



DECEMBER 2012

**GUIDANCE DOCUMENT FOR COMPETENT AUTHORITIES FOR
THE CONTROL OF COMPLIANCE WITH EU LEGISLATION ON:**

**Council Directive 90/496/EEC of 24 September 1990 on nutrition
labelling of foodstuffs**

and

**Regulation (EU) No 1169/2011 of the European Parliament and of the
Council of 25 October 2011 on the provision of food information to
consumers, amending Regulations (EC) No 1924/2006 and (EC)
No 1925/2006 of the European Parliament and of the Council, and
repealing Commission Directive 87/250/EEC, Council Directive
90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC
of the European Parliament and of the Council, Commission Directives
2002/67/EC and 2008/5/EC and Commission Regulation (EC)
No 608/2004**

**WITH REGARD TO METHODS OF ANALYSIS FOR
DETERMINATION OF THE FIBRE CONTENT DECLARED ON
A LABEL**

IMPORTANT DISCLAIMER

**"This Document has no formal legal status and, in the event of a dispute, ultimate
responsibility for the interpretation of the law lies with the Court of Justice"**

Note

**This document is an evolving document and will be updated to take account of the experience
of the competent authorities or of information provided**

1. INTRODUCTION

1.1 Scope of this guidance

This document has been prepared to provide guidance to Member States' control authorities and food business operators on the methods of analysis for determination of the fibre content declared on a label with respect to the nutrition labelling or declaration.

1.2 Definition of fibre

The term 'fibre' was defined by Commission Directive 2008/100/EC of 28 October 2008¹ amending Council Directive 90/496/EEC² on nutrition labelling for foodstuffs as regards recommended daily allowances, energy conversion factors and definitions as:

'fibre' means carbohydrate polymers with three or more monomeric units, which are neither digested nor absorbed in the human small intestine and belong to the following categories:

- edible carbohydrate polymers naturally occurring in the food as consumed;
- edible carbohydrate polymers which have been obtained from food raw material by physical, enzymatic or chemical means and which have a beneficial physiological effect demonstrated by generally accepted scientific evidence;
- edible synthetic carbohydrate polymers which have a beneficial physiological effect demonstrated by generally accepted scientific evidence."

This definition has been included in Annex 1 of Regulation 1169/2011/EU³ on the provision of food information to consumers. Regulation 1169/2011/EU will apply from 13 December 2014 and at the same time Directive 90/496/EEC will be repealed.

Furthermore, Commission Directive 2008/100/EC specifies additional information in the following recitals concerning the definition of fibre:

"(5) Fibre has been traditionally consumed as plant material and has one or more beneficial physiological effects such as: decrease intestinal transit time, increase stool bulk, is fermentable by colonic microflora, reduce blood total cholesterol, reduce blood LDL cholesterol levels, reduce post-prandial blood glucose, or reduce blood insulin levels. Recent scientific evidence has shown that similar beneficial physiological effects may be obtained from other carbohydrate polymers that are not digestible and not naturally occurring in the food as consumed. Therefore it is appropriate that the definition of fibre should include carbohydrate polymers with one or more beneficial physiological effects.

(6) The carbohydrate polymers of plant origin that meet the definition of fibre may be closely associated in the plant with lignin or other non-carbohydrate components such as phenolic compounds, waxes, saponins, phytates, cutin, phytosterols. These substances when closely associated with carbohydrate polymers of plant origin and extracted with the carbohydrate polymers for analysis of fibre may be considered as fibre. However, when separated from the carbohydrate polymers and added to a food these substances should not be considered as fibre."

2. METHODS OF ANALYSIS FOR FIBRE

¹ OJ L 285, 29.10.2008, p. 9–12

² OJ L 276, 6.10.1990, p. 40–44

³ OJ L 304, 22.11.2011, p. 18-63

The definition of fibre gives a chemical definition of materials that can be considered as fibre (carbohydrate polymers with three or more monomeric units) and the physiological criteria of being neither digested nor absorbed in the human small intestine. A number of substances fall within this definition. Such edible substances that are naturally occurring in the food as consumed are considered as being fibre. Edible substances meeting the chemical and physiological criteria of the definition which have been obtained from food raw material by physical, enzymatic or chemical means or which are produced synthetically and that have a beneficial physiological effect demonstrated by generally accepted scientific evidence are considered as being fibre as well.

