



Dietary Fiber & Starch Analysis



Contents

This brochure features highlights from our range of analytical products.
For the full catalogue, visit our website: www.megazyme.com

Megazyme: Providing Analytical Solutions since 1988

Research is at the core of Megazyme's product development. Continual innovation has allowed us to develop novel methodology and to introduce advances to accepted, industry-standard methods of analysis. Backed by best-in-class customer support, Megazyme products offer:

- novel assays with excellent selectivity for the analyte in question
- improved enzyme stability (resulting in a longer 'shelf-life')
- unrivalled enzyme purity
- reduced reaction times
- extended cofactor stability

Megazyme test kits - developed and manufactured in-house - have attracted worldwide acclaim for their novel methodologies and for the exceptional purity of the enzymes employed.

Dietary Fiber

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Dietary Fiber





Methods for the Measurement of Total Dietary Fiber

Dietary fiber can generally be described as that portion of dietary carbohydrates that is not digested in the human small intestine. The most suitable analytical method to use will vary depending on which components are already known to be present within the sample.

- HMWDF includes natural fibers such as cellulose, β -glucan, galactomannan and arabinoxylan
- Resistant Starch comes from a variety of sources (see table below for types of Resistant Starch)
- NDO includes inulin/FOS, GOS, polydextrose, resistant maltodextrin (such as Fibersol 2)

Why does dietary fiber matter?

Food manufacturers invest heavily into means of maximising the dietary fiber content of their products. However, resistant starch - a key dietary fiber component - is not measured accurately by the traditional methods used in dietary fiber analysis.

Since the release of the internationally-recognised Codex definition of dietary fiber, Megazyme has developed two methods which address this issue. Our most advanced method - the Rapid Integrated Total Dietary Fiber (RINTDF) method - accurately measures all of the components of Total Dietary Fiber (as defined by Codex).

Following interlaboratory evaluation, the RINTDF method has been adopted as AOAC Method 2017.16 and ICC Standard No. 185. The RINTDF method now stands as the new gold standard for comprehensive, accurate measurement of total dietary fiber in foods.

Components of Total Dietary Fiber

Comprehensive Total Dietary Fiber					
High Molecular Weight DF			Low Molecular Weight DF		
"Classical" Fibers		Resistant Starch		Non-digestible Oligosaccharides (NDOs)	
<ul style="list-style-type: none"> • Cellulose • β-Glucan • Galactomannan • Arabinoxylan • Pectin • Arabinogalactan 		<ul style="list-style-type: none"> • RS₁ (physically inaccessible starch) • RS₂ (resistant starch granules) • RS₃ (retrograded starch) • RS₄ (phosphate-crosslinked starch) 		<ul style="list-style-type: none"> • Fructooligosaccharides (FOS) • Galactooligosaccharides (GOS) • Polydextrose • Resistant Maltodextrins (RMD) • Xylooligosaccharides 	
Which methods accurately measure this component?					
RINTDF	✓	RINTDF	✓	RINTDF	✓
Prosky/Lee	✓	Prosky/Lee	✗	Prosky/Lee	✗
Matsutani	✓	Matsutani	✗	Matsutani	✓

Choosing the Right Total Dietary Fiber Method

Sample Details	Information Required	AOAC Method	Megazyme Product Code
A. Unknown	TDF (HMWDF and SDFS)	2017.16	K-RINTDF
	IDF, SDFP and SDFS	Modified 2017.16	K-RINTDF
B. Devoid of RS	HMWDF	985.29 (Prosky)	K-TDFR / K-RINTDF
	IDF and SDFP	991.43 (Lee)	K-TDFR / K-RINTDF
	HMWDF and SDFS	2001.03 (Matsutani)	K-TDFR / K-RINTDF
	IDF, SDFP and SDFS	991.43 plus 2001.03 modification	K-TDFR / K-RINTDF
C. Devoid of NDO and RS	HMWDF	985.29 (Prosky)	K-TDFR / K-RINTDF
	IDF and SDFP	991.43 (Lee)	K-TDFR / K-RINTDF

Key to Acronyms:

RS	resistant starch
NDO	non-digestible oligosaccharides (or SDFS)
TDF	total dietary fiber
IDF	insoluble dietary fiber
SDFP	soluble dietary fiber that precipitates in the presence of 78% aqueous ethanol
SDFS	soluble dietary fiber which remains soluble in the presence of 78% aqueous ethanol
HMWDF	higher molecular weight dietary fiber which includes IDF and SDFP
LMWDF	lower molecular weight dietary fiber

Notes:

AOAC Method 2017.16 supersedes AOAC Method 2009.01.

