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Milk and milk products — Determination of the lipase activity of pregastric lipase preparation

Lait et produits laitiers — Détermination de l'activité de lipase de la préparation de lipase prégastrique

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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ISO 13082 | IDF 218 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF). It is being published jointly by ISO and IDF.

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Foreword

IDF (the International Dairy Federation) is a non-profit organization representing the dairy sector worldwide. IDF membership comprises National Committees in every member country as well as regional dairy associations having signed a formal agreement on cooperation with IDF. All members of IDF have the right to be represented on the IDF Standing Committees carrying out the technical work. IDF collaborates with ISO in the development of standard methods of analysis and sampling for milk and milk products.

The main task of Standing Committees is to prepare International Standards. Draft International Standards adopted by the Standing Committees are circulated to the National Committees for endorsement prior to publication as an International Standard. Publication as an International Standard requires approval by at least 50 % of IDF National Committees casting a vote.

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ISO 13082 | IDF 218 was prepared by the International Dairy Federation (IDF) and Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*. It is being published jointly by IDF and ISO.

All work was carried out by the Joint ISO-IDF Project Group *Lipase activity* of the Standing Committee on *Analytical methods for processing aids and indicators* under the aegis of its project leaders, Mrs M. Harboe (DK) and Dr J. Jacobsen (DK).

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Introduction

Lipases (EC 3.1.1.3) are the group of esterases that hydrolyse emulsified triacylglycerolesters, which are the main component of milk fat.

Commercial pregastric lipase and some rennet preparations (paste or liquid) contain lipases from calf, kid-goat or lamb sources. These lipase preparations are used particularly in the production of Italian type cheeses, e.g. in Romano, Provolone, and Asiago and in other similar cheese varieties and in enzyme-modified dairy products as described in IDF Bulletin 294[6]. Lipase is not allowed in Feta, but it is often used in Feta-type cheese.

The method is based on the principle of the FCCIV method for forestomach lipase activity[7], but in its current form the FCCIV method is not sufficiently developed. As such, it does not provide adequate details in several critical areas, most notably in sample and substrate preparation. However, the FCCIV method served as a useful model for the development of this International Standard.

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1 Scope

This International Standard specifies a method for the determination of the lipase activity. It is intended for the preparation of pregastric lipase and rennet paste, both of animal origin.

NOTE No reference method was used to check this method as no stable standard can be found. On the other hand, a reference method can be omitted as the substrate is reproducible and well defined.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
international lipase unit
ILU
amount of lipase activity that releases butanoic acid, also known as butyric acid, at a rate of 1,25 µmol/min under specified conditions

NOTE 1 Lipase activity is expressed either in international lipase units (ILU) per gram of product or ILU per millilitre of product.

NOTE 2 The definition is based on the direct consumption of titrant while not considering that a small molar fraction of the butyric acid (4 %) is not dissociated and thus cannot be titrated. As such, that creates a small error in the definition.

3 Principle

Triglyceride esters are hydrolysed by lipase. The free fatty acids (as butyric acid) released from the substrate tributyrin are titrated in a pH-stat with sodium hydroxide. The amount of sodium hydroxide consumed within a defined period is used to calculate the activity in ILU per millilitre or ILU per gram.

Due to the non-existence of a reference standard, it is recommended that a control (known) sample be included in the test.

4 Reagents

During the analysis, unless otherwise stated, use only reagents of recognized analytical grade and distilled water or demineralized water or water of equivalent purity.

The brand of chemicals can affect the result. Therefore, before using a brand other than the one mentioned, verify whether it gives the same result.

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