



# **NUTRIOSE®**

## **OUTSTANDING STABILITY**

1. Powder

Ⓢ **Stability of NUTRIOSE® 06 powder**

2. Solutions

Ⓢ **Stability of NUTRIOSE® 06 water solutions at various pH and temperatures**

3. Applications

Ⓢ **Stability of NUTRIOSE® 06 during production and storage of food and drinks**

- Beverages
- Sterilised soups
- Yoghurts
- Fruit preparations
- Biscuits
- Cereal Bars
- Hard-Boiled candies
- Bread
- Fermentation with *Saccharomyces cerevisiae*
- ...

# Stability of NUTRIOSE® FB 06 powder

**Powdered products were stored in open container at various relative humidities for 24h at 20°C (68°F).**

1. Powder

2. Solutions

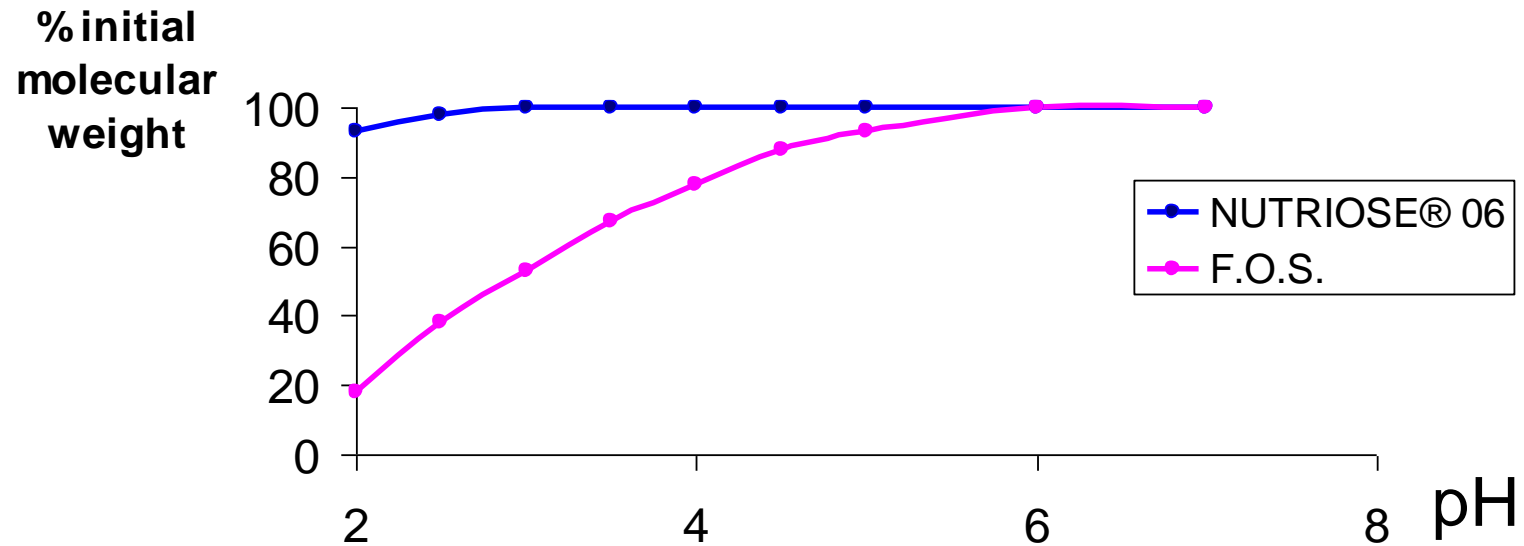
3. Applications

Relative humidity (%)	30	40	50	60	70	80
NUTRIOSE® 06	Free flowing product				Begins to lump	Lumping

**NUTRIOSE® FB 06 powder has a good stability**  
(normal storage conditions)

- 1. Powder
- 2. Solutions
- 3. Applications

**Evolution of molecular weight in % of initial mass after 90 days in 10% dry solids water solutions at pH 2.0 to 7.0 and 20°C (68°F)**