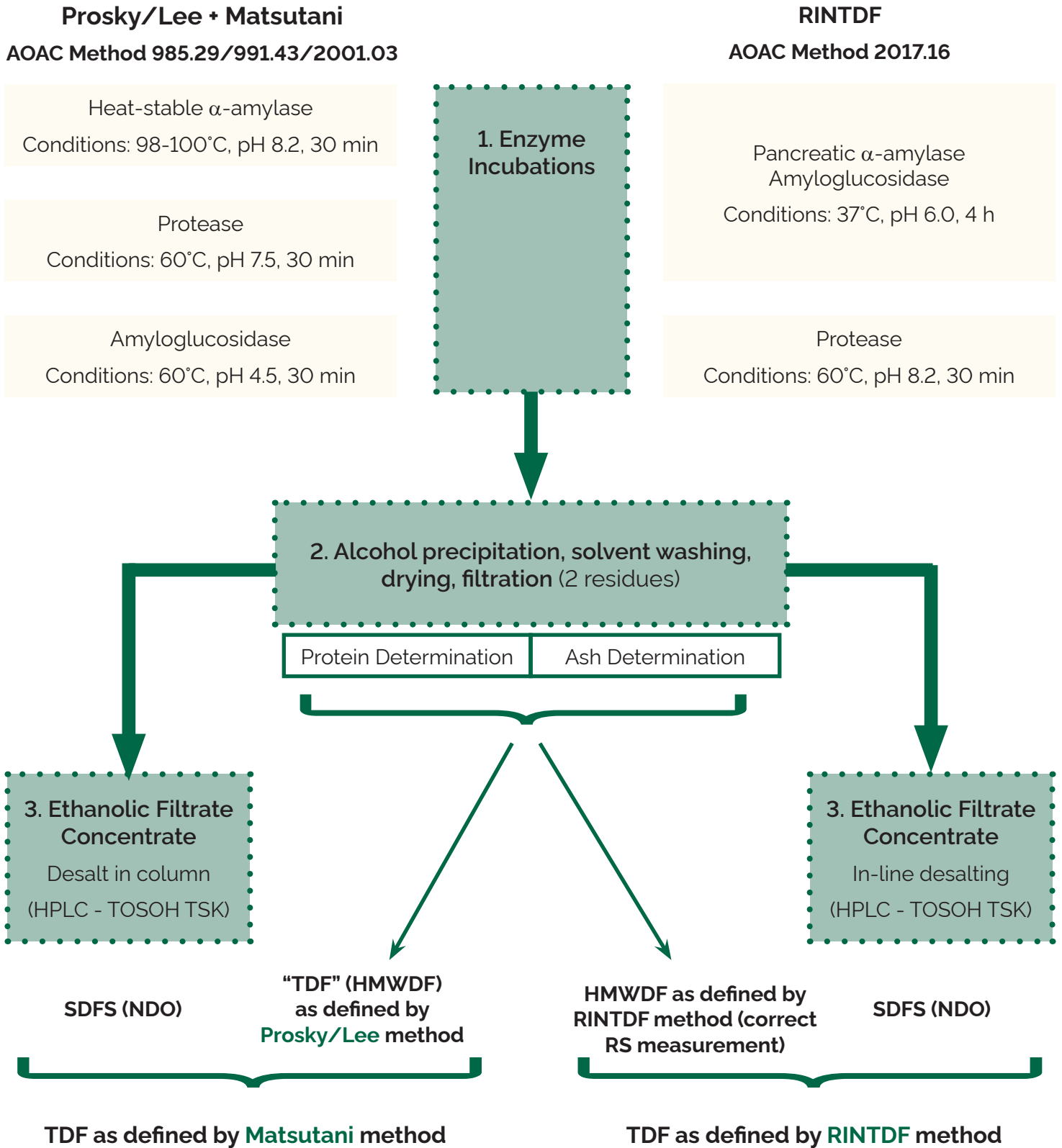
AOAC Method 2017.16 (modified to separately measure IDF and SDFP) supersedes AOAC Method 2011.25.



Assay procedure for the Rapid Integrated Total Dietary Fiber method:

comparison of RINTDF with traditional methods

Dietary Fiber



RINTDF: The Rapid Integrated Total Dietary Fiber Method

AOAC Method 2017.16

Product Code	Product Name	Pack Size
Assay Kits		
K-RINTDF	Rapid Integrated Total Dietary Fiber Assay Kit	100 assays
Enzymes		
E-PANAA	α -Amylase (Porcine pancreatic)	3 g 9 g
E-AMGDFNG	Amyloglucosidase (<i>A. niger</i>) Glycerol Free	20 mL 50 mL
E-AMGDFPD	Amyloglucosidase (<i>A. niger</i>) Powder	4 g
E-BSPRPD	Protease (Subtilisin A from <i>B. licheniformis</i>) Powder	1 g



Dietary Fiber

What's different about Megazyme's new RINTDF method?

