printable. There are currently no comprehensive studies on the nature of food pastes and the processes involved in preparing them and their short- and long-term impact on human health.

Likewise, post printing handling and processing of 3D printed food products itself may pose various risks and may need to be considered an integral part of the printing technology, requiring the setting of certain standards equivalent to other food processing technologies.

Finally, there is still the need for a better understanding and evidence based assessment of the claims made by developers of novel types of 3D printed foods around health as well as claims that the technology as such may contribute to the sustainability of the food system.

To that effect development of relevant safety, quality and sustainability criteria for food printers and processes would help all stakeholders in the 3DFP ecosystem to make most of future opportunities. Businesses would have a standard to work towards, and consumers a measure of what to demand from the products they will have the choice to purchase. This might also help build consumer trust and remove some of the currently existing negative perceptions around the technology.