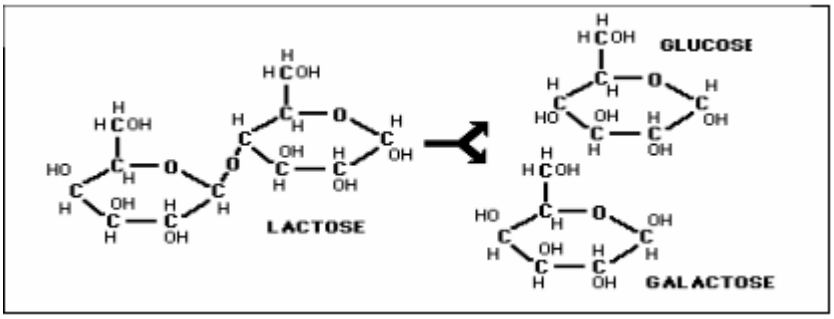
Ha-Lactase 5200

Product Information

Version: 3 PI-GLOB-EN 03-14-2014

Description

Ha-Lactase 5200 is a highly-purified, standardized liquid neutral ß-galactosidase (lactase). It is produced by submerged fermentation on a vegetable substrate using a select strain of the yeast *Kluyveromyces lactis* kept under contained conditions and not present in the final product. The product hydrolyses lactose to a mixture of glucose and galactose.



Material No:	450804		
Size	5 L	Storage temp:	0 - 8 °C / 32 - 46 °F
Type	Can	Conditions:	Cool. Keep closed in the original container.

Shelf life

24 months from quality release when stored according to the recommended storage conditions. The shelf life is limited to 3 months after opening, provided the product is maintained according to the recommended storage conditions.

Transport

The product should be transported between -5 and 20 °C with a maximum transit time of 4 days outside this interval. Prolonged exposure to heat above this temperature may influence the shelf life and activity of the product.

Application

Ha-Lactase 5200 may be used in various dairy-based products such as milk, cream, fermented products, cheese, whey drinks, whey/whey permeate, dulce de leche, ice cream and other desserts. The product is suitable for

- Lactose free/reduced lactose products (Lactose malabsorption/intolerance);
- Increased sweetness without increasing caloric content;
- Reduction of added sugar, flavors;
- Improved appearance/stability by preventing lactose crystallization;
- Improved product characteristics (e.g. improved scoopability in ice cream);

Separate application sheets on milk, fermented milk products, ice cream and dulce de leche are available upon request.

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	Milk	Fermented products	Dulce de leche	Condensed milk	Probiotics	Ice cream
Removal of lactose	x	x	x	x	x	x
Decrease added sugar		x	x	x	x	x
Increase sweetness	x	x	x	x	x	x
Decrease ferm. time		x			x	
Higher cell count					x	
Avoid lactose crystallisation			x	x		x
Increase Maillard effect			x	x		
Less calories	x	x	x	x	x	x

Dosage

500-4000 NLU/ L milk
The composition of the milk/substrate and preceding treatment will influence lactase activity during hydrolysis. Dosage is dependent on the initial lactose concentration. As calcium and sodium ions can inhibit the enzyme, it is advised to treat products such as condensed milk and dulce de leche with lactose prior to evaporation. In fermented milk production, the pasteurization temperature will affect enzymatic activity during subsequent fermentation with high temperature pasteurization (95°C/203°F) providing the most optimal substrate.

Directions for use

Directions for use are highly dependent on the application. Application sheets are available upon request.

Composition

Glycerol (E 422) , Water , Beta-galactosidase

Specification

Properties

Average activity:	5200 NLU/g	Guaranteed activity:	>= 4.800 NLU/g

Guaranteed activity is the minimum activity at best-before date.

Content

Enzyme type:	Lactase

Physical Properties

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Color:	Light brown	Form:	Liquid
Solubility:	Water soluble	Odor:	Characteristic
pH:	6.50 - 8.00	Density:	1.10 - 1.20

The product may exhibit batch-to-batch color variations. This has no influence on the activity.