The Rapid Integrated Total Dietary Fiber Method (RINTDF) (AOAC Method 2017.16) is compared side-by-side with the traditional Prosky/Lee methods (AOAC Methods 985.29/991.43) in the figure opposite.

The Prosky method measures only high molecular weight dietary fiber (HMWDF), consisting of:

- insoluble dietary fiber (IDF)
- soluble dietary fiber that precipitates in the presence of 78% v/v ethanol (SDFP)
- resistant starch (RS) which is underestimated

In the Matsutani modification (AOAC Method 2001.03) of the Prosky method, **non-digestible oligosaccharides (NDO)** are also measured. NDO is soluble dietary fiber which remains soluble in the presence of 78% v/v ethanol (SDFS). Addition of the HMWDF and SDFS fractions gives the **total dietary fiber**.

Using the Prosky procedure, some of the resistant starch (RS₂ and RS₃) is hydrolysed under the extreme conditions required in the α -amylase incubation step. This leads to underestimation of some RS components, while RS₄ (chemically crosslinked starch) is overestimated.

The RINTDF method accurately measures all dietary fiber components, including resistant starch and non-digestible oligosaccharides.



Total Dietary Fiber

Discover Megazyme's bestselling range for total dietary fiber measurement

Megazyme are experts in dietary fiber analysis, having developed two revolutionary AOAC-recognised methods for its measurement. Our dietary fiber range includes products suitable for use with all mainstream methods of dietary fiber analysis, recognising the 2009 Codex definition of total dietary fiber and methods designed for use with earlier definitions.

AOAC Methods 2011.25/2009.01

Product Code	Product Name	Pack Size
Assay Kits		
K-INTDF	Integrated Total Dietary Fiber Assay Kit	100 assays
Enzymes		
E-PANAA	α -Amylase (Porcine pancreatic)	3 g 9 g
E-AMGDF	Amyloglucosidase (<i>A. niger</i>)	10 mL 40 mL 100 mL
E-BSPRT	Protease (Subtilisin A from <i>B. licheniformis</i>)	10 mL 40 mL 100 mL



AOAC Methods 991.43/985.29

Our ultra-pure enzymes for use with this method are also available in formulations specifically designed for use with ANKOM auto-analysers. See our website (www.megazyme.com) for full details.

Product Code	Product Name	Pack Size
Assay Kits		
K-TDFR-100A K-TDFR-200A	Total Dietary Fiber Assay Kit	100 assays 200 assays
Enzymes		
E-BLAAM	α -Amylase (<i>B. licheniformis</i>)	10 mL 40 mL 100 mL
E-AMGDF	Amyloglucosidase (<i>A. niger</i>)	10 mL 40 mL 100 mL
E-BSPRT	Protease (Subtilisin A from <i>B. licheniformis</i>)	10 mL 40 mL 100 mL



Available Carbohydrates

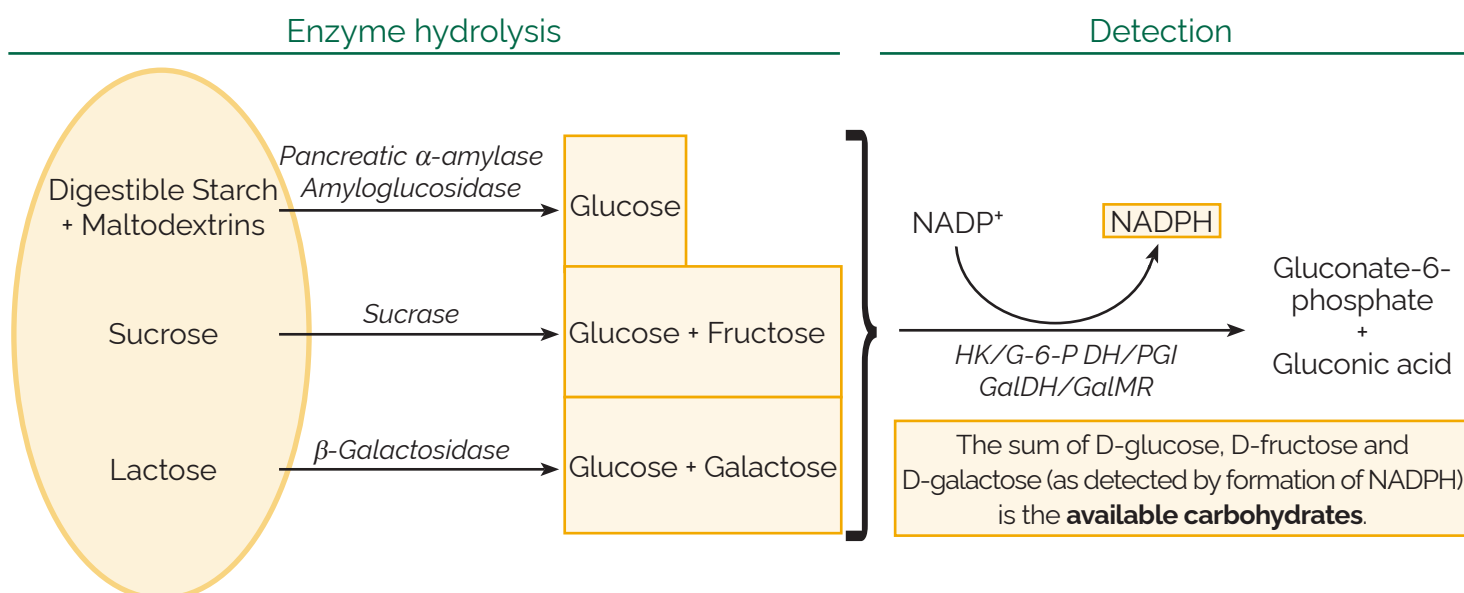
Available carbohydrates is one of the key parameters required in nutritional tables. The UN's Food and Agriculture Organisation (FAO) defines **available carbohydrates** as "that fraction of carbohydrate that can be digested by human enzymes, is absorbed and enters into intermediary metabolism."

