

# Gum Acacia

## [ Bread ]



*ALLAND & ROBERT*

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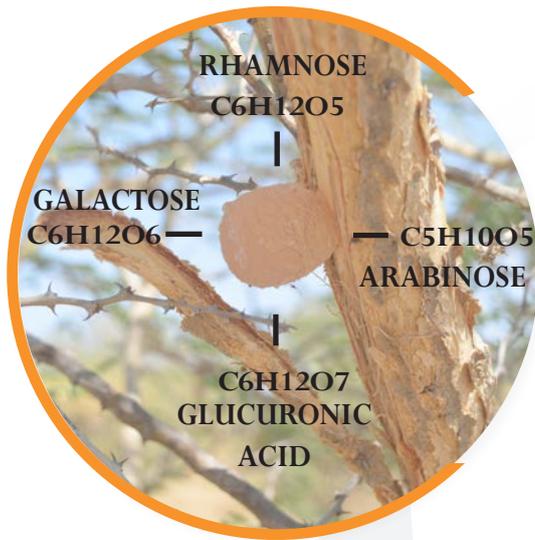
ROBERT

*Technical Paper*  
ACACIA GUM  
in BREADS

INCREASES SOFTNESS AND PRESERVATION

IMPROVES CONSUMERS SENSORY EXPERIENCE

A CLEAN LABEL INGREDIENT AND SOLUBLE FIBER



## ACACIA GUM, A NATURAL ADDITIVE

Acacia Gum is a **high safety food additive** also known as *Gum Arabic*, which comes from an exudation of Acacia trees after the incision of their stems and branches.

This natural product is a complex non starch polysaccharide with a small fraction of protein. Acacia Gum is odorless, tasteless, colorless and is a soluble fiber. It has a low calorific value which makes it ideal for dietary applications and for fiber enrichment purposes.

As an **all-natural and vegetal hydrocolloid** coming from a tree, Acacia gum is **allergen-free, GMO-free and completely safe**. Acacia Gum offers numerous functional properties and this additive is today found in thousands of day-to-day products.

## STUDY ON THE IMPACT OF ACACIA GUM IN BREADS

Acacia Gum is already used worldwide in breads in selected products. In order to investigate further opportunities, **Alland & Robert** appointed LEMPA (*Laboratoire d'Essais des Matériels et Produits Alimentaires / Laboratory for the testing of food products*), a French and independant expert and professional laboratory specialized in bakery based in Rouen- France, to conduct an **independant study on the impact of acacia gum in breads**. All tests were carried out according to panification standard NFV03-716 in accordance with AFNOR standards.



In order to **characterize the effects of adding acacia gum to the properties of breads**, trials were made with professional equipments (texturometer Shimadzu, colorimeter Konica Minolta, alveograph, volumeter, farinograph Mixolab). Tests have been practiced at **3 dosages of 2 Alland & Robert acacia gum products**: a seyal grade (*Acacia Gum 381*) and a senegal grade (*Acacia Gum 396*) compared to a control. The 3 dosages of each product were 1%, 3%, 6%.

Trials were made on 2 types of breads, using the LEMPA's reference recipes for:



### White sandwich bread, aka American bread



### Gluten free bread

A sensory study was also conducted for the **sensory evaluation of the addition of acacia gum** in the above recipes. The LEMPA recruited a panel of 58 people, consumers of the products tasted, according to pre-defined criteria (frequency of consumption, degree of appreciation).

Tastings were conducted in equipped rooms with cabins, and each taster completed one questionnaire per product, including comments and notes to be given on a scale from 1 to 9 (1 being *highly unpleasant* / 5 being *neutral opinion* / 9 being *exceptionally good*). For each product tasted, the tasters had to give a score for the overall assessment.

The products to be tested were offered to the tasters on an anonymous basis and were identified by a 3-digit number. They were presented under the same conditions (temperature, quantity, cooking) for all members of the panel. The test was carried out in monadic sequences, in order to avoid comparison between products. Tasters had water at their disposal.

