

MEASUREMENT OF TOTAL FRUCTAN IN FOODS ACCORDING TO GB 5009.255-2016

The Carbohydrate Competence Centre (Eurofins Food Testing NL, The Netherlands) is proud to announce the availability of the method conform the national standard of the people's republic of China GB 5009.255-2016, Determination of fructan in foods, as a validated test according to ISO 17025. The method is available with the test codes HEC3I, HEC3J, HEC3K. This method is needed for importing fructan containing products in to China, in particular infant formula and adult nutrition.

Introduction

Fructans, inulin, polyfructose and fructo-oligosaccharides (FOS) are used as health enhancing ingredients in food, feed and pet food. Fructans pass the stomach and small intestine unchanged and are fermented in the large intestine, where they stimulate growth and activity of the gastrointestinal microbiota and are conferring benefits upon hosts health. They are such considered as prebiotics.

Methods of fructan analysis

The GB standard specifies the determination of fructan content in food by ion chromatography and applies to the determination of oligofructose, polyfructose or inulin content separately added in milk and dairy products, infants and young children's formula, infants and young children cereals, solid beverages and formulated wines. The method is mandatory for importing products in to China. The China National Health & Family Planning Commission released the method March 1 2017.

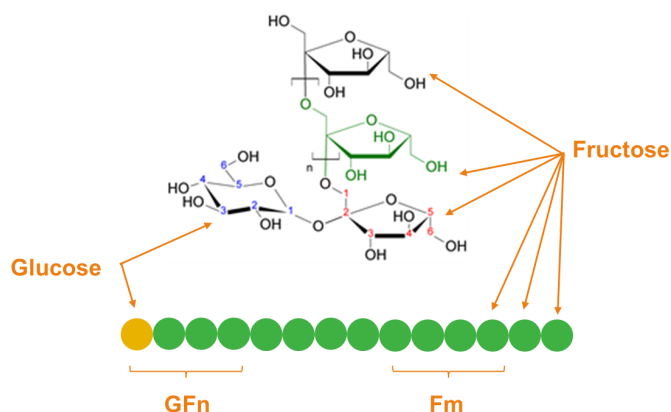
Different AOAC analytical methods are described for fructan analysis in food as well, f.i. AOAC 997.08, 999.03 and 2016.14. The methods have different application areas. The different underlying principles of analysis are the reason that there is not one 'golden standard' method yet available. It is thus necessary to always choose the method that is best suitable for your product. At the end of this brochure you will find a decision tree that will help guide you to choose the correct test.

AOAC methods vs GB 5009.255-2016

The AOAC methods differ from the GB 5009.255, which can lead to differences in results. Although 3 methods are based on the AOAC 999.03, the AOAC 997.08 is rather different because any interference caused by free sugars and starch/maltodextrin is not handled.

Advantage: GB method is based on AOAC 999.03 but with modifications improving the underestimations due to the borohydride step: in the assay the glucose end group of GF_n type fructans and the fructose end group of F_m type fructans are not measured. Corrections for this are made by multiplying the measured content with a factor n.

Disadvantage: In order to know the factor it is essential that the average chain length, DP, of the fructan used is known. The AOAC 2016.14 does not need information on the fructan present in the product.

