

TRUVIA[®] SWEETENER: A NEW CALORIE-FREE SUGAR SUBSTITUTE FROM THE STEVIA LEAF

INFORMATION FOR HEALTHCARE PROFESSIONALS



CONTENTS



1 FOREWORD

PAGE 3 >



2 LOW CALORIE SWEETENERS AND WEIGHT MANAGEMENT

THE BENEFITS OF LOW CALORIE SWEETENERS FOR WEIGHT MANAGEMENT
LOW CALORIE SWEETENERS AND DIABETES

PAGE 4 >



3 LOW CALORIE SWEETENERS EXPLAINED

PAGE 7 >



4 TRUVIA® STEVIA LEAF EXTRACT AND TRUVIA® CALORIE-FREE SWEETENER

STEVIA – A UNIQUE PLANT WITH A UNIQUE STORY
FROM THE STEVIA PLANT TO CALORIE-FREE SWEETENER OF NATURAL ORIGIN

PAGE 8 >



5 TRUVIA® SWEETENER – A NEW SWEETENER WITH A STRONG SAFETY RECORD

CARGILL'S STEVIA LEAF EXTRACT SAFETY PROGRAM
THIRD PARTY EXPERT REVIEWS

PAGE 12 >



6 REGULATORY PROCESS AT A GLANCE

PAGE 14 >



7 ABOUT CARGILL

PAGE 15 >



8 APPENDIX – OBESITY IN EUROPE

THE FACTS
THE NEED FOR PREVENTION

PAGE 16 >



9 REFERENCES

PAGE 19 >

FOREWORD

1

Achieving and maintaining a healthy weight is a daily challenge for many patients, as is evident from the increasing prevalence of overweight and obesity in Europe. Controlling calorie intake, alongside increased physical activity, is vital to successful weight management.

Low calorie sweeteners can make a useful contribution to calorie control by offering a choice that helps patients manage their intake of sugars as part of a healthy balanced diet.

Now there is an entirely new choice of non-sugar sweetener derived from the stevia plant, which has long been used in many parts of the world on account of the natural sweetness of its leaves.

Truvia® is the brand name of the first calorie-free sugar substitute derived from the leaves of the stevia plant. Widely used in the US since its introduction in 2008, the Truvia® brand is comprised of a tabletop sugar substitute for consumer use and as an ingredient, Truvia® stevia leaf extract, to sweeten foods and beverages. Truvia® calorie-free sweetener, developed by Cargill, will be brought to consumers in the United Kingdom and Ireland by the Silver Spoon Company.

Cargill, which developed and pioneered this stevia sweetener innovation, has designed this brochure to give health professionals both scientific and practical information about Truvia® sweetener. In the pages that follow, you will find information on the origins of stevia, its unique properties, the scientific background and safety record behind Truvia® sweetener, its potential benefits for weight management and diabetes, together with practical suggestions for dietary applications.

For further information on Truvia® sweetener, visit www.truvia.co.uk



LOW CALORIE SWEETENERS AND WEIGHT MANAGEMENT

2

Overweight and obesity continue to rise and cause significant health problems for many adults and children across Europe. Improvements in dietary and physical activity habits across the population are widely promoted solutions to the problem of rising rates of obesity and related diseases¹ (see appendix, page 17, for obesity prevalence figures in Europe).

Low calorie sweeteners can play a useful role as part of a healthy, balanced diet by helping patients control their calorie intake. Low calorie sweeteners can also improve compliance with dietary goals as a key ingredient in good-tasting, reduced-calorie foods that patients will accept. As part of a balanced, healthy diet, and combined with regular physical activity, reduced calorie foods can help patients achieve a healthy weight.

THE BENEFITS OF LOW CALORIE SWEETENERS FOR WEIGHT MANAGEMENT

Balancing intake of sugars with the inclusion of low calorie sweeteners may help to reduce the overall amount of calories consumed. This, combined with regular physical activity, is critical for weight control, weight loss and the prevention of weight gain and related co-morbidities.

Overweight patients consuming sweet foods are more likely to stick to their diets and the use of low calorie sweeteners is particularly useful during the maintenance phase after weight loss, and to help prevent weight regain after successful weight loss^{2,3}. In addition, research has shown that the consumption of intense sweeteners does not stimulate the appetite nor result in increased food intake^{4,5} and does not lead to an increased desire for sweet foods⁶.

So far, alternatives to sugar have included artificial sweeteners (see section 3, page 7, for more information about different types of sweeteners), which provide sweetness with few or no calories. There is now another option for patients wanting to manage the calories in their diets with new choices of foods from natural plant origin: Truvia® sweetener, the calorie-free sweetener which originates from the best-tasting part of the stevia leaf.



Overview of studies looking at the effects of low calorie sweeteners on weight management, appetite and desire for sweet foods

STUDY AREA

Sucrose (saccharose) vs. artificial sweeteners: different effects of supplementation on ad libitum food intake and body weight in overweight individuals².

The effect of aspartame as part of a multidisciplinary weight-control program on short- and long-term control of body weight³.

Effects of stevia, aspartame, and sucrose (saccharose) on food intake, satiety, and postprandial glucose and insulin levels⁴.

Effects of consumption of calorific vs. non-calorific sweet drinks on indices of hunger and food consumption in normal adults⁵.

The effect of frequency of consumption of artificial sweeteners on sweetness liking in women⁶.

