

ALLAND & ROBERT

ACACIA GUM

A versatile ingredient
for sugar-reduced
and sugar-free food
and drinks!

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Farbest
BRANDS

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Acacia gum is naturally and directly harvested from Acacia trees in the Sahel desert.

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2 / ACACIA GUM, A VERSATILE INGREDIENT HELPING WITH SUGAR-FREE AND SUGAR-REDUCED PRODUCTS!

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The change of attitude towards sugar is one of the most important food evolution of the last few years. In the food and beverages industry, reducing or eliminating sugar content is a necessity in order to address the health issues faced by the world population. Public authorities, consumers and brands must face and tackle this issue collectively. In order to find solutions, the food industry can count on acacia gum, a natural additive and ingredient sourced from the African Acacia tree.

1 THE REDUCTION OF SUGAR CONSUMPTION, A PUBLIC HEALTH NECESSITY

Sugar consumption & public health

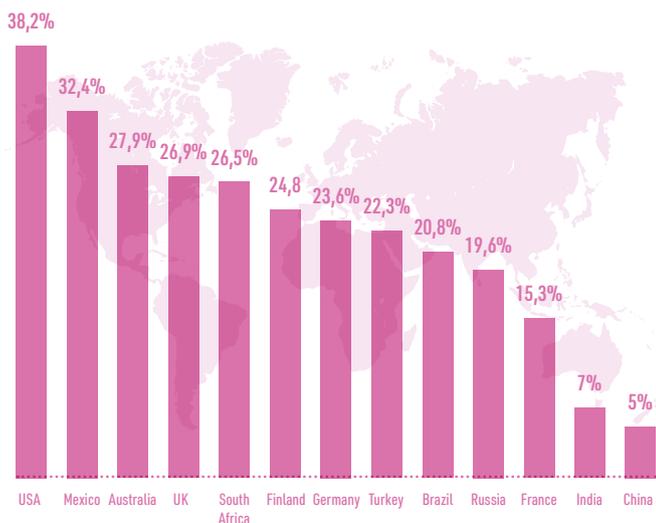
Sugar is defined by the World Health Organization as one of the simple forms of carbohydrates which contains mono-saccharides, such as fructose (found in fruits), galactose (found in milk products), and disaccharides (carbohydrates with two sugars), such as sucrose (table sugar) and lactose (from dairy)⁽¹⁾.

Free sugars are referred by the Joint WHO/FAO Experts⁽²⁾ as « all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer, plus sugars naturally present in honey, syrups and fruit juices »⁽³⁾.

Foods and beverages that are made with free sugars may lead to weight gain and unhealthy diet, as they typically only provide « empty calories » : calories who do not contain any minerals, fibers or vitamins. For example liquid sugar, such as in sodas, energy drinks and sports drinks, is the leading single source of added sugar in the American diet, representing 36% of the added sugar consumed by Americans⁽⁴⁾.

MAP OF OBESITY

(2017 figures - In % of the population, 15 years old and older)
Source: OECD statistiques www.oecd.org/health/obesity-update.htm



Scientific studies have recently pointed that an increased intake of sugar is associated with an increase in body weight in adults (N2). **A high level of free sugar intake is not recommended by the public health authorities**, as it is a risk factor for dental caries, and most importantly for obesity and risk of Noncommunicable Diseases (NCDs) like diabetes or cardiovascular diseases.

Obesity has been increasing in all divisions of society since 1975, and **today, almost 30% of the global population is overweight or obese**. In some countries, this percentage is alarming: in the United States, 70.2% of adults are overweight or obese⁽⁵⁾. In 2015, 12% of the adults and 5% of children in the world were obese, which represents about 108 million children. Obesity rates among children are rising faster than obesity rates in adults, especially among countries like China and Brazil⁽⁶⁾.

In 2018, the number of obese people in the world was approximately 2.1 billion, which represents 30% of the total population⁽⁷⁾. **About 3 million people every year die from obesity**. This is why the worldwide population need to be educated about the health hazards associated with sugar consumption.

