



BRITISH
Nutrition
FOUNDATION

**BNF webinar:
A sweet solution?
Can low calorie sweeteners
help us to reduce our
sugars intake?**

**Wednesday 16th May 2018
13.00-14.00 (BST)**

Introduction

The British Nutrition Foundation (BNF), a registered charity, delivers impartial, authoritative and evidence based information on food and nutrition. Its core purpose is to make nutrition science accessible to all, working with an extensive network of contacts across academia, education and the food chain, and through BNF work programmes focussing on education in schools and nutrition science communication. The key role of BNF's Council and Trustees is to ensure that the Foundation delivers its charitable aims, is impartial, transparent and acts with integrity. BNF's Articles of Association require a majority of Council's members to be leading academics from the nutrition science community, supported by leaders in education, communication and the food chain.

BNF's funding comes from a variety of sources including EU projects; contracts with national government departments and agencies; conferences, publications and training; membership subscriptions; donations and project grants from food producers and manufacturers, retailers and food service companies; funding from grant providing bodies, trusts and other charities. BNF is not a lobbying organisation nor does it endorse any products or engage in food advertising campaigns. More details about BNF's work, funding and governance can be found at www.nutrition.org.uk/aboutbnf.

We would like to thank our Sustaining Member Companies for their continued support which enables us to offer an ongoing programme of events and training. BNF is also grateful to International Sweeteners Association (ISA) for providing an educational grant towards the success of this webinar. However, the programme has been directed by the Foundation alone, which is committed to producing independent, evidence-based science.

At British Nutrition Foundation conferences, each participating speaker/organisation is responsible for the accuracy of the information provided and is required to declare any relevant interests.

Are you on Twitter?

Follow @BNFEvents and use #BNF18LCS for highlights from today's event.

Upcoming BNF events

28 June 2018 Why is everybody talking about gut microbiota?

1-2pm (BST) Free lunch time webinar

For more details and to register visit BNF's events page
<https://www.nutrition.org.uk/index.php/bnfevents.html>

2 Oct 2018

Save the date

When, what and how: the complexity of diets for weight loss

London, UK

For more information email h.gibson-moore@nutrition.org.uk

Programme

13:00 Setting the scene – the public health context

Sara Stanner, British Nutrition Foundation

What should you say when asked whether low-calorie sweeteners help with weight management in adults?

13:10 The Academic insight - the evidence

Prof Peter Rogers, University of Bristol

13:25 The Dietetic insight – the practical approach

Dr Duane Mellor, Coventry University and British Dietetic Association (BDA)

13:40 The sweet tooth hypothesis

Prof Katherine Appleton, Bournemouth University

13:55 Emerging Research: New studies being undertaken

Dr Una Masic, University of Liverpool

Speakers

Sara Stanner

Science Director

British Nutrition Foundation

Setting the scene – the public health context



Sara joined the BNF having completed an MSc in Public Health Nutrition from the London School of Hygiene and Tropical Medicine. Prior to this she worked at the Centre of Diabetes and Cardiovascular Risk at University College London Medical School where her activities included the coordination of a project in St Petersburg to investigate the relationship between intrauterine malnutrition and adult cardiovascular disease. Sara is Science Director at the BNF, where her main role is to ensure the accuracy and quality of the scientific output of the science team. She is one of the editors of Nutrition Bulletin and has been involved in editing several of the BNF's recent Task Force reports (including Cardiovascular Disease, Healthy Ageing and Nutrition and Development).

Take home message

- Expert authorities strongly support the safety of low calorie sweeteners up to the Acceptable Daily Intake (ADI).
- In the current climate, where obesity is a major public health concern, low calorie sweeteners offer a useful tool for reformulation to achieve sugar and calorie reduction in some products.
- Many health authorities note that substitution of sugars for low calorie sweeteners may be helpful in weight management. The European Food Safety Authority has

also approved health claims for some low calorie sweeteners in relation to dental health and glucose control.