METHODOLOGY OVERVIEW

10 week study; overweight subjects consumed daily supplements incorporated into a variety of foods and beverages) of either sucrose (saccharose) (n=21) or artificial sweeteners – mixture of aspartame, acesulfame K, cyclamate and saccharin (n=20).

Obese female subjects (n=163) randomly assigned to consume or to abstain from aspartame- sweetened foods and beverages for 16 weeks of a 19 week weight-reduction program and encouraged to continue assignment during a 1 year maintenance program; 2 year follow-up period.

Healthy subjects (n=19) and obese subjects (n=12) completed three separate food test days during which they received preloads containing stevia (290 kcal), aspartame (290 kcal), or sucrose (saccharose) (493 kcal) before their lunch and dinner meal.

Healthy subjects (n=20) consumed approximately seven ounces (207ml) of water or soft drink sweetened with saccharin, aspartame or sucrose (saccharose), three hours after a standard breakfast and one hour before ad libitum consumption of a standard lunch.

Female subjects (n=64) evaluated orange juice samples (ranging from 0% added sucrose (saccharose) to 20% added sucrose/saccharose) for liking of sweetness using a 9-point hedonic scale. Based on screening survey data, participants were categorized according to sweetener consumption group (artificial sweetener consumers and natural sweetener consumers) and by overall sweetened beverage intake (low or high, regardless of sweetener type normally consumed).

MAIN FINDINGS

Subjects consuming sucrose (saccharose) supplements experienced increases in total energy intake, body weight, fat mass and blood pressure. This was not observed in subjects consuming “artificial sweetener” supplements.

Both groups lost about 10% of their initial body weight during the active weight loss program. However, the aspartame group lost significantly more weight overall and regained significantly less weight during maintenance and follow-up than did the no-aspartame group.

When consuming stevia and aspartame preloads, participants did not compensate by eating more at either their lunch or dinner meal. As a result, the sucrose (saccharose) group had a higher calorific intake. Reported hunger or satiety levels did not differ by treatment or condition at any time point.

Consumption of saccharin and aspartame did not increase hunger or food consumption compared with water. Hunger ratings in the hour between preload consumption and lunch were generally highest for water, followed by aspartame, saccharin and sucrose (saccharose).

Individuals in the high sweetened beverage intake group preferred sweeter orange juice than those in the low-intake group. Categorization by sweetener type resulted in no significant differences between the groups, indicating that regardless of the type of sweetener consumed in a beverage, liking of sweetness will be influenced in the same manner.



N.B. The study details in the above table were excerpted from the study abstracts.

LOW CALORIE SWEETENERS AND DIABETES

Type 2 diabetes is a serious obesity co-morbidity and its risk increases progressively as Body Mass Index (BMI) rises. People with type 2 diabetes may find low calorie sweeteners useful to help manage the calories and carbohydrates in their diet.

Low calorie sweeteners do not affect blood glucose levels⁷. These sweeteners are used in a wide range of manufactured sugar-free, reduced sugar and low calorie foods and drinks and are also available as tabletop sweeteners.

People with diabetes can also safely consume products containing Truvia[®] stevia leaf extract and Truvia[®] calorie-free sweetener. Both are non-glycemic and non-caloric. As well as providing no calories, clinical studies have shown that chronic daily consumption of Truvia[®] stevia leaf extract in doses consistent with, and exceeding, the acceptable daily intake does not affect blood sugar control and is well-tolerated by people with type 2 diabetes. Truvia[®] sweetener also has no effect on the glycemic index^{8,9}.



Clinical evidence – Truvia[®] sweetener as a choice for people with diabetes

A double-blind, placebo controlled, multi-center clinical study⁸ was conducted to evaluate 16 weeks of daily consumption of 1,000mg of stevia leaf extract. Subjects included 122 men and women with type 2 diabetes.

- After 16 weeks of daily consumption of Truvia[®] stevia leaf extract or placebo (cellulose), there were no differences in glycosylated haemoglobin.
- Truvia[®] stevia leaf extract had no effect on fasting glucose, insulin, blood lipids and C-peptide.

KEY POINTS

In light of the growing awareness of the serious health risks related to obesity, including diabetes, sensible eating and improved fitness are increasingly important to many patients.

Truvia[®] stevia leaf extract and Truvia[®] calorie-free sweetener, which originate from the best-tasting part of the stevia leaf, provide sweetness with no calories and can play a useful role in a healthy balanced diet. The use of low calorie sweeteners can contribute to weight management as part of a calorie-controlled diet with regular physical activity^{10,11}.

People with diabetes can safely consume both Truvia[®] stevia leaf extract and Truvia[®] calorie-free sweetener as they do not influence insulin or blood glucose levels.

Truvia[®] stevia leaf extract and dental health

A study, presented at the International Association for Dental Research General Sessions in July 2010, reports that Truvia[®] stevia leaf extract, the calorie-free sweetener purified from the leaf of the stevia plant in an aqueous solution, does not lower dental plaque pH. It also reported it is less acidogenic than sucrose (saccharose) solutions and comparable to the currently marketed non-sugar sweetener, sucralose¹².

LOW CALORIE SWEETENERS EXPLAINED

3

There are two types of low calorie sweeteners. High-intensity sweeteners that replace the sweet taste of sugar in foods are the most familiar to consumers. There are, however, also less well-known bulk sweeteners that are widely used in foods and perform a very important function.