Available Carbohydrates	Total Dietary Fiber	
Digestible Starch	Total Starch	Resistant Starch
Maltodextrins Sucrose D-Fructose D-Glucose Lactose	Non-Digestible Oligosaccharides 'Classical' Fibers	

In order to gain a complete picture of a foodstuff's carbohydrate content, laboratories should measure and state the available carbohydrates alongside the total dietary fiber value for the sample. The available carbohydrates are defined as those that are digested and absorbed by the human small intestine and which are glucogenic.

Methodology

Our newest kit, the Available Carbohydrates Assay Kit (**K-AVCHO**), simulates *in vivo* digestion in the small intestine with its physiologically-relevant enzyme hydrolysis protocol. The figure below shows how this assay kit works.





Available Carbohydrates

Products

Megazyme offers two approaches to the measurement of available carbohydrates alongside dietary fiber, reflecting the pre- and post-2009 definitions of TDF.

- The **Available Carbohydrates Assay Kit (K-AVCHO)** is a perfect complement to the cutting-edge RINTDF method (AOAC 2017.16) available from Megazyme. Both methods use an enzyme incubation step that is physiologically relevant (37°C, 4 h), making the kits ideal for simultaneous analysis.
- Laboratories that continue to work with pre-2009 definitions are supported by our **Available Carbohydrates/Dietary Fiber Assay Kit (K-ACHDF)**, which measures TDF using the Prosky/Lee methods (AOAC 985.29/991.43) in addition to measuring available carbohydrates.



Product Code	Product Name	Pack Size
Assay Kits		
K-AVCHO	Available Carbohydrates Assay Kit	100 assays
K-ACHDF	Available Carbohydrates/Dietary Fiber Assay Kit	100 assays of each

Resistant Starch

'Resistant starch' is any starch that is not digested in the small intestine but passes to the large bowel.

Megazyme's new **Resistant Starch Assay Kit (Rapid) (K-RAPRS)** represents a further advance on Megazyme's existing resistant starch method (**K-RSTAR**; AOAC 2002.02, AACC 32-40.01, Codex Type II), which has been widely adopted as a reference method since its launch.

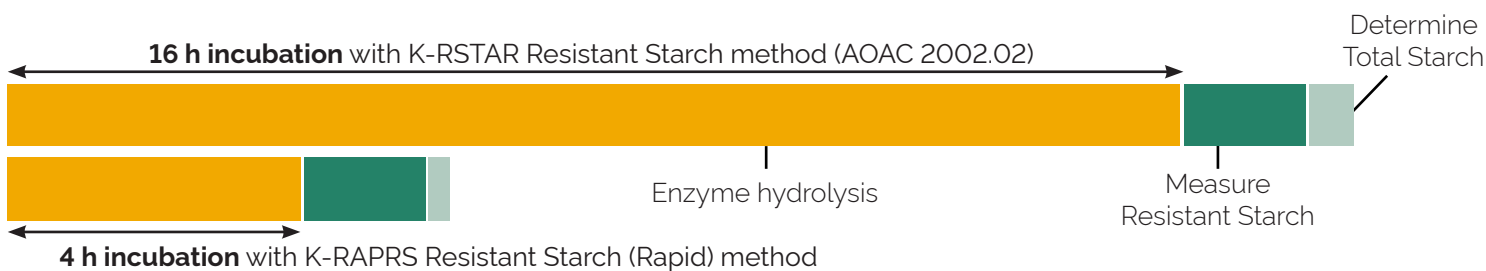


Dietary Fiber

Methodology

Based on the groundbreaking RINTDF method (AOAC 2017.16) for Total Dietary Fiber, Megazyme's **Resistant Starch Assay Kit (Rapid) (K-RAPRS)** introduces a new procedure that generates the most accurate and physiologically-relevant *in vitro* results available for resistant starch.

