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DIETETICS AND NUTRITION:

What role can acacia gum play in the food industry today?

ALLAND & ROBERT

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1 FOOD TRENDS AROUND THE WORLD

Consumer fears trigger food trends

Increasing health fears

The various food crises that have influenced public opinion around the world in recent years have created acute awareness among consumers, who are increasingly attentive to their diet.

Indeed, more and more scientific studies are questioning the consequences of certain foods for our health. For example, a recent study by the WHO in 2015 pointed out the cancer risk associated with cured meats. Another article, published the same year in Nature by researchers from Georgia State University, also showed that some emulsifiers used in food could alter the composition of gut bacteria, which can lead to inflammatory problems, especially in the colon, and obesity.

All these studies, some of which were covered extensively in the media, sowed the seeds of doubt in the minds of consumers. The Food 360TM worldwide study conducted in 2012 in seven countries by TNS Sofres perfectly illustrated this food safety concern since, regardless of the country, at least 1 in 3 consumers believed there was a chance that the products they eat pose a risk to their health. The rate was 39% in the U.S., 44% in Germany, 55% in Russia, 59% in France and 93% in China.

Moreover, according to the Mintel database, 84% of consumers are looking for more natural — and thus less industrial — foods and 70% invoke a dietary or nutritional reason to justify their preference for food that is «without» or «free from».

90% of U.S. consumers even believe that the fewer ingredients a product contains, the healthier it is.

Consumers concerned about their diet

The importance of product quality and a healthy diet is reflected in consumer choices and behaviors. According to PERIscope2015, 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.

However, half of them also say that they often have trouble understanding the products' nutritional information and the food labeling system. Thus consumers expect producers to play a supporting role in their balanced diet.

[1] *Base: 1,594 Internet users over the age of 18 buy «free from» products - Source: Mintel 2015*

Finally, a majority of European consumers, or 60% on average, are sensitive to environmental issues related to food, except for the Dutch (only 40% of whom feel it is important).

The Food 360TM study by TNS Sofres also showed that consumers are more reassured by wording that includes «without» rather than «with». They reject preservatives (77%), pesticides (76%), artificial flavorings (72%), antibiotics (71%) and GMOs (69%). So nearly 8 out of 10 consumers want natural ingredients.

Among American consumers who buy «free from» products, 71% prefer products without preservatives, 69% are avoiding growth hormones, 58% buy non-GMO products and 29% want products that contain no allergens.

Because of these different fears, some consumers have changed their diets in favor of vegetarism. In Europe, Germany and Italy are the countries that have the most vegetarians, with 8 and 6 million people respectively. There are 25 million in the United States.

The search for naturalness is also seen in the growth of «organic», which is increasingly popular. In 2015, 65% of the French regularly consumed organically grown foods (versus 37% in 2003).

Growing organization among consumers

Increasingly well informed consumers

As consumers become more worried, they are also trying to better inform themselves. A lot of writing is regularly published about the risks associated with consuming harmful additives. Guides, such as «Choosing Right at the Supermarket» and «Choosing Right for Children», break down product ingredients to identify which foods to consume or not consume. Some books, including best sellers, also aim at informing consumers about the adverse effects of chemical additives found on the market.

With the rise in diseases such as diabetes, obesity and cancer, the distances traveled by consumer goods and their implications for global climate change, agricultural crises, food insecurity and the fast food culture, the Western industrial food system is increasingly perceived as problematic and must face many challenges.

Alison Blay-Palmer, Associate Professor and founding Director of the Centre for Sustainable Food Systems at Wilfrid Laurier University in Canada, addresses the topic in her book Food Fears, From Industrial to Sustainable Food System. She notably refers to the trend toward local, sustainable foods that, for some consumers, reflects a form of personal activism or engagement. She also notes that the development of this trend could lead to pressure on governments and, therefore, policy changes.

[2]Study conducted in April 2012 with a representative sample of 1,000 people by Terra Eco.

...responsible and connected

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 palm oil. This means consumers can scan a product's bar code to determine instantly whether the product contains palm oil.

A demand for food choices has emerged. Sought out because they are low in salt, sugar 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 that anyone can access. Product sheets give detailed information about their contents (ingredients, allergens, additives) and nutritional qualities.