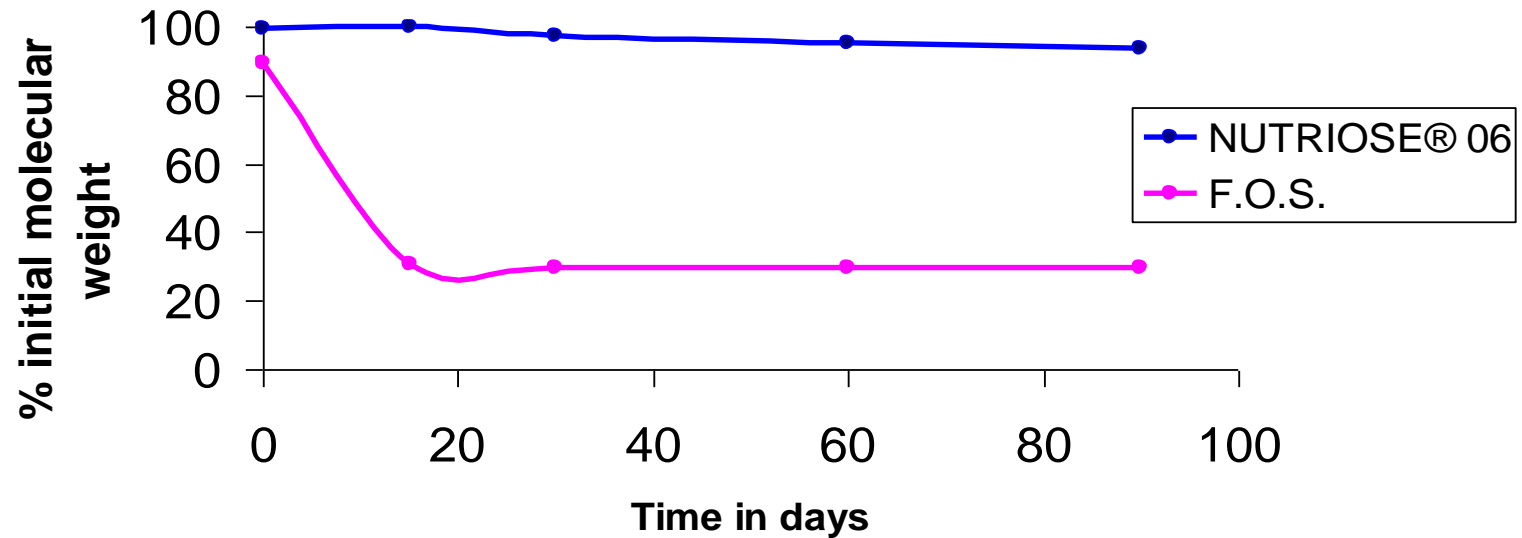


1. Powder

2. Solutions

3. Applications

**Evolution of molecular weight in % of initial mass  
in 10% dry solids water solutions during storage  
at pH 2.0 and 30°C (86°F)**

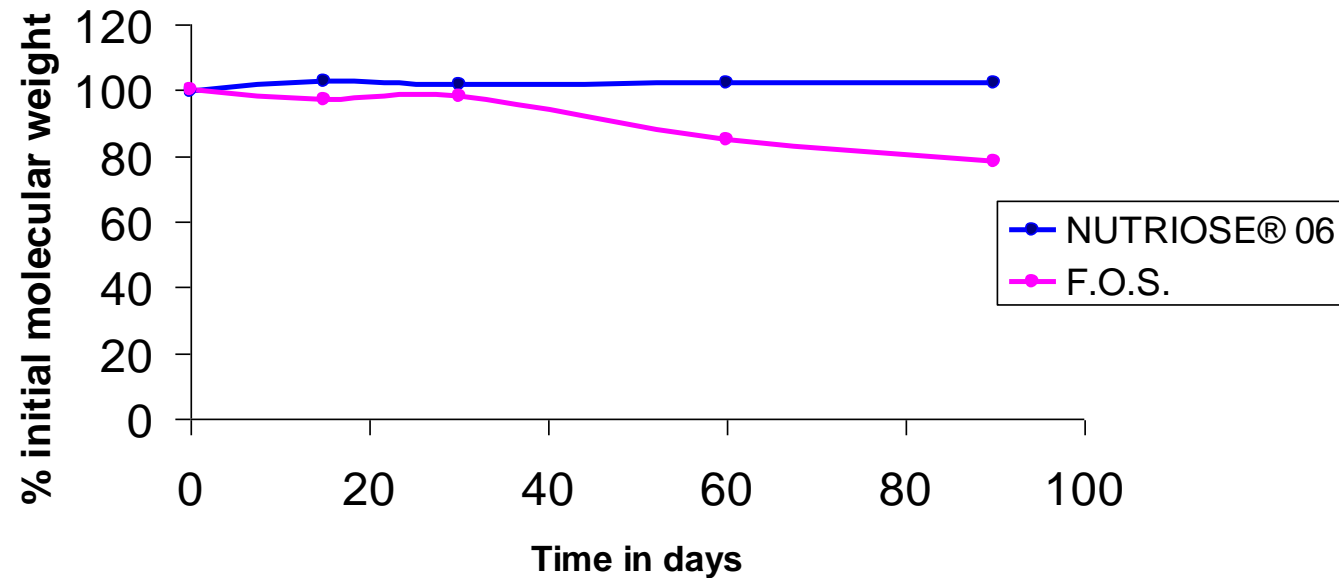


1. Powder

2. Solutions

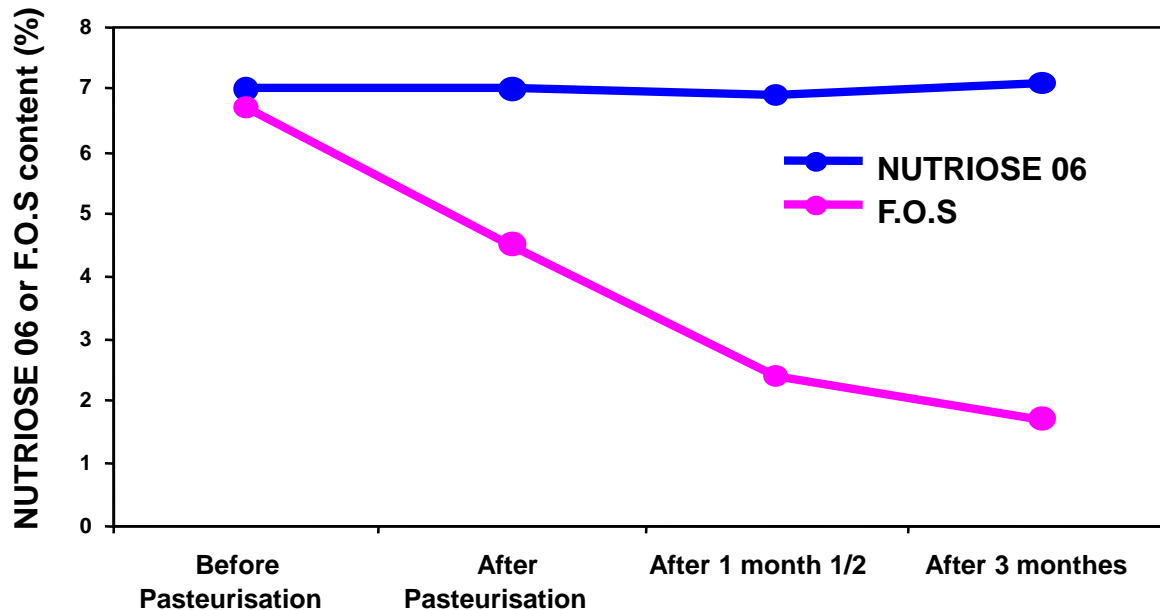
3. Applications

## Evolution of molecular weight in % of initial mass in 10% dry solids water solutions during storage at pH 4.5 and 40°C (104°F)