Recent studies on the hydrolysis of "newer" resistant starch materials - such as phosphate crosslinked starch (RS₄) - indicate that to obtain meaningful physiologically relevant values for RS, the time of incubation with PAA/AMG should be in line with the time of residence of food in the small intestine. This improved rapid method therefore **reduces the length of the enzyme incubation step from 16 h to just 4 h**, allowing laboratories to obtain results that more accurately simulate *in vivo* studies and to reduce the overall assay time.



Results obtained using the new Resistant Starch (Rapid) procedure correlate closely with those of AOAC method 2002.02. For a number of samples, results from the Rapid method indicate that there may be significant under-reporting of Resistant Starch under the established method.

Products

Product Code	Product Name	Pack Size
Assay Kits		
K-RAPRS	Resistant Starch Assay Kit (Rapid) NEW	100 assays
K-RSTAR	Resistant Starch Assay Kit	100 assays
K-RSTCL	Resistant Starch Control Flours	5 controls



Resistant Starch

Results Obtained from Resistant Starch (Rapid) vs AOAC Method 2002.02

Results obtained using the new Resistant Starch (Rapid) procedure correlate closely with those of AOAC method 2002.02. For a number of samples, results from the Rapid method indicate that there may be significant under-reporting of Resistant Starch under the established method as demonstrated in the table below.

Sample	Resistant starch (average of duplicate analyses) % w/w 'as is' basis	
	AOAC Method 2002.02	Resistant Starch (Rapid) Method
Native potato starch	60.9	63.9
Fibersym (RS₄)	29.7	60.2
Hylon VII®	41.5	52.3
Actistar®	46.3	49.3
High Amylose Maize starch	37.9	48.5
Novelose 240®	40.4	44.6
Potato Amylose	35.6	35.3
Semi green banana	13.8	11.0
Tinned garden peas	8.2	7.7
Tinned chickpeas	5.0	5.1
Tinned kidney beans	4.3	4.3
Kidney beans	3.5	4.0
Heinz® baked beans (FD)	3.6	3.8
Tinned butter beans	3.1	3.3
UB Ready Extra White Rice	3.2	3.2
UB Express boiled rice	2.4	2.4
Corn Flakes	2.2	2.1
Ryvita® dark rye crackers	1.7	1.9
Regular maize starch	0.9	1.8
Brennan's wholemeal bread	0.9	0.8
Wheat Starch	0.4	0.5

Source: K-RAPRS Data Booklet

β-Glucan

Megazyme's tried and trusted β-Glucan Assay Kit (**K-BGLU**) is suitable for the measurement of β-glucan in cereal grains, milling fractions, wort, beer and food products.

The β-Glucan Assay Kit (Mixed Linkage) is widely recognised internationally by:

- AOAC Method 995.16
- AACC Method 32-23.01
- ICC Standard No. 166
- Codex Type II
- RACI Standard Method
- European Brewing Confederation methods 3.10.1, 4.16.1 and 8.13.1.

Product Code	Product Name	Pack Size
Assay Kits		
K-BGLU	β-Glucan Assay Kit (Mixed Linkage)	100 assays





Polydextrose

Polydextrose is a synthetic polymer of glucose that is widely used as a source of lower molecular weight dietary fiber (LMWDF). As a non-digestible oligosaccharide (NDO), it is not measured by the Prosky/Lee Method (985.29/991.43) but is accounted for by the RINTDF method for total dietary fiber (AOAC 2017.16).

There is also a recognised method for analysts who wish to measure polydextrose in isolation. AOAC Method 2000.11 recommends the following Megazyme enzymes.



Product Code	Product Name	Pack Size
Enzymes		
E-AMGDF	Amyloglucosidase (<i>A. niger</i>)	10 mL 40 mL 100 mL
E-FRMXPD	Fructanase Mixture (Purified-Powder)	20,000 U
E-ISAMY	Isoamylase (Glycogen 6-gluconohydrolase)	600 U



Fructans and FOS

Inulin, Levan and Branched (Agave)

Fructans are of increasing interest to manufacturers in areas as diverse as infant formula and animal feed. Inulin and branched fructans stimulate the growth and activity of beneficial bacteria in the gut. The third type of fructan, levan, is an anti-nutrient that causes bloating in animals.



Methodology

The Megazyme fructan methods employ ultra high-purity enzymes produced in-house. The methods are completely specific for all fructans including levans. The Megazyme Fructan Assay Kit (**K-FRUC**) was developed specifically for AOAC Methods 999.03 and 2018.17, but the enzyme components also form the basis of AOAC Methods 997.08 and 2016.06.

