



**International  
Sweeteners  
Association**

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**2018**

International Sweeteners Association (ISA)  
Symposium

## Low calorie sweeteners: Safety, use and benefits in the diet

Date: Monday 24<sup>th</sup> September 2018

Time: 12.45 - 14.15

Room: 2 - EQUIPO



# Low calorie sweeteners: Safety, use and benefits in the diet

Monday 24<sup>th</sup> September 2018, 12.45 - 14.15

## Detailed overview

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### 12.50 International regulations and approval of non-caloric sweeteners - Generalities, absorption, distribution, metabolism and excretion

**Dr Susana Socolovsky, PhD, CFS**

*President of the Argentine Association of Food Technologists*

Although all low and no-calorie sweeteners (LNCS) induce perceptions of sweetness, they are very different molecules with varying kinetics and absorption profiles and different metabolic destinations and excretion channels. These properties are critical components of their safety evaluation, as they are each significantly different. This aspect of their safety profile often goes unrecognized.

Non-caloric sweeteners are meticulously analyzed and evaluated by multiple scientific bodies and regulatory agencies at the national and international levels prior to approval for their use in food and drinks. Non-caloric sweeteners, individually or as a group, are the food additives most extensively researched in food supply. A lengthy scientific risk evaluation process is required before the technical inspection and approval of food additives.

All regulatory food bodies, both national and international, require a series of studies prior to beginning the inspection of a food additive, including genetic studies of acute, chronic, reproductive and developmental toxicity, mutagenicity / genotoxicity, carcinogenicity, neurotoxicity by immunotoxicity and other specialized studies.

Food additives, including non-caloric sweeteners, are evaluated and regulated by a diverse array of national and international organizations and institutions. These international organizations include the Joint Expert Committee on Food Additives (JECFA) and the Codex Alimentarius Commission of the Joint Committee on Agriculture and Food / Joint Expert Committee on Food Additives of the World Health Organization (FAO / WHO).

This presentation will cover all aspects of the safety evaluation of non-caloric sweeteners and will discuss in detail the physical-chemical properties as well as the absorption, distribution, excretion and metabolic peculiarities of the non-caloric sweeteners available on our market.

### 13.10 Low Calorie Sweeteners and Obesity

**Dr Hugo Laviada-Molina**

*Professor and Researcher, Marist University of Merida, Mexico*

*Clinical Endocrinologist*

Low calorie sweeteners (LCS) have been promoted as a possible tool for helping to reduce sugar and overall energy intakes. However, a scientific debate exists around the actual benefits of using LCS for this purpose. LCS are some of the most extensively evaluated substances. Consumer education about these products must be strengthened in an objective way, based on the best scientific evidence.

Taken together, results from observational studies of LCS and obesity are inconsistent. Observational studies are difficult to interpret as associations may be due to confounding or reverse causality. Even so, there is controversial evidence from these studies to conclude that LCS increase the risk of weight gain or obesity, as some cohort studies suggest.

Although controlled clinical trials are considered the "gold standard" design to evaluate cause and effect relationships and the effectiveness of any intervention or treatment in particular, they also exhibit clear limitations. Most of them have a small

## Agenda

- 12.45 **Welcome and opening**  
by chair **Dr Hugo Laviada-Molina**
- 12.50 **International regulations and approval of non-caloric sweeteners -**  
**Generalities, absorption, distribution, metabolism and excretion**  
**Dr Susana Socolovsky**
- 13.10 **Low Calorie Sweeteners and Obesity**  
**Dr Hugo Laviada-Molina**
- 13.30 **Low calorie sweeteners, glucose control and diabetes**  
**Dr Pilar Riobó**
- 13.50 **Panel discussion**

sample size and most of the times does not provide a justification for its calculation. Others are built with cross-over design limitations, consisting in the possibility of a residual effect between treatments and often there is no information about whether there was wash out period or not. Another constraint is that many of published clinical trials are of short or very short duration. Despite these limitations, the vast majority of intervention studies, at the highest level of evidence, do not show that non-caloric sweeteners are cause of obesity. Rather, the metaanalysis suggest that they could favor a modest reduction.

The use of LCS in programs of weight reduction, by replacing sucrose or simple sugars with low calorie sweeteners, may favor the reduction and weight maintenance, all in the context of structured diet plans. Furthermore, their use in diabetic patient control programme may contribute to a better glycaemic control, but always with very discrete results.

### 13.30 **Low calorie sweeteners, glucose control and diabetes**

**Dr Pilar Riobó, MD, PhD**

*Specialist in Endocrinology and Nutrition - Fundación Jiménez Díaz- Quiron Salud Hospital*  
*Associate Professor, Universidad Autónoma Madrid, Spain.*

Low and no-calorie sweeteners (LNCS) are food additives that are used as sugar substitutes and have been evaluated in depth. In diabetes mellitus sufferers, the consumption of LNCS does not alter glucose or insulin concentrations in plasma, insulin resistance, glycosylated haemoglobin (HbA1c) levels, nor affects the pancreatic reserve (C-peptide levels), the lipid profile or alters blood pressure figures. In randomized clinical trials evaluating the substitution of simple sugars by sweeteners, we can see a slight tendency to improve metabolic control in diabetic patients. They represent, therefore, a good alternative so that patients with diabetes can enjoy sweet tastes.

Reducing energy intake is extremely important in Medical Nutrition Therapy for diabetics, as weight loss, however slight, improves insulin-resistance and blood glucose in the short term. The rational use of these additives in slimming programs, replacing sugars, may stimulate weight loss and its maintenance, preferably when in it is done in the context of a structured diet plan, which is clearly beneficial in type 2 diabetes.