- 1. Powder
- 2. Solutions
- 3. Applications

**Dissolution in juice: very easy and quick**  
**Pasteurisation: 74 °C (165 °F) – 17 min; pH =3.8**



**Excellent stability of NUTRIOSE® 06: no loss of fibre during pasteurisation and during 3 months storage at 20°C (68°F)**

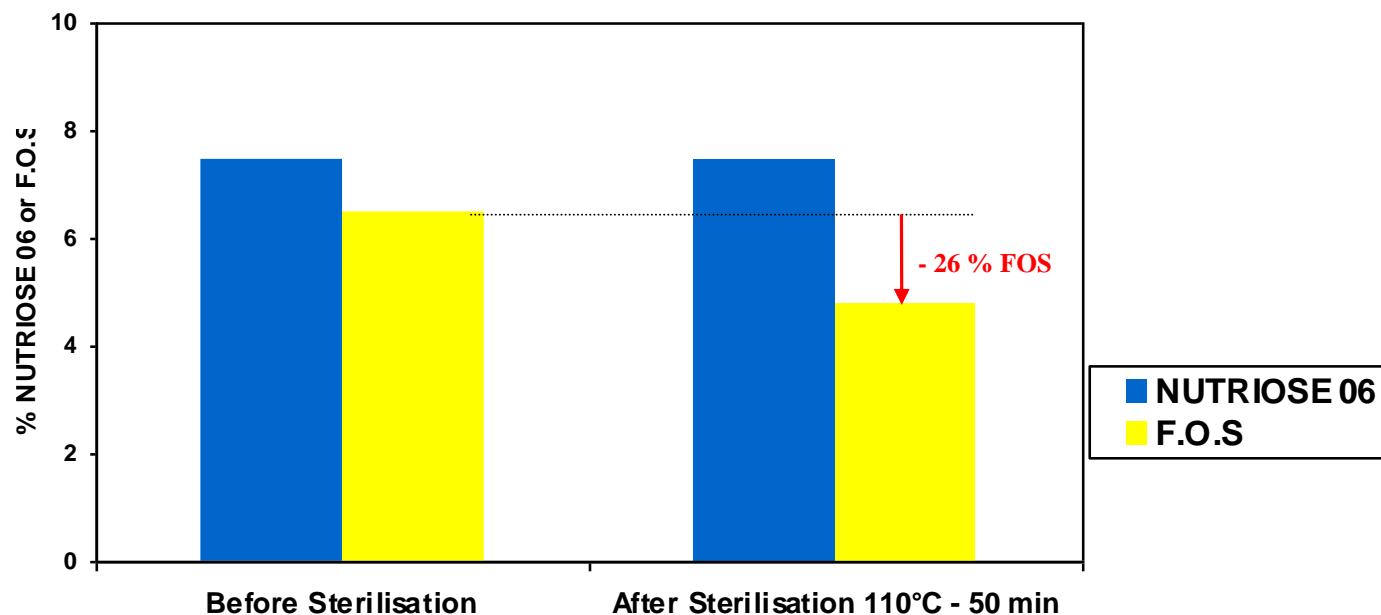
**Stability of NUTRIOSE® 06 during shelf life of commercial drinks:**  
**Orange juice with 1% NUTRIOSE® added → 1.0% NUTRIOSE® 06 after 2 years**  
**Acidic beverage (pH 3.4) with 1% NUTRIOSE® 06 added → 1.0 % NUTRIOSE® 06 after 1 year**



- 1. Powder
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**Tomato soup – pH = 4.2**

**Sterilisation: 110°C (230°F) – 50 min**



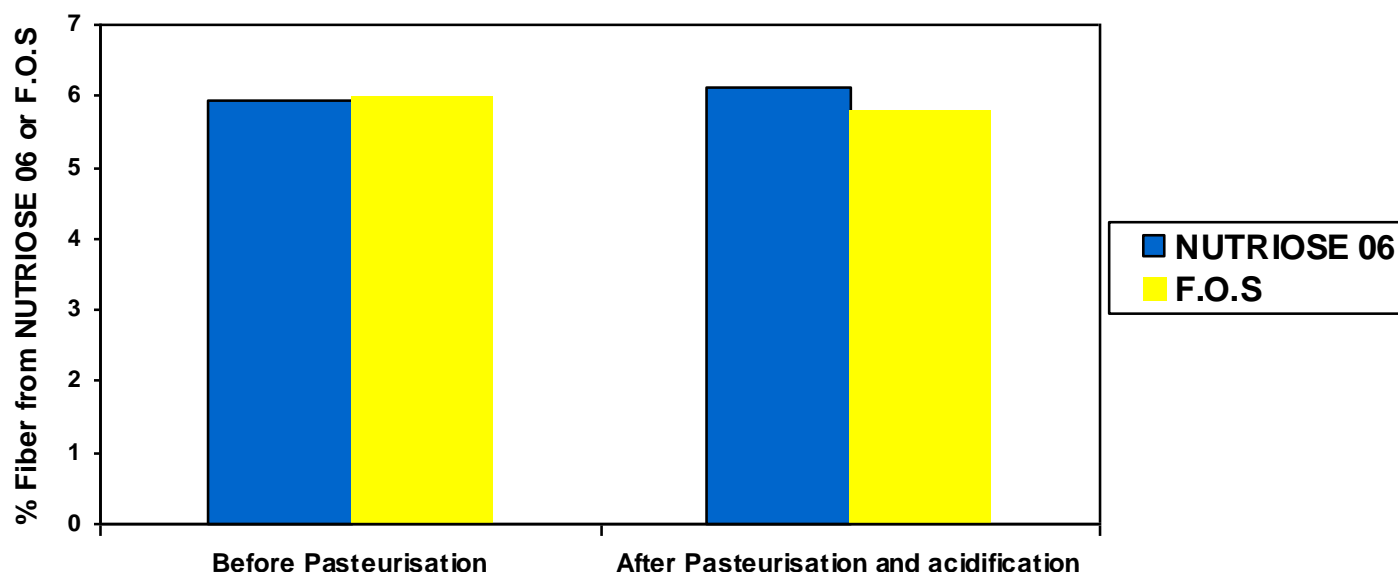
**Excellent stability of NUTRIOSE® 06 during sterilisation**





