

Dietary fiber measurement in food containing NUTRIOSE®FB 06 by Enzymatic-gravimetric-HPLC method

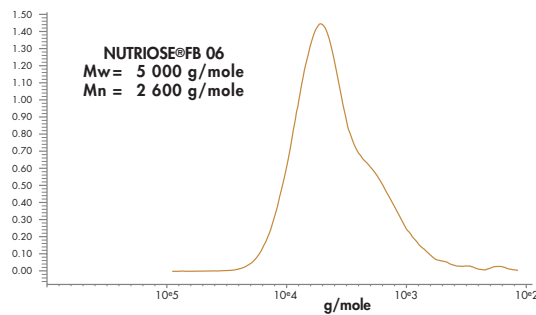
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NUTRIOSE®FB 06 is produced using a highly controlled process of starch dextrinization followed with chromatographic separation. It contains a high level of oligosaccharides and polysaccharides that are resistant to digestion and absorption in the human small intestine. These compounds provide beneficial physiological effects with a very good tolerance.

STRUCTURE OF NUTRIOSE®FB 06

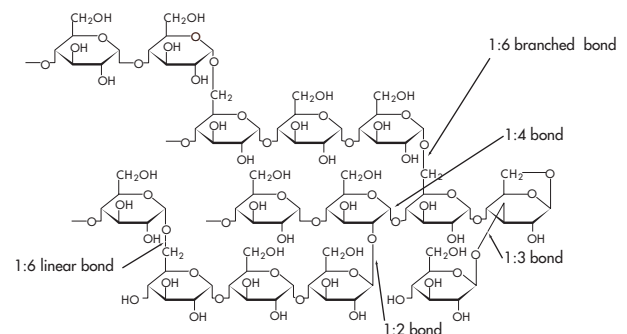
Average molecular mass of NUTRIOSE®FB 06 by Size exclusion chromatography

NUTRIOSE®FB 06 is produced using a highly controlled process of wheat starch dextrinization followed by a chromatographic step. This process ensures a high fiber content and expected molecular weight distribution which relates to rheological behaviour.



The chromatographic step decreases the polydispersity of molecular weight distribution.

Chemical structure:



Glucosidic linkages of NUTRIOSE®FB 06 (indicative values)

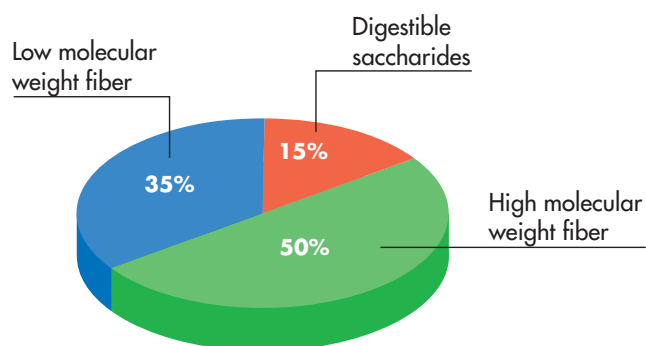
1,4	41%
1,6	32%
1,2	13%
1,3	14%

It is well known that Dextrinization process involves hydrolysis of linear α -(1,4) linked glucose and a recombination (transglucosidation) of fragment through (1,6), (1,2), (1,3) linkages to form more highly branched structure that is not hydrolysed by human digestive enzymes (fiber effect).