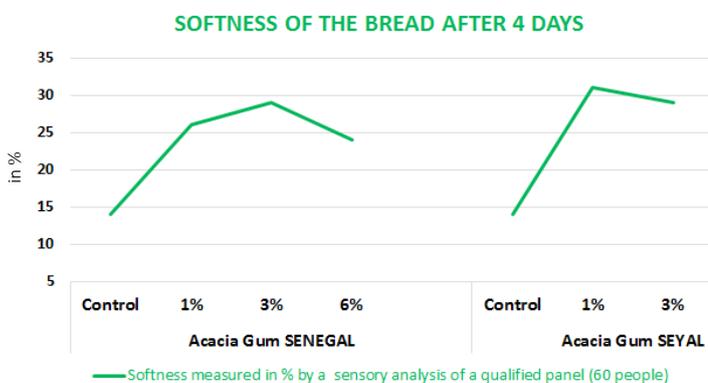


## IMPACT OF ACACIA GUM ON TEXTURE & PRESERVATION OF BREADS

### TEXTURE OF WHITE SANDWICH BREADS

The addition of both *Acacia Gum seyal* and *Acacia Gum senegal* in the sandwich bread offers a higher softness after 4 days than control. This phenomenon was measured by the texturometer and confirmed by consumer sensory tests. The texturometer results show that hardness is decreasing proportionally to the addition of acacia gum, meaning the bread is softer.

In the case of *Acacia Gum seyal*, the texture improvement is more favorable at a concentration below 6%. At a concentration of 1% and 3%, the graphic curves show a more pronounced deflection for *Acacia Gum seyal*, meaning the effect on softness is greater compared to the control. At a concentration of 6%, results are not significant compared to control as the softness decreases.



**HARDNESS AFTER 4 DAYS measured by texturometer (in Newtons)**

|                              |       |
|------------------------------|-------|
| <b>Control</b>               | 12,53 |
| <b>Acacia Gum SENEGAL 1%</b> | 11,56 |
| <b>Acacia Gum SENEGAL 3%</b> | 10,94 |
| <b>Acacia Gum SENEGAL 6%</b> | 9,93  |
| <b>Control</b>               | 12,53 |
| <b>Acacia Gum SEYAL 1%</b>   | 9,77  |
| <b>Acacia Gum SEYAL 3%</b>   | 9,38  |

**Alland & Robert recommends :** in order to keep breads soft longer, incorporate 1% to 3% of *Acacia Gum seyal* into the preparation. The bread will gain up to 25% in softness after 4 days, a true feeling of fluffiness for consumers and a better texture.

A 3% fiber content can allow nutritional allegations (« source of fibers») according to the dosage and the country regulation\*.

**Add 1 to 3% of *Acacia Gum seyal* and gain up to 25% softness and a significant improvement in the preservation of the bread : for short shelf lives (about a few days shelf lives), up to 50% of preservation gain.**

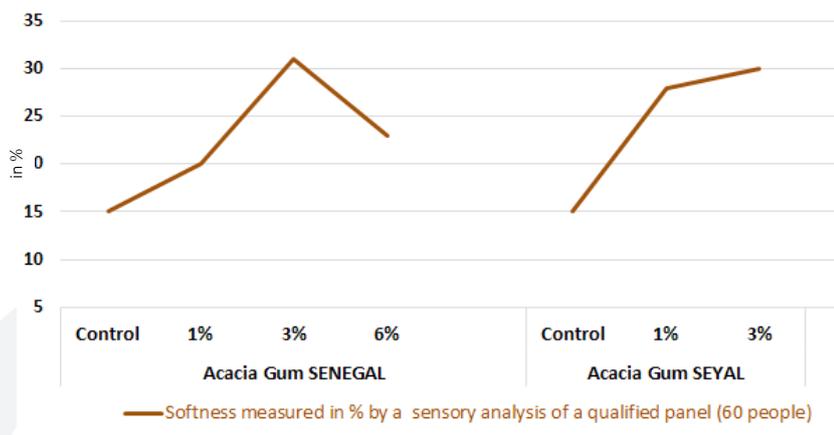
\* depending on the country regulation. Please check your country regulation for nutritional allegations.