2 ADDITIVES AT THE HEART OF MISGIVINGS

Not all additives have a good image with consumers

Consumers ever more sensitive to product quality

More and more consumers are expressing concern over the quality of the products they use and their effects on health.

A 2010 Eurobarometer study evaluating the degree of public concern for food-related risks revealed that 19% of European citizens spontaneously declared they were concerned about chemicals.

Moreover, that worry spreads across all age and class categories in the population. Young people under age 35 and executives, who were less concerned than the average a few years ago (respectively 48% and 46% in 2007), are now at the same level as their fellow citizens as a whole (respectively 65% and 63% of them say they are worried now).

This growing apprehension translates, as we have seen, into greater demands for information about how foods are grown, raised and processed. According to the Mintel database on «free from» diet trends, 46% of consumers look at labels to avoid consuming ingredients that are not necessary and 27% of them think that additives may cause disease over the course of their lives.

A desire to minimize consumption of chemicals

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.

In October 2012, a FoodFirm-LJ Corporate-OpinionWay survey showed that 44% of the French wanted to stiffen existing regulations on food additives, or even ban products that contained too many additives.

The consumption trend is moving toward more naturalness and the desire to minimize products with too many additives and products that are bad for one's health if consumed in excess or harmful to the environment. Thus recent years have seen the emergence of «free from» products with reduced ingredients after controversies around products like aspartame, sugar, gluten, salt and palm oil. According to the Mintel figures, 33% of consumers also say that «free from» products are more natural than other foods.

Use of additives in food and why acacia gum is a safe, natural additive

General characteristics of food additives

Additives are added to food products in order to improve their shelf life, color, taste or appearance. Additives may be natural or chemical in origin, such as modified starches.

Under conventional labeling rules, additives are indicated with an «E». The number that appears immediately after describes what the food additive does:

1. indicates a dye
2. indicates a preservative
3. indicates an antioxidant
4. indicates a thickener or stabilizer
5. indicates a pH regulator or anti-caking agent
6. indicates a flavor enhancer
9. indicates a wax, packaging gas or sweetener

Additives are often considered to be the most toxic compounds to the body. The most frequently demonized among them are food dyes, nitrates, sodium benzoate, artificial sweeteners, MSG (monosodium glutamate) and butylated hydroxytoluene (BHT), a food additive that serves as a synthetic antioxidant.

While the term «additive» on its own can arouse fears, it is nevertheless important to distinguish between products based on their source and their impact on health.

In fact, some additives are completely natural, absolutely safe for the body and eco-friendly. Such is the case for acacia gum, a completely safe additive that has many functional properties.

E414: Acacia gum, a natural, multipurpose additive

Acacia gum is a natural exudation that is produced naturally and extracted 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. Acacia gum is harvested from wild trees in the southern Sahel of Africa.

Acacia gum helps to protect the environment because it is guaranteed to be free from pesticides and GMOs and serves as a natural defense against the desertification afflicting the countries of the southern Sahel. This makes it an economic and environmental asset and boosts its naturalness.

Acacias are used to reforest deserts and play a role in preserving biodiversity, in addition to being a major socio-economic boon to local populations. Finally, acacia trees feed the soil and restore its fertility, lend shade to crops, provide fodder for livestock and help feed local communities.

Acacia gum is one of the additives that pose no threat to human health. Its harmlessness has been demonstrated historically and no maximum daily intake (ADI-acceptable daily intake) was set by the Food and Drug Administration (FDA) or the JECFA (Joint FAO/WHO Expert Committee on Food Additives).