Bulk sweeteners

Sugar not only impacts the taste of foods, but also adds to its texture by providing volume or bulk in a similar manner to fats. Bulk sweeteners are used in foods where volume (as would be traditionally provided by sugar) is required as well as sweetness. They are mainly polyols (sugar alcohols) such as sorbitol, manitol, xylitol, hydrogenated glucose syrup, erythritol and isomalt. They provide approximately 2kcal/g (with the exception of erythritol which is 0kcal/g) compared to 4kcal/g for sugar (sucrose or saccharose). They are not as sweet as sucrose, with the exception of isomalt.

Did you know?

Erythritol is different from other sugar alcohols because the body cannot use it for energy or glucose. This means that it is non-glycemic.

High-intensity sweeteners

High-intensity sweeteners provide sweetness to foods and beverages while adding few, if any, calories. Gram for gram, high-intensity sweeteners are much sweeter than sugar and therefore are used in comparatively very small amounts. Some high-intensity sweeteners are not metabolized and provide no calories (e.g. sucralose and saccharin). Other high-intensity sweeteners are metabolized but provide virtually no calories because they are used in very small quantities (e.g. aspartame). The most commonly used high-intensity sweeteners in Europe are aspartame, acesulfame potassium (acesulfame K), saccharin and sucralose.

Stevia-based sweeteners

Stevia-based sweeteners are a new category of high-intensity sweetener derived from the stevia leaf. Truvia® is the brand name of the first calorie-free sweetener made from the leaves of the stevia plant. Truvia® stevia leaf extract is made from the best-tasting part of the stevia leaf. It is available as Truvia® stevia leaf extract (ingredient) and Truvia® calorie-free sweetener.

Truvia® sweetener – the calorie-free sweetener made from stevia leaf extract, erythritol and natural flavors

- Cargill stevia leaf extract comes from the best-tasting components of the stevia leaf and is a high-purity intense sweetener that is consistent in quality and taste. Truvia® stevia leaf extract is different from less well characterized stevia because its composition is carefully monitored to ensure the best taste and quality.
- Erythritol is a sugar alcohol found naturally in some fruits such as grapes and melons. It is a non-calorific sweetener, used as an ingredient that provides bulk for Truvia® calorie-free sweetener. Since stevia leaf extract is a high-intensity sweetener, only extremely small quantities are required to create a tabletop packet. Erythritol is used to add bulk so that Truvia® calorie-free sweetener is easy for consumers to use. Other tabletop high-intensity sweeteners use ingredients such as dextrose and maltodextrin that add bulk for ease of use.
- Natural flavor is used to complement the natural sweetness and the clean, sweet taste.

TRUVIA® STEVIA LEAF EXTRACT AND TRUVIA® CALORIE-FREE SWEETENER

4

Truvia® is the brand name for the first calorie-free sweetener made from the leaves of the stevia plant. Truvia® stevia leaf extract is made from the best-tasting part of the stevia leaf. Cargill has worked for years to develop Truvia® sweetener in response to consumer demand for natural-origin, plant-based foods and a way to reduce sugar and calories in foods and beverages.

Truvia® sweetener has been available in the US since late 2008 both as a tabletop sweetener for consumer use and as an ingredient (Truvia® stevia leaf extract) to sweeten foods and beverages. It is also available in France, following regulatory approval of rebaudioside A in August 2009.

The EC approval of use of steviol glycosides, the sweet-tasting components of the stevia leaf was completed in 2011 (see section 6, page 14, for an overview of the regulatory process). In April 2010, the European Food Safety Authority published a Scientific Opinion, which confirmed that steviol glycosides, including rebaudioside A used in Truvia® stevia leaf extract, are safe for use in foods and beverages.

STEVIA – A UNIQUE PLANT WITH A UNIQUE STORY

The stevia plant is a small shrub native to northeastern Paraguay. As a member of the Asteraceae family, stevia is related to herbs, vegetables and flowers such as chamomile, tarragon, endive, lettuce, daisies, sunflower and chrysanthemums.

- It was first discovered by indigenous people who used the plant's leaves to sweeten drinks. By the 1800s, stevia consumption was established throughout South America, including Brazil and Argentina.
- Stevia became more widely known outside central South America following the 1887 "discovery" of stevia by botanist, M.S. Bertoni. Due to its sweetness, stevia has been given many names including honey leaf, sweet leaf of Paraguay, sweet leaf, sweet herb, candy leaf and honey yerba.
- In 1931, two French chemists, M. Bridel and R. Lavielle, isolated the components that give stevia its sweet taste, steviol glycosides.
- Today, stevia is grown commercially in South America and Asia.



Figure 1 – The sweet constituents of stevia – steviol glycosides



STEVIA – THE VOCABULARY

Stevia

- General term used to refer to the plant and commercially to food uses of *Stevia rebaudiana* (botanical name).
- Stevia extract refers to compounds isolated (extracted) from stevia without regard to purity or identity of the compounds.

Steviol glycosides

- Sweet-tasting components in leaves of the stevia plant.
- Leaf contains at least 10 unique steviol glycosides including rebaudioside A, stevioside, rebaudioside C.

Rebaudioside A

- Best-tasting of the predominant steviol glycosides.
- Also called “reb A” for short.
- Purified from the leaf, it provides a clean, sweet taste.
- Stevia leaf extracts comprised of not less than 97% rebaudioside A were temporarily authorized in France in 2009.

Stevia leaf extract

- Ingredient containing high-purity steviol glycosides.
- Purity assures clean, sweet taste.
- Rebiana is a common name for stevia leaf extract and appears on ingredient labels in the US.

Truvia®

- Brand name of global leading sweetener derived from stevia.