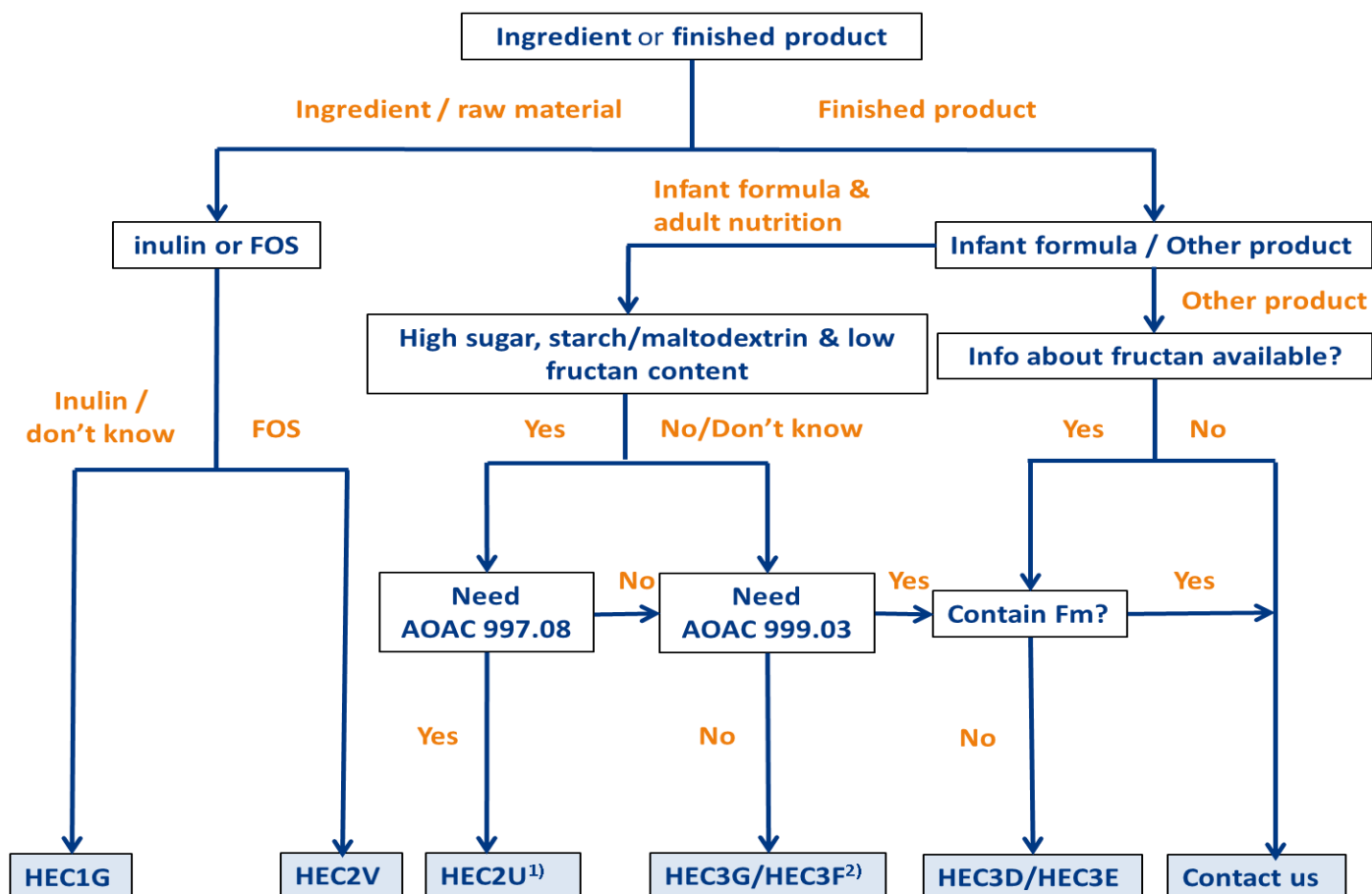


Fructans

Inulin & polyfructose molecules consist of linear β(2→1) linked fructose blocks and may contain a starting, non-reducing, glucose moiety. In native inulins (e.g. chicory) the number of fructose units can be over 60. Inulin consists of a broad range of molecules (both GF_n- and F_m-type) with a number of fructose units (ca. 2-50). GF_n are non-reducing, while F_m molecules have a reducing fructose moiety.

FOS has a low molecular mass with a degree of polymerization, DP, up to 10. There are two FOS types: Materials prepared by hydrolysis of inulin (mixtures of primarily oligofructose (F_m) and small inulin (GF_n) molecules) or by enzymatic elongation of sucrose (primarily containing GF_n-type of FOS with n = 2-5).

Decision tree to choose the most suitable fructan test



- 1) Suitable for inulin or hydrolyzed inulin with avg. DP=10 and ratio fructose/glucose 9:1. Not suitable for FOS such as Actilight, inulin with DP>10 or samples with very high sucrose concentrations.
- 2) The test is conform AOAC 2016.14. For matrices other than infant formula and adult nutrition, please contact us.

Our tests at a glance

Test code	Analytical method
HEC1G / HEC2V / HEC2U	In house method based on AOAC 997.08
HEC3E (liquid samples) HEC3D (solid samples)	AOAC 999.03 (equivalent & accredited)
HEC3G HEC3F (ready for consumption)	AOAC 2016.14 (conform)
HEC3I (FOS, av. DP=4), HEC3J (Inulin, av. DP=10), HEC3K (polyfructose, av. DP=23).	GB 5009.255-2016 (conform)
HEC30	Fingerprint (qualitative)
HEC0R (quant. FOS DP2-DP7)	in house method

Contact us

Websites: www.carbohydratetesting.com & www.eurofinsfoodtesting.nl/en

Email: carbohydrates@eurofins.com