

SMELL, TASTE AND TEXTURE: WILL THE LOW-FAT, LOW-SALT PIZZA EVER PLEASE?

How the PLEASURE project changes the food processing matrix

The project: Searching for concepts and novel technologies

More than 60% of all reported diseases in modern industrial countries originate from malnutrition due to low vitamin intake and high caloric food. The cause of this high consumption of fat saturated and trans-fatty acids, salt (sodium) and sugar (mono- and disaccharides) — is that Western diets contain a considerable amount of processed foods such as pizza, ready-to-eat sauces and pastry products that are energy-dense and over-seasoned. These fatty products such as pizza and puff pastry – the model products of the PLEASURE project – are among consumers' favourites. If healthier versions of these products can be accepted in future, the sensory properties of the new products such as smell, taste and texture will have to be reformulated. This process will go together with sustainable concepts of caloric reduction and ingredient reduction.

The PLEASURE project addresses this challenge from the processing side and the search for new food micro-structures. Novel technologies will lead to new textures (solidity, crispiness, softness, elasticity, etc.) of well-known food products and different dispersion of salt and fat in the food layers will be achieved. This will allow for reductions in fat (in particular saturated and trans-fatty acids), salt and sugar (mono- and disaccharides) while the new micro-structures in these food products will help reduce the use of additives like sweeteners and emulsifiers, achieving an optimised taste. The sensorial perception of sugars, salts and fats present in these new products will be key to acceptance by consumers.

The product: Traditional models with new properties

The goal is to optimise model-products—pizza dough, mozzarella-type cheese, sausages and fruit/vegetables sauces—with five or six new recipes. The end-products will contain 10% to 30% less salt, fat and sugar. Fat will be substituted with fibres, natural ferments and enzymes, changing the micro-structures of these products to reformulate taste and other properties.

Another approach will be to test and implement novel processing technologies for the market uptake of innovative

production know-how.

The concepts will first be developed for four mono food systems:

- Bakery (pizza dough and puff pastry);
- Cheese (mozzarella style);
- Meat (bologna-type sausages and cooked ham);
- Fruit and vegetable preparations.

In a second step these novel processes will be applied to three Ready-To-Eat (RTE) meals gathering the mono food systems which have been previously optimised: a pizza system (dough, mozzarella, sausages/ham and tomato sauce), a puff pastry with a meat filling and a puff pastry with a sweet fruit filling.

To substitute fat in sausage batter the use of carbohydrates such as starch, pectin, guar as well as soluble and non-soluble fibres will be tested. Salt replacements will be used to reduce salt content as well as enhancing saltiness through processing. To facilitate reduction in fat content in cooked and raw sausages saturated animal fats will be replaced by plant oils.



For cheese, a model based on mozzarella—low in sodium and fat—for immediate consumption and for the use on pizza products will be tested. High pressure homogenisation and enzyme technologies will be investigated to modulate taste and texture and enhance the flavour intensity of fat mozzarella-style cheese with reduced sodium. The aim is to achieve 30% reduction in salt and a reduction in fat contents from 0.95% to 17%.

The end users: Food manufacturers, marketing, retailers, consumers

SMEs and consumers: PLEASURE involves novel processing approaches and tailor-made technologies that can be used by food producers to manufacture healthier food for European



consumers.

Retailers and marketing: PLEASURE will contribute to the CLEAN LABEL movement, which removes any substance from food formulation that is not food based (i.e. conservatives, substitutes, etc.). This will support future marketing and labelling strategies.

The inventors: SMEs, research and technology organisations, academia

The project has 16 partners—with more than 50% from private businesses or private institutions. Other participants include universities and non-profit research institutions.

The lead partner is BIOZOOM Food Innovations GmbH, an SME specialised in molecular gastronomy and specific food segments.

Development stage: Proof of principle and patenting

The patent is pending for a biotech process for sugar reduction in apple juice by fermentative and enzymatic processes. The process is to be transferred also to tomato juice.

Sensory and perception tests for salt and sugar taste and its alternatives will be prepared *in vitro* and *in vivo* (expert panels and consumer blind tests).

The pizza model is the ambassador of the reduction strategies concept, as pizza is a widely consumed product. Having such a popular product as model has the potential for wide communication actions to the European food industry and to the general public.

Policy impact: Adjustment of nutritional indices

The key elements of the PLEASURE concept aim to contribute to improving scientific understanding of the perception of saltiness and sweetness in mono food systems and in complex food systems. It will also provide a new opportunity to amend existing regulations on nutrition using specific salt, fat and sugar indices developed in this project.

A thorough dialogue through direct consultation with European policy makers such as DG SANCO and EFSA, national ministries and others will be established to obtain their support for this approach.

Next steps: Testing and transfer workshops, marketing strategies

PLEASURE will organise a conference, 17-18 June 2014 in Nantes. During this event, the state-of-the-art in flavour perception techniques using *in vivo* and *in vitro* approaches will be benchmarked against other projects and methodologies. Recent results obtained within the project and in selected parallel initiatives in Europe on salt, sugar and lipid reduction will be presented. This will include tasting new products developed within PLEASURE which will be benchmarked against a control product.

The study on the perception of saltiness in assembled solid food is a distinctive feature of the PLEASURE project. Coffee breaks and lunch breaks will be used as opportunities to taste and compare different products based on the salt, sugar, and lipid reduction process.

Additionally:

- Several demonstration workshops will be carried out to ensure efficient technology transfer into the European food industry to facilitate the widespread uptake of the results from the PLEASURE project;
- The development of detailed exploitation and marketing strategies is key for the participation of SME beneficiaries;
- Several consumer acceptance studies will be organised to test the sensory acceptance as this, along with the affordability of these new food products, is one of the most important success factors.



PLEASURE

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