Although it has been seen that the use of sweeteners could produce changes in gut flora in laboratory animals, we still do not know whether this may be of clinical importance in humans, as controlled randomized trials show a neutral effect on blood sugar control; therefore, the role of dysbiosis as a factor causing glucose intolerance should be evaluated in greater depth.

Furthermore, LNCS administration tends to produce a neutral effect or minimal changes in most appetite regulating gut hormones and satiety. In some studies, increases can be seen in GLP-1 concentrations, whose clinical significance has yet to be explained.

With respect to LNCS consumption and the risk of developing diabetes, although some studies find a positive association between the consumption of low calorie sweetened beverages and the diabetes rate, this association generally disappears following a body mass index adjustment, suggesting that it may be due to reverse causality. In other words, individuals may have changed from sugar-sweetened beverages to low calorie sweetened beverages following a diabetes diagnosis in an attempt to prevent weight gain.

Therefore, LNCS may form part of Medical Nutrition Therapy for diabetics, adapted to an integrated management plan, and could help reduce the need for drugs or insulin, or both, and delay possible complications. Given that diabetes is an important public health issue worldwide, this intervention may represent a significant benefit in terms of cost reduction.

## About the speakers

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### Dr Susana Socolovsky

Susana Socolovsky, Ph.D., CFS is a Doctor in Chemistry from the University of Buenos Aires and President of the Argentine Association of Food Technologists. She is a Fellow of the International Academy of Food Science and Technology IAFoST. Dr. Socolovsky has devoted 20 years to full time scientific research and teaching at the University of Buenos Aires. She was awarded the Argentine National Biannual Prize on Organic Chemistry in 1985 and is a Certified Food Scientist by the Certification Institute of the Institute of Food Technologists, USA. She is a member of the Argentine Nutrition Society (SAN) and has served as a member of the International Scientific Committee of the 21st International Congress of Nutrition (IUNS-ICN- 2017). She is a member of the Editorial Council of the Journal Actualización en Nutrición, published by SAN. As invited expert, chair, resource person, and keynote speaker Dr. Socolovsky has lectured in more than 160 Conferences around the world, and has authored multiple scientific papers and book chapters. Dr. Socolovsky is President of Pentachem Consulting, a regulatory consulting network. For the past 29 years, she has done work as a Technical Consultant in Regulatory and Scientific Affairs and Food Innovation. Since 1992 Dr. Socolovsky acts as a non-governmental representative at Mercosur regulatory meetings and participates as a member of the Advisory National Commission for Healthy Eating and Prevention of Obesity since 2016. Dr. Socolovsky is a Professional Member of the Institute of Food Technologists and an IFT Food Science Communicator and an active collaborator of ALACCTA and IUFoST.



### Dr Hugo Laviada-Molina

Dr Hugo Laviada Molina is a clinical endocrinologist who obtained his medical degree from the University of Yucatan, in Merida, Mexico, and graduated from the postgraduate unit of the Faculty of Medicine of the National Autonomous University of Mexico. He received a master's degree in Medical Sciences (in endocrinology) from the University of Sheffield, UK. He is also a graduate in clinical nutrition and obesity at the Institute of Technology and Higher Education of Monterrey, (Campus Guadalajara), in Mexico. Currently, he is a professor-researcher in Metabolism and Human Nutrition at the Marist University of Mérida, Mexico. He belongs to the national system of researchers of the National Council of Science and Technology of Mexico (CONACyT). He is titular member of the Mexican Society of Nutrition and Endocrinology and of the Latin American Diabetes Society being coordinator of their position papers on non-caloric sweeteners.



### Dr Pilar Riobó

Dr. Pilar Riobó Serván obtained her Bachelor's degree from the Complutense University in Madrid, receiving the Special Graduation Award. She then did her doctoral thesis on "High Blood Pressure in Diabetes", achieving a Cum Laude distinction for her doctorate degree from the same university. She specialised in Endocrinology and Nutrition (Resident Medical Intern) at the Ramón y Cajal Hospital in Madrid, where she also worked as a Specialist Physician. In 1990, she joined the Endocrinology and Nutrition service of the Jiménez Díaz Foundation University Hospital in Madrid, as head of the Nutrition and Dietetics Unit, and where she currently works as the Associate Chief Officer of the abovementioned Endocrinology and Nutrition service. In her teaching role, she is an Associate Professor of the subject of Endocrinology and Nutrition at the School of Medicine of the Autónoma University of Madrid. Thanks to a scholarship awarded by the Conchita Rábago Foundation, she formed part of a professional rotation programme at the Nutritional Support Unit of the Jackson Memorial Hospital, at Miami University. An active collaborator in a variety of national and international scientific societies, she was Chairwoman of the Congress of the Spanish Society of Parenteral and Enteral Nutrition (SENPE), held in Madrid in 2012, and will preside the forthcoming SENPE congress which will also take place in Madrid in 2020. She has published over one hundred articles in scientific journals, has contributed with chapters in multiple scientific books and has published, as the editor, 3 scientific works. She is also known for her work as a communicator in the mass media and in social networks (@DraRiobo) on nutrition and obesity issues. She has published 5 books addressing the nutritional education of the population in general and is a frequent participant in TV and radio programmes and in publications in magazines and newspapers. Her main areas of interest include all aspects of human nutrition, obesity and diabetes.

Please visit us at ISA booth in the exhibition area to find out more about the role low calorie sweeteners can play in the diet, and to share your views on low calorie sweeteners by taking part in our survey.

For more information about low calorie sweeteners, please visit:  
[www.sweeteners.org](http://www.sweeteners.org)