- Levels of exposure are typically well within the ADI limits for the individual sweeteners. However, as intakes are likely to increase in response to calls for further sugar reduction, it is important to continue to monitor potential exposures.

Declaration of interest:

Employed by BNF. Details regarding BNF funding can be found at www.nutrition.org.uk

Prof Peter Rogers

Professor of Biological Psychology
University of Bristol

The Academic insight - the evidence



Peter Rogers is Professor of Biological Psychology at the University of Bristol, UK. He trained in biological sciences and experimental psychology at the University of Sussex UK (1972-1976). He completed his PhD and postdoctoral work at the University of Leeds UK, moving to the Institute of Food Research, Reading UK in 1990. He moved to the University of Bristol UK in 1999, where he teaches biological psychology and does research on nutrition and behaviour: which includes work on human appetite and weight control, food choice, dietary effects on mood and cognitive function, and the psychopharmacology of caffeine. His first study on low-calorie sweeteners and appetite was published in 1988. Peter Rogers is a Chartered Psychologist, a Fellow of the British Psychological Society, and a Registered Nutritionist.

Take home message

By reducing the calorie content of food and drink products, low-calorie sweeteners can be expected to decrease overall calorie intake and thereby decrease body weight. However, such effects will be limited by the extent of calorie reduction in products, and by the dynamics of appetite and weight control, which include acute compensatory eating, and an increase in appetite and decrease in energy expenditure accompanying weight loss.

Declaration of interest:

Peter Rogers has received funding from Sugar Nutrition UK for research on sugar and satiety, provided consultancy services for Coca-Cola Great Britain, and received speaker's fees from the International Sweeteners Association and the Global Stevia Institute. He recently led an expert group undertaking the systematic review of low-calorie sweetener consumption and energy intake and body weight which received support from ILSI Europe. See abstracts of interest.

Dr Duane Mellor

Senior Lecturer in Human Nutrition
Coventry University

The Dietetic insight – the practical approach



Duane has worked clinically as a dietitian, mainly in diabetes management and education and then as a researcher in clinical trials. However, reflecting back on the first two decades of his career he has begun to question a number of aspects of nutrition and dietetic practice. He is now interested in looking at evidence in nutrition, both in terms of causality and quality along with how this is communicated to the public by the media. Looking to challenge thinking in this area, to consider aspects of benefit and the risks of harm, ultimately looking at how the public can be best supported to eat food they enjoy that also supports good health.

Take home message

- Sweeteners are something some consumers do have concerns about.
- They can be a way of helping to reduce energy and especially sugar intake.
- It may be best to view them as a dietary 'stepping stone' toward a healthier diet, helping to change diet but keep some sweetness on the way.

Declaration of interest:

Duane has been involved in a Food Standard Agency (FSA) funded study to assess the effects of aspartame on people who reported themselves to be sensitive to aspartame, and has also received honoraria to speak from the International Sweetener Association.

Prof Katherine Appleton

Professor in Psychology
Bournemouth University

The sweet tooth hypothesis



Katherine graduated from the University of Southampton in 1993 with a BSc (Hons) in Psychology, and from the University of Leeds in 1998 with a PhD in Biological Psychology/Nutrition. Since, she has worked as a Research Fellow at the University of Leeds (1999), University of Surrey (2000-2002), University of Bristol (2002-2005) and as a lecturer at Queen's University Belfast (2005-2012). Katherine joined Bournemouth University in September 2012, following a yearlong sabbatical at the University of Iowa, US. Katherine is a Chartered Psychologist (British Psychological Society, 2001) and a Registered Nutritionist (Nutrition Society, 2001).

Take home message

The work we conducted looked at the impact of sweet taste consumption on subsequent generalized sweet taste preferences and intakes, using a systematic review of the literature. We found very little research addressing this question, and more work is definitely required before firm conclusions are drawn. From the limited evidence currently available, we found some suggestion that sweet taste consumption results in a reduction in preferences and intakes of sweet taste in the short term, but effects in the long term were equivocal.