1-Guideline: Sugars intake for adults and children. Geneva: World Health Organization; 2015
2-Consultation on Diet, Nutrition and the Prevention of Chronic Diseases held in 2002 (WHO TRS 916, Geneva, 2003)
3-N2. <http://www.actiononsugar.org/sugar-and-health/sugar-and-obesity/>
4-Department of Agriculture, U.S. Department of Health and Human Services.
5-<https://www.niddk.nih.gov/health-information/health-statistics/overweight-obesity>
6-<https://www.theverge.com/2017/6/12/15781314/obesity-health-disability-global-survey-data>
7-According to the world population review

Public authorities want to tackle this issue

In Europe, consumer attention to added sugars is strongly increasing. In March 2017 the European Food Safety Authority (EFSA) announced that it will provide scientific advice on the daily intake of added sugar in food by early 2020*. EFSA aims to establish a science-based cut-off value for added sugars from all sources which is not associated with adverse health effects.

Since 2015, the World Health Organization has published recommendations to reduce free sugar intake among adults and children. Globally, every person should reduce their daily intake of free sugars to less than 10% of their total energy intake. A further reduction to below 5% or roughly 25 grams (6 teaspoons) per day would provide additional health benefits.

Countries and national authorities have used various policies to help educate consumers: pricing and fiscal measures, children interventions, advertising regulation, prescribing physical activity, changes in portion sizes. Taxation policies have been increasingly implemented in the past few years (for example in Belgium, Chile, Finland, France, Hungary, and Mexico) in order to increase the price of potentially unhealthy products such as foods high in salt, sugar or fat, or sugary drinks.

* <https://www.efsa.europa.eu/en/press/news/170323-0>

Consumers get more concerned and more educated about their diet and the food they eat

Engaged consumers are better informed and more capable of expressing themselves today, using the technological tools of our time to send alerts and build alliances. To this end, several solutions have been developed, including smartphone apps designed to evaluate the food products sold in supermarkets. These tools respond to consumer needs because they provide assistance in making more informed purchases. For example, they dissect the characteristics of food products: ingredients, nutritional value, additives, allergens, GMO content, certifications, country of origin, manufacturers, etc. The products are scrutinized by committees of independent nutrition experts who help formulate opinions and recommendations.

Some applications also specialize in certain aspects, such as sugar content. This means consumers can scan a product's bar code to determine instantly whether the product contains added sugar or natural sugar.

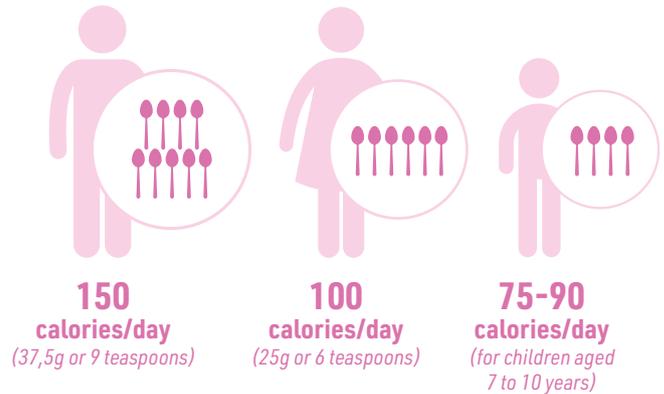
A demand for food choices has emerged. Sought out because they are low in sugar and/or calories, some products can help prevent health problems such as high blood pressure, obesity, high cholesterol or even type 2 diabetes. Other applications help users get a list of healthier food choices that people can make based on predefined filters and the nutritional value of products.

In addition, there are collaborative projects that enable individuals around the world to add to the platform's database by inputting products. The goal of these initiatives is to create a database that contains information about food products



HOW MUCH SUGAR SHOULD YOU CONSUME PER DAY ?

Source: American Heart Association (AHA) and WHO recommendations



Maximum 10% of total calories, less than 5% is even healthier.

