In the face of today’s challenge to make the healthy choice the easy choice, it is vital for the food industry and research organizations to pool knowledge and resources for multidisciplinary research. TiFN is a unique public/private partnership that generates vision on scientific breakthroughs in food and nutrition, resulting in development of innovative products and technologies that respond to consumer demands for safe, tasty and healthy foods.

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Background

Many commercially available foods contain particles embedded in a food matrix varying in size and hardness, such as fruit pieces in yogurt, vegetable pieces in soups, and chocolate pieces in biscuits. These composite foods with dispersed particles display complex texture profiles and are often associated with positive hedonic responses. Despite the high consumer appreciation and industrial relevance of such foods, the properties that contribute to texture perception and positive hedonic responses are poorly understood.

Study design

Particles varying in size and hardness (fracture stress) were prepared to obtain heterogeneous foods with controlled mechanical contrast. K-carrageenan was used as gelling agent. The particles (15%) were added to liquid, starch-based model soups and semi-solid, protein-based model gels. The sensory profiles were quantified by untrained panellists (n=54) using the Rate-All-That-Apply (RATA) method.

Results

The addition of mechanical contrast in the form of particles changed the sensory perception. Particle size mainly affected the type of selected sensory descriptors, whereas fracture stress of the particles determined mostly the perceived intensity of selected descriptors. Specific sensations, such as grittiness and lumpiness, were changed by varying particle size. By tuning the fracture stress of the embedded particles, the perception of some attributes was enhanced (i.e., chewy, lumpy, and beady for medium-large particles) or reduced (grittiness for small particles).

Conclusions

- Sensory perception of heterogeneous foods can be changed by varying the size and the fracture stress of their embedded components.
- The mere mechanical contrast is not sufficient to enhance food appreciation of model soups and gels, but a combination of changes in the flavour and texture might be required to boost food liking.