This is a repository copy of Influence of both chewing and lubrication during oral processing of hydrogels on hunger and energy intake.

White Rose Research Online URL for this paper:
http://eprints.whiterose.ac.uk/137116/

Version: Accepted Version

Proceedings Paper:

https://doi.org/10.1017/S0029665118001453

© The Authors 2018. This is an author produced version of a paper published in Proceedings of the Nutrition Society. Uploaded in accordance with the publisher's self-archiving policy.

Reuse
Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.
Influence of both chewing and lubrication during oral processing of hydrogels on hunger and energy intake. By EM Krop\textsuperscript{1}, MM Hetherington\textsuperscript{2}, S Miquel\textsuperscript{3} and A Sarkar\textsuperscript{1}, \textsuperscript{1}Food Colloids and Processing group, School of Food Science and Nutrition, University of Leeds, LS2 9JT, UK, \textsuperscript{2}School of Psychology, University of Leeds, LS2 9JT, UK and \textsuperscript{3}Mars Wrigley Confectionery, 1132 West Blackhawk Street, Chicago, IL 60642, USA

It is widely accepted that oral processing is an important factor in the regulation of food intake, with slow eating rate, high number of chews, longer oro-sensory exposure, smaller bites and harder food textures being recommended for decreasing the energy intake\textsuperscript{(1)}. However, the effects of oral lubrication remain unclear. This study aimed to determine the individual and combined effects of the chewing and lubrication aspects of oral processing on subjective appetite and snack intake. Model biopolymer gels with mint flavouring were designed varying in their textural properties (as measured instrumentally and sensorially, unpublished data) to generate different oral processing behaviour as related to the chewing and the lubrication.

Fifty-five participants (26.3 ± 7.1 years old, BMI 23.0 ± 3.2 kg/m\textsuperscript{2}) were recruited to participate in a between-subjects randomized study design with three hydrogel samples varying in their chewing and lubrication attributes, as well as a control group. For the control group, a mint tea with the same green food colouring as in the gels was used. First, participants received a sandwich lunch, followed 3 hours later by the mint preload and an ad libitum salty snack. Hunger, fullness, desire to eat and appetite were rated on 100 mm visual analogue scales (VAS) before (t\textsubscript{0}) and after the preload (t\textsubscript{1}), as well as after the snack (t\textsubscript{3}), and the snack intake was weighed.

Snack intake appeared to be suppressed after eating the low chewing/high lubricating sample as compared to the high chewing/low lubricating, medium chewing/high lubricating sample and the tea (reduced by 30\%). No other significant differences were found for food intake (p > 0.05). Hunger ratings decreased from t\textsubscript{0} to t\textsubscript{3} (p < 0.05), however differences between conditions were rather subtle. Thus, a model food with high oral lubrication properties could help reduce the snack intake, but more research is necessary on the interaction between chewing and lubrication properties.