Formulation

Glycerol %:	>=45 %

Microbiological quality

Total count:	< 100 cfu/ml	Yeast and mould:	Negative in 1 ml
Clostridia:	< 1 cfu/ml	Coliform bacteria:	Negative in 5 ml
Escherichia coli:	Negative in 25 ml	Salmonella:	Negative in 25 ml
Listeria:	Negative in 25 ml	Staphylococcus aureus:	Negative in 1 ml

Conformity

Protease side activity PU/g:	<= 75,00 PU/G

Comments

Methods are available on request.
Our fermentation produced enzymes are tested for the relevant mycotoxins and metabolites according to JECFA's General Specifications for Enzymes.
This product complies with the recommended purity specifications for food-grade enzymes given by the Joint FAO/WHO Expert Committee on Food Additives (JECFA) and the Food Chemical Codex (FCC) with heavy metal specifications for Lead (≤ 5 ppm), Cadmium (≤ 0,5 ppm), Mercury (≤ 0,5 ppm) and Arsenic (≤ 3 ppm).

Certificate of Analysis

A Certificate of Analysis (CoA) will normally accompany the goods.

Technical Data

Temperature

The desired degree of hydrolysis can be obtained by selecting the appropriate temperature, time and dosage for the reaction. The optimal temperature is between 35-45°C (95-113°F). The enzyme is denatured at temperatures above 50°C (122°F).

Figure 1 illustrates the influence of temperature on activity using whey permeate substrate. It is often preferable to carry out hydrolysis at low temperatures to minimize microbial spoilage.
Figure 2 illustrates the degree of hydrolysis obtained in milk at 5°C (41°F) for 24 hours at different dosages of lactose. The reaction time may be reduced at higher temperatures. A hydrolysis of 80-90% is observed within 2-4 hours at 40°C (104°F) using a dosage of 2000 NLU/L.

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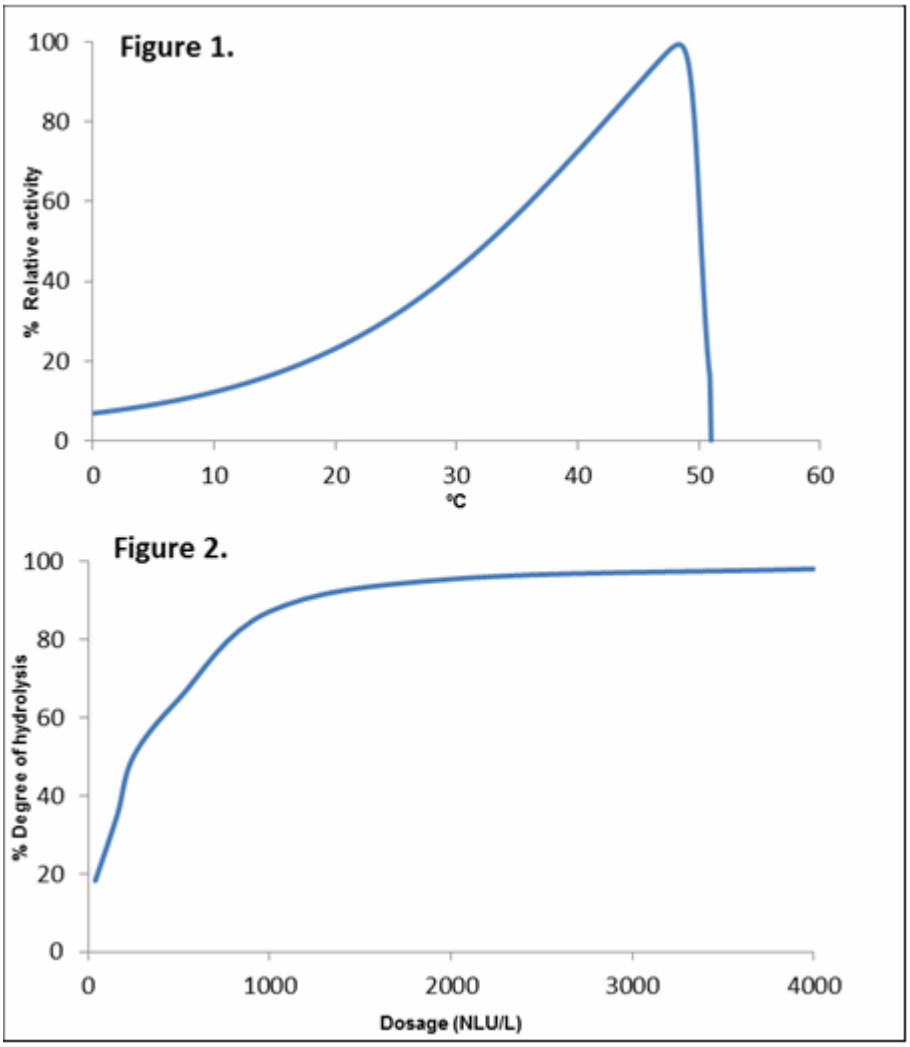