In the scientific literature, a number of suitable analytical methods which can be used to determine fibre substances in food have been described. The analysed content would serve as the basis for nutrition labelling of fibre. The adopted definition of fibre encompasses a large and heterogeneous group of substances for which there is currently no single method of analysis available, therefore, a number of methods to determine the fibre content of foods have been identified.

The Codex Alimentarius Commission, at its 34th session in 2011, adopted a list of methods of analysis of dietary fibre⁴. This list serves as a basis for the methods included in this guidance document.

Table 1 summarises the methods of analysis for fibre. Section 1 of the table includes 2 general methods that measure both the higher (monomeric units >9) and the lower molecular weight fraction (monomeric units ≤9) of fibre and are therefore closer to the definition of fibre than the general methods listed in section 2 of the table that do not include the lower molecular weight fraction (monomeric units ≤9) of fibre. Therefore, if methods of analysis of section 2 of the table are used and the measured value is lower than the declared value, taking into account analytical variation and the tolerances around fibre determination, the possibility that the underestimation of the amount due to a method that does not cover monomeric units between 3 and 9, or higher molecular weight soluble fibres that do not precipitate in alcohol, should be considered.

Section 3 of the table lists methods of analysis for individual specific components. If general methods are combined with methods that measure individual specific components, some fibre components may be measured in more than one method, and this double accounting should when possible be correlated when combining the analytical results.

Section 4 lists other methods that have not been subjected to interlaboratory evaluation under Association of Official Analytical Chemists (AOAC) international guidelines.

Member States are responsible for ensuring conformity with the definition of fibre as a whole and in particular concerning components not naturally occurring in the food as consumed.

⁴ REP11/CAC, endorsement of methods of analysis provisions in Codex Standards as listed in REP11/MAS: Report of the 32 session of the Codex Committee on Methods of Analysis and Sampling, Appendix III, C. Committee on Nutrition and Foods for Special Dietary Uses, Method of Analysis of Dietary Fibre

Table 1: Methods of analysis for fibre

STANDARD	PROVISIONS	METHOD	PRINCIPLE	TYPE ⁵
Section1: General methods that measure both the higher (monomeric units >9) and the lower molecular weight fraction (monomeric units ≤9)				
All foods ⁶	Method applicable for determining the content of fibres of higher and lower molecular weight, in food where resistant starches are not present	AOAC 2001.03 AACC Intl 32-41.01 (2002)	Enzymatic gravimetry and Liquid chromatography	Type I
All foods ⁶	Method applicable for determining the content of fibres of higher and lower molecular weight. The method is applicable in food that may, or may not, contain resistant starches.	AOAC 2009.01 AACC Intl 32-45.01 (2009)	Enzymatic gravimetry High Pressure Liquid chromatography	Type I
Section 2: General methods that do not measure the lower molecular weight fraction (i.e. monomeric units ≤9)				

⁵ Type of methods as referred to in Codex Alimentarius Commission: Procedural Manual, 20th edition, page 63.
ftp://ftp.fao.org/codex/Publications/ProcManuals/Manual_20e.pdf

⁶ Users should consult the description of each method for the food matrices that were the subject of interlaboratory study in the Official methods of Analysis of AOAC International