MORE THAN 1/2 CONSUMERS say that they always check the nutritional information for the food they buy.

NEARLY 8/10 CONSUMERS want natural ingredients.

that anyone can access. Product sheets give detailed information about their contents (ingredients, allergens, additives) and nutritional qualities.

The importance of product quality and a healthy diet is reflected in consumer choices and behaviors. According to PERIscope2017, an international study by the Irish Food Board, more than 80% of consumers around the world are convinced they must eat healthfully to be healthy. In Ireland, France and Spain, more than 90% of the population believes this. The importance of a balanced diet for children is also a universal concern that is especially pronounced in Spain, Germany and China. Overall, more than 1 in 2 consumers say that they always check the nutritional information for the food they buy. The rate climbs to over 80% in Spain and China.

The Food 360TM study by TNS Sofres also showed that consumers are more reassured by wording that includes «without» rather than «with». So nearly 8 out of 10 consumers want natural ingredients.

Acute awareness is growing among consumers, who are increasingly attentive to their diet, responsible and looking for education and solutions. They expect producers and manufacturers to play a supporting role in their balanced diet.

The Food & Beverages industry must play a role

The food industry also has a role to play via the reformulation of products and the promotion of healthy diets. In fact, manufacturers add sugar to 74% of packaged foods sold in supermarkets (1). So, even if you skip dessert, you may still be consuming more added sugar than is recommended (2).

In the United States, studies have shown that over 46 grams of added sugar can be found in 350ml sodas. Thus a single serving of such a soda exceeds the American Heart Association recommendation for men (not to mention the recommendation for women or children).

In addition, sugar is not only found in beverages and baked goods, but can also be added to "healthy-looking" items in high quantities. In the United States, one can find yogurts containing 29 grams of sugar per serving, breakfast bars made with «real fruit» and «whole grains» lists 15 grams of sugar, redfruit juices advertising «no high-fructose corn syrup» or «100% Vitamin C,» and still containing 30 grams of added sugar per serving. Some of the sugar is naturally occurring, but some of it has been added.

Americans consume **57 pounds or 25+ kg** of added sugar each year, on average.

Reformulating products with less sugar, fat and salt is an important trend right now in the food industry. This trend is reinforced by the necessity to prevent and address the obesity epidemic.

Educating consumers through products advertising and labelling is another way for the food industry to promote healthy diets. Finally, the food & beverages industry should also make sure that healthy products are available to all.

1-Guideline: Sugars intake for adults and children. Geneva: World Health Organization; 2015
2-Use of caloric and noncaloric sweeteners in US consumer packaged foods, 2005-2009. Journal of the Academy of Nutrition and Dietetics 2012



Desire for healthier food with less sugar

Studying the consumer behaviors shed light on trends that are constantly shaping marketing messages. Shoppers now take their role very seriously and wish to be heard. They are empowered as consumers with the advent of the Internet and the array of possibilities, including invitations to share and comment. The consumption trend is moving toward more naturalness and the desire to minimize products with too much sugar, as it is bad for one's health if consumed in excess. Recent years have seen the emergence of «sugar-free», «sugar-reduced», and «alternative sweetener» products. According to the Mintel* figures, 33% of consumers also say that «free from» products are more natural than other foods.

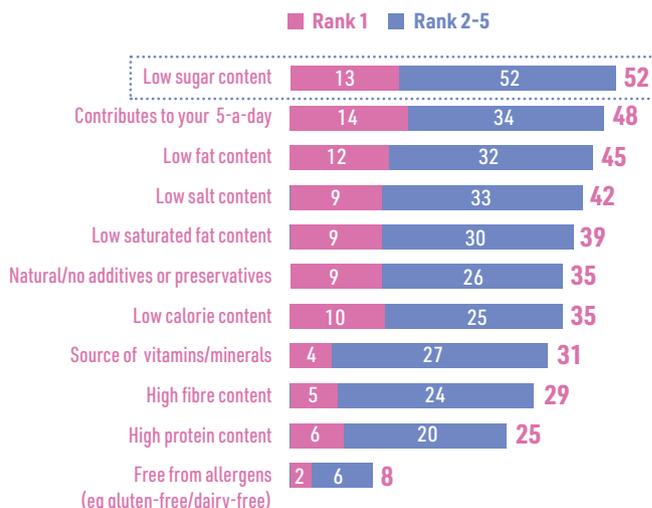
According to Mintel*, reduced sugar claims show growth over the last 3 years in Europe, US, and Mexico. The launch activity of food and drink products with a claim of no/low/reduced sugar has grown by 19.2% between 2015 and 2017 in Europe, Mexico, and the US. In the UK, sugar content stands out as the most important factor for people who try to eat healthy.