pH

Ha-lactase is a neutral lactase. The pH optimum is between pH 6.0 - 7.0. The enzyme is significantly inhibited at pH values below 5.5.

The figure illustrates the influence of pH on activity using whey permeate substrate.
Temp: 40°C (104°F), Dosage: 800 NLU/L, Substrate: Whey permeate (5% lactose)

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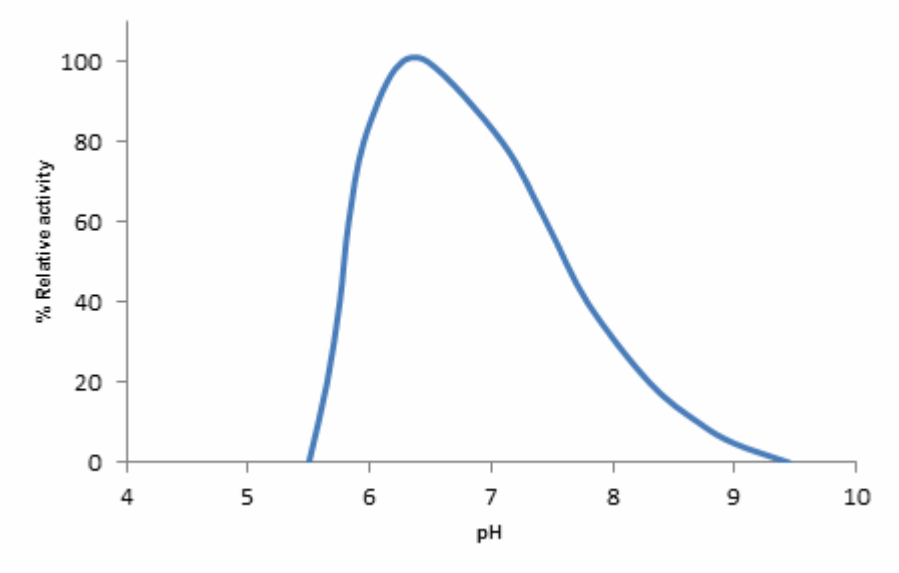
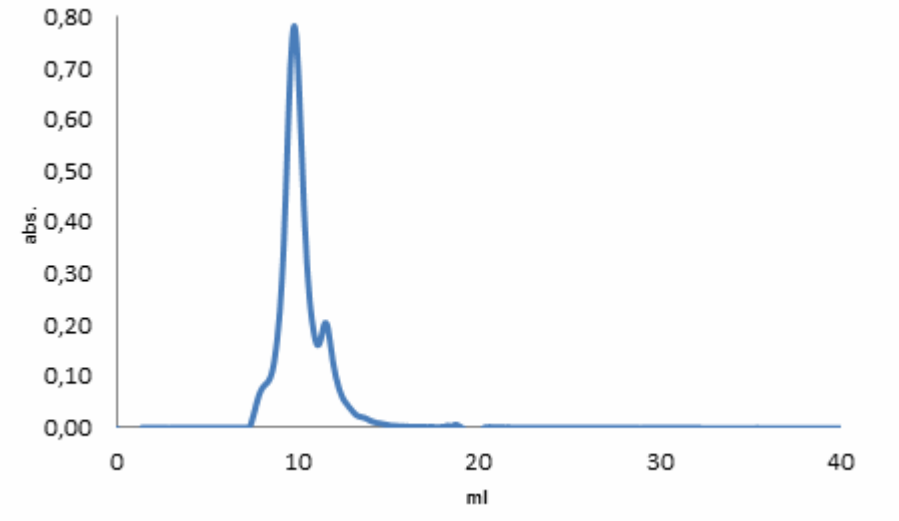


Purity
This product is one of the purest lactase products available on the market.