- 1. Powder
- 2. Solutions
- 3. Applications

**5.95 % fibres from NUTRIOSE® 06 or FOS in Yoghurts**  
**Pasteurisation: 85°C (185°F) – 5 min;**  
**Fermentation and acidification to pH 4.4 with blend\* of**  
***Lactobacillus bulgaricus** and **Streptococcus thermophilus***  
 \* ferment : YC-380 CHR Hansen

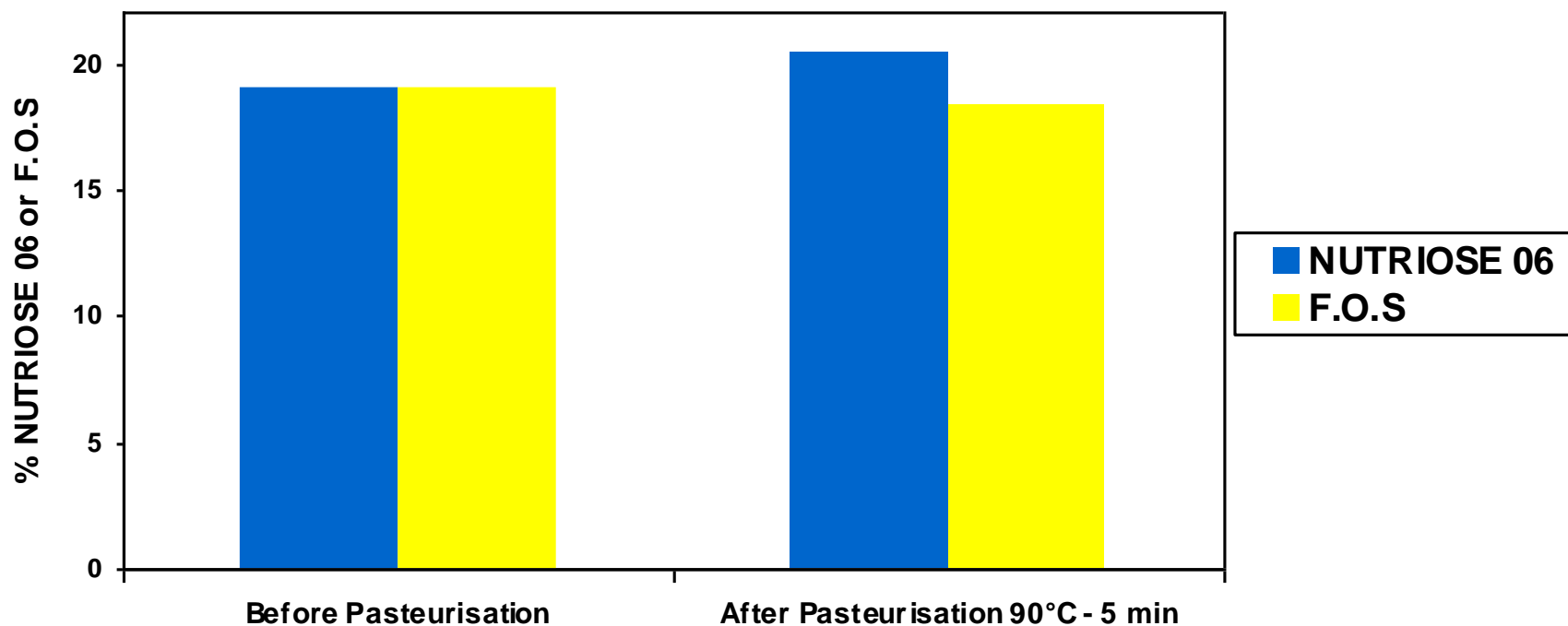


**Excellent stability of NUTRIOSE® 06:**  
**no loss of fibre during pasteurisation and acidification to pH 4.4.**  
**NUTRIOSE® 06 is not fermented by *Lactobacillus bulgaricus* and**  
***Streptococcus thermophilus***



- 1. Powder
- 2. Solutions
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## Pasteurisation 95°C (203 °F) – 5 min – pH = 3.8

