



Lactose Assay Kit (K-LOLAC)

Our new unique Lactose assay kit (K-LOLAC) for testing low-lactose and lactose-free foods and beverages now joins our existing bestselling Lactose/Galactose kit (K-LACGAR).

Final action status AOAC 2020.08

- World's first sequential (single cuvette) enzymatic assay for lactose.
- Highly selective enzyme allows accurate measurement in low-lactose and lactose-free products.
- Produces a lower and more accurate result than any other enzymatic assay.



Benefits of K-LOLAC over Common Enzymatic Assays

- OFFICIAL METHOD** K-LOLAC is the ONLY enzymatic method that has been validated by a multi-laboratory evaluation and as of May 2021 is the only method granted Final Action Status: AOAC 2020.08.
- SENSITIVE** Can quantify lactose at **lower limits** than all other available enzymatic assays - essential for low-lactose and lactose-free products.
- EFFICIENT** First **sequential** enzymatic assay for lactose, i.e. reduced analyst hands-on time and increased cost-effectiveness.
- SELECTIVE** Uses an exclusive enzyme which hydrolyses lactose **more selectively** than competing methods leading to reduced overestimation.
- ACCURATE** Method includes 15 min pre-incubation step to remove high background glucose levels, allowing **rapid accurate measurement** in low-lactose and lactose-free products.

Examples of Applications for K-LOLAC

- Standard and low-lactose/lactose-free dairy products
- Foods containing milk (e.g. dietetic foods, bakery products, chocolates and confectioneries) particularly for markets with prevalent lactose intolerance
- Food additives
- Cosmetics, pharmaceuticals and other materials (including biological cultures)
- Animal feed

Recently tested Infant formula (values obtained for 'SMA-LF' and 'Aptamil Lactose Free' are in close agreement with those measured using HPAEC-PAD).

Product	Megazyme		Competitor
	K-LOLAC	K-LACGAR	Lactose / D-Glucose Kit
Format	Sequential ^b	Non-sequential ^a	Non-sequential ^a
Number of lactose assays (samples)	65	57	32
Assay time for "lactose-free" (i.e. pre-treatment + reaction) in minutes	35 (20+15)	135 (120+15)	110 (75+20+15)
Assay time for "regular" dairy samples in minutes	15	15 (10+5)	35 (20+15)
Supplied with reagents for pre-treatment	✓	X	X
Minimum reagent stability	2 years	2 years	6 months
Suitable for low-lactose and lactose-free	✓	X	X

a: requires two cuvettes: one for free glucose/galactose, one for glucose/galactose released from lactose

b: requires a single cuvette: both determinations take place in a single cuvette



Lactose Assay Kit (K-LOLAC)

A new solution for the dairy industry: the K-LOLAC advantage: Rapid, Selective, Sensitive and Accurate Measurement in Low-Lactose & Lactose Free Products.

Final action status AOAC 2020.08

Lactose Detection: Challenges for Lactose-Free Products

Low-lactose and lactose-free products are manufactured through the β -galactosidase mediated hydrolysis of the naturally present lactose. Glucose and galactose are the major products formed but transglycosylation reactions also lead to the formation of a range of di- and tri- saccharides.

Methodologies designed for standard dairy are not readily applicable to lactose-free products.

Detection methods typically employed for HPLC (ELSD and RI) lack the required sensitivity, **ion chromatography** (HPAEC-PAD) is expensive to run and requires technical expertise, and standard **enzymatic methods** lack specificity for lactose in real samples.

K-LOLAC represents an advance on existing enzymatic assays for lactose-free products by addressing three key challenges in the measurement of residual lactose.

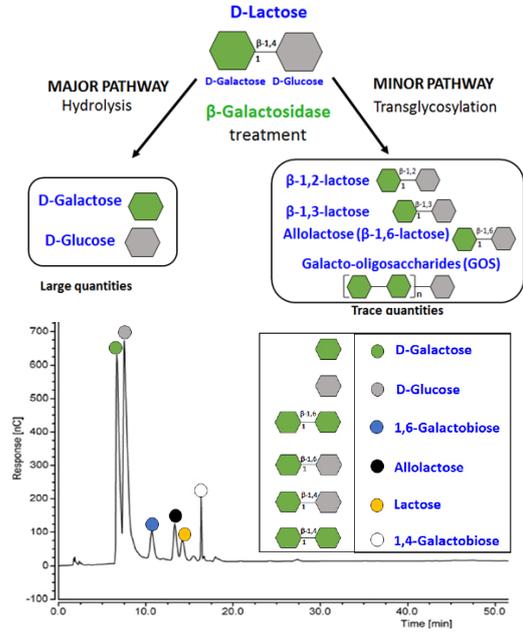


Figure: HPAEC-PAD chromatogram for the analysis of a commercially-available 'lactose-free' milk

Problems Solved by Megazyme's K-LOLAC

1. Background Glucose

Our kit uses highly optimised glucose oxidase and catalase pre-treatment to remove free glucose prior to analysis, offering **improved accuracy** by reducing errors.

2. Galactosidase Selectivity

K-LOLAC is unique in using **highly selective** MZ104 β -galactosidase. Other commercially-available assays quantitatively hydrolyse various transglycosylation products present, resulting in an overestimation of the lactose content.

K-LOLAC produces a lower and more accurate result by significantly reducing the over-reporting that occurs in competing products.



3. Detection Assay

The K-LOLAC format allows for sequential measurement of lactose while having the **lowest detection limit** on the market - detecting lactose at 1.62 mg/L versus 8 mg/L for competitors.

Which Lactose Assay Kit Should I Choose?

	K-LOLAC	K-LACGAR
Sequential Assay Format	✓	X
Uses selective β -galactosidase	✓	X
Suitable for Standard Dairy Products	✓	✓
Suitable for Low-Lactose and Lactose-Free	✓	X