



## Restaurant of the Future ...

As 2012 starts draws to a close, it is our pleasure to send you this final newsletter of the year. We can look back on a year that has generated lots of expertise and applications focused on consumers, emotions and elderly people. This newsletter provides information about these subjects as well as our research on sustainable food choice and the effects of food packaging. We hope you enjoy the read and look forward to receiving your feedback.

*Marchel Gorselink, R&D manager, Wageningen UR Food & Biobased Research*

Visit our website [www.restaurantvandetoekomst.wur.nl](http://www.restaurantvandetoekomst.wur.nl)



How ambient aromas affect emotions



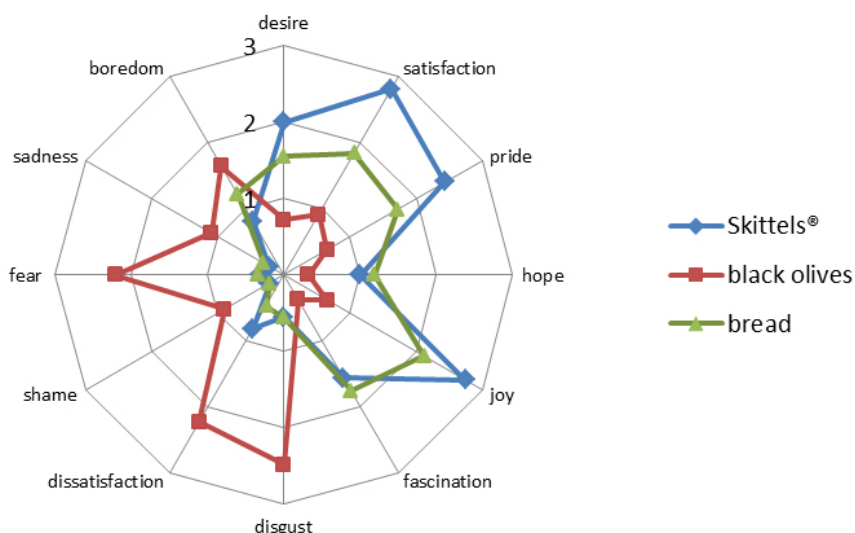
Meat substitutes



Communication via packaging

## Emotion as predictor for product acceptance

**Predicting the acceptance of food products is a difficult issue. A good product does not on its own guarantee product acceptance and success in the long term. The TI Food & Nutrition Sensory & Liking project, a cooperation between the Consumer Science department (Food & Biobased Research) and Human Nutrition division (Wageningen University) in collaboration with the UMCG, is focused on developing models to better predict product acceptance.**



Part of the research is focused on the practicability of emotion tests to distinguish between products and better predict product acceptance. A first study<sup>1</sup> looked at two emotion tests. The Essense™ test consists of 39 emotion terms, and PrEmo® is a test that uses animations of 12 emotions. Both test made the distinction between three types of breakfast drinks. Products that are very similar, and only vary in flavour, for instance, do not result in a different emotion profile. A follow-up study focused on the emotional perception of packaging and the predictive capacity of emotion profiles. The results of this second study are expected in 2013.

In addition to studies onto emotional perception in adults, research was also carried out into whether the non-verbal PrEmo® can be used for >

## Column

### Emotions; a new discipline in sensory consumer research



*Consumers choose food products they like, which is why sensory consumer research is often focused on 'initial product liking'. A new product should get a higher score than*

*the competitors' products. But more is at stake: We don't always choose what we like best. For breakfast we don't think long about our choice as we usually prefer a familiar product that gives us energy for the day ahead. In the evenings we tend to opt for something that rewards our day's hard work. These aspects are related to the emotions evoked by eating a product and how these emotions fit into the context in which the food is eaten.*

*While research into emotions has a long scientific history in psychology and neuroscience, research into emotions and their relation to food choice is still in its infancy. The Division of Human Nutrition is working on this discipline in cooperation with Consumer Science of Food & Biobased Research. There are currently three PhD projects underway in the Restaurant of the Future, focused on basic questions regarding emotions: How can we best measure emotions, and how can we use these measurements to predict consumer food choices, even after repeated exposure?*

*We are also looking at how flavours and aromas evoke emotions in what has turned out to be a genuinely exciting investigation. As well as being fascinating from a scientific perspective, the research has many practical implications for everyday questions regarding product development. Emotions and food choice: A new discipline in which Wageningen UR hopes to leverage on our renowned energy and enthusiasm to become leaders in the field.*

Kees de Graaf, Professor in Sensory Science and Eating Behaviour, Division of Human Nutrition, Wageningen University

*Continued from page 1*

children<sup>2</sup>. A pilot study showed that children from 8 to 12 were able to apply the PrEmo properly, and resulted in various emotion profiles for products that were considered good (sweets), neutral (bread) and unpleasant (black olives) - see the spider diagram. For the sweets we see a high score on the animations of satisfaction, pride and joy, while black olives score heavily in terms of

dissatisfaction and disgust. Testing emotional perception seems to be an applicable method to test product acceptance by children.