A modified version of AOAC 999.03 - employing the hexokinase/phosphoglucose isomerase/glucose 6-phosphate dehydrogenase system for the enzymatic detection of fructose and glucose - is also available (**K-FRUCHK**).

Megazyme offers an extremely pure fructanase mixture containing recombinant *exo*- and *endo*-inulinases plus *endo*-levanase. Our enzyme range is suitable for use with the following analytical methods used in fructan determination:

- AOAC Method 997.08
- AOAC Method 2016.06
- Chinese Standard: GB 5009.255-2016

Products

Product Code	Product Name	Pack Size
Assay Kits		
K-FRUC	Fructan Assay Kit Updated format (2018): accurately measures inulin, levan and branched fructans	100 assays
K-FRUCHK	Fructan HK Assay Kit	50 assays
Enzymes		
E-FRMXLQ	Fructanase Mixture (Purified-Liquid - 2000 U/mL)	20,000 U
E-FRMXPD	Fructanase Mixture (Purified-Powder)	20,000 U
E-SUCR	Sucrase (from yeast)	300 U
E-AMGFR	Amyloglucosidase (<i>A. niger</i>) - 100 mg Amyloglucosidase (<i>A. niger</i>) - 500 mg	3,500 U 17,500 U

Starch



Total Starch

As the main source of carbohydrate in the human diet, starch is an analyte of huge importance to the food industry.

Using enzymatic methods, it is possible to determine the total starch ([K-TSHK](#), [K-TSTA](#)) content in any sample.

Methodology

The total starch method developed by Megazyme has been widely used and validated over the past two decades:

- AOAC Method 996.11
- AACC Method 76-13.01
- ICC Standard No. 168
- RACI Standard Method



More recently, introduction of a thermostable α -amylase (which is stable at pH 5) has allowed further simplification of this method. The method has also been updated to allow for convenient use with samples of animal feed and pet food.

Products

Product Code	Product Name	Pack Size
Assay Kits		
K-TSTA-50A	Total Starch (AMG/ α -Amylase/GOPOD Method) Assay Kit UPDATED	50 assays
K-TSTA-100A	Updated rapid format: suitable for use with animal feed and pet foods.	100 assays
K-TSHK	Total Starch (AMG/ α -Amylase/Hexokinase Method) Assay Kit	100 assays

Reference:

Measurement of Starch: Critical evaluation of current methodology. McCleary, B. V., Charmier, L. M. J. & McKie, V. A. (2019). *Starch-Stärke*, 71(1-2), 1800146.

Link to article: <https://onlinelibrary.wiley.com/doi/full/10.1002/star.201800146>



Digestible Starch and Resistant Starch

The **Digestible and Resistant Starch Assay Kit (K-DSTRS)** allows food laboratories to measure the digestible and resistant components of starch with a single kit.

Rapidly digested starch (RDS)

Starch hydrolysed after **20 min incubation** under physiological conditions

Digestible Starch

"Digestible" forms of dietary starch can be hydrolysed and absorbed in the small intestine at the same rate as simple sugars. The glycemic index (GI) of a food is influenced by the relative presence of **rapidly-digested starch** and **slowly-digested starch**.

Slowly digested starch (SDS)

Starch hydrolysed **between 20 min and 120 min (2 h) incubation** under physiological conditions

This assay kit (K-DSTRS) employs a more physiologically-relevant 4 h incubation step with pancreatic α -amylase/amyloglucosidase than existing methods such as AOAC 2002.02 (16 h). This reflects the transit time in the human small intestine.

Total digestible starch (TDS)

Total starch hydrolysed within **240 min (4 h) incubation** under physiological conditions

Resistant Starch

"Resistant" starch remains undigested even after 4 h (the typical residence time of food in the small intestine).

Resistant starch (RS)

Starch which is **not digested** within 240 min (4 h) incubation under physiological conditions

