



Newsletter



Setting New Standards in Test Technology

Jan-Mar 2012

Welcome..

to our January - March 2012 edition of the Megazyme Newsletter. Wishing you all a very Happy New Year!

As with every issue we highlight our quarterly special offers, new product profiles and details of upcoming conferences and exhibitions

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Conferences & Exhibitions

- 24th - 26th January 2012
Unified Wine & Grape Symposium
Sacramento, California
- 30th March - 2nd April 2012
11th European Conference on Fungal Genetics
Marburg, Germany
- 7th - 9th May 2012
5th International Dietary Fibre Conference
Rome, Italy
- 30th September - 3rd October 2012
AACC Annual Meeting
Hollywood, Florida

MOVEMBER

Movember aims to change the way in which men approach their health, empowering them to talk about their health through raising awareness of men's health issues, chiefly cancers affecting men, in a light hearted and inclusive way.

Movember hopes to increase early detection, diagnosis and effective treatment of all cancers including prostate and testicular cancer. These aims broadly correspond to those of the Irish Cancer Society and with the much needed funds raised through Movember the Society can increase cancer awareness, fund cancer research and provide a cancer information centre for men who are diagnosed with the disease.

An elite unit of Megazyme professionals, team "MOZYME" courageously sprouted magnificent examples of the fabled moustache throughout the month of November in order to raise awareness and funds for the cause.



Conference



Pro Lab Marketing Pvt. Ltd.



Pictured above:

Our Indian Distributor Pro Lab Marketing Pvt. Ltd. participating in the International Conference on Functional Dairy Foods

Web Special Offers 20% Discount

Total Sulphite Kit

K-TSULPH	80 Assays
€125.00	€100.00
US\$150.00	US\$120.00

L-Rhamnose Kit

K-RHAM	50 Assays
€158.00	€126.00
US\$210.00	US\$168.00

Lactose/Sucrose/ D-Glucose Kit

K-LACSU	100 Assays
€213.00	€170.00
US\$290.00	US\$232.00

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New Products

We have just added the following **NEW** substrates to our range of Oligosaccharides:

O-ONPXBI-5	<i>ortho</i> -Nitrophenyl- β -Xylobioside (5mg)	A colourimetric substrate for the assay of xylanase and xylosidase activity
PURITY:	> 98 % (TLC).	
PRICE:	€150 / \$210	
O-ONPXBI-25	<i>ortho</i> -Nitrophenyl- β -Xylobioside (25mg)	A colourimetric substrate for the assay of xylanase and xylosidase activity
PURITY:	> 98 % (TLC).	
PRICE:	€220 / \$308	
O-4MUXBI-5	4-Methylumbelliferyl- β -Xylobioside (5mg)	A fluorogenic substrate for the assay of xylanase and xylosidase activity
PURITY:	> 98 % (TLC).	
PRICE:	€120 / \$168	
O-4MUXBI-10	4-Methylumbelliferyl- β -Xylobioside (10mg)	A fluorogenic substrate for the assay of xylanase and xylosidase activity
PURITY:	> 98 % (TLC).	
PRICE:	€200 / \$280	

Milk and Dairy Kits - What to use and when?

Enzymatic bio-analysis plays an important role during the processing of milk, and production of cheese, yogurt and other fermented milk beverages, such as kefir.

In the processing of milk, levels of ammonia, D- and L-lactic acid, and urea are critical indicators of "freshness" and hygienic status. Levels of L-ascorbic acid, lactose, D-galactose, D-glucose, and D-gluconic acid are also routinely determined. Heat treatment of milk converts a small amount of lactose into lactulose. As this is the only source of lactulose in milk, measurement of this analyte reveals the extent of heat treatment.

In the production of cheese, rising levels of L-lactic acid and falling levels of lactose are monitored during fermentation. In some cases, such as in the manufacture of "Swiss" cheese, subsequent falling levels of L-lactic acid and rising levels of acetic acid due to the growth of propionic acid bacteria are also monitored. Levels of L-glutamic acid rise throughout the cheese production process as a result of microbial utilisation of milk proteins. Other commonly measured analytes include citric acid, D-lactic acid, succinic acid, D-galactose, D-glucose and cholesterol.

