

Sensory perception and preferences and their effect on reducing salt, sugar and fat in foods

Dr Lisa Methven

Sensory Science Centre; Food and Bioprocessing Sciences

Working with:

Hugh Sinclair Unit of Human Nutrition

Psychology & CINN

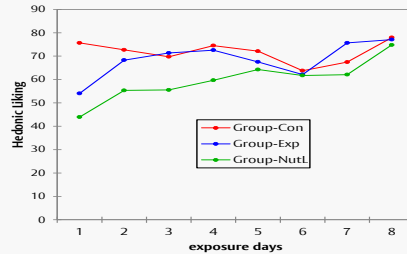
Agriculture Policy & Development



Salt: What have we done already?



Exposure / Adaptation



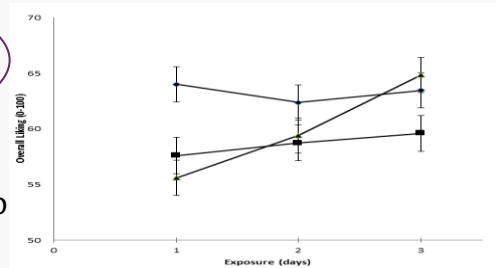
Food Quality and Preference 26 (2012) 135-140

Changes in liking for a no added salt soup as a function of exposure

Lisa Methven^{a,*}, Elodie Langrenay^{a,b}, John Prescott^{a,c}

Tastant & Aroma Enhancers

- = low salt soup
- ▲ = oregano soup
- ◆ = standard soup



Enhancing consumer liking of low salt tomato soup over repeated exposure by herb and spice seasonings*

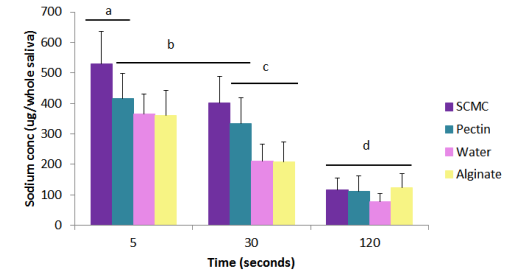
Sameer Khalil Ghawi, Ian Rowland, Lisa Methven*



What are we doing now?

Mucoadhesion

- Using polymers as mucoadhesives
- Measuring retention in-vitro & in vivo
- Dynamic sensory perception
- This has **reduced sugar & fat application too**



What could we do?

Mucoadhesion & Crossmodal Enhancement & Exposure

Fat: What have we done already?

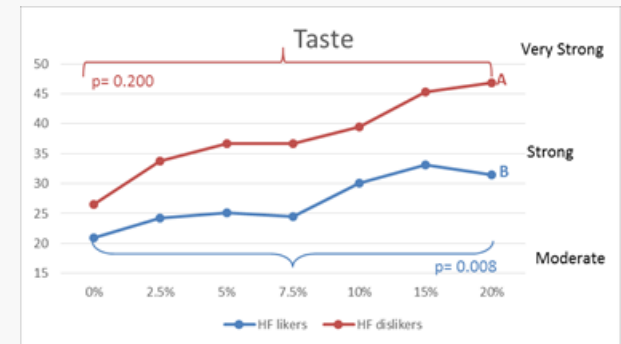


- Used plant oilseeds and oils supplementation of the bovine diet to partially replace milk SFA with MUFA
- Research findings led to a new retail milk

What are we doing now?



- Nutritional intervention & consumer studies with dairy foods with partial replacement of SFA with MUFA
- Fat perception = Mouthfeel & Aroma & TASTE
- Individuals differ in FFA thresholds AND perceived fat intensity in foods (with & without mouthfeel cues)
- High fat likers are LESS sensitive to fat TASTE



What could we do?

- Stimulate oral lipase or modify FFA levels in lower fat thickened food matrices
- Evaluate with Fat likers & dislikers
- Measure oral release of FFA
- Investigate crossmodal aroma cues
- Study reduced fat absorption due to effect of food matrix

Sugar: What have we done already?



- Intervention study on energy compensation where habitual foods were replaced with commercial **low sugar equivalents** vs. regular sugar alternatives (*Advance online publication*)
 - Significant reduction in sugar intake
 - But no change in body weight due to energy compensation
- Consumer study showed room for improvement...

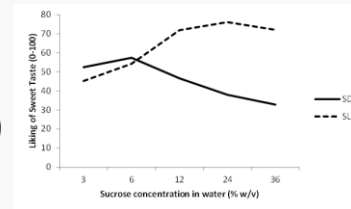
Food Research International 72 (2015) 133–139

Sensory profiles and consumer acceptability of a range of sugar-reduced products on the UK market

Oonagh Markey ^{a,b}, Julie A. Lovegrove ^{a,b}, Lisa Methven ^{a,*}

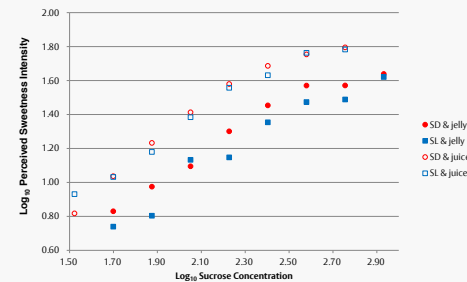


- **Sweet Likers** : are easy to distinguish from dislikers
- Liker status (aqueous) effects preference in juice
- Sweetness intensity significantly lower in jelly than juice
- Sweet liker status not largely related to sweetness perception (*in press*)



Dr Ciara McCabe,
UoR

- **Sweet taste regulates** carbohydrate metabolism
 - Sweet associated with dopamine reward & homeostatic post-ingestive signals (Small, D. 2015)
 - Metabolism & preference diminished when sweetness <OR> expected from carbohydrate load



What could we do?

- Manipulate sweetness of foods : viscosity / structure / tastants
- Determine Low & Optimum sucrose sweetness levels for SL & SD, match sweetness of Low samples with AS.
- Use fMRI to determine brain response
- Measure glucose metabolism