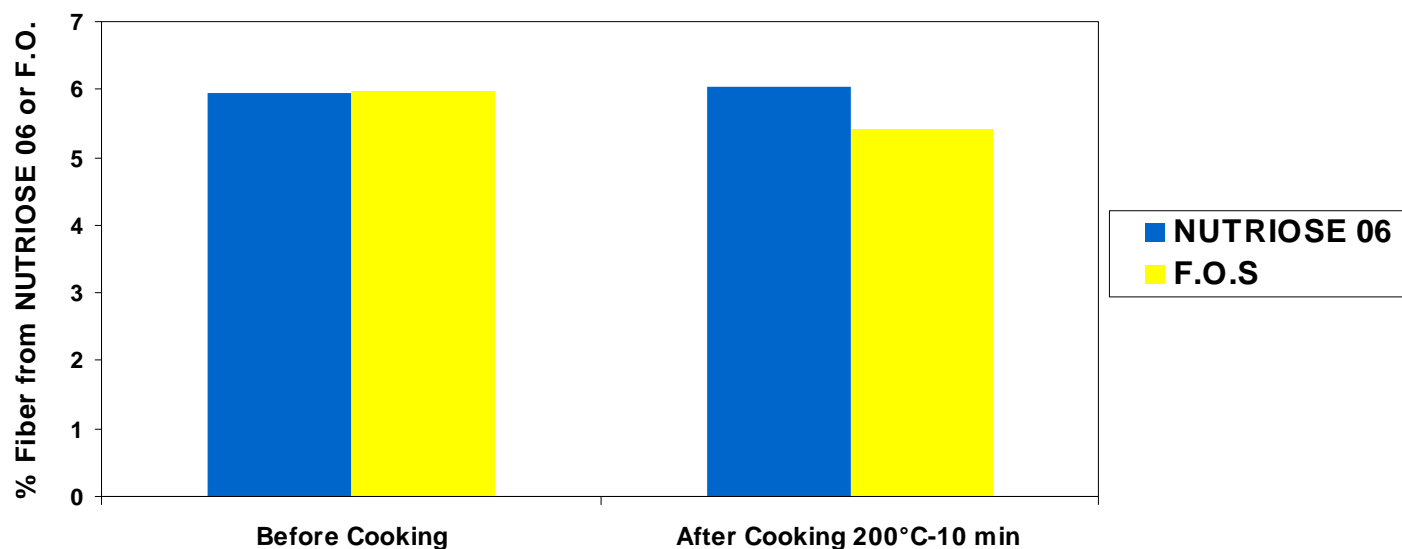


**Excellent stability of NUTRIOSE® 06  
to low pH and to pasteurisation**



- 1. Powder
- 2. Solutions
- 3. Applications

## Biscuits with 5.95 % fibres from NUTRIOSE® 6 or F.O.S Baking at 200°C (392°F) – 10 min



**Excellent stability of NUTRIOSE® 06:  
no loss of fibre during cooking at 200°C (392°F)**

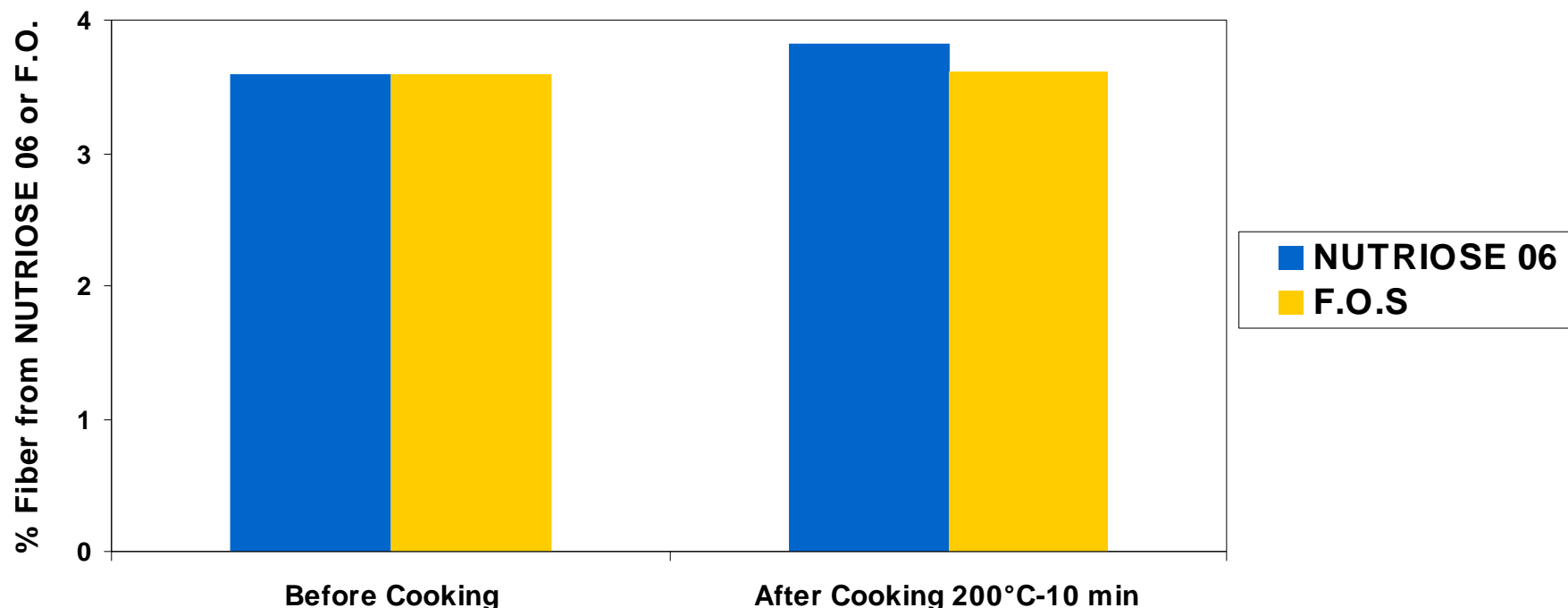


1. Powder

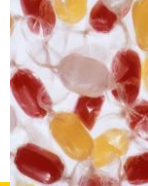
2. Solutions

3. Applications

**3.6% fibres from NUTRIOSE® 6 or F.O.S in the binder before cooking**  
**Cooking of the binder at 115°C (239°F)**



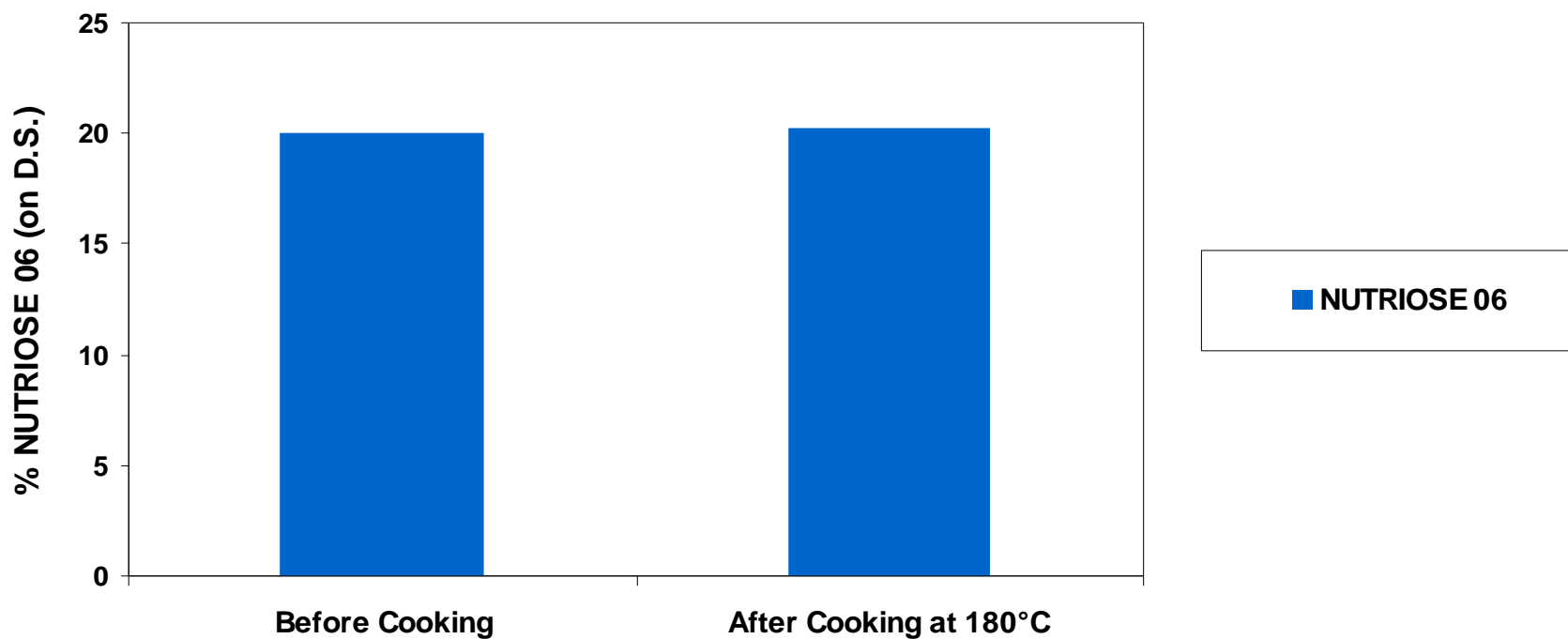
**Excellent stability of NUTRIOSE® 06:**  
**no loss of fibre during cooking at 115°C (239°F)**