In the production of yogurt, the conversion of lactose into D- and L-lactic acid is monitored, along with many other analytes including acetaldehyde, ammonia and ethanol. Artificial sweeteners, such as aspartame, are added to modify the final taste profile of some yogurt products.

There are many fermented milk beverages, including acidophilus milk, cultured buttermilk, sour cream and kefir. Commonly measured analytes include ethanol, which may reach 2-3 %, L-lactic acid, lactose, D-galactose and D-glucose.

The accurate determination of low levels of lactose is especially important for products manufactured for the lactose intolerant.

Lactose / Galactose



INTRODUCTION:

Lactose, or milk sugar, is a white crystalline disaccharide. It is formed in the mammary glands of all lactating animals and is present in their milk. Lactose yields D-galactose and D-glucose on hydrolysis by lactase (β -galactosidase), an enzyme found in gastric juice. People who lack this enzyme after childhood cannot digest milk and are said to be lactose intolerant. Common symptoms of lactose intolerance include nausea, cramps, gas and diarrhoea, which begin about 30 minutes to 2 hours after eating or drinking foods containing lactose. Between 30 and 50 million Americans are lactose intolerant, with certain ethnic and racial populations being more widely affected than others; as many as 75 percent of all African-Americans and Native Americans and 90 percent of Asian-Americans are lactose intolerant. The condition is least common among persons of northern European descent.

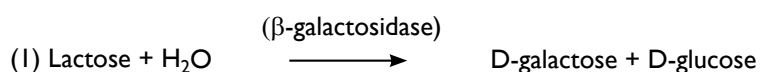
Enzymatic methods for the measurement of lactose are well known and are generally based on the hydrolysis of lactose to D-galactose and D-glucose with β -galactosidase, followed by determination of either D-galactose or D-glucose. In the International Dairy Federation Method (79B:1991) for the measurement of lactose in "dried milk, dried ice-mixes & processed cheese", details are given for deproteinisation of samples, hydrolysis of lactose with β -galactosidase and measurement of either released D-galactose or D-glucose. The measurement of lactose as D-galactose liberated is more generally reliable than measurement as D-glucose liberated because preparations generally contain more free D-glucose than free D-galactose.

Enzymatic kits for the determination of D-galactose are very slow. This is due to the low rate of natural chemical "mutarotation" between the α - and β -anomeric forms of D-galactose. Only the β -form is recognised by β -galactose dehydrogenase. In incubations containing NAD^+ , D-galactose and β -galactose dehydrogenase, there is a very rapid initial increase in absorbance due to the consumption of β -D-galactose, and this is followed by a very slow approach to the endpoint. This very slow approach results from the very low rate of chemical "mutarotation" of α -D-galactose into β -D-galactose. Using technology developed by Megazyme (patent pending), a galactose mutarotase has now been incorporated into the assay format to rapidly catalyse this rate-limiting mutarotation step. The result is very rapid analysis times of approx. 5 min at room temperature.

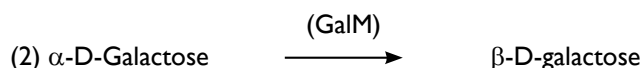
The Megazyme Lactose / Galactose (Rapid) kit is also suitable to confirm the lack of lactose in "lactose-free" products. A detailed sample preparation procedure for such samples is provided with the kit and involves removal of existing monosaccharides prior to testing.

PRINCIPLE:

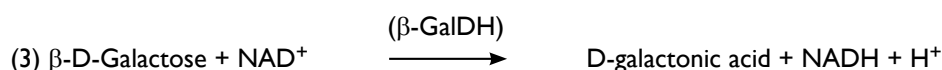
In the currently described procedure (a modification of AOAC Official Method 984.15; lactose in milk) lactose is hydrolysed to D-galactose and D-glucose by *Aspergillus niger* β -galactosidase at pH 5.0 (1).



Interconversion of the α - and β -anomeric forms of D-galactose is catalysed by galactose mutarotase (GalM) (2).



The β -D-galactose is oxidised by NAD^+ to D-galactonic acid in the presence of β -galactose dehydrogenase (β -GalDH) at pH 8.6 (3).



The amount of NADH formed in this reaction is stoichiometric with the amount of lactose. It is the NADH which is measured by the increase in absorbance at 340 nm.

