International Sweeteners Association

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International Sweeteners Association (ISA)
Supported Roundtable

# Low calorie sweeteners' effects on energy intake and diabetes, and psychological determinants of consumption behaviour: What the latest evidence shows.

Date: Friday 19th May 2017
Time: 13.15 – 14.45
Room: Nobre, Alfândega Congress Centre, Porto (Portugal)

# Low calorie sweeteners' effects on energy intake and diabetes, and psychological determinants of consumption behaviour: What the latest evidence shows.

Friday 19th May 2017, 13.15 - 14.45, Nobre

## Detailed overview

13.20 Low calorie sweeteners: Do they have a role in the fight against diabetes?

Dr John L. Sievenpiper, MD, PhD, FRCPC
Department of Nutritional Sciences, Faculty of Medicine University of Toronto; Division of Endocrinology & Metabolism, Li Ka Shing Knowledge Institute, and Toronto 3D Knowledge Synthesis & Clinical Trials Unit, St. Michael's Hospital, Toronto, ON, Canada.

The dual epidemics of obesity and diabetes represent two of the most important unmet prevention and treatment challenges. Sugars have been singled out as one of the prime culprits in these epidemics, leading health authorities such as the World Health Organization to recommend reductions in free sugars. Low calorie sweeteners provide a potentially important means for displacing excess calories from free sugars in the diet. There is, however, a concern from prospective cohort studies that low calorie sweetened beverages are associated with an increased risk of obesity and diabetes. Reverse causality cannot be ruled out in this relationship, as people who are already overweight and at risk for diabetes may be higher consumers of low calorie sweeteners. Higher quality evidence from systematic reviews and meta-analyses of randomized trials that protect against reverse causality shows the opposite. Pooled estimates from these analyses show a clear signal for weight loss when low calorie sweeteners displace calories from sugars (especially, sugar-sweetened beverages) for up to 18 months. Well-powered, individual randomized controlled trials have also shown significant advantages of this approach for cardiometabolic risk factors for up to 6 months. Taken together, these data argue against a role of low calorie sweeteners in the promotion of obesity and diabetes and make a compelling argument for benefit. To address the uncertainties, there remains a need for larger, longer, high quality trials.

13.40 Psychological determinants of consumption of low-calorie sweetened (LCS) beverages

Dr Charlotte A. Hardman
Department of Psychological Sciences, University of Liverpool, Liverpool L69 7ZA, UK.

Consumption of low-calorie sweetened (LCS) beverages has increased considerably in recent years. However, very little is known about the factors which influence and sustain LCS beverage intake in frequent consumers. To address this gap in knowledge, our research aims to identify the key psychological determinants of LCS beverage consumption. In a community sample of adults, we have found that frequent consumers of LCS beverages (>825 ml per day; N=108) have higher levels of dietary restraint and body weight concerns than non-consumers (N=103). We have also developed a novel questionnaire to quantify beliefs and attitudes towards LCS beverages. Using this tool, we have found that frequent

## Agenda

13.15 Opening
by chair Prof Maria Hassapidou, Alexander Technological Educational Institute of Thessaloniki (Greece)

13.20 Low calorie sweeteners: Do they have a role in the fight against diabetes?
Dr John Sievenpiper, University of Toronto (Canada)

13.40 Psychological determinants of consumption of low-calorie sweetened (LCS) beverages
Dr Charlotte Hardman, University of Liverpool (UK)

14.00 Effects of acute or long-term consumption of beverages containing low calorie sweeteners on energy intake and food behaviour
Dr Marc Fantino, Honorary Professor, University of Burgundy (France)

14.20 Panel discussion

consumers believe that LCS beverages are highly palatable as well as being effective in controlling appetite (hunger, cravings) and body weight. According to goal conflict theory, restrained eaters experience a conflict between two incompatible goals – hedonic (enjoyable) eating and weight control. Our results thus suggest that LCS beverages may help individuals to reconcile these goals. To explore this idea further, in a laboratory study, we have examined consumption behaviours in frequent and non-consumers of LCS in response to food cravings. Initial results indicate that frequent consumers choose to consume LCS beverages and may be protected from craving-induced increases in food consumption as a result. Taken together, these findings suggest that positive beliefs about palatability and appetite control are key determinants of LCS beverage consumption. Results also tentatively suggest that LCS beverages may be used as part of a successful strategy to combat sweet food cravings.

### 14.00 Effects of acute or long-term consumption of beverages containing low calorie sweeteners on energy intake and food behaviour

Dr Marc Fantino
Honorary Professor, University of Burgundy (France).
Scientific and medical Director of clinical research centre CreaBio Rhône-Alpes (France).

Substitution of low calorie sweeteners (LCS) for caloric sweeteners (sugars) is currently proposed to reduce energy intake to fight obesity. However the usefulness of LCS in weight reduction is questioned on the basis that uncoupling between taste and post-ingestive responses by LCS may rather increase total energy intake (TEI), disrupting the learned responses that normally contribute to energy homeostasis. Contrary to this theory, a recent systematic review and meta-analysis by Rogers et al[1] concluded that low calorie sweeteners do not lead to full energy compensation and can decrease total energy intake.

