



**International
Sweeteners
Association**

14th European Nutrition Conference

FENS 2023 | Belgrade, Serbia

Food, Nutrition and Health: Translating science into practice

International Sweeteners Association (ISA) Scientific Symposium

Low/no calorie sweeteners as a tool in reducing sugars intake, body weight and risk of non-communicable diseases (NCDs): From evidence to recommendations

Date: Thursday 16th November 2023

Time: 11:00 – 12:30

Room: Room 1, Sava Center, Belgrade, Serbia



Low/no calorie sweeteners as a tool in reducing sugars intake, body weight and risk of non-communicable diseases (NCDs): From evidence to recommendations

Thursday 16th November 2023, 11:00 – 12:30 (Room 1)

Detailed overview

Low/no calorie sweeteners and risk of non-communicable diseases (NCDs): Correlation vs. Causation

Prof. Carlo La Vecchia – Professor of Medical Statistics and Epidemiology, University of Milan, Italy

The role of low-no-calorie sweeteners (LNCS) on cancer has been widely debated since the 70s. Still, the meta-analyses from the WHO 2022 – Health effects of the use of non-sugar sweeteners found no excess risk of other cancers from LNCS.¹

To provide further information on the role of LNCS on the risk of cancer, we performed a meta-analysis using the four studies including information on non-SSB and mortality from all cancer sites combined.² All estimates were close to unity with no between-study heterogeneity. Our pooled estimate for all cancers was 1.01 (95% CI: 0.96, 1.06), thus indicating no excess risk for the highest level of consumption. The International Agency for Research on Cancer (IARC) classified in June 2023 aspartame as possibly carcinogenic to humans (Group 2B) mainly on the basis of a European cohort study on liver cancer.³ However, a study subsequently published based on the Women's Health Initiative cohort study found no association between aspartame and liver cancer.⁴ Thus, we can now exclude a consistent association between LNCS and cancer risk, too.

With reference to cardiovascular diseases and related indicators, the WHO 2022 – Health effects of the use of non-sugar sweeteners indicate systematic different findings from randomized controlled trials (RCT) and observational (mainly cohort) studies.¹ Observational studies, in fact, found moderate associations between LNCS and cardiovascular diseases or stroke. This was however not confirmed when substitution analysis was performed.⁵ Randomized clinical trials (RCT) indicate moderate but consistent favorable effects of LNCS on measures of body weight and consequently indicators of metabolic and cardio-metabolic risk.¹ Observational studies are exposed to a series of biases, information, selection, follow-up participation biases, etc., and can hardly prove moderate associations, i.e. relative risks of the order of 1.1 to 1.3. The key issue here however is **reverse causation**, i.e., overweight and obese subjects tend to use and continue to use more frequently LNCS.

References

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2. Pavanello S, Moretto A, La Vecchia C, Alicandro G. Non-sugar sweeteners and cancer: Toxicological and epidemiological evidence. Regul Toxicol Pharmacol. 2023;139:105369
3. Riboli E, Beland FA, Lachenmeier DW, et al. Carcinogenicity of aspartame, methyleugenol, and isoeugenol. Lancet Oncol. 2023;24(8):848-850
4. Zhao L, Zhang X, Coday M, et al. Sugar-Sweetened and Artificially Sweetened Beverages and Risk of Liver Cancer and Chronic Liver Disease Mortality. JAMA. 2023 Aug 8;330(6):537-546.
5. Lee JJ, Khan TA, McGlynn N, et al. Relation of Change or Substitution of Low- and No-Calorie Sweetened Beverages With Cardiometabolic Outcomes: A Systematic Review and Meta-analysis of Prospective Cohort Studies. Diabetes Care. 2022;45(8):1917-1930

Agenda

11:00 – 11:05	Introduction by chair – Prof. Alison Gallagher, <i>Ulster University, UK</i>
11:05 – 11:30	Low/no calorie sweeteners and risk of non-communicable diseases (NCDs): Correlation vs. Causation – Prof. Carlo La Vecchia, <i>University of Milan, Italy</i>
11:30 – 11:55	Low/no calorie sweeteners as a means of achieving weight control: A review of evidence – Prof. Katherine Appleton, <i>Bournemouth University, UK</i>
11:55 – 12:15	Dietary recommendations for reducing free sugar intakes: Outcomes of a randomised controlled trial – Lucy Boxall, <i>Bournemouth University, UK</i>
12:15 – 12:30	Q&As – Chair-led discussion

Low/no calorie sweeteners as a means of achieving weight control: A review of evidence

Prof. Katherine Appleton – *Professor of Psychology, Bournemouth University, UK*

A role for low/no calorie sweeteners (LNCS) in body weight is currently contested. LNCS provide sweet taste in the absence of energy, and theoretically, any effects of LNCS on body weight may be associated with this sweet taste, with the absence of energy, or with some other aspect of LNCS, such as chemical composition. We recently undertook a systematic review and series of meta-analyses of sustained intervention studies aiming to address these three theoretical mechanisms – Rogers PJ, Appleton KM. *Int J Obesity* 2021; 45: 464-78. We found effects of LNCS on body weight as a result of the absence of energy, but no effects as a result of the sweet taste and no effects as a result of ingestive or post-ingestive consequences. This talk will provide the details of this review, consider our findings in association with body weight management and in relation to sweet taste, compare our results to those of similar other reviews, and place our findings in the context of current recommendations for the use of LNCS in body weight control.