Megazyme Dairy Industry Kits

Analyte	Cat. No.	Analyte Significance	Advantages of Megazyme Test Kits
Acetaldehyde	K-ACHYD	One of the most important aroma compounds in yogurt, responsible for the characteristic taste. Also formed in milk during storage	AIDH supplied as a stabilised solution rather than a lyophilised powder, thus less wasted enzyme. Stable reagents
Acetic Acid	K-ACET K-ACETAF K-ACETAK K-ACETRM	Fermentation product of yogurt and cheese	All kits contain PVP to prevent tannin inhibition. 1. K-ACET (manual, efficient) contains stable ACS suspension 2. K-ACETAF (auto) very stable R1 and R2 3. K-ACETAK (auto) is a stable, and very rapid acetate kinase (AK) based kit with excellent linearity 4. K-ACETRM is a rapid, manual assay kit employing AK and phosphotransacetylase Stable reagents
Ammonia	K-AMIAR	Important indicator of the hygienic quality (microbial load) of milk	K-AMIAR has a very rapid reaction rate (~ 3 min at room temperature). Ideal for manual and auto-analyser applications. Stable reagents
L-Ascorbic Acid	K-ASCO	Antioxidant present in dairy products. Permitted additive	Rapid reaction, stable reagents
Aspartame	K-ASPTM	Common milkshake and yogurt sweetener	Rapid reaction, stable reagents, only enzymatic kit available
Citric Acid	K-CITR	Important quality indicator of milk, especially for butter and cheese production. Permitted additive	Ideal for both manual and auto-analyser applications. Reconstituted citrate lyase stable for > 6 months at -20°C. Stable reagents
Ethanol	K-ETOH	Produced during the fermentation of kefir	Rapid reaction, stable reagents (AIDH supplied as a stable suspension)
Formic Acid	K-FORM	Minor acid in dairy products	FDH supplied as a stabilised suspension rather than a lyophilised powder, thus less wasted enzyme. Stable reagents
D-Fructose / D-Glucose	K-FRUGL K-FRGLMQ	Common milkshake and yogurt sweetener	Rapid reaction times, choice of simple formats available, ideal for manual and auto-analyser applications. Stable reagents
D-Gluconic Acid	K-GATE	Weak organic acid found in dairy products. High levels found in certain cheeses	Rapid reaction, stable reagents
D-Glucose	K-GLUC K-GLUHKR/L	Low levels expected in unprocessed / unadulterated milk and in cheese. Useful marker when producing lactose depleted dairy products	Choice of simple formats available, based either on glucose oxidase / peroxidase, or hexokinase / G-6-PDH. Stable reagents
L-Glutamic Acid	K-GLUT	Found in high concentrations, especially in cheese	No wasted diaphorase solution (stable suspension supplied). Stable reagents
D-Lactic Acid	K-DATE	Quality indicator of milk, yogurt and cheese	Rapid reaction, stable reagents
L-Lactic Acid	K-LATE	Quality indicator of fresh milk. High levels in yogurt and cheese	Rapid reaction, stable reagents. Ideal for manual and auto-analyser applications
D-/L-Lactic Acid	K-DLATE	Quality indicator of fresh milk, yogurt and cheese	Rapid reaction, flexible concurrent format. Stable reagents
Lactose / D-Galactose	K-LACGAR	Key quality (value) indicator of milk	Very rapid reaction (~ 5 min even at room temperature). Stable reagents
D-Sorbitol / Xylitol	K-SORB	Dairy product sweetener	No wasted diaphorase solution (stable suspension supplied). Stable reagents
Succinic Acid	K-SUCC	Minor dairy acid	Rapid reaction (~ 6 min even at room temperature). Stable reagents
Sucrose	K-SUFRG K-SUCGL	Not present naturally in dairy products	Choice of simple formats available, based either on glucose oxidase / peroxidase, or hexokinase / G-6-PDH. Stable reagents
Urea	K-URAMR	Quality indicator of milk, especially that used for cheese production. Used as a metabolic marker of bovine blood urea levels	Simple, very rapid (both urea and ammonia measured in < 10 min at room temperature) and sequential / efficient (only one cuvette required per sample)

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