## TEXTURE OF GLUTEN FREE BREADS

The addition of any acacia gum improves the softness of gluten free breads after 4 days, and thus their preservation and texture. The addition of 1 to 3% of *Acacia Gum seyal* improves the feeling of softness among the consumers while maintaining the hardness of the bread. But this feeling of softness is a bit higher in breads enriched with 3% of *Acacia Gum senegal*. The hardness of gluten free breads is maintained even if softness is improved.

**SOFTNESS OF THE BREAD AFTER 4 DAYS**



**Alland & Robert recommends :** use *Acacia Gum seyal* or *Acacia Gum senegal* at 1 to 3% in gluten-free breads, and enrich your gluten free bread in fiber at the same time! The texture of breads will remain stable while improving the sensory experience of the consumers. A 3% fiber content can allow nutritional allegations (« source of fibers») according to the dosage and the country regulation\*.

For a nutritional allegation of the bread « enriched in fibers», usually the formulation must contain at least 6% of fibers\*. In that case, it is preferable to use *Acacia Gum senegal* in order to maintain a great softness after 4 days.

**3% of *Acacia Gum seyal* or *Acacia Gum senegal* added to a gluten-free bread, it's twice as many satisfied consumers of the softness of the bread, and a better preservation of the bread. For short shelf lives (about a few days shelf lives), up to 50% of preservation gain.**

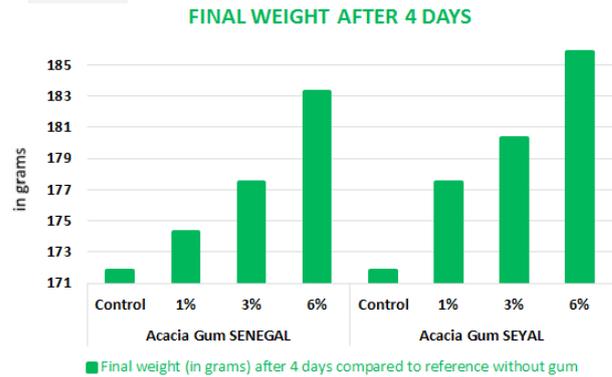
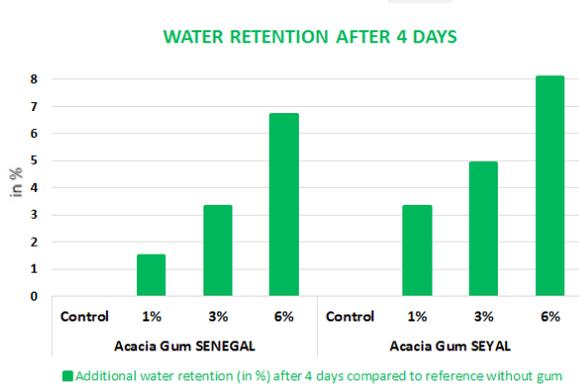
\* depending on the country regulation. Please check your country regulation for nutritional allegations.

## IMPACT OF ACACIA GUM ON THE WEIGHT GAIN & WATER RETENTION OF BREADS

For both sandwich breads and gluten-free breads, the addition of *Acacia Gum seyal* or *Acacia Gum senegal* helps to increase the mass and water retention after 4 days. This phenomenon is more important for conventional breads.

### WEIGHT GAIN & WATER RETENTION IN WHITE SANDWICH BREADS

The addition of *Acacia Gum seyal* offers the best mass increase due to water retention. The more acacia gum is added, the bigger the retention, and an improved freshness sensation of the bread.