1 S. Gutjar et al (submitted) Food and context evoked emotions: relationship with food choice and liking.

2 Thanks to the Susagroup for providing PrEmo® ([www.susagroup.com/www.premotool.com](http://www.susagroup.com/www.premotool.com)).

Valesca Kooijman, Scientist Consumer Science & Intelligent Systems, Wageningen UR Food & Biobased Research

## How ambient aromas affect emotions

Although ambient aromas are often associated with physiological, psychological and affective behavioural effects, the scientific basis for this is limited. In the mood rooms of the Restaurant of the Future we studied whether it was possible to measure the effects of weak concentrations of citrus and vanilla under a small number of test subjects (22; 'young' (32.0 ± 10.3 yrs) and 'middle-aged' (51.1 ± 4.0 yrs)) with relatively simple psychological and physiological tests, and in semi-real life settings. Being exposed to the aroma of citrus resulted in increased physical activity, shorter response times among the young participants, fewer negative emotions and a

different food choice: When exposed to citrus the subjects ate slightly more tangerine ( $p < 0.1$ ) and significantly less cheese ( $p < 0.05$ ). Exposure to the aroma of vanilla resulted in more introverted emotions. It can be concluded that exposure to aromas results in measurable effects on emotions and a different food choice. The results of the research will be published in the scientific magazine Flavour.

*de Wijk, R.A., and Zijlstra, S.M. Differential effects of exposure to ambient vanilla and citrus aromas on mood, arousal and food choice.*

René de Wijk, Senior Scientist Consumer Science & Intelligent Systems, Wageningen UR Food & Biobased Research



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# Meat substitutes: Acceptance in real-life

**A vegetarian schnitzel or wok stripes? Do consumers like these types of healthier and climate-friendly products? Which would they choose from a dinner buffet? And when they prepare such meat substitutes at home, do they appreciate them and will they want to eat them more often? These are some of the questions currently being studied by Food & Biobased Research as part of the EU Research project LikeMeat for SMEs.**

The project is a partnership with research institute Fraunhofer (Freising, Germany), BOKU (Vienna, Austria) and ten industrial partners. The purpose is to develop meat substitutes and recipes for the target group of so-called flexitarians, people who don't always eat meat.

The research took place in the Restaurant of the Future in a unique test set-up: An 'out-of-home test' was combined with a 'home-use' test. For a period of six weeks, on every Tuesday evening, the restaurant served a dinner consisting of three buffets.

Each buffet included a different meat substitute:

- A Mexican buffet, where participants could make a taco with a Mexican LikeMeat filling;
- An Italian buffet with a pasta sauce containing LikeMeat mince;
- A buffet that included fried LikeMeat stripes with rice and curry sauce.

The choices of the 80 flexitarians who dined on average at the restaurant every night were registered.

The consumers' walking patterns during the selection process were recorded by cameras in the Restaurant of the Future, carefully registering



individual movements and pauses, and the way consumers looked at and served themselves food. The so-called gaze-detection cameras analysed the behaviour of the consumers at the buffet. By combining all data, we now know what the individual consumers selected and which types of LikeMeat products caused them to hesitate. It also allowed us to see if consumers checked all options before making their selection and whether there were differences between the six nights. After the meal, the participants were asked to fill out a survey giving their opinions of the meal and the meat substitutes. They were also given a LikeMeat hamburger or a LikeMeat 'raw meat' slice to prepare the next day at home plus another survey with questions about the preparation and flavour. The data from walking patterns, gaze cameras, purchasing behaviour and surveys is currently being analysed, and the results will be published in 2013.