- 1. Powder
- 2. Solutions
- 3. Applications**

**80% isomalt + 20% NUTRIOSE® 06**

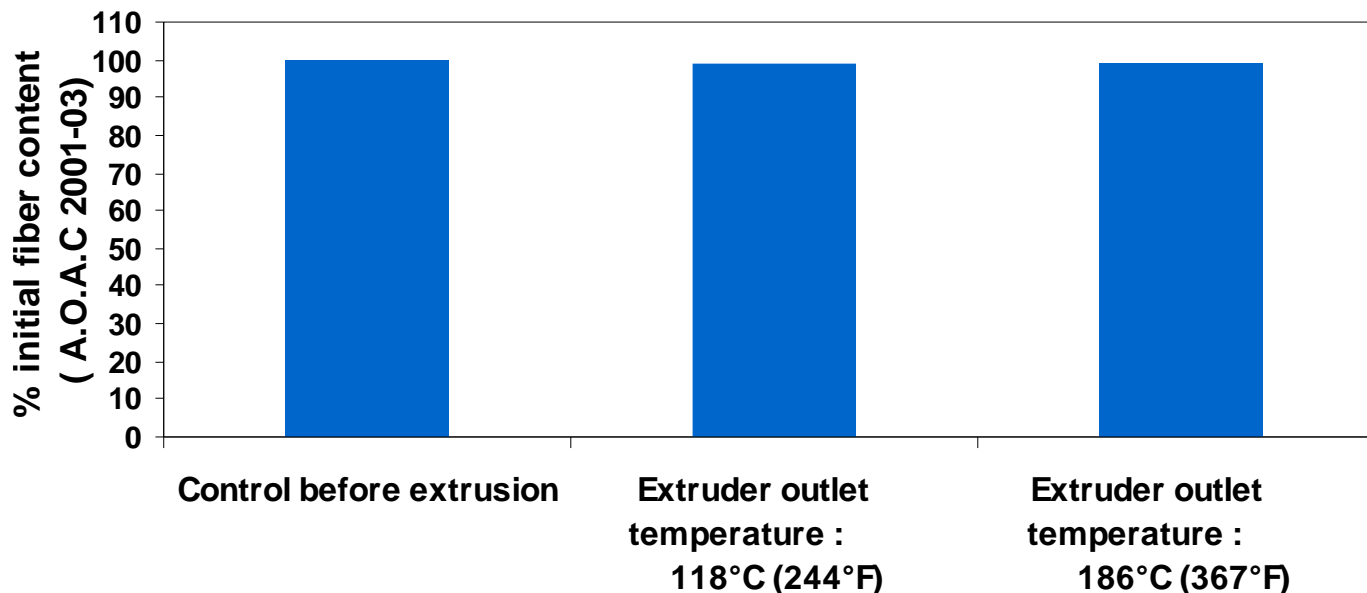
**Cooking : 180°C (382°F)**



**Excellent stability of NUTRIOSE®06 at very high temperatures**



**89% NUTRIOSE 06 + 11% water**  
**Twin-Screw Bühler Extruder**



■ NUTRIOSE 06