FROM THE STEVIA PLANT TO STEVIA LEAF EXTRACT, SWEETENER OF NATURAL ORIGIN

In a process comparable to steeping tea, the dried stevia leaves are soaked in water. The steeping process unlocks the best-tasting components of the leaf. These components are then further isolated and purified to obtain stevia leaf extract – the high potency, calorie-free sweetener which originates from the best-tasting part of the stevia leaf.

The composition of Truvia® stevia leaf extract has been fully characterized. Truvia® stevia leaf extract contains no less than 75% rebaudioside A, the best tasting major glycoside that is about 200 times sweeter than sucrose (saccharose). Stevia leaf extract is both non-calorific and non-glycemic. It is also soluble as well as being heat and pH stable in food and beverage systems.



Figure 2 – Truvia® calorie-free sweetener: the nutritional breakdown



Truvia® stevia leaf extract

Truvia® stevia leaf extract contains no less than 75% pure rebaudioside A, is reproducibly purified to specifications that exceed regulatory requirements and is already used as an ingredient to sweeten foods and beverages in the US and France. Approval in EC means that this sweetener of natural origin may be used more widely as a way to reduce calories and sugar in many popular foods and beverages.

Truvia® calorie-free sweetener

As well as Truvia® stevia leaf extract, Cargill has developed Truvia® sweetener, the first calorie-free sweetener made with stevia leaf extract, which originates from the best-tasting part of the stevia leaf. Truvia® calorie-free sweetener is available to consumers in various formats, including a spoonable jar and portable packets. One packet of Truvia® calorie-free sweetener provides the same sweetness as one teaspoon of sugar, with no calories, giving patients a new sweetener choice to help them manage sugar and calories in their diet.

Dietary applications

Truvia® calorie-free sweetener has a clean sweet taste and sprinkles like sugar because of its crystal (granular) form. It can also be used in a variety of recipes replacing some or all of the sugar e.g. in drinks, smoothies, pie fillings, cheesecake, sauces, dressings and marinades.

For recipe suggestions, cooking tips and a sweetness conversion chart, visit www.truvia.co.uk

Calorie-saving ideas

For patients managing their weight, here are some ideas for replacing added sugar with Truvia® calorie-free sweetener to help reduce overall sugar intake:

CHOOSE	IN PLACE OF	CALORIES SAVED APPROXIMATE VALUES PER SERVING
Use Truvia® sweetener to sweeten coffee.	1 teaspoon of sugar	15
Mix sparkling water with Truvia® sweetener and a splash of cranberry juice.	A sugar sweetened soft drink (350ml)	140
Make a healthy dessert of fresh mixed berries using Truvia® sweetener.	28 grams of sugar on fruit	100
Brew berry-flavored tea in a pot with Truvia® sweetener while still hot. Cool tea and pour over ice for a refreshing sweet berry tea.	Regular sweet tea (350ml)	150
Make your own skinny almond latte using espresso, steamed low fat milk, Truvia® sweetener, and ½ teaspoon almond extract.	Shop-bought flavored latte	100
Use Truvia® sweetener for the filling and topping of your apple crumble for a tasty family dessert.	Traditional apple crumble	77



TRUVIA® SWEETENER – A NEW SWEETENER WITH A STRONG SAFETY RECORD

5

Truvia® stevia leaf extract's safety has been evaluated in a rigorous scientific research program – the first of its kind to thoroughly and critically examine the safety of a fully-characterized, high-purity form of rebaudioside A and steviol glycoside. The results of this program definitively established the safety of Truvia® stevia leaf extract for use as a general purpose sweetener.

The safety of sweeteners extracted from the stevia leaf has been established on the basis of:

- Stevia's long history of use around the world (see section 4, page 8).
- More than 25 years of scientific research on the sweet-tasting components of the stevia leaf (steviol glycosides).
- Cargill's rigorous safety evaluation program for Truvia® stevia leaf extract.
- EFSA's positive scientific opinion in April 2010, which confirmed that steviol glycosides are safe for use in foods and beverages.

STEVIA LEAF EXTRACT SAFETY PROGRAM

Cargill, maker of Truvia® stevia leaf extract and Truvia® calorie-free sweetener, and The Coca-Cola Company collaborated to develop a high purity rebaudioside A. Before making its stevia leaf extract available to consumers, Cargill commissioned a rigorous set of scientific studies that established the safety of Truvia® stevia leaf extract – The Cargill Stevia Leaf Extract Safety Program.

The overarching objective of Cargill's safety program was to demonstrate the safety of stevia leaf extract for consumption by all consumers, in all foods, for all eating occasions in all countries.

Bringing together, assessing and documenting the basis for safety of fully characterized stevia leaf extract was a critical milestone in the development of Cargill's calorie-free sweetener, purified from the stevia leaf. It was also transparent. Twelve papers evaluating the safety of Cargill's stevia leaf extract have been published in the peer-reviewed journal Food and Chemical Toxicology¹³. Free copies of these papers are available. Please contact Amy Boileau for electronic copies (amy_boileau@cargill.com; +1 952 742 4262).