Anke Janssen & Nicole Koenderink, Senior Scientists  
Consumer Science & Intelligent Systems, Wageningen UR  
Food & Biobased Research

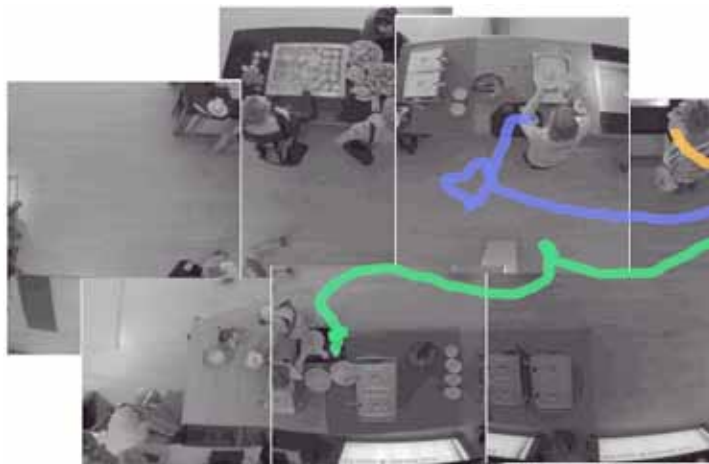


Figure in which three people are being tracked (green, blue and orange tracks)

## Flair study

Obesity is a growing problem with major health and economic consequences. According to data from the WHO there were 1.5 billion obese people in 2008. The Flair study, a joint initiative between PhD students Vivian He (Wageningen UR, FBR) and Jet Zoon (Wageningen University, Human Nutrition), was designed to discover

the effect of hunger/satiation and body weight on:

- Bodily functions (heart rate, skin conductance and saliva production)
- Sensitivity to food cues
- Appreciation of various types of food.

René de Wijk, Senior Scientist Consumer Science & Intelligent Systems, Wageningen UR Food & Biobased Research

Held in the mood rooms of the Restaurant of the Future, the study runs until the end of February 2013, and the results are expected shortly after. Eventually the research hopes to find new insights into how to approach the issue of obesity.

## Communication via packaging

**Everyone gets older but how we experience the ageing process varies per person. In a recent study into packaging communication first indications were found that being directly confronted with our age via a label might make consumers choose not to buy a specific product.**

In cooperation with VTT Technical Research Centre of Finland we carried out research into the main factors related to product communication via packaging to elderly consumers. Members of the SenTo panel (SenTo is the Dutch abbreviation of senior network of the future) were asked to evaluate various existing and non-existing product labels, and indicate whether they would purchase packaging with such a label or whether they would prefer the regular packaging.

The existing labels received a positive evaluation from older participants, while the unknown and non-existing labels were received neutrally. However, there was one exception: The '50+' label, which indicated that a product was

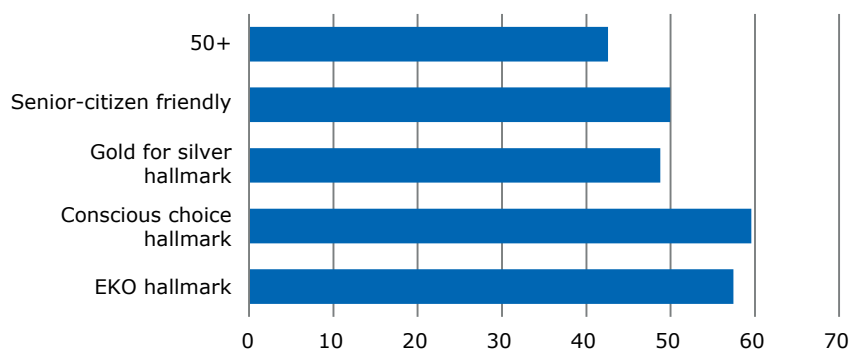


intended specifically for middle-aged and elderly people, was seen as unattractive; even compared to another fictive label aimed at these age groups that did not include a number. In case of the '50+' label, the SenTo members preferred a regular packaging without the label. Interestingly, this effect was observed to be stronger among women than men.

Therefore it seems wise not to confront elderly consumers with their age on product packages.

Anna Maaskant, Scientist Consumer Science & Intelligent Systems & Elina Rusko, Scientist VTT, Wageningen UR Food & Biobased Research & VTT Technical Research Centre

Average score per label



## Coming soon

### Care@Home Workshop

23 January 2013, from 13.00  
Restaurant of the Future, Wageningen

Elderly people prefer to live on their own as long as possible, but they often encounter various problems. Food is a prime example. How can you continue to buy and prepare healthy and tasty food if your taste as well as your mobility are in decline? Are ready-made meals the only solution? Is there a good catering concept or special neighbourhood restaurant available? Who can arrange all of this and what will it cost? In this workshop for businesses, Food & Nutrition Delta and Food & Biobased Research will be working with the participants to find innovation opportunities. Taking part in the workshop will enable you to influence the research themes of the near future.

More information: [Herman.Peppelenbos@wur.nl](mailto:Herman.Peppelenbos@wur.nl)

### Restaurant of the Future Participants Day

Note in your calendar:  
21 February 2013, from 14.30  
Restaurant of the Future, Wageningen

More information: [Marchel.Gorselink@wur.nl](mailto:Marchel.Gorselink@wur.nl)



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