All foods ⁶	Method applicable for determining fibres that do not include the lower molecular weight fraction ⁷	AOAC 985.29 AACC Intl 32-05.01 (1991,1999)	Enzymatic gravimetric	Type I
All foods ⁶	Method applicable for determining fibres that do not include the lower molecular weight fraction and also includes determination for soluble and insoluble fibres ⁷	AOAC 991.43 AACC Intl 32-07.01 (1999,1991) NMKL 129, 2003	Enzymatic gravimetric	Type I
All foods ⁶	Method applicable for determining fibres that do not include the lower molecular weight fraction in foods and food products containing more than 10% fibre and less than 2% starch (e.g. fruits) ⁷	AOAC 993.21	Gravimetry	Type I
All foods ⁶	Method applicable for determining fibres that do not include the lower molecular weight fraction. Provides sugar residue composition of fibre polysaccharides, as well as content of Klason lignin ⁷	AOAC 994.13 AACC Intl 32-25.01 (1999,1994) NMKL 162, 1998	Enzymatic gas chromatography colourimetry gravimetry	Type I
All foods ⁶	Insoluble fibres in food and food products ⁷	AOAC 991.42 (specific for insoluble fibre) AACC Intl 32-20.01 (1999,1982) NMKL	Enzymatic gravimetric	Type I
All foods ⁶	Soluble fibres in food and food products ⁷	AOAC 993.19 (specific for soluble fibre)	Enzymatic gravimetric	Type I
Section 3: Methods that measure individual specific components (monomeric units: the whole range for each type of components is covered)				
All foods ⁶	(1→3)(1→4)Beta-D-Glucans	AOAC 995.16	Enzymatic	Type

⁷ Quantitation lost for inulin, resistant starch, polydextrose and resistant maltodextrins. Refer to specific methods.

		AACC Intl 32-23.01 (1999,1995)		II
All foods ⁶	Fructans (oligofructoses, inulin, hydrolysed inulin, polyfructoses, fructooligosaccharides) (applicable to added fructans)	AOAC 997.08 AACC Intl 32-31.01 (2001)	Enzymatic & HPAEC-PAD	Type II
All foods ⁶	Fructans (oligofructoses, inulin, hydrolysed inulin, polyfructoses, fructooligosaccharides) (not applicable to highly depolymerised fructans)	AOAC 999.03 AACC Intl 32-32.01 (2001)	Enzymatic & colourimetric	Type III
All foods ⁶	Polydextrose	AOAC 2000.11 AACC Intl 32-28.01 (2001)	HPAEC-PAD	Type II
All foods ⁶	Trans-galacto-oligo saccharides	AOAC 2001.02 AACC Intl 32-33.01 (2001)	HPAEC-PAD	Type II
All foods ⁶	Resistant starch (recommended for RS3)	AOAC 2002.02 AACC Intl 32-40.01 (2002)	Enzymatic	Type II
Section 4: Other methods that have not been subjected to interlaboratory evaluation				
Yeast cell wall	Insoluble glucans and mannans of yeast cell wall (for yeast cell wall only)	Eurasyp (European association for speciality yeast product) – LM Bonanno. Biospringer – 2004 – online version: http://www.eurasyp.org/public.technique.home.screen .	Chemical & HPEAC-PAD	Type IV
All foods	Fructo-oligosaccharides (monomeric units<5)	Ouarné et al. 1999 in Complex Carbohydrates in Foods. Edited by S. Sungsoo, L. Prosky & M. Dreher. Marcel Dekker Inc, New York	HPAEC-PAD	Type IV
All foods	Non-starch polysaccharides (NSP) ⁸	Englyst H.N, Quigley M.E., Hudson G. (1994) Determination of dietary fibre as non-starch polysaccharides with gas-liquid chromatographic high performance liquid chromatographic or spectrophotometric measurement of constituent sugars – Analyst 119, 1497-1509	Gas-Liquid Chromatography	Type IV

⁸ Quantitation lost for resistant starch. Refer to specific methods.

List of Abbreviations:

AACC Intl.	American Association of Cereal Chemists International (http://www.aaccnet.org/about/)
AOAC:	Association of Analytical Communities (http://www.aoac.org/)
HPAEC-PAD:	High Performance Anion Exchange Chromatography with Pulsed Amperometric Detection
RS3:	Resistant starch that is formed when starch-containing foods are cooked and cooled