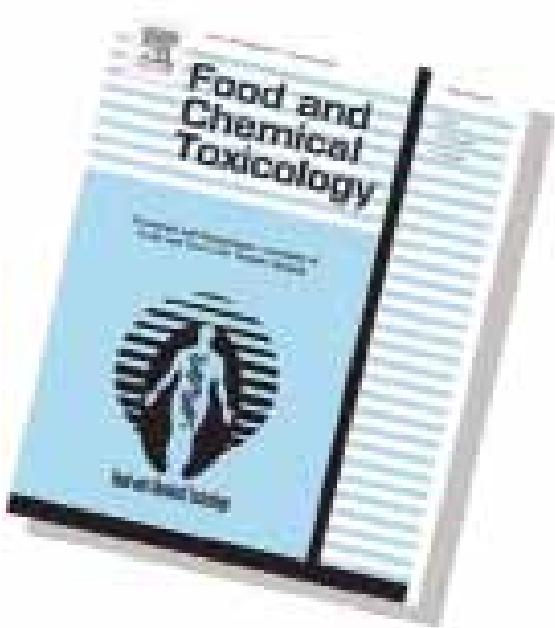


THIRD PARTY EXPERT REVIEWS

In addition to Cargill's extensive research program, there have been a number of third party expert reviews confirming the safety of Truvia® stevia leaf extract, which include: The Joint FAO/WHO Expert Committee on Food Additives (JECFA), GRAS (Generally Recognised As Safe) Independent Expert Panel whose conclusions were reviewed and accepted by the United States Food and Drug Administration (FDA), French Food Safety Agency (AFSSA), European Food Safety Authority (EFSA) and The Food Standards Australia New Zealand (FSANZ).

EFSA's positive Scientific Opinion was a critical milestone in the EU approval process. EU regulatory approval occurred in November 2011.

Please contact amy_boileau@cargill.com for a copy of the stevia leaf extract safety research, published in *Food and Chemical Toxicology*.



EFSA Scientific Opinion

EFSA confirmed that steviol glycosides are safe for use in foods and beverages: "Steviol glycosides complying with JECFA specifications are not carcinogenic, genotoxic or associated with any reproductive/developmental toxicity."¹⁴

