Food dangers on our 'global' table

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Credit: Imelda Bettinger

Global fight against food poisoning and the requirement for high quality products push European scientists into developing new technologies in food processing

About 75% of the new diseases that have affected humans over the past

10 years have developed from animals or products of animal origin.

According to the Europe Food Safety Authority (EFSA), Campylobacteriosis remains the most commonly reported foodborne disease in the European Union, with over 190,000 human cases annually. Common routes of the bacterium are raw milk and undercooked poultry.

Salmonella, often transmitted by eggs, is the second most common intestinal infection, with over 100,000 human cases reported each year.

But Listeriosis is causing great concern, and continues to rise in Europe. In 2014, there were 2,161 confirmed cases, resulting in 210 deaths, the highest annual number reported since 2009. Dairy products, vegetables, fruit and seafood are the possible vehicles of the infection.

"Globalisation and the movement of people have brought about trade in food, but there are also the chemical and biological hazards that come with it – and they know no borders", explains Marta Hugas, head of the Biological Hazards and Contaminants Unit at EFSA.

To this complex set of circumstances must be added people's growing demand for a wider variety of foods to be available throughout the year, foods which are expected to look fresh and be as free from chemical preservatives as possible.

The challenge is huge: "Consumer preferences for convenient food that is easy to prepare, but as fresh as possible and minimally processed, are sidelining techniques like freezing, canning and chemical preservatives. Such techniques are very effective in terms of safety but may affect food quality and taste. Now we have to create new technologies to meet these demands and to ensure the long shelf life required by distant export markets ", says Geraldine Duffy, researcher at the Head Food Safety Department of the Teagasc Food Research Centre in Dublin,

Ireland.

Duffy's department is contributing to a European project called HIPSTER, which is trying to validate and implement a food processing technology combining High Pressure Processing (HPP) with Temperature (HPT).

"We are testing its efficacy on prepared meals with extended shelf life, including soups and ready-to-eat meals that contain chicken and fish. If the HPT technology works, it could be applied to other foodstuffs in the future", explains Duffy.

The High Hydrostatic Pressure on its own inactivates vegetative bacteria on the food, but not the spores that could make it unsafe or lead to spoilage.

Thus, scientists are investigating if submitting the food product to the high pressure treatment, in combination with temperatures of about 90 degrees Celsius, will inactivate such spores whilst guaranteeing quality, safety and taste and in addition giving a long shelf life -conditions that are much valued by the market and the catering industry.

Other European research is contributing by improving the monitoring process.

For example scientists working for the project i3Food are developing three different technologies: pulsed electric field preservation (PEF-P) of liquid food products, like fruit juices and smoothies; high pressure thermal sterilisation (HPTS) for ready-to-eat-meals; low shear extrusion of cold food products, mainly ice cream.

"We need sensors to control and monitor the whole process from the beginning in order to avoid an effect of over processing, which could

cause quality losses in the food product afterwards", explains Stefan Töpfl, food technologist at the German Institute of Food Technologies (DIL).

Töpfl says that these techniques will reduce damage to the product by avoiding excess treatment intensity and energy use at every stage of processing.

"I think in Europe we have a high level of food safety, but we now face the challenge of finding a variety of preservation techniques to maintain this level while at the same time increasing the quality of the product in terms of consumer demands", says Töpfl.

Consumers want to be able to obtain food whenever they like, whatever the season, but expect it to be fresh and free from chemical additives.

Doesn't this seem contradictory? "Yes, it does", answers Duffy, while food technologist Töpfl concludes that "it responds to this general idea in our society that we can have anything at any time".

The new food processing techniques try to extend shelf life, improve taste and texture of food. But at the end of the day, they will all be adapted, if only for safety reasons.

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