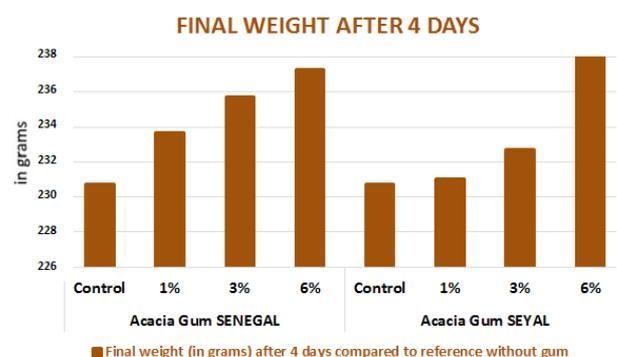
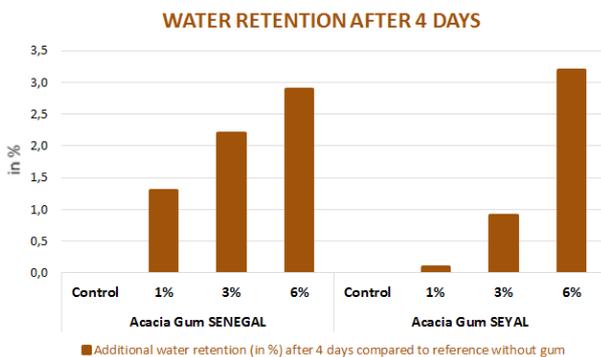


**Alland & Robert recommends:** for the manufacturing of classic sandwich breads, *Acacia Gum seyal* at a concentration of 1 to 3% will be the best match, adding furthermore a texturing effect to your product and increasing the fiber content.

1% of *Acacia Gum seyal* added is a gain > 3% of the yield of sandwich breads.  
 3% of *Acacia Gum seyal* added is a gain = 5% in water retention of sandwich breads.

### WEIGHT GAIN & WATER RETENTION IN GLUTEN FREE BREADS

If you need to incorporate 6% acacia gum in your product formulation, *Acacia Gum senegal* will allow to maintain softness, as it is less sensitive to the loss of softness in high concentration.



For the manufacturing of gluten-free breads, 1 to 3% of *Acacia Gum senegal* is recommended, and will increase the fiber content of the bread as well as its softness.



## SENSORY STUDY RESULTS

### GLOBAL RATINGS OF THE PANEL

Breads added with 1% *Acacia Gum seyal* are standing out the most in both gluten free and regular white breads. In the graphics, all breads with added acacia gum are ranked better than their control.

**Breads containing acacia gum are better rated and better appreciated by consumers.**

**100% of breads with *Acacia Gum seyal* were ranked better than their control.**

The ratio «liked / didn't like» measures the number of positive comments versus negative comments.

Example: a ratio = 2 means there was twice as much positive comments than negative ones.

All breads enriched with acacia gum received more positive comments than negative ones. This is especially important for white sandwich breads.

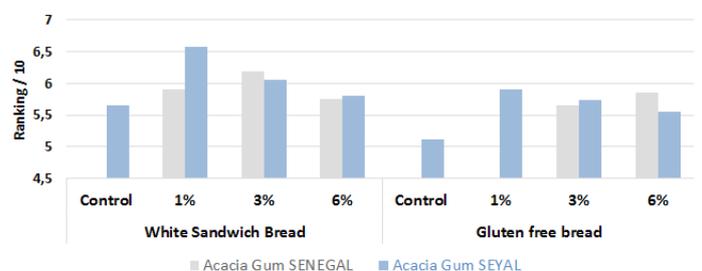
**Consumers generally much prefer breads with acacia gum added.**

### TASTE

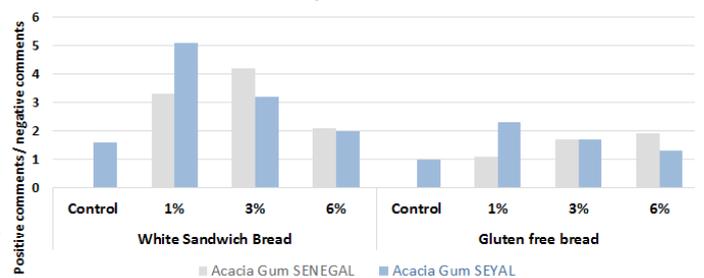
Whether for *Acacia Gum seyal* or *Acacia Gum senegal*, breads with added acacia gum have had more positive feedback on taste than control. 100% of the breads with *Acacia Gum senegal* have had better appreciations regarding the taste of breads.