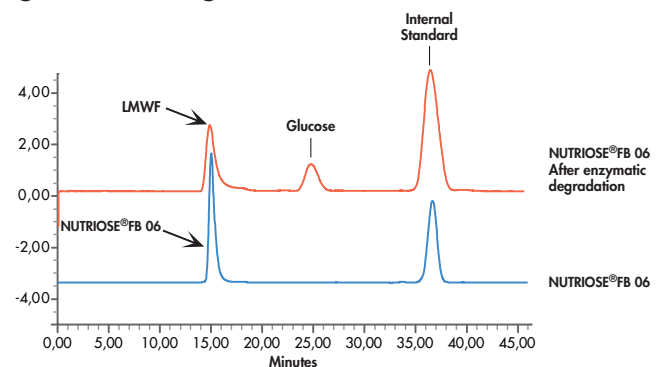
FIBER CONTENT OF NUTRIOSE®FB 06

Recently, AOAC has proposed a new method by HPLC for the total fiber determination in food (*AOAC official method 2001.03, total dietary fiber in foods containing resistant starch*). This method occurs in two steps: the first step directly corresponds to the AOAC enzymatic gravimetric method (985-29), which uses ethanol to precipitate dietary fiber, thought to be higher than 10 degrees of polymerisation (= **High Molecular Weight Fiber**). A second step, is carried out by HPLC for the quantification of resistant (non digestible) oligosaccharides (= **Low Molecular Weight Fiber**).

This method was applied on NUTRIOSE®FB 06 and on formulated foods, biscuits and yogurts, containing NUTRIOSE®FB 06.



Total fiber in NUTRIOSE®FB 06 = 85% (dry basis) = HMWF + LMWF



Low molecular weight fiber (LMWF) determination in NUTRIOSE®FB 06 by HPLC (Column-Na; mobile phase, water; detector, refractive index (RI)). LMWF (35% in NUTRIOSE®FB 06) are non digestible oligosaccharides that are resistant to enzymatic degradation.

FIBER CONTENT OF BISCUITS, YOGURTS CONTAINING NUTRIOSE®FB 06

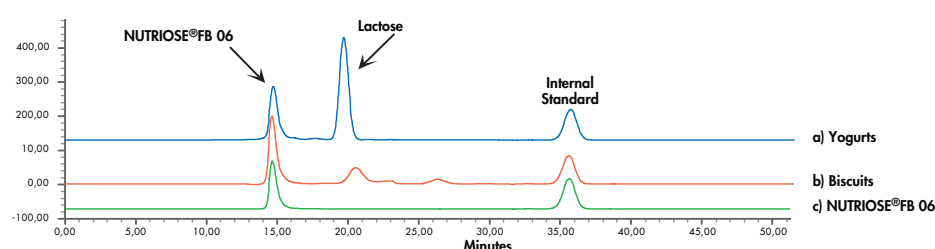
Dietary fiber of NUTRIOSE®FB 06 and biscuits and yogurts containing NUTRIOSE®FB 06

	TOTAL FIBER (AOAC method 2001-03 Enzymatic-gravimetric-HPLC method)
	Total fiber (sum of HMWF and LMWF) % product as is
Biscuits Control (Dry solid 95%)	5.2 ± 0.8 ^{a)}
Biscuits with 7% NUTRIOSE®FB 06	10.7 ± 0.8 ^{a)}
Yogurts Control (Dry solid 15%)	0.2 ± 0.02 ^{b)}
Yogurts with 7% NUTRIOSE®FB 06	6.1 ± 0.5 ^{b)}

^{a)} n= 12 ^{b)} n= 4

Conclusion: Analysis demonstrates that the added fibers had significantly increased the fiber content in the finished products as anticipated.

NUTRIOSE®FB 06 DETERMINATION IN BISCUITS AND YOGURTS



Biscuits and yogurts were manufactured using NUTRIOSE®FB 06 as a partial saccharose substitute without any noticeable changes in taste or texture characteristics. It is possible to analyse NUTRIOSE®FB 06 in biscuits and yogurts with water extraction. NUTRIOSE®FB 06 elutes from the HPLC column as a well resolved peak.

As shown in figure above, the chromatograms have about the same profile with the aqueous extract as with NUTRIOSE®FB 06 alone. This demonstrates good stability of this dextrin in food processing at high temperatures for biscuits, as well as with acidic media for yogurts.