

ROQUETTE
NUTRIOSE®, more than just a soluble fiber

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INTRODUCTION

- The WHO/FAO⁽¹⁾ recommend that a well-balanced diet should include a balanced energy intake with specifically **55 to 70% from total carbohydrates** and foods that release their energy slowly, i.e. about **40% from complex sugars, such as fibers**.
- The recommended daily intake is around 30 g fiber per day per person in most European countries. The **soluble fiber NUTRIOSE®** is a **resistant dextrin** obtained using a highly controlled process of dextrinification, followed by separation steps, which ensures an amount of fiber of 85%.
- It can be easily added to make up to 20-25% (w/w) of a foodstuff, even a beverage, and help achieve the nutritional "fiber" goal of the WHO/FAO.

NUTRIOSE®: digestive tract and blood compartment

- As a fiber and according to clinical studies⁽²⁾, NUTRIOSE® has a caloric value of 2 kcal/g. It is partially (15%) hydrolyzed in the upper part of the digestive tract where it induces low glycaemic (GR = 25; figure 1) and insulinaemic responses (IR = 13; figure 2) while the rest passes to the colon, where 75% of the initial amount is slowly and progressively fermented in the large intestine and 10% excreted (figure 3).

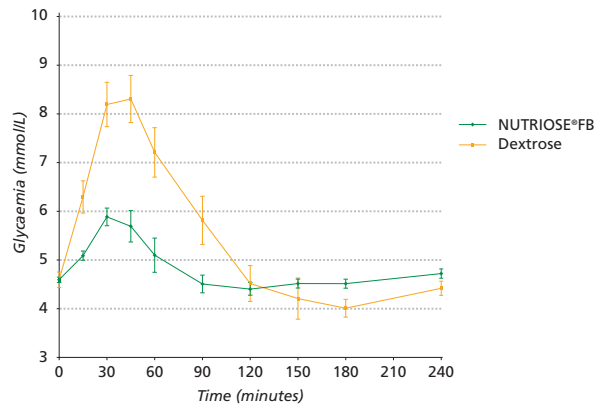


Figure 1: mean blood glucose response measured in 6 healthy volunteers after ingestion of either 50 g dextrose, or NUTRIOSE® in 250 mL drinking water, after overnight fasting.

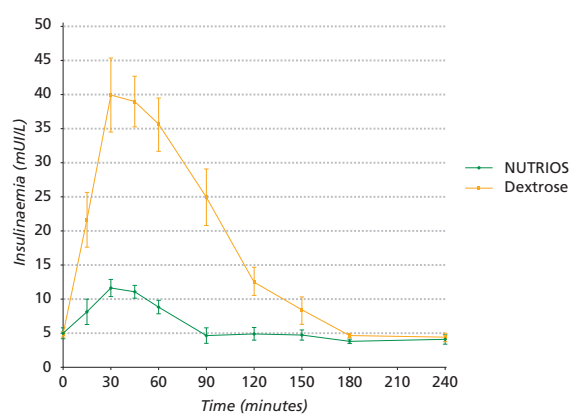


Figure 2: mean blood insulin response measured in 6 healthy volunteers after ingestion of either 50 g dextrose, or NUTRIOSE® in 250 mL drinking water, after overnight fasting.

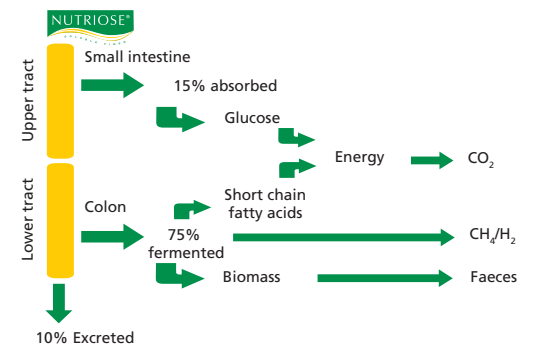


Figure 3: digestive pattern of NUTRIOSE® in the upper and lower parts of the digestive tract.