To test the hypothesis, we conducted a randomised controlled trial with 80 female and 86 male participants comparing the effect of LCS beverages or water, when consumed with meals, on energy intake, and in subjects who were not habitual users of LCS in beverages or foods compared to LCS-habituated participants.
LCS beverage consumption with meals did not increase total energy intake, macronutrient intakes or sweet foods selected, either in LCS-naïve male and female subjects, or after the 4-week habituation period to daily LCS consumption by previously LCS naïve subjects. LCS beverage drinking did not alter food motivation ratings in both conditions. In conclusion, our study findings are in line with the conclusions of Rogers et al systematic review, that LCS use does not disrupt feeding behaviour, nor control of energy intake.

[1] Reference: Rogers PJ, Hogenkamp PS, de Graaf K, et al. 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 2016; 40(3): 381-94

# About the speakers

### Prof Maria Hassapidou

Maria Hassapidou is currently professor of Nutrition and Dietetics in the department of Nutrition and Dietetics of the Alexander Technological Educational Institution of Thessaloniki (ATEI), Greece. She is also head of the post-graduate course on Clinical nutrition, director of the Human Nutrition Laboratory and vice-president of the research committee of the same institution. She has coordinated and/or participated in several research projects funded by the E.U. (Europe against cancer, Health, Diets I and II, Healthgrain, Eurreca, JANPA), the research committee of ATEI, the Greek Ministries of Health, Education, Research and Technology, food and pharmaceutical companies, in the areas of dietary assessment and nutritional evaluation, dietary treatment of obese patients with cardio metabolic diseases and childhood obesity. She is the national coordinator for Greece for COSI (WHO European Childhood Surveillance Initiative), member of the EASO Childhood Obesity Task Force, member of the executive board of ECOG (European Childhood Obesity Group) and co-chair of the European Specialized Dietetic Network (ESDN) of EFAD on Obesity. She has been author of several books and has published more than 100 scientific papers (referred papers in journals and conference proceedings) in the areas of nutrition and obesity. She is also a reviewer in many related European and International journals.

### Dr John L Sievenpiper, MD, PhD, FRCPC

Dr Sievenpiper is an Associate Professor in the Department of Nutritional Sciences and the Lifestyle Medicine Lead in the MD Program, Faculty of Medicine, University of Toronto. He is also a Staff Physician in the Division of Endocrinology & Metabolism and Scientist in the Li Ka Shing Knowledge Institute, St. Michael's Hospital. Dr Sievenpiper completed his MSc, PhD and Postdoctoral Fellowship training in the Department of Nutritional Sciences, Faculty of Medicine, University of Toronto. He completed his MD at St. Matthew's University followed by Residency training in Medical Biochemistry at McMaster University. His research is focused on using randomized controlled trials and systematic reviews and meta-analyses to address important questions in relation to diet and chronic disease prevention. He currently holds a PSI Foundation Graham Farquharson Knowledge Translation Fellowship, Canadian Diabetes Association Clinician Scientist Award, and Banting & Best Diabetes Centre Sun Life Financial New Investigator Award. He has authored 130 scientific papers and 13 book chapters. Dr Sievenpiper is directly involved in knowledge translation with appointments to the nutrition guidelines' committees of the Canadian Diabetes Association (CDA), European Association for the study of Diabetes (EASD), and Canadian Cardiovascular Society (CCS).

### Dr Charlotte A. Hardman

Dr Charlotte Hardman is a lecturer in the Department of Psychological Sciences at the University of Liverpool. She is interested in psychological determinants of appetite and eating behaviour and in the application of this knowledge to interventions for health behaviour change. She completed her undergraduate degree in psychology at the University of Leeds and her PhD research at Bangor University. While at Bangor she developed novel interventions to increase fruit and vegetable intake and physical activity in children. She then conducted postdoctoral research at the University of Bristol to examine psychological and biological determinants of food reward. In current work at the University of Liverpool, she is examining the effects of low-calorie sweetened (LCS) beverages on appetite in the context of a large randomized controlled trial for weight management. Her work specifically focuses on the impact of consumer beliefs and goals on consumption of sweeteners and other food-related behaviours.

### Dr Marc Fantino

Marc Fantino is a Medical Doctor (MD) and Doctor of biological sciences. Appointed as full professor of medicine at the Medical School / University-Hospital of Dijon-France (1982), he was the head of the Department of Human Physiology and Nutrition from 1987 to 2013. At the same time, he was Director of the Doctoral School of life sciences of the Universities of Burgundy and of Franche-Comté (1993 to 2001), expert at the French National Agency for Food Safety (1996-2006) and also Chairman of the National Nutrition and Health Program logo award committee (2004-2011). Being an Honorary Professor of the Burgundy University since 2013, he recently co-founded and manages a new clinical research organization, CREABio Rhône-Alpes®, accredited by health authorities to conduct human studies. In this center, basic and applied research is implemented in the field of the sensorial and metabolic processes which regulate feeding behaviours and fat mass. For these works, different behavioural, neurophysiologic or pharmacological approaches and models are developed.

Please visit us at ISA booth (number 17) to find out more about the role low calorie sweeteners can play in the diet.

For more information about low calorie sweeteners, please visit:
www.sweeteners.org