**The best taste for white sandwich bread is achieved with 1 to 3% acacia gum added.**

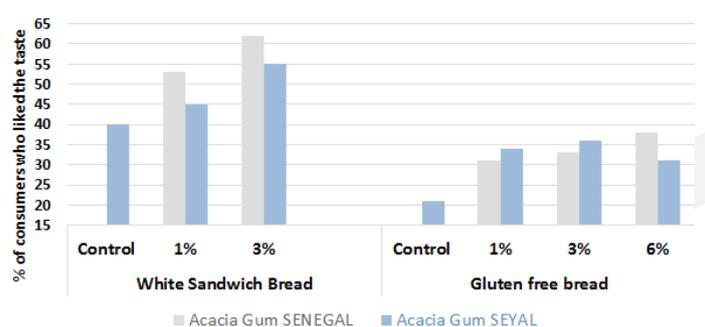
CONSUMER GLOBAL RANKING



RATIO LIKED / DIDN'T LIKE



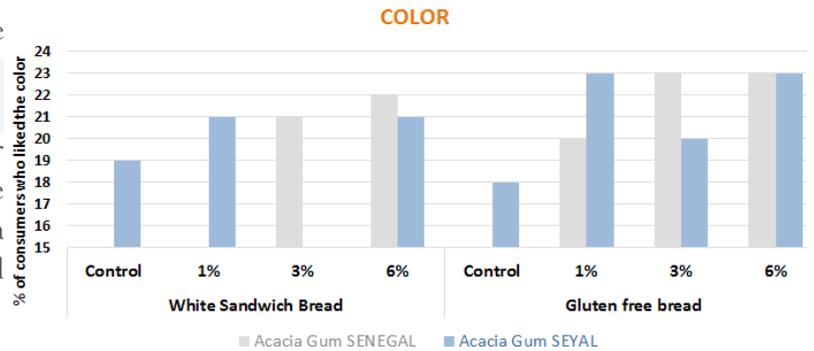
TASTE



## COLOR

The sensory study shows that consumers prefer the color of breads when acacia gum is added.

In addition, further tests have shown little color difference between breads before and after the addition of acacia gum, meaning that adding acacia gum has little effect on the color of the crumbs and crust of breads.

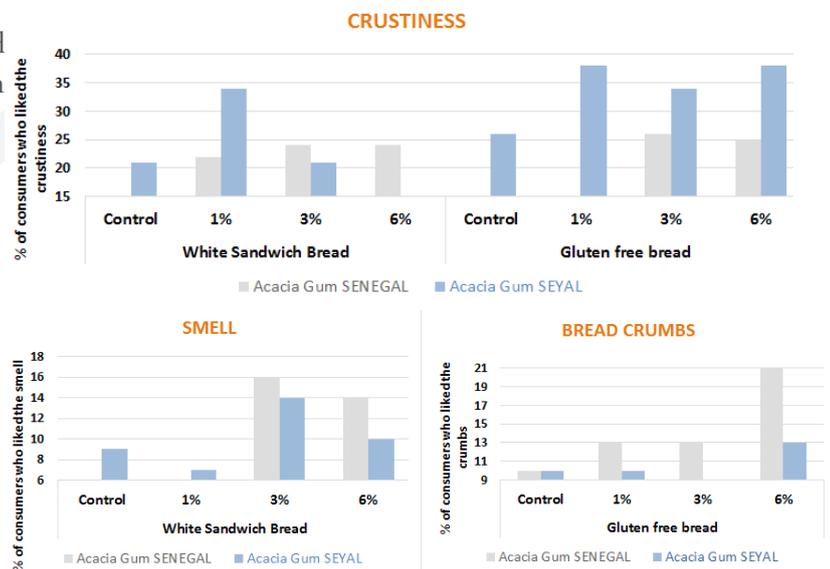


It's possible to improve the preservation of breads while improving the color of breads.

## OTHER PARAMETERS

The study shows that consumers prefer the smell and crustiness of white sandwich breads when acacia gum is added. It can be an addition of either *Acacia Gum senegal* or *Acacia Gum seyal*.