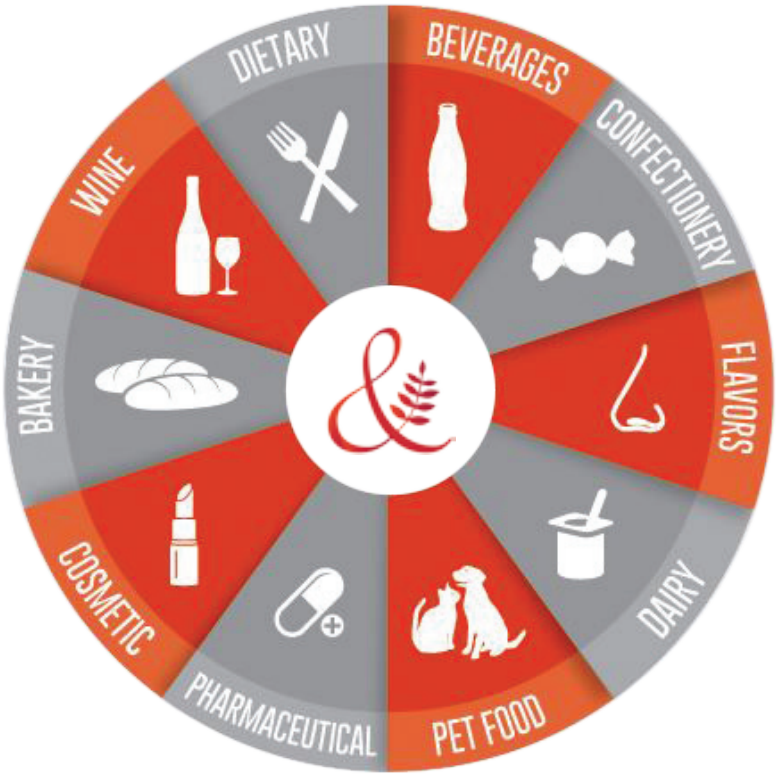
Furthermore, acacia gum is recognized as a «noble» additive because of its ancient origins: it was used by the pharaohs and appears in paintings in the pyramids, then it was used by scribes and applied to art (great painters like Rembrandt and Da Vinci added gum to their oil paint).

Acacia gum has the characteristics of a polysaccharide with very particular properties: this molecule is notably used to emulsify and stabilize essential oils. For the team working under Professor Sanchez at the IATE* laboratory at Montpellier SUPAGRO, «It also has the characteristics of a fiber, which gives it valuable nutritional properties».

Thus acacia gum (E414) is a multifunctional additive that can be used as a coating for confectionery or pharmaceuticals, an emulsifier (oils, lotions), a stabilizing agent (drinks like wine, as well as mascara and eyeliner), a medium (aromas) or a fiber (dietetic products). Acacia gum is found in small doses in a large number of everyday products, including wines, candies, cosmetics, soft drinks, flavorings, paint and pharmaceuticals. It can also be employed as a texturizing alternative to the animal-based ingredients used in some products.

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

Areas of use	Key properties of acacia gum
FOOD	
Confectionery: chewing gum, candy, Jordan almonds.	Texturizing and gelling agent; sugar-free, stable coating
Sodas and non-alcoholic beverages	Emulsifier
Wine making and beer brewing	Colloidal protective agent (color); foam clarification and stabilization; improved mouth feel
Bread and pastry making	Extrusion
Snacks	Fixer
Dairy products and ice creams	Stabilization and thickening; fiber enrichement
Dietetic products	Fiber enrichement (Senegal and Seyal acacia gums are over 90% natural fiber)
Flavorings, fragrance	Encapsulating, emulsifying
PHARMACEUTICALS	
Gelcaps, tablets and pills, creams and lotions, syrup, dental adhesive.	Texturizing agent, coating, emulsifier, fiber enrichement, binding (via direct compression)
COSMETICS	
Mascara, eyeliner, cream, hair care	Stabilizer, emulsifier, thickener, emulsifier and protective agent
TECHNICAL APPLICATIONS	
Printing inks, paints and industrial technical applications	Emulsifier, stabilizer, natural glue, stabilizing thickener, adhesive



As part of its research and development program, **Alland & Robert**, a worldwide leader in acacia gum with over 130 years of product expertise, invests more than €1 million each year to advance knowledge about acacia gum and find new applications.

Professor Christian Sanchez's team has been working with **Alland & Robert** for many years. Based at the University of Montpellier at 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. We believe that there is a real potential in these two areas.»**

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

3 AN ENVIRONMENT RIPE FOR DEVELOPING «HEALTHY» ALTERNATIVES

Several giants in the food industry are adapting to the new challenges surrounding food safety and health

With regard to product labeling requirements, Mars® and Kellogg® recently decided to label products in the United States that contain genetically modified organisms (GMOs). The two American giants are mimicking an initiative taken by General Mills® and Campbell®'s Soups. In addition to responding to consumer groups asserting their right to know if they are purchasing genetically modified products, this move also gave the companies a chance to speak out on their various platforms.