The challenge for manufacturers of consumers products is to find a solution to reduce sugar content without diminishing the taste of their products. And that is where Acacia Gum has a role to play.

*Mintel is an international database for new product launches. Check www.mintel.com

FACTORS DEEMED IMPORTANT WHEN LOOKING FOR HEALTHY FOOD, November 2017

Base: 1,968 internet users aged 16+ why try to eat healthily - «Which of the following factors are the most important to you when looking for healthy foods? Please select up to 5 and rank them 1-5, with 1 being the most important factor.»



Source : Lightspeed/Mintel

2

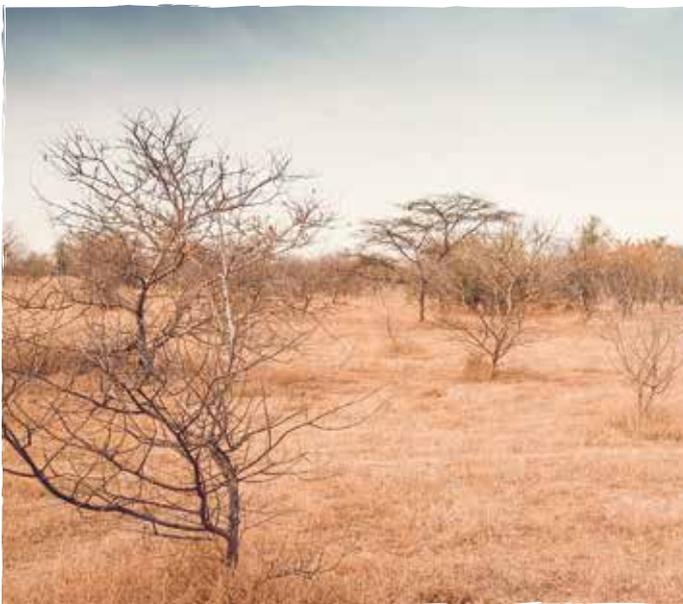
ACACIA GUM HAS A ROLE TO PLAY FOR THE FORMULATION OF SUGAR REDUCED PRODUCTS!

What is Acacia Gum?

Acacia gum is a natural exudation that is produced and extracted naturally after an incision is made in an acacia tree's trunk or branches. In addition to being a fully natural product, its harvest is also 100% natural and sustainable, as it is done manually by local population from wild trees in the southern Sahel of Africa. Acacia gum is guaranteed to be free from pesticides and GMOs.

Nowadays, Acacia gum is used as an additive in the food and beverages industry. It has many functional properties: for example it is an emulsifier, a coating agent, natural glue, a texturing agent, etc. Acacia gum's versatility makes it one of the most widely used additive in thousands of day-to-day products all over the world. As an additive, Acacia gum has been classified as E414.

In addition, Acacia gum is an additive that poses no threat to human health. Its harmlessness has been demonstrated historically and no maximum daily intake (ADI-acceptable daily intake) has ever been set by the Food and Drug Administration (FDA) or the JECFA (Joint FAO/WHO Expert Committee on Food Additives). Acacia gum is also recognized as a «noble» additive because of its ancient origins: it has been used by men for thousands of years, and many usages can be traced back to the pharaohs.