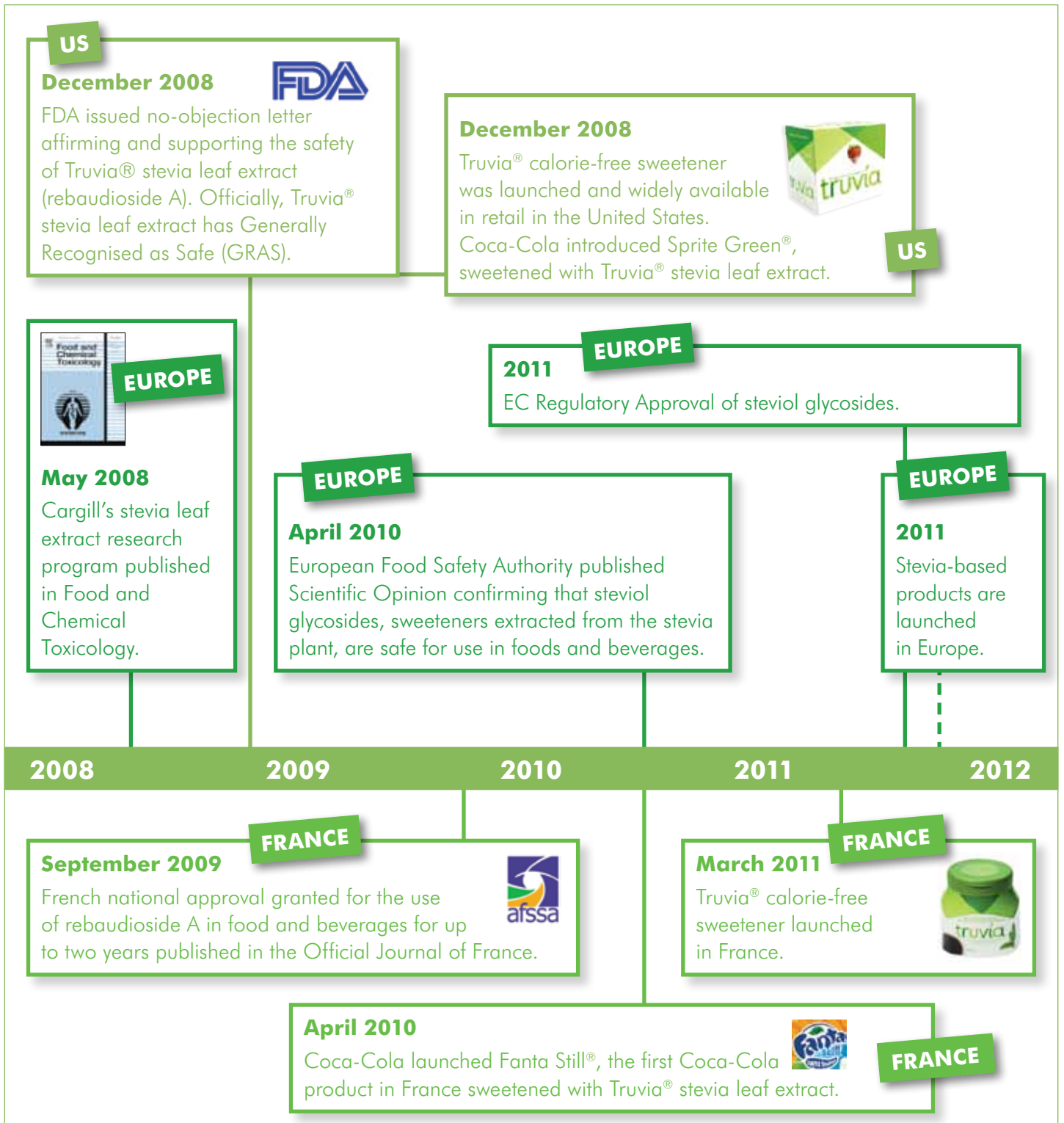
KEY POINTS

- Truvia® stevia leaf extract is safe for use in food and beverages.
- Truvia® stevia leaf extract is fully differentiated from crude and uncharacterized stevia extracts.
- Truvia® stevia leaf extract contains no less than 75% pure rebaudioside A, is reproducibly purified to specifications that exceed regulatory requirements.
- Clinical studies indicate a lack of pharmacological action of steviol glycosides:
 - No effect on blood pressure in individuals with normal and low-normal blood pressure.
 - No effect on glucose homeostasis.
- Successive independent expert assessments have validated the weight of safety evidence:
 - EFSA's positive Scientific Opinion (April 2010) is the latest and most relevant to European regulatory approval.



REGULATORY PROCESS AT A GLANCE

6



ABOUT CARGILL

7

Cargill, the maker of Truvia® calorie-free sweetener from the stevia leaf

Cargill is an international provider of food, agricultural, financial and industrial products and services. Founded in 1865, the privately held company employs 131,000 people in 66 countries. Cargill helps customers succeed through collaboration and innovation, and is committed to applying its global knowledge and experience to help meet economic, environmental and social challenges wherever it does business.

Cargill Health & Nutrition is a leading developer, processor and marketer of science-based, health and sweetness-promoting ingredients for the food and dietary supplement industries worldwide.

In 2008, building on its strong reputation and research and development of high quality ingredients over the last 145 years, Cargill, in partnership with The Coca-Cola Company, developed a fully characterized stevia leaf extract, a calorie-free sweetener from natural origin, which is marketed by Cargill under the brand name Truvia®. Truvia® sweetener leads the category of stevia-based sweeteners in the US.

Truvia® sweetener is available both as a tabletop sweetener for consumer use and as an ingredient (Truvia® stevia leaf extract) to the global food industry to sweeten foods and beverages.

Our vision is to accelerate health and sweetness innovations in foods and supplements by focusing on qualities that are important to customers and consumers.



APPENDIX: OBESITY IN EUROPE

8

Overweight and obesity continue to rise and cause significant health problems for many adults and children across Europe¹⁵.

THE FACTS

According to the International Association for the Study of Obesity approximately 60% of adults and 20% of school-age children are overweight or obese in the EU¹. In the 53 countries of the WHO European Region, experts estimated that 150 million adults and 15 million children would be classified as obese in 2010.

The potential consequences of obesity are serious – from type 2 diabetes, heart disease and stroke to some forms of cancer – and their risk increases progressively as Body Mass Index (BMI) rises.

It is predicted that 1 in 10 Europeans aged 20-79 years will have developed diabetes by 2030¹⁶. Once a disease of old age, diabetes is now affecting adolescents and children and the highest increase is in the 30-40 year old age group.

As a result, obesity is now considered one of the most significant public health challenges of the 21st Century¹.



Obesity trends in Europe: then, now, and what lies ahead

The impact of overweight and obesity on the European population is severe, directly accounting for about 1.5% to 5% of total healthcare costs¹⁷. In addition, in European countries, the odds of disability, or limitation in activities of daily living, are nearly twice as high among the obese as in normal weight individuals¹⁵. Furthermore, obesity is associated with increased morbidity and mortality; for example, about 80% of diabetes mellitus cases¹⁸ and 1 in 13 annual deaths¹⁹ in the EU are associated with these conditions of excess weight. Although systematic obesity surveillance activities are not conducted in many European countries, the following trends have been reported:

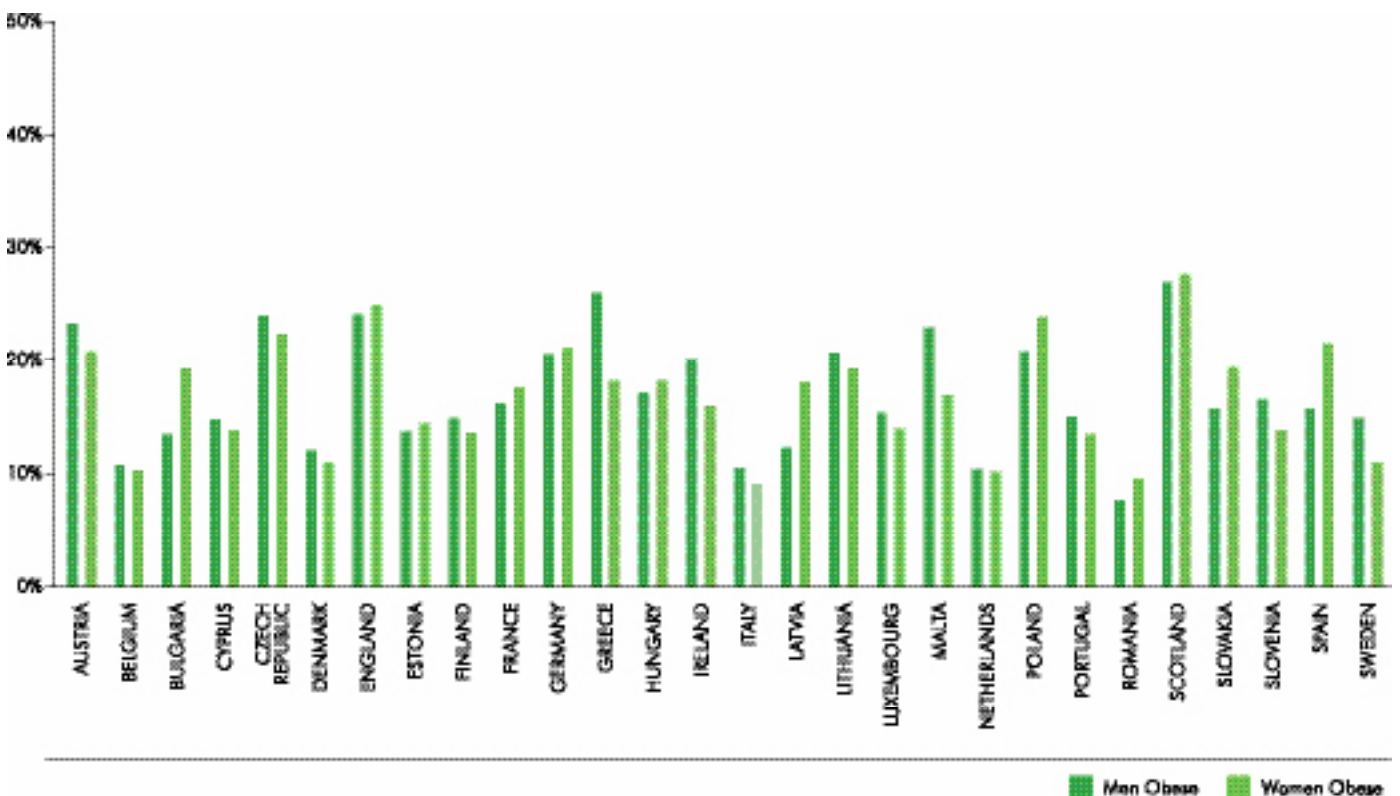
Children

- While annual increases in childhood prevalence of overweight were around 0.2% in the 1970s, increases as high as 10 times that rate have been documented in some countries over the past decade²⁰.
- In 2010, 1 in 5 European children was overweight or obese¹.
- Overweight and obesity affects at least 400,000 additional children each year^{20,21}.

Adults

- Over the past 10-15 years, the obesity rate across Europe has risen by approximately 30%²².
- In 2010, more than half of the adult population in the EU was reported as overweight or obese²³.
- In France, where the obesity rate has historically been lower, rates among men and women notably increased from about 8% to 11% between 1997 and 2003²⁰, and are expected to continue to increase at a progressively faster pace¹⁵.
- Rates of overweight and obesity among adults are believed to be growing in most European countries, especially those in the Central, Eastern and Southern regions²⁰.

Obesity prevalence in Europe¹



THE NEED FOR PREVENTION

Prevention is essential to stop the escalating burden of overweight, obesity and related chronic diseases such as diabetes. Diet and lifestyle modifications are the cornerstone of successful prevention. For example, research shows that people who lead a physically active life, do not smoke, drink alcohol in moderate quantities and eat plenty of fruit and vegetables have a risk of death that is less than one quarter of the risk of those who have invariably unhealthy habits¹⁵.

The challenge for healthcare professionals is to target and motivate people at all levels of risk to make simple changes to their diet and lifestyle, as an effective and sustainable way of managing their weight.

As there are different reasons for weight gain and obesity, prevention requires an integrated approach:

- Limiting the consumption of fatty and sugary foods, calorie-dense foods that do not provide other nutrients; replacing them with more fruits, vegetables and whole grains.
- Increasing physical activity levels.
- Motivating and empowering patients to make small, realistic, yet effective changes to their diet and lifestyle for weight management and the prevention of weight gain.

For example, including low calorie sweeteners, such as Truvia® sweetener, in a healthy, balanced, calorie-controlled diet alongside regular physical activity, can give patients a helping hand, whether they are trying to lose weight or prevent weight gain.



A family approach to a healthy lifestyle: our top five tips

Prevention is essential for controlling the obesity epidemic. Research has shown that overweight parents are more likely to have overweight children, and overweight children are more likely to become overweight adults^{24,25}. Thus, the benefits of making healthy lifestyle changes can influence generations, reinforcing positive lifelong habits beginning at an early age.

Here are some tips for families aiming to achieve or maintain a healthy weight:

1. **A healthy diet is a family affair:** Dietary guidance for adults and children is similar. The focus should be on variety, offering plenty of fruit and vegetables and limiting empty calories.
2. **Mealtimes matter:** Eat breakfast in the morning and gather the family together for a meal as often as possible – both have been associated with positive outcomes such as better dietary quality and decreased obesity risk in young people.^{26,27,28}
3. **Limit sedentary time and increase physical activity:** Connect with family during group walks or bicycle rides instead of television-viewing. Children should be physically active for at least 60 minutes a day, and for adults, 30 minutes most days of the week is a good start²⁹.
4. **Know when weight loss is appropriate:** While weight loss may be recommended for some adults, overweight or obese children should generally focus on reducing their rate of weight gain and adopting healthier lifestyle habits.
5. **Be a healthy role model:** Parents have a strong influence on shaping their children's dietary and physical activity habits. If parents want their children to eat well and exercise, they should set the example first.