Declaration of interest:

The work presented was funded by Unilever R&D. See abstracts of interest.

Dr Una Masic

Post Doctoral Researcher and Research Co-Ordinator
University of Liverpool

Emerging Research: New studies being undertaken



Una currently works as a post-doctoral researcher and research co-ordinator as part of the SWITCH Trial at the University of Liverpool. This involves research and management of a research team on a large scale two year project examining the effects of water and non-nutritive sweetened drinks in a dietary intervention trial. Una's early research focussed on the effects of umami on sensory and post-ingestive experiences and subjective ratings of satiation and satiety. This progressed to her post-doctoral work assessing the influence of satiety relevant properties on acute markers of rated appetite and intake as part of the EU Framework Seven Satiety Innovation (SATIN) project.

Take home message

Current research investigating the effects of sweeteners on the long term psychological and physiological parameters is sparse but will yield some exciting new results and potential for this ever growing field.

Declaration of interest:

The current research trial on which Una is employed is funded by the American Beverage Association.

Abstracts of interest

Appleton KM, Tuorila H, Bertenshaw EJ *et al.* (2018) [Sweet taste exposures and the subsequent acceptance and preference for sweet taste in the diet: Systematic review of the published literature.](#) *American Journal of Clinical Nutrition* 107:405-19.

Background

There are consistent, evidence-based global public health recommendations to reduce intakes of free sugars. However, the corresponding evidence for recommending reduced exposure to sweetness is less clear.

Objective

Our aim was to identify and review the published evidence investigating the impact of dietary exposure to sweet-tasting foods or beverages on the subsequent generalized acceptance, preference, or choice of sweet foods and beverages in the diet.

Design

Systematic searches were conducted to identify all studies testing relations of variation in exposure to sweetness through foods and beverages with subsequent variation in the generalized acceptance, preference, or choice of sweetened foods or beverages, in humans aged >6 mo.

Results

Twenty-one studies met our inclusion criteria, comprising 7 population cohort studies involving 2320 children and 14 controlled trials involving 1113 individuals. These studies were heterogeneous in study design, population, exposure, and outcomes measured, and few were explicitly designed to address our research question. The findings from these were inconsistent. We found equivocal evidence from population cohort studies. The evidence from controlled studies suggests that a higher sweet taste exposure tends to lead to reduced preferences for sweetness in the shorter term, but very limited effects were found in the longer term.

Conclusions

A small and heterogeneous body of research currently has considered the impact of varying exposure to sweet taste on subsequent generalized sweet taste preferences, and this evidence is equivocal regarding the presence and possible direction of a relation. Future work should focus on adequately powered studies with well-characterized exposures of sufficient duration.

Rogers PJ, Hogenkamp PS, de Graaf C *et al.* (2016) [Does low-energy sweetener consumption affect energy intake and body weight? A systematic review, including meta-analyses, of the evidence from human and animal studies.](#) *Int J Obes* 40:381-394

By reducing energy density, low-energy sweeteners (LES) might be expected to reduce energy intake (EI) and body weight (BW). To assess the totality of the evidence testing the null hypothesis that LES exposure (versus sugars or unsweetened alternatives) has no effect on EI or BW, we conducted a systematic review of relevant studies in animals and humans consuming LES with ad libitum access to food energy. In 62 of 90 animal studies exposure to LES did not affect or decreased BW. Of 28 reporting increased BW, 19 compared LES with glucose exposure using a specific 'learning' paradigm. Twelve prospective cohort studies in humans reported inconsistent associations between LES use and body mass index (-0.002 kg m⁻²) per year, 95% confidence interval (CI) -0.009 to 0.005). Meta-analysis of short-term randomized controlled trials (129 comparisons) showed reduced total EI for LES versus sugar-sweetened food or beverage consumption before an ad libitum meal (-94 kcal, 95% CI -122 to -66), with no difference versus water (-2 kcal, 95% CI -30 to 26). This was consistent with EI results from sustained intervention randomized controlled trials (10 comparisons). Meta-analysis of sustained intervention randomized controlled trials (4 weeks to 40 months) showed that consumption of LES versus sugar led to relatively reduced BW (nine comparisons; -1.35 kg, 95% CI -2.28 to -0.42), and a similar relative reduction in BW versus water (three comparisons; -1.24 kg, 95% CI -2.22 to -0.26). Most animal studies did not mimic LES consumption by humans, and reverse causation may influence the results of prospective cohort studies. The preponderance of evidence from all human randomized controlled trials indicates that LES do not increase EI or BW, whether compared with caloric or non-