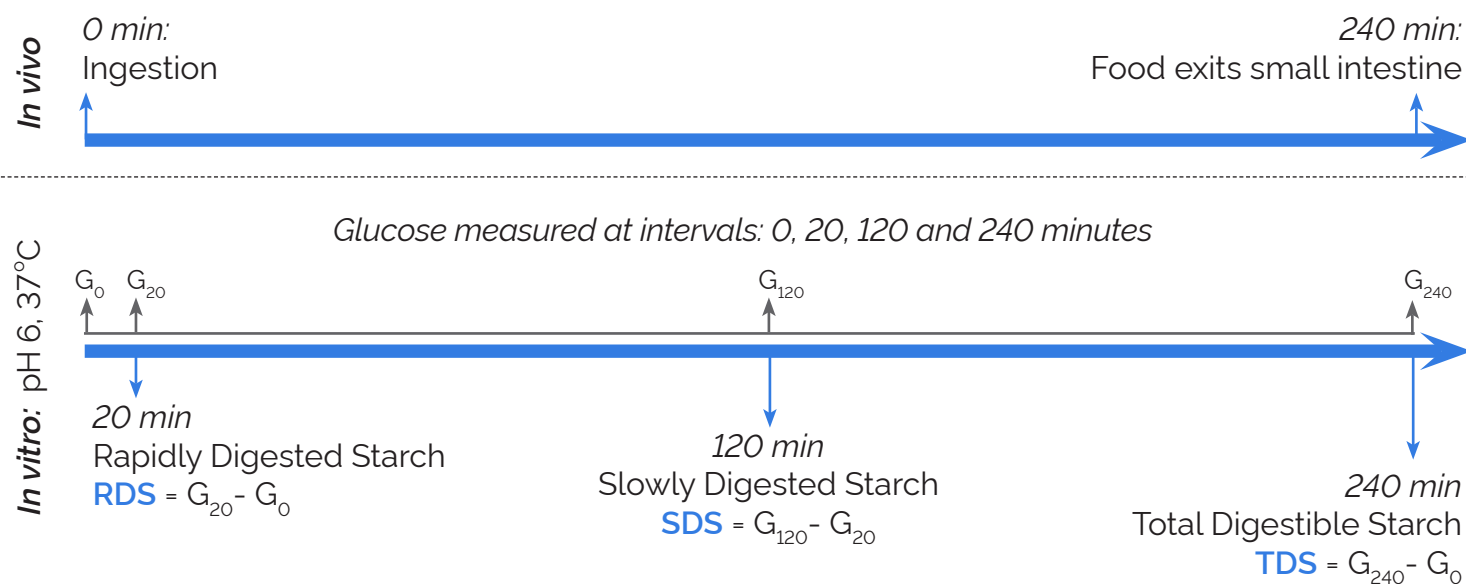
Since 2009, this digestion-resistant starch (RS) has been defined as dietary fiber by Codex Alimentarius. Consequently, **accurate measurement of RS** is imperative in accurately measuring **total dietary fiber (TDF)**.



Digestible Starch and Resistant Starch

Methodology

The Digestible and Resistant Starch Assay Kit (**K-DSTRS**) describes procedures for the measurement of RDS, SDS, TDS and RS, and is applicable to all samples. As in AOAC Method 2017.16 (Megazyme's **K-RINTDF**), pure starches or starch-containing samples are incubated with a mixture of purified pancreatic α -amylase and amyloglucosidase (PAA/AMG) in maleate buffer, under physiological conditions (at pH 6, 37°C).



The starch remaining after 240 min is washed to remove glucose and is then dissolved in sodium hydroxide, neutralised and fully hydrolysed with AMG to glucose, which is then measured to give the **RS** content. A separate procedure is employed for dissolution and hydrolysis of RS_4 .

Products

Product Code	Product Name	Pack Size
Assay Kits		
K-DSTRS	Digestible and Resistant Starch Assay Kit NEW	40 assays of each



Amylose/Amylopectin and Starch Damage

Amylose and Amylopectin

For manufacturers who rely on enzyme-mediated starch degradation for their production processes, accurate measurement of the amylose:amylopectin ratio is crucial to making informed process decisions.

Methodology

The ratio of amylose:amylopectin in a starch sample can be determined using the Amylose/Amylopectin (**K-AMYL**) assay kit. This kit is based on a Concanavalin A-mediated precipitation step.



Products

Product Code	Product Name	Pack Size
Assay Kits		
K-AMYL	Amylose/Amylopectin Assay Kit	100 assays

Starch Damage

The level of so-called 'starch damage' can be analysed enzymatically using the Starch Damage Assay Kit (**K-SDAM**). This parameter is of particular interest in the milling and baking industries.

Methodology

This kit uses a highly purified fungal α -amylase to break down damaged starch granules which displays almost no hydrolytic activity on undamaged granules. The method used in the Starch Damage Assay Kit (**K-SDAM**) is recognised as follows:

- ICC Standard No. 164
- AACC Method 76-31.01
- RACI Standard Method



Products

Product Code	Product Name	Pack Size
Assay Kits		
K-SDAM	Starch Damage Assay Kit	200 assays

α -Amylase Activity and α -Amylase/ β -Amylase Activity

α -Amylase Activity

Product Code	Product Name	Pack Size
Assay Kits		
K-CERA	Ceralpha Assay Kit (AOAC 2002.01) Kit for the measurement of α -Amylase. <i>Available separately:</i> α -Amylase Reagent (R-CAAR4) and Amylase HR Reagent (R-AMHR4)	100 assays
K-AMYLS	α -Amylase SD Assay Kit High sensitivity method based on AOAC 2002.01	160 assays
Enzyme Substrates		
T-AMZ-200T T-AMZ-1000T	Amylazyme Tablets Contains AZCL-Amylose for the assay of cereal and microbial α -amylase	200 tablets 1000 tablets