REFERENCES

9

- ¹ European Association for the Study of Obesity. Obesity Facts and Figures. Available at http://www.easoobesity.org/facts_and_figures/
- ² Rabin A et al (2002). Sucrose compared with artificial sweeteners: different effects on ad libitum food intake and body weight after 10 weeks of supplementation in overweight. *Am J Clin Nutr.* 76, 721-729.
- ³ Blackburn GL et al (1997). The effect of aspartame as part of a multidisciplinary weight-control program on short- and long-term control of body weight. *Am J Clin Nutr.* 65, 409-418.
- ⁴ Anton SD et al (2010). Effects of stevia, aspartame, and sucrose on food intake, satiety, and postprandial glucose and insulin levels. *Appetite.* 55(1), 37-43.
- ⁵ Canty D J & Chan MM (1991). Effects of consumption of calorific vs non-calorific sweet drinks on indices of hunger and food consumption in normal adults. *Am J Clin Nutr.* 53, 1159-1164.
- ⁶ Mahar A & Duizer LM (2007). The effect of frequency of consumption of artificial sweeteners on sweetness liking by women. *Journal of Food Science.* 72(9), S714-718.
- ⁷ Diabetes UK. Sugar and sweeteners. Available at http://www.diabetes.org.uk/Guide-to-diabetes/Food_and_recipes/Sugar-and-sweeteners/
- ⁸ Maki KC et al (2008). Chronic consumption of rebaudioside A, a steviol glycoside, in men and women with type 2 diabetes mellitus. *Food Chem Toxicology.* 46/7S, S47-S53.
- ⁹ Jeppesen P et al (2006). Efficacy and tolerability of oral stevioside in patients with type 2 diabetes: a long-term, randomized, double-blinded, placebo-controlled study. *Diabetol. Suppl.* 49, 511-512 [Abstract No. 0843].
- ¹⁰ Bellisle F & Drewknowski A (2007) Low-calorie sweeteners, energy intake and the control of bodyweight. *Eur J Clin Nutr.* 61, 691-700.
- ¹¹ Mattes RD & Popkin BM (2009) Non-nutritive sweetener consumption in humans: Effects on appetite and food intake and their putative mechanisms. *Am J Clin Nutr.* 89(1), 1-4.
- ¹² Goodson JM et al (2010). Effect of a Truvia® Rebiana on the pH of Dental Plaque. Abstract presented at the International Association for Dental Research General Sessions, Barcelona, July 2010.
- ¹³ Brusick DJ et al. (2008) Rebaudioside A: An Assessment of Safety. *Food and Chemical Toxicology.* 46 (7) 1-92.
- ¹⁴ EFSA Panel on Food Additives and Nutrient Sources added to Food (2010). Scientific Opinion on the safety of steviol glycosides for the proposed uses as a food additive. *EFSA Journal.* 8(4),153. Available at: <http://www.efsa.europa.eu/en/scdocs/doc/1537.pdf>
- ¹⁵ Organisation for Economic Co-operation and Development (2010). Obesity and the Economics of Prevention: Fit not Fat.
- ¹⁶ IMAGE (2010). Recommendations launched at the 6th World Congress on Prevention of Diabetes and its Complications, Dresden, Germany, April 2010. See <http://www.image-project.eu/Default.aspx?id=0>
- ¹⁷ International Obesity Task Force and the European Association for the Study of Obesity (2002). Obesity in Europe: The Case for Action. Available at: http://www.iaso.org/site_media/uploads/Sep_2002_Obesity_in_Europe_Case_for_Action_2002.pdf
- ¹⁸ World Health Organization (2002). The World Health Report 2002: Reducing Risks, Promoting Healthy Life. Available at: <http://www.who.int/whr/2002/en/>
- ¹⁹ Banegas JR et al (2003). A simple estimate of mortality attributable to excess weight in the European Union. *Eur J Clin Nutr.* 57(2), 201-8.
- ²⁰ Lobstein T, Rigby N, Leach R (2005). EU Platform on Diet, Physical Activity and Health. Available at: http://ec.europa.eu/health/ph_determinants/life_style/nutrition/documents/iotf_en.pdf
- ²¹ International Obesity Task Force (2004). EU childhood obesity "out of control."
- ²² Berghofer A et al (2008). Obesity prevalence from a European perspective: a systematic review. *BMC Public Health.* 8, 200.
- ²³ Organisation for Economic Co-operation and Development (2010) Health at a Glance: Europe 2010 Available at: http://www.oecd.org/document/19/0,3343,en_2649_33929_46460563_1_1_1_37407,00.html#HTO
- ²⁴ Manios Y et al (2007). Prevalence of obesity in preschool Greek children, in relation to parental characteristics and region of residence. *BMC Public Health.* 7, 178.
- ²⁵ Serdula MK et al (1993). Do obese children become obese adults? A review of the literature. *Prev Med.* 22, 167-17.
- ²⁶ Ruxton CHS & Kirk TR (1997). Breakfast: a review of associations with measures of dietary intake, physiology and biochemistry. *Brit J Nutr.* 78, 199-213.
- ²⁷ Szajewska H & Ruszczynski M (2010). Systematic review demonstrating that breakfast consumption influences body weight outcomes in children and adolescents in Europe. *Crit Rev Food Sci Nutr.* 50(2), 113-9.
- ²⁸ Berge JM (2009). A review of familial correlates of child and adolescent obesity: What has the 21st century taught us so far? *Int J Adolesc Med Health.* 21(4), 457-83.
- ²⁹ EU Working Group "Sport & Health." EU Physical Activity Guidelines. Available at: http://ec.europa.eu/sport/what-we-do/doc/health/pa_guidelines_4th_consolidated_draft_en.pdf