Technical support
Chr. Hansen's Application and Product Development Laboratories and personnel are available if you need further information.

Dietary Information

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Kosher:	Kosher Pareve Excl. Passover
Halal:	Certified
Vegetarian:	Yes

Handling precautions

For detailed handling information, please refer to the appropriate Safety Data Sheet. Enzymes may cause irritation upon inhalation or skin contact among sensitive individuals. The use of personal protection equipments such as gloves, goggles and respiratory equipment can prevent sensitisation. For additional guidelines refer to 'Guide to the safe handling of microbial enzymes preparations' published by the Association of Manufacturers and Formulators of Enzyme Products (AMFEP) and 'Working Safely With Enzymes' by the Enzyme Technical Association (ETA).

According to EU legislation, disposal of packaging material of this product should be treated as hazardous waste. Alternatively, or for non EU countries, packaging may be disposed of as normal waste by rinsing with plenty of water to ensure no enzyme residues are present.

Legislation

This product complies with JECFA- (FAO/WHO) and FCC-recommended specifications for food-grade enzymes. The application of enzymes in food processing is governed by general food laws and by Reg. (EC) No 1332/2008. However, the approval system provided by Reg. 1332/2008 is not yet fully operational. Chr. Hansen A/S will ensure EU approval in due time. Meanwhile, please check for local/national rules or regulations as national requirements may apply.

The product is intended for use in food.

Labeling

The product is a processing aid. There are no legislative requirements for labelling processing aids on final food products.

Trademarks

Product names, names of concepts, logos, brands and other trademarks referred to in this document, whether or not appearing in large print, bold or with the ® or TM symbol are the property of Chr. Hansen A/S or used under license. Trademarks appearing in this document may not be registered in your country, even if they are marked with an ®.

Additional information

The following application sheets are available upon request:

- Ha-lactase™ - Milk
- Ha-lactase™ - Fermented milk products
- Ha-lactase™ - Dulce de leche
- Ha-lactase™ - Ice cream

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GMO Information

In accordance with the legislation in the European Union* we can state that Ha-Lactase 5200 does not contain GMOs and does not contain GM labeled raw materials**. In accordance with European legislation on labeling of final food products** we can inform that the use of Ha-Lactase 5200 does not trigger a GM labeling of the final food product. Chr. Hansen's position on GMO can be found on: www.chr-hansen.com/About us/Policies and positions/Quality and product safety.

** Directive 2001/18/EC of the European Parliament and of the Council of 12 March 2001 on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EEC.*
*** Regulation (EC) No 1829/2003 of the European Parliament and of the Council of 22 September 2003 on genetically modified food and feed.*
Regulation (EC) No 1830/2003 of the European Parliament and of the Council of 22 September 2003 concerning the traceability and labeling of genetically modified organisms and the traceability of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC.

Allergen Information

List of common allergens in accordance with the US Food Allergen Labeling and Consumer Protection Act of 2004 (FALCPA) and EU labeling Directive 2000/13/EC with later amendments	Present as an ingredient in the product
Cereals containing gluten* and products thereof	No
Crustaceans and products thereof	No
Eggs and products thereof	No
Fish and products thereof	No
Peanuts and products thereof	No
Soybeans and products thereof	No
Milk and products thereof (including lactose)	No
Nuts* and products thereof	No
List of allergens in accordance with EU labeling Directive 2000/13/EC only	
Celery and products thereof	No
Mustard and products thereof	No
Sesame seeds and products thereof	No
Lupine and products thereof	No
Mollusks and products thereof	No
Sulphur dioxide and sulphites at concentrations of more than 10 mg/kg or 10 mg/litre expressed as SO_2	No

** Please consult the EU Labeling Directive 2000/13 Annex IIIa for a legal definition of common allergens, see European Union law at: www.eur-lex.europa.eu*