caloric (for example, water) control conditions. Overall, the balance of evidence indicates that use of LES in place of sugar, in children and adults, leads to reduced EI and BW, and possibly also when compared with water.

Wittekind A, Higgins K, McGale L et al (2017) [A workshop on 'Dietary sweetness—Is it an issue?' *Int J Obes*](#)

This report summarises a workshop convened by ILSI Europe on 3rd and 4th April 2017 to discuss the issue of dietary sweetness. The objectives were to understand the roles of sweetness in the diet; establish whether exposure to sweetness affects diet quality and energy intake; and consider whether sweetness per se affects health. Although there may be evidence for tracking of intake of some sweet components of the diet through childhood, evidence for tracking of whole diet sweetness, or through other stages of maturity are lacking. The evidence to date does not support adverse effects of sweetness on diet quality or energy intake, except where sweet food choices increase intake of free sugars. There is some evidence for improvements in diet quality and reduced energy intake where sweetness without calorie replaces sweetness with calories. There is a need to understand the physiological and metabolic relevance of sweet taste receptors on the tongue, in the gut and elsewhere in the body, as well as possible differentiation in the effects of sustained consumption of individual sweeteners. Despite a plethora of studies, there is no consistent evidence for an association of sweetness sensitivity/preference with obesity or type 2 diabetes. A multifaceted integrated approach, characterising nutritive and sensory aspects of the whole diet or dietary patterns, may be more valuable in providing contextual insight. The outcomes of the workshop could be used as a scientific basis to inform the expert community and create more useful dialogue among health care professionals.

[Sylvetsky AC, Rother KI \(2018\) *Nonnutritive Sweeteners in Weight Management and Chronic Disease: A Review. Obesity \(Silver Spring\). 26\(4\): 635-640.*](#)

OBJECTIVE

The objective of this review was to critically review findings from recent studies evaluating the effects of nonnutritive sweeteners (NNSs) on metabolism, weight, and obesity-related chronic diseases. Biologic mechanisms that may explain NNS effects will also be addressed.

METHODS

A comprehensive review of the relevant scientific literature was conducted.

RESULTS

Most cross-sectional and prospective cohort studies report positive associations between NNS consumption, body weight, and health conditions, including type 2 diabetes, cardiovascular disease, and nonalcoholic fatty liver disease. Although findings in cellular and rodent models suggest that NNSs have harmful effects on metabolic health, most randomized controlled trials in humans demonstrate marginal benefits of NNS use on body weight, with little data available on other metabolic outcomes.

CONCLUSIONS

NNS consumption is associated with higher body weight and metabolic disease in observational studies. In contrast, randomized controlled trials demonstrate that NNSs may support weight loss, particularly when used alongside behavioral weight loss support. Additional long-term, well-controlled intervention studies in humans are needed to determine the effects of NNSs on weight, adiposity, and chronic disease under free-living conditions.

Registration for *A sweet solution?*

BNF would like to thank all our registrants in the UK and Europe, and further afield including our delegates from the US, South and Latin America, Africa, South East Asia and Australia for joining our event.

We have had 800 registrations for this event