Acacia gum, aka Acacia fiber

Acacia gum has the characteristics of a polysaccharide with very particular properties: it is notably used to emulsify and stabilize essential oils. For The team working under Professor Sanchez at the IATE* laboratory at Montpellier SUPAGRO, improved considerably academic knowledge related to this gum. For them, acacia gum presents unique properties to emulsify and stabilize oil-in-water emulsions. Furthermore, it is also a fiber, which gives it valuable nutritional properties.

Thus, acacia gum is a multifunctional additive that can be used as a soluble fiber for fiber enrichment of dietary and health products. As such, it can sometimes be labelled as "Acacia Fiber" when used for fiber enrichment and not for technological purposes. Alland & Robert has a range of Acacia Fibers and guarantees a 90% Total Dietary Fiber content minimum, according to the international method AOAC 985-29. In addition, Acacia gum is a scientifically proven source of prebiotics.



Professor Christian Sanchez's team has been working with Alland & Robert for many years. Based at the University of Montpellier at the IATE* laboratory, the team comprises around 20 employees who have been involved for over eight years in research programs that should lead to discoveries of new uses for acacia gum. Professor Sanchez and his team think they have pinpointed new applications for this natural additive: « Because of its classification as a fiber and its emulsifying properties, acacia gum could, theoretically, be used in all formulated food products since it also has the advantage of being temperature stable. Think yogurts, dairy products and derivatives, as well as baked goods and, more broadly, any flour-based products ».

*IATE: Ingénierie des Agropolymères & Technologies Emergentes : Agropolymer Engineering and Emerging Technologies

Acacia fiber and Glycemic response

The glycemic response to a food or meal is the effect that food or meal has on blood sugar (glucose) levels after consumption. It is normal for blood glucose and insulin levels to rise after eating and then return again to fasting levels over a short period of time ⁽¹⁾. A low **glycemic index** is usually to **lose weight** and prevent chronic diseases related to obesity such as diabetes and cardiovascular disease. In order to maintain a low glycemic index, one must eat carbohydrate-containing foods that are less likely to cause large increases in blood sugar levels.

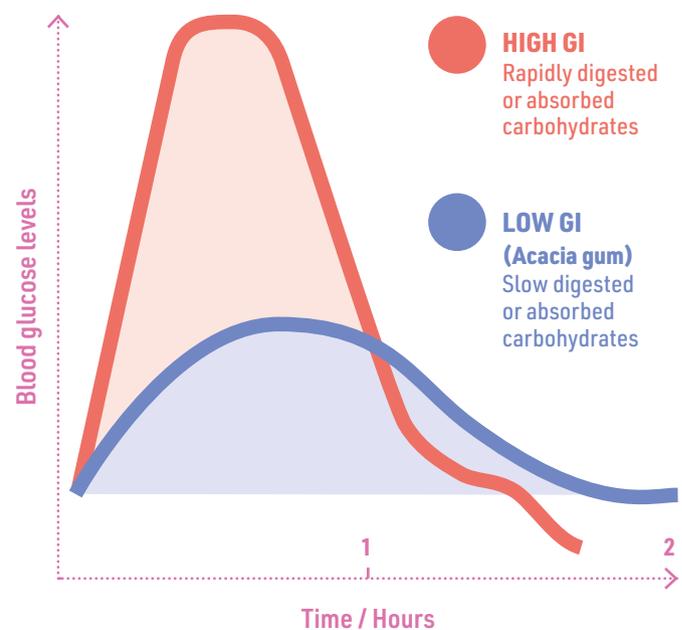
Clinical studies suggest fiber can exert a wide range of benefits in areas such as bowel function, gut health, immunity and blood glucose control ⁽²⁾. Studies have shown a correlated response between the consumption of acacia gum and the control of blood glucose.

The same results have been found with Glycemic Index control ⁽³⁾. If fiber is added to a certain food, it generally lowers the GI of that food. This is certainly the case with acacia gum. Acacia gum will help break down food more slowly in the digestive system and slows the absorption of any sugars it contains. The result is a slower increase in blood glucose levels.