α -Amylase/ β -Amylase Activity

Product Code	Product Name	Pack Size
Assay Kits		
K-MALTA	Malt Amylase Assay Kit (AOAC 2002.01) Kit for the measurement of both α -Amylase and β -Amylase <i>Available separately:</i> α -Amylase Reagent (R-CAAR4) and β -Amylase Assay Reagent (R-BAMR3)	100 assays



β -Amylase Activity and Pullulanase/Limit Dextrinase Activity

β -Amylase Activity

Product Code	Product Name	Pack Size
Assay Kits		
K-BETA3	β -Amylase Assay Kit (Betamyl-3) <i>Available separately: β-Amylase Assay Reagent (Betamyl-3) (R-BAMR3).</i>	100 assays



Pullulanase/Limit-Dextrinase Activity

Product Code	Product Name	Pack Size
Assay Kits		
K-PullG6	Pullulanase/Limit-Dextrinase Assay Kit (PullG6 Method)	100 assays
Enzyme Substrates		
T-LDZ-200T	Limit-Dextrizyme Tablets	200 assays
T-LDZ-1000T	Contains AZCL-Pullulan for the assay of limit-dextrinase and pullulanase	1000 assays










In addition to assay kits and reagents, Megazyme also offers a world-class range of colourimetric substrates for the measurement of starch hydrolases, including our full range of novel and convenient tablet formulations.

To find out more, visit our website:

www.megazyme.com

AOAC Validation

Megazyme products can be used with a variety of AOAC validated methods - including methods developed in-house at Megazyme

AOAC Method	Method Name	Megazyme Products
2017.16 	Total Dietary Fiber in Foods	K-RINTDF: Rapid Integrated Total Dietary Fiber Assay Kit
2016.14	Fructans in Infant Formula and Adult Nutrition	K-FRUC: Fructan Assay Kit
2016.06	Fructans in Infant, Adult and Paediatric Nutritional Formulas	E-FRMXPD: Fructanase Mixture (Purified-Powder) E-SUCR: Sucrase (from yeast)
2011.25 	Insoluble, Soluble and Total Dietary Fiber in Foods	K-INTDF: Integrated Total Dietary Fiber Assay Kit
2009.01	Total Dietary Fiber in Foods	K-INTDF: Integrated Total Dietary Fiber Assay Kit
2006.06 	Lactose in Milk	K-LACGAR: Lactose/Galactose Assay Kit (Rapid)
2002.02 	Resistant Starch in Starch and Plant Materials	K-RSTAR: Resistant Starch Assay Kit
2002.01 	α -Amylase Activity in White Wheat Flour, Milled Malt and Microbial Enzyme Preparations	K-CERA: Ceralpha (α -Amylase) Assay Kit K-AMYLS: α -Amylase SD Assay Kit (High Sensitivity Method)
2000.11	Polydextrose in Foods	E-FRMXPD: Fructanase Mixture (Purified-Powder) E-FRMXLQ: Fructanase Mixture (Purified-Liquid) E-AMGDF: Amyloglucosidase (<i>A. niger</i>) E-ISAMY: Isoamylase (Glycogen 6-glucanohydrolase)
999.03 	Total Fructan in Foods (Enzymatic / Spectrophotometric Method)	K-FRUC: Fructan Assay Kit K-FRUCHK: Fructan HK Assay Kit
997.08	Total Fructan in Foods	E-FRMXPD: Fructanase Mixture (Purified-Powder) E-FRMXLQ: Fructanase Mixture (Purified-Liquid) E-AMGFR: Amyloglucosidase (<i>A. niger</i>)
996.11 	Starch (Total) in Cereal Products	K-TSTA: Total Starch Assay Kit (AA/AMG) K-TSHK: Total Starch HK Assay Kit
995.16 	β -D-Glucan in Oats and Barley	K-BGLU: β -Glucan Assay Kit (Mixed Linkage)
993.19	Soluble Dietary Fiber in Food and Food Products	K-TDFR: Total Dietary Fiber Assay Kit
991.43	Total, Soluble and Insoluble Dietary Fiber in Foods	K-TDFR: Total Dietary Fiber Assay Kit
991.42	Insoluble Dietary Fiber in Foods and Food Products	K-TDFR: Total Dietary Fiber Assay Kit
985.29	Total Dietary Fiber in Foods	K-TDFR: Total Dietary Fiber Assay Kit

 developed in-house at Megazyme

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07/21