Dietary recommendations for reducing free sugar intakes: Outcomes of a randomised controlled trial

Lucy Boxall – *Post graduate researcher, Bournemouth University, UK*

Investigations into the use of nutrient, food and substitution advice using LNCS to aid reductions in free sugars in those with high intakes has been little reported in literature.

In this parallel-group RCT, 242 adults consuming >5% total energy intakes (TEI) from free sugars (%FS) were randomised to receive nutrient-based (N), nutrient- and food-based (NF), nutrient-, food- and food-substitution-based recommendations (NFS) or no recommendations regarding free sugar intakes. Our primary outcome was %FS and adherence at an endpoint of 12 weeks.

Multiple regression models significantly predicted endpoint %FS ($F(7,234)=8.86$, $p < 0.001$, $R^2=0.21$). Significant predictors were recommendations received ($B=-0.636$, $p=0.029$), baseline %FS ($B=0.377$, $p < 0.001$) and baseline bodyweight ($B=-0.04$, $p=0.04$). Mean %FS reduced in all intervention groups N, NF, NFS by 2.47%, 3.25%, 3.08% respectively, in comparison to no change in the control group (-1.18%). There were no significant differences between intervention groups at endpoint %FS. Further analysis into the use of LNCS foods showed no differences within or between groups in the amount (grams) or number (counts) of items consumed. Commentary from qualitative interview analyses will be discussed in terms of practical findings and habitual practices. Our results show that providing participants with N, NF or NFS dietary guidelines reduced %FS at 12 weeks.

About the speakers



Prof. Alison Gallagher – Professor of Public Health Nutrition, Ulster University, UK

Alison Gallagher is Professor of Public Health Nutrition at Ulster University, where she contributes to the research conducted within the Nutrition Innovation Centre for Food and Health (NICHE). Her research interests resonate within the area of obesity and include low energy/non-nutritive sweeteners and their potential impact on health, development of risk factors for disease and lifestyle interventions at key stages across the lifecycle particularly to enhance physical activity and health.

She is a Registered Nutritionist (Public Health) and a Fellow of the Association for Nutrition. In addition to being an expert member on the Scientific Advisory Panel on Sweeteners supported by the International Sweeteners Association (ISA), she is Editor-in-Chief of the Proceedings of the Nutrition Society, Chair of the Editorial Advisory Board of the Nutrition Bulletin, Vice-chair of the Northern Ireland Chest Heart and Stroke (NICHs) Research Committee, and member of the UK Nutrition and Health Claims Committee (UKNHCC). A passionate advocate for the European Nutrition Leadership Platform (ENLP), she is also the current chair/president of the ENLP Board.



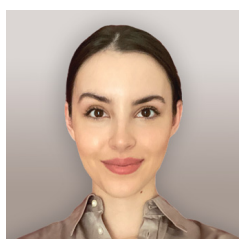
Prof. Carlo La Vecchia – Professor of Medical Statistics and Epidemiology, University of Milan, Italy

Dr. La Vecchia received his Medical Degree from the University of Milan and a Master of Science Degree in Medicine (epidemiology) from Oxford University. Presently, he is Professor of Medical Statistics and Epidemiology at the School of Medicine at the University of Milan. Dr. La Vecchia serves as an editor for numerous clinical and epidemiologic journals. He is among the most renowned and productive epidemiologists in the field with over 2600 peer-reviewed papers in the literature and is among the most highly cited medical researchers in the world, according to Clarivate HighlyCited.com, the developer and publisher of the Science Citation Index. Dr. La Vecchia was an Adjunct Professor of Medicine at Vanderbilt Medical Centre and the Vanderbilt-Ingram Cancer Centre, Nashville, TN, (2002-18), Adjunct Professor of Epidemiology at the University of Lausanne, CH (2000-14) and Associate Professor of Epidemiology at the Harvard School of Public Health (1995-2000).



Prof. Katherine Appleton – Professor of Psychology, Bournemouth University, UK

Katherine Appleton is a Professor of Psychology at Bournemouth University, UK. She has research interests in understanding and encouraging healthy, sustainable eating, for the optimization of health and well-being, in the general population. Her work focusses on the roles of taste, liking and enjoyment, alongside roles for awareness and knowledge, in healthy, sustainable eating behaviour. She has current research programmes investigating sugar consumption and sweet taste, aiming to encourage fruit, vegetable and legume consumption, and investigating healthy, sustainable food consumption in older adults. She is a Chartered Psychologist (British Psychological Society) and Registered Nutritionist (UK Association for Nutrition).



Lucy Boxall – Post graduate researcher, Bournemouth University, UK

Lucy Boxall is a post graduate researcher in the Psychology department at Bournemouth University. She is a Registered Associate Nutritionist who also gained experience working in dietetic clinics during her undergraduate Nutrition BSc at Surrey University. Over the past 3 years Lucy has been working towards her PhD via a studentship sponsored by the International Sweetener Association and Bournemouth University. Her main research topics have been on reducing free sugar advice, national dietary recommendations, and adherence to dietary guidelines.

For further information about the ISA scientific symposium at FENS 2023 and overall about the science behind low/no calorie sweeteners please visit www.sweeteners.org