The consumption of products where acacia gum is partially or totally replacing sugars is inducing a lower glycemic response than products not containing acacia gum. Thus acacia gum is a great asset for the formulation of healthy products, sugar reduced and sugar free products, and reduced glycemic index products.

1- Wikipedia definition
 2- <https://onlinelibrary.wiley.com/doi/abs/10.1177/0884533611416126>
 3- <https://www.nutritionexpress.com/article+index/vitamins+supplements+a-z/acacia+fiber/showarticle.aspx?id=2956>

WHAT IS GLYCEMIC INDEX (GI) ?



Acacia gum for texture of sugar free products

Formulating sugar-free / sugar-reduced products to reach satisfactory organoleptic profile and low-calorie content involve new formulation and can be challenging. As a texturing agent bringing low viscosity, Acacia gum can be a big help.

Properties of sugar in food & beverages

In food and beverages formulation, sugar is not only an agent of taste, but also an agent of texture, and has outstanding properties for the conservation of food and beverages.



Improves rheology
(Mouthfeel)



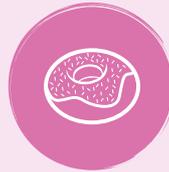
Improves texture
(Crunchiness of biscuits)



Improves stability of mousses
(Desserts)



Favours nice colors and flavors



Improves water retention
(Softness)



Decreases a_w
(Meaning a better preservation)

This is why, once the product is reformulated with less or zero sugar, the texture can be strongly affected, for the displeasure of the final consumer.

Acacia gum will help bring volume, texture, and mouthfeel.

Benefits of Acacia Gum



Stability



The loss of creaminess and bitterness is compensated by a mix of polyols – sucralose and acacia gum



Addition of isomalt



The loss of palatability is compensated by a mix of acacia gum and sweeteners

Acacia gum and sweeteners

The amazing properties of acacia gum can be used in combination with various sweeteners used today to replace sugar.

SWEETENERS USED TODAY IN THE FOOD & BEVERAGE INDUSTRY

SWEETENER	SWEETENER COMPARED TO TABLE SUGAR	GLYCEMIC IMPACT*
Agave Nectar	1 1/2 times sweeter	Low
Coconut Sugar	Same	Low
Date sugar	Same	High
Dextrose (Glucose)	3/4 the sweetness	High
Erythritol	60-70% the sweetness	Low
Fructose	More than 1/2 times sweeter	Low
Honey	Approximately the same	Medium to High
Lactose	Less than 1/4 the sweetness	Low
Maple Syrup	1/2 the sweetness	Low
Monk Fruit	150 top 200 times sweeter	Low
Stevia	Up to 300 times sweeter	Low
Sucanat®	Same	Medium
Turbinado Sugar	Same	Medium
Xylitol	Same	Low

* Low Glycemic Index is considered to be <55, Medium is 56-69, and High is >70.

Acacia gum will have a masking effect on the aftertastes sometimes generated by sweeteners and act as a bulking agent. Food companies have been using acacia gum/acacia fiber with sweeteners in order to develop innovative responses to the demands of the consumers and manufacturers.

For example, HEYLO company developed a patented combination of stevia and acacia fiber that can replace traditional sugar (4) and, according to the company, is water soluble and 10 to 15 times sweeter than sugar.

4-<https://www.foodnavigator-usa.com/Article/2018/01/08/HEYLO!-There-s-a-new-sugar-replacement-in-town-and-this-one-s-a-game-changer-says-ex-PepsiCo-exec>

CONCLUSION

Sugar consumption is too high in most countries of the world, creating health problems that authorities, countries and people are now facing. To tackle this issue, policies, regulations and strategies are emerging to help consumers reduce their sugar consumption and improve their lifestyle.

In this context, the food industry is also evolving and changing formulations to take into account this major evolution. Acacia gum is worth considering, as it is a natural, sustainable and vegetal additive. It will help formulating sugar-free / sugar-reduced products by providing a low glycemic response to the products containing it, and it will bring properties like mouthfeel, texture and stability to these products.





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