**Excellent stability of NUTRIOSE® 06:  
no loss of fibre during extrusion cooking**

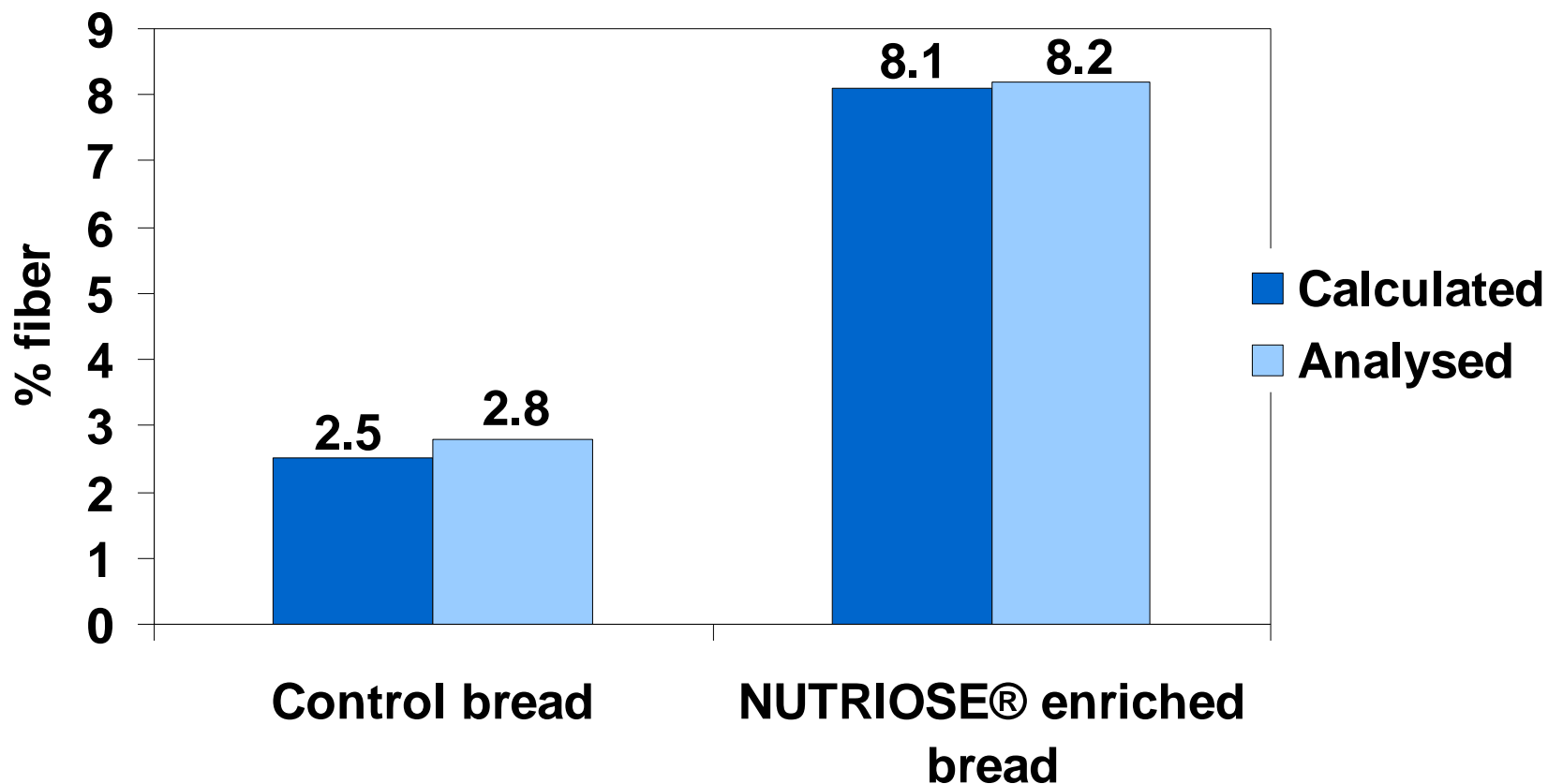
1. Powder

2. Solutions

3. Applications



- 1. Powder
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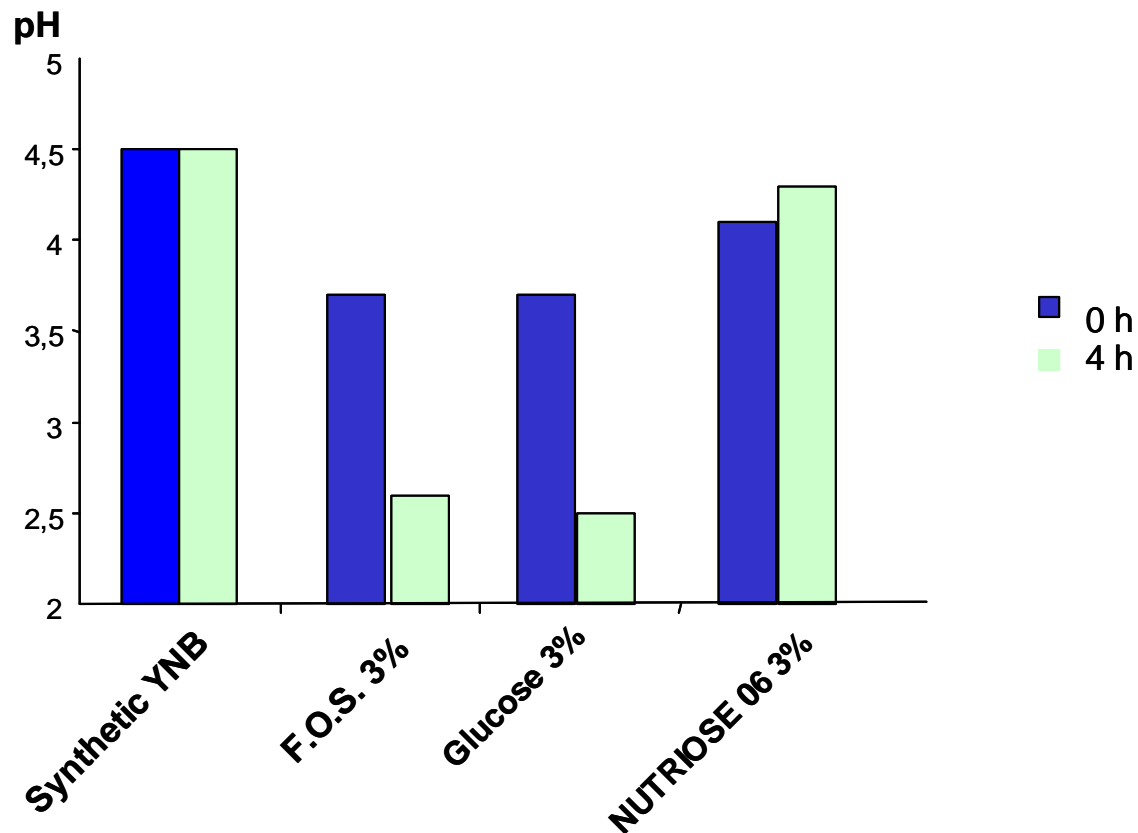