Furthermore, the Subway® fast food chain has planned to totally eliminate artificial flavorings, dyes and preservatives from its sandwiches by 2017.

Other agribusiness groups are making decisions to adjust to demand. For example, the American food industry specialist Kraft-Heinz® decided to rework its macaroni and cheese by replacing synthetic colors with natural ingredients like paprika, annatto and turmeric.

Acacia gum, a natural additive with no health risks, is currently used primarily in candies and chocolates as a coating or thickening agent. It is also increasingly used in the production of sweet and savory snacks. Its use has grown in recent years, enabling manufacturers to develop products that are «rich in fiber», «vegetarian», «allergen-free», «gluten-free» and «free of chemical additives».

It is also employed in the beverage industry to stabilize mixtures: acacia gum creates more stability in oil-in-water emulsions over the long term. This means it can better protect aromas from external aggressions like light and oxygen, and thus prevent them from deterioration, which would be detrimental to brands because consumers might find that products do not have the taste they expect and like. Widely used in the food industry, this essential process is referred to as «encapsulation». Esarom®, an Austria-based company, provides emulsifying solutions to the beverage industry. It attests to the important role of acacia gum in its business: «Compared to other products –a starch base, for example -- acacia gum has unquestionable advantages in terms of technology – and using it is also more profitable."

Benefits of acacia gum in agrifood applications

Acacia gum, a natural product from harvest to production

An unmodified natural plant fiber, acacia gum is a solidified exudate that is extracted directly from acacia trees. It flows naturally after an incision is made in a tree's trunk or branches. In addition to being a fully natural product, its harvest is also 100% natural. A rarity in the agrifood business, acacia gum can only be harvested from wild trees, the majority of which are found in Africa, in the southern Sahel.

Acacia gum helps to protect the environment because it is guaranteed to be free from pesticides and GMOs and serves as a natural defense against the desertification afflicting the countries of the southern Sahel. This makes it an economic and environmental asset and boosts its naturalness. Alland & Robert strongly believes in the naturalness of the product and helps preserve its qualities by conducting strict audits of its suppliers throughout the whole production process and ensuring harvesters have good working conditions. This same level of control also applies in the company's plants that process the acacia gum, which remains natural until it is sold because its composition is not altered at any time. No additives are introduced from harvest to sale.

A multifunctional product yesterday, today and tomorrow

Acacia gum was already being used by the Egyptians 3,000 years ago as an adhesive for mummy bandages. Today it is used in the food, pharmaceutical and cosmetic industries and for technical applications. Its many functions ensure it has a wide array of uses and **Alland & Robert** continues to innovate with acacia gum to meet its customers' demands. Guaranteed to be 100% plant-based, GMO-free, pesticide-free, odorless, colorless, very low-calorie and gluten-free, acacia gum has a bright future ahead of it! **Alland & Robert**'s track record in securing its supply and ensuring safe, sustainable operations suggest that this small French business will continue to play a role in the future.

A safe product in every way

Acacia gum has been certified worldwide by various competent authorities, including the Food and Drug Administration (FDA) in the United States. It is recognized as having no negative impact on health and no maximum daily intake has been defined. **Alland & Robert** makes every effort to preserve acacia gum's stability and natural properties thanks to strict standards and a production process that guarantees its traceability from the beginning to the end of the chain.

As such, the company qualifies for a host of exemplary certifications:

Food safety:

- BRC certification
- Application of HACCP procedures, which are key to risk prevention in food companies

Drug safety:

ANSM certification (French National Agency for Drug and Health Product Safety)

Quality system certification:

ISO 9001

Social and societal commitments:

- SEDEX, a non-profit organization that promotes responsible and ethical improvements in current supply chain practices.
- Evaluation against the SMETA standard (developed by SEDEX), which addresses working conditions, occupational health and safety, environmental issues and ethical practices.

Other food certifications:

- Certified organic
- Certified halal
- Certified kosher

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