# Health & well-being

**“ Let food be thy medicine and medicine be thy food” (Hippocrates).**

Bread is no exception to the rule that states that all foods, especially those consumed daily, address the real-life concerns of health and well-being on the part of consumers today.

*For several years now, consumers' expectations towards their diet have changed greatly: today they not only eat to live, but also for the sake of enjoyment. What's more, having witnessed a number of health crises in the past few decades and a dramatic rise in the prevalence of metabolic diseases (excessive weight and obesity), the link between diet and health can no longer be denied.*

## GLUTEN-FREE EATING

Whether we are dealing with genuine celiac population (proven intolerance to gluten), demand from consumers sensitive to gluten proteins, or simply the results of fashion trends, bread making has adapted to find an alternative to wheat gluten.

However, the use of gluten-free flours (rice, corn, buckwheat, quinoa, etc..) alters deeply the:

- **Crumb structure,** since wheat starch is also highly specific and resembles no other: starches are combined to approximate the properties of wheat starch and thus obtain a satisfactory crumb structure;
- **Network enabling $CO_2$ retention:** to retain $CO_2$, it is necessary to combine hydrocolloids, fibres and proteins to trap water and form a gel which will present a behaviour similar to that of a gluten network;
- **Aromatic profile:** the use of sourdoughs (starter for fermentation on buckwheat, or devitalised rice or buckwheat sourdoughs) allow to obtain interesting aromatic profiles which are also close to those found in wheat bakery products.

### LESAFFRE SOLUTIONS

Considering the specificities of gluten-free issue and its expertise, Lesaffre develops tailor-made solutions including improvers, mixes and sourdoughs.

## SALT REDUCTION

Salt has become a public health concern due to its excessive consumption and the risk of associated pathologies (high blood pressure, cardiac disease, heart attacks and strokes, renal insufficiency, etc..). Due to the high consumption levels as a staple food, bread is an important vector for salt in the diet. Therefore it is important to reduce the salt content of dough. This is not an easy task however, since salt plays a number of roles in bread-making:

- **Organoleptic:** salt, which is composed of sodium chloride (NaCl), gives the salty flavour and enhances 'taste';
- **Hydroscopic:** in terms of dough rheology, salt absorbs water and increases dough elasticity and firmness. It also forms ionic bonds with proteins to ensure improved stability and resistance in the gluten network;
- **Crumb colour:** salt increases ionic strength, which tends to reduce enzyme activity, especially that of the lipoxygenases responsible for oxidising carotenoid pigments in flour;
- **Crust colour:** salt lowers water activity (the content of free water in a product) and enhances the browning process.

### LESAFFRE SOLUTIONS

To reduce salt levels, Lesaffre has developed a range of formulations based on sourdough and devitalised yeast rich in organic elements (amino acids, minerals, vitamins, etc.), thereby allowing to reach the recommendations issued by public health bodies. Salt content can be reduced by up to 30% depending on the use of these agents and the type of baked products .

Combined with a formulation comprising improvers or pre-mixes, this solution guarantees the same rheological performance in dough, avoiding stickiness, and maintaining an appealing crumb and crust colour. It is compatible with all types of bakery products: tin breads, buns, baguettes, rustic breads, etc.)

## REDUCING CALORIFIC CONTENT

Reducing the calorie content of bakery products is achieved through:

- **Reducing lipid content,** especially in delicatessen products, such as brioche (indeed bread is low in fat). These indulgence products contain fat in quantities up to 30% of the finished product's weight, conveying flavour and melting texture;
- **Reducing the content of simple sugars,** especially in delicatessen products where sugar (especially sucrose) is added to give a sweet flavour, as well as texture (soft dough) and preservation properties (by lowering water activity). It is important to address all three factors when replacing sugar.
- **Reducing the glycaemic index (GI),** which categorises foods according to the increase in blood sugar level (or glycaemia) generated from their consumption. The higher the GI, the quicker the increase in glycaemia, which has a negative health impact. The composition of wheat starch impacts the GI: the higher the proportion of amylose, the lower the GI.

## LESAFFRE SOLUTIONS

**To reduce the calory content** without impacting flavour or softness, Lesaffre developed :

- **Rheological solutions** (see chapters on "machinability", "softness" and volume tolerance") ;
- **Aromatic solutions,** based on an extensive sourdough range.

**To reduce the simple sugar content,** it is possible to use:

- **Intense sweeteners,** which also require the use of bulking agents to compensate for the loss of sugar in terms of weight;
- **Bulking sweeteners** (substituted in a 1:1 ratio), such as polyols, which have sweetening properties similar to sugar and the bulking effect required for texturizing the finished product. Maltitol, which has little impact on fermentation, seems to be the best choice of polyol. It should be noted that polyols are non-cariogenic and have a low glycaemic index (25 vs. 64 for sucrose). Their consumption is allowed in small doses in diabetes sufferers;
- **A combination of both strategies** so as to balance the use of polyols and intense sweeteners.

**To reduce the glycaemic index (GI)** and therefore the starch content (amylose), while maintaining the bread's structure, it is possible to use fibres of biochemical structure close to starch. Not only is the GI lowered, but since fibres are not assimilated by the human body, they contribute to reducing calories.

## FIBRE INTAKE

The fibre intake of the population in developed countries is considered insufficient when it comes to the recommended daily allowance (15 to 22 g/day consumed vs. 25 to 30 g/day recommended). Nutritionists therefore **encourage the consumption of fibre-rich foods.** Fibre plays an essential role in satiety, improving intestinal transit, and has a preventive role in numerous diseases: reducing glycaemia and preventing type II diabetes, reducing cholesterolemia and preventing cardiovascular disease, regulating energy intake and preventing obesity, preventing colorectal cancer, etc.

All breads are a source of fibre, with levels varying from 4 g/100 g for a standardFrench baguette to 9 g/100 g for a wholemeal loaf, which is not always popular amongst consumers. Fibre-enrichment in bread must be carried out using more neutral solutions than wholemeal or bran flours.

## IMPROVING THE NUTRITIONAL PROPERTIES OF BREAD

Vegetarianism and environmental concerns have played a role in the current trend to reduce animal protein intake. In quantitative terms, bread represents an important source of protein (200 g bread provides around 20% of an adult's protein requirements), but in qualitative terms, wheat does not provide all the essential amino acids that meat products can offer.

In order to restore balance to the amino acid composition of bread, the answer is to enrich the product with vegetable proteins not traditionally used in the manufacturing of bakery products, all the while ensuring that taste and texture are preserved.

Thanks to Lesaffre's expertise, mixes and pre-mixes are available to address the needs that can vary radically from one country to the another.

### LESAFFRE SOLUTIONS

Lesaffre has developed mixes and pre-mixes containing different types of fibres with specific properties. Insoluble fibres (not soluble in water) are a classic solution, with a flour replacement ratio of up to 20% (higher levels result in the risk of bloating).

The addition of fibres can have an impact on the process: weaker dough, blistering and holes occurring more frequently, lower $CO_2$ retention capacity, fragile crumb, darker crust and crumb, modified flavour and taste, etc.. This not only requires adapting the process (e.g. by reducing the mixing time), but also using improvers.