**Excellent stability of NUTRIOSE during bread fermentation with *Saccharomyces cerevisiae* and during baking**

# NUTRIOSE® FB is not fermented by *S. cerevisiae*



***Saccharomyces cerevisiae* as wet baked yeast (10 % in water) inoculated as 1/100 in synthetic medium (YNB /DIFCO) + 5 g/l (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> + 3% NUTRIOSE 06 or F.O.S**  
**Incubation: 30°C – 4h under agitation (165 rpm) - Growth evaluation : pH at T0 and 4h**



**No change of the pH with NUTRIOSE®06 (as observed for the synthetic medium).**  
**→ No growth of *S. cerevisiae* on NUTRIOSE®FB**

1. Powder

2. Solutions

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***Saccharomyces cerevisiae* as wet baked yeast (10 % in water) inoculated as 1/100 in synthetic medium (YNB /DIFCO) + 5 g/l (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> + 3% NUTRIOSE 06 or F.O.S**

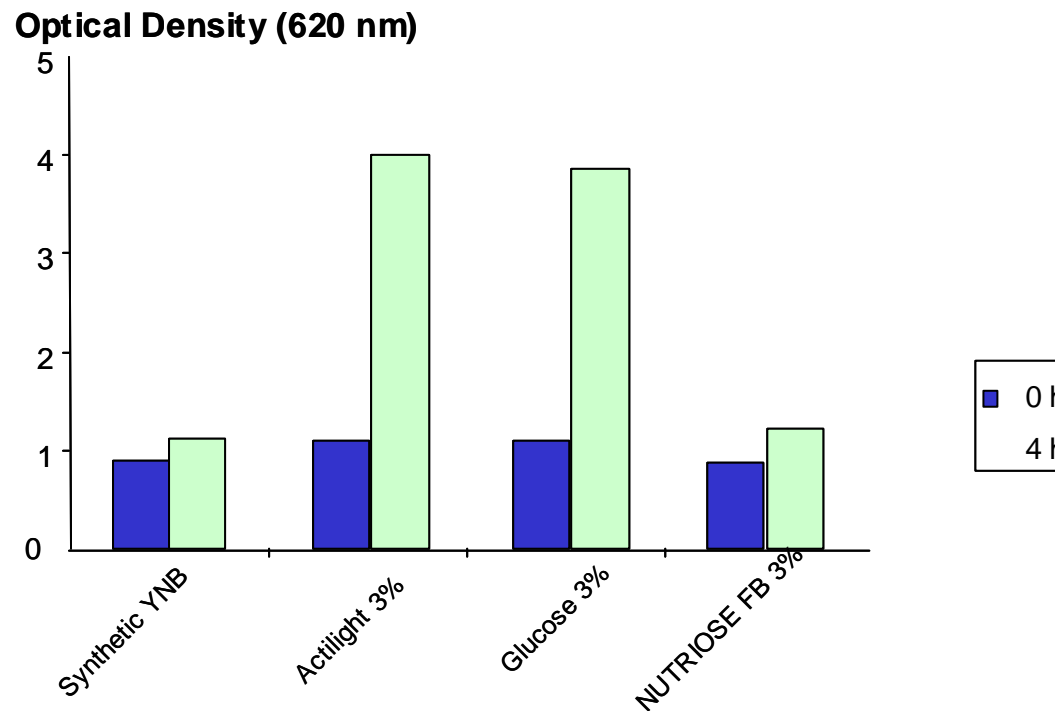
**Incubation : 30°C – 4h under agitation (165 rpm)**

**Growth evaluation : Optical Density (620 nm) at T0 and 4h**

1. Powder

2. Solutions

3. Applications



**No significant change of the O.D. NUTRIOSE®06 (as observed for the synthetic medium).**

**→ No growth of *S. cerevisiae* on NUTRIOSE®FB**

1. Powder

2. Solutions

3. Applications

## NUTRIOSE® FB 06 is stable :

- In a wide range of pH : 2.5 to 9.0
- To pasteurisation (ex. : 74 °C =165 °F – 17 min; pH =3.8)
- To sterilisation (ex. : 110°C = 230°F; 50 min pH = 4.2)
- During cooking at 180°C (ex. : Hard-Boiled Candies)
- During Extrusion at 186°C =367°F
- Fermentation with *Saccharomyces cerevisiae*
- Fermentation with *Lactobacillus bulgaricus* and *Streptococcus thermophilus...*

## Other processes where NUTRIOSE® FB 06 is stable :

- Freeze / thaw
- Spray drying
- ...