TEXT **Eveline Thoenes**

They set themselves ambitious goals: to maintain food texture, improve shelf life, and reduce energy consumption during preservation processes. The EU-funded 'NovelQ' consortium, consisting of 36 research partners from across Europe, is co-ordinated by the Agrotechnology and Food Sciences Group (AFSG) of Wageningen UR. Halfway through the five-year term, Wageningen Update examines the state of affairs and the experiences thus far.

EUROPEAN BOOST FOR FOOD TECHNOLOGY RESEARCH

High pressure processed products are on the market already. New foods, pasteurized in this way, will come onto the market this year.

We have been preserving food in the same way for decades", says Huug de Vries, project coordinator of NovelQ at AFSG. "For some years, researchers have been looking at alternatives and now they are joining forces within this consortium." The project's objective, to develop innovative technologies for the European food industry and thus boost its competitiveness, requires practical applicability and knowledge sharing. Those were also absolute prerequisites for acquiring funding from the EU. An Industry Advisory Platform will ensure effective information transfer to and from the project.

The standard ways to prevent decay are pasteurization (by heating to 80˚C) and sterilization (by heating to 120˚C, thus killing even spores), in combination with hermetically sealed packaging. De Vries: "We wanted to see if there wasn't a gentler way to kill these microorganisms, so that food quality would be less affected."

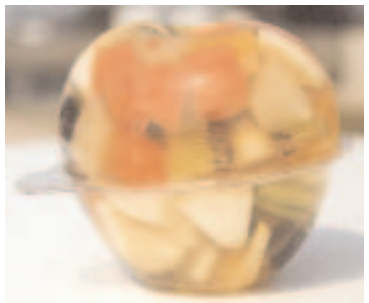
Membrane pumps

Preservation by heat alters the food's texture and destroys vitamins. One of the new techniques currently under investigation is high-pressure processing. While heat spreads gradually from the surface to the core, pressure instantly distributes evenly.

"We found in some cases that microorganisms perish because the pressure disrupts their membrane pumps, whereas the cells of the treated vegetable or fruit retain their structure and freshness", explains De Vries. "This enables pasteurization at maximum temperatures of 40˚C. In the US and Japan, this technique has already been applied for a while, but Europe was lagging behind. We're catching up now." He estimates that next year, several new high-pressure pasteurized convenience foods will enter the market.

photo's NC Hyperbaric

'HIGH-PRESSURE STERILIZATION IS AN ENTIRELY NEW CONCEPT'



High-pressure sterilization, however, is an entirely new concept. The product is pre-heated to 85˚C, after which ultra-high pressure is applied for only a few minutes. De Vries: "Carrots remain relatively crisp this way. The reason why heating normally makes them flabby is that warmth activates cell wall-degrading enzymes." The pressure eliminates those enzymes, so the cells keep their structure, is what their Belgian partner from Leuven University found out. "In Wageningen, we are focusing on the equipment and process engineering. Together with our British partners, we are looking at the microbiological side. This is why this large-scale collaboration is so valuable. Thanks to NovelQ, we are establishing a unique, strong, interdisciplinary network, with fundamental-research partners and industrial labs, as well as consumer organizations." Other innovative preservation techniques include cold plasma for disinfecting surfaces and Ohmic heating, which uses electromagnetic energy, the latter resulting in a high-quality ratatouille dish about to be introduced on the market.

Search for new materials

Over the past few years, the demand for fresh products and ready-to-eat meals has increased spectacularly. The problem with these products is that they have a short shelf life. Some estimate that as much as twenty percent ends up in supermarkets' garbage containers. This, of course, is reflected in the price. By using new techniques that prolong shelf life, this problem can be solved, and the environment spared.

New processing techniques require packaging materials that can withstand the applied forces. Hence the search for new materials and, while they're at it, eco-friendly alternatives, constitutes a quarter of the NovelQ research.

Salvatore Iannace, project director at the Italian Institute of Composite and Biomedical Materials and coordinator of the packaging sub-project within NovelQ, reports they've already found some biodegradable polymers that are suitable for packaging in combination with high pressure. About Wageningen UR's co-ordinating role he says: "We highly appreciate their way of communicating. They are good at collaborating."

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