Gluten free bread consumers much prefer the crustiness and bread crumbs when acacia gum is added.



With acacia gum, improving the preservation of breads also means improving the consumers sensory experience!

## FIBER ENRICHMENT



Acacia Gum is a soluble fiber. Alland & Robert guarantees a **minimum fiber content of 90%** (measures according to the international method AOAC 985-29) for its products Acacia Fiber 381 and Acacia Fiber 396.

Fiber enrichment with acacia gum can allow nutritional allegations according to the dosage (« source of » / « enriched in fibres ») and the regulation of every country.

As a fiber, acacia gum offers several advantages:

- Resistance to acidity and heat
- Neutral taste with very low viscosity
- PH compatible with milk proteins
- Scientifically recognized prebiotic effects
- Very low glycemic index
- No side effect, discomfort or stomach issues
- Low calorific value
- Positive effect on rheology
- Non-cariogenic effect

## CONCLUSION: WHICH GUM TO USE FOR WHICH BENEFIT?

|                     |                        | WHITE SANDWICH BREAD |                    |                             | GLUTEN FREE BREAD |                    |  |
|---------------------|------------------------|----------------------|--------------------|-----------------------------|-------------------|--------------------|--|
|                     |                        | Acacia Gum SEYAL     | Acacia Gum SENEGAL | Best performer              | Acacia Gum SEYAL  | Acacia Gum SENEGAL | Best performer   |
| PRESERVATION        | Softness               | Up to 3%             | Up to 6%           | Acacia Gum SEYAL            | Up to 3%          | 1%                 | Acacia Gum SENEGAL at 1%<br>Acacia Gum SEYAL at 3%       |
|                     | Mass / Water retention | Up to 6%             | Up to 6%           | Acacia Gum SEYAL            | Up to 6%          | Up to 6%           | Acacia Gum SENEGAL                                       |
| SENSORY EXPERTIENCE | General                | Up to 3%             | Up to 3%           | Acacia Gum SEYAL            | Up to 6%          | Up to 6%           | Acacia Gum SEYAL at 1% or 3%<br>Acacia Gum SENEGAL at 6% |
|                     | Taste                  | Up to 3%             | Up to 6%           | Acacia Gum SENEGAL          | Up to 6%          | Up to 6%           | Acacia Gum SEYAL at 1% or 3%<br>Acacia Gum SENEGAL at 6% |
| FIBER ENRICHMENT    | Source of fibers       | 3% minimum           | 3% minimum         | Acacia Gum SENEGAL or SEYAL | 3% minimum        | 3% minimum         | Acacia Gum SENEGAL or SEYAL                              |
|                     | Fiber enrichment       | 6% minimum           | 6% minimum         | Acacia Gum SENEGAL          | 6% minimum        | 6% minimum         | Acacia Gum SENEGAL                                       |

The addition of *Acacia Gum seyal* or *senegal* can, depending on the bread and the dosage, **increase the freshness, softness and preservation of breads, with a shelf life up to 50% for breads with a very short shelf life.**

## WHO IS ALLAND & ROBERT?

Created in 1884, **Alland & Robert** is a french family company. **Alland & Robert** is a **global leader in natural plant exudates with a strong focus on acacia gum, a completely natural additive or ingredient used in the food, pharmaceutical and cosmetics industries.** **Alland & Robert** is present in 69 countries worldwide via 37 distributors, and continues its development on every continent. The company is proud to offer its customers:

- A **strong expertise** on acacia gum thanks to a dedicated R&D and laboratory team, investment in ultra modern equipments, research programs and exclusive partnerships with globally recognized universities.
- Production and laboratory reaching the **highest quality standards through international certifications**, including BRC and ISO certifications, HACCP procedures, social and societal commitment through a membership to the SEDEX.
- A strong will to develop the **quality and safety of products** through investments in highly technical production equipments on two different plants.
- Solid partnerships with an extensive network of African suppliers to ensure **security of supply and work to develop local communities** related to Gum Acacia.
- A focus on **sustainable development, social investment and environmental awareness** to maintain the naturality of products, a sustainable harvest of natural resources and the respect of people and stakeholders.

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