NUTRIOSE® modulates food intake

- NUTRIOSE® may help to delay the return of the sensation of hunger, and as will be attested by shortly published results of a recent clinical study, it may have a potential role in weight management by significantly modifying some of the risks factors usually associated with the metabolic syndrome (figure 4).
- Moreover, the effects on vigilance and cognitive performances following NUTRIOSE® administration⁽³⁾ suggest that the GR is not the only factor to be considered for predicting the efficiency of a food ingredient but that the colonic effects, and mainly the production of short chain fatty acids (SCFA) as contributors to the daily energy supply, may probably be key factors in providing a long-lasting energy supply.

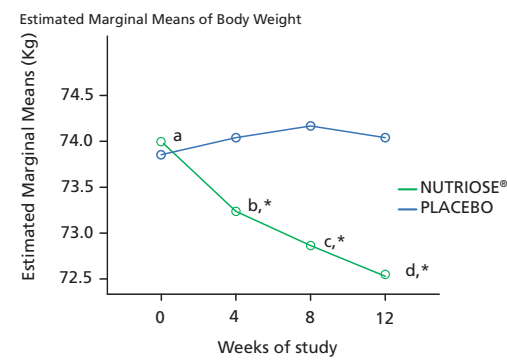


Figure 4: Weight measurements (kg) at weeks 0, 4, 8, and 12 of the clinical trial for the NUTRIOSE® and PLACEBO groups. Volunteers had consumed twice daily 250 ml fruit juice containing either 17 g NUTRIOSE® fiber (= 34 g/day) or PLACEBO: 17 g (= 34 g/day) standard maltodextrin.

◆: Weeks with different letters (a,b,...) are significantly different one from another within NUTRIOSE® group. Weeks with asterisks (*) are significantly lower as compared to placebo group for the same week.

NUTRIOSE® is a prebiotic

- A need for a broader definition of prebiotic effects has progressively emerged, reflecting more recent understanding of the microbial ecology of the human microbiota and of its potential role for human health. The FAO (2007) has revised this definition as :
"a non-viable food component that confers a health benefit on the host associated with modulation of the microbiota".
- NUTRIOSE® has been shown through different studies to display prebiotic effects through colonic fermentations⁽⁴⁾ :
 - benefiting the colonocytes in the digestive epithelium
 - encouraging an increase in the population of beneficial glucidolytic flora
 - encouraging a decrease in colonic pH and therefore in potentially pathogenic flora
 - contributing a significant quantity to the body's daily energy supply ("metabolic fuel")
- Because of a progressive fermentation through the colon, the sustained production of SCFAs in addition to the initial release of glucose from the partial digestion in the small intestine makes of NUTRIOSE® a long-lasting source of energy (figure 5).
- NUTRIOSE® also offers an outstanding digestive tolerance threshold (figure 6), allowing its consumption in the amounts best suited to achieving the desired beneficial changes in the gut ecosystem with a threshold of 45g a day producing no symptoms at all of digestive discomfort and no diarrhea-occurring events at a dosage of 100 g a day.
- Moreover, as a completely soluble fiber, withstanding extreme conditions of temperature and processing, it is an ideal ingredient for fortifying the fiber content of food and drink⁽⁵⁾.

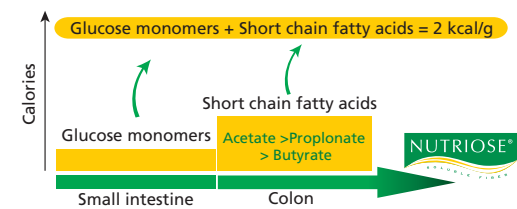


Figure 5: digestive pattern of NUTRIOSE® in the upper and lower parts of the digestive tract and caloric value.

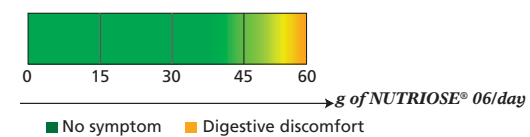


Figure 6: schematic representation of the digestive tolerance of NUTRIOSE® depending on the amount ingested.

CONCLUSION

- NUTRIOSE® is an invaluable ingredient from a nutritional point of view, and is also technologically very easy to use.
- NUTRIOSE® is a promising tool for fortification of diets in fibers, but also for weight management and chronic metabolic disorders associated with overweight.
- NUTRIOSE® preserves the original taste of the finished product and is from natural origin.

Bibliography

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