

# INTERNATIONAL STANDARD

**ISO  
14673-1**

**IDF  
189-1**

First edition  
2001-11-01

---

---

## **Milk and milk products — Determination of nitrate and nitrite contents —**

### **Part 1: Method using cadmium reduction and spectrometry**

*Lait et produits laitiers — Détermination des teneurs en nitrates et en  
nitrites —*

*Partie 1: Méthode par réduction au cadmium et spectrométrie*



Reference numbers  
ISO 14673-1:2001(E)  
IDF 189-1:2001(E)

© ISO and IDF 2001

**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. Neither the ISO Central Secretariat nor the IDF accepts any liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies and IDF national committees. In the unlikely event that a problem relating to it is found, please inform the ISO Central Secretariat at the address given below.

© ISO and IDF 2001

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO or IDF at the respective address below.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.ch](mailto:copyright@iso.ch)  
Web [www.iso.ch](http://www.iso.ch)

International Dairy Federation  
41 Square Vergote  
Tel. + 32 2 733 98 88  
Fax + 32 2 733 04 13  
E-mail [info@fil-idf.org](mailto:info@fil-idf.org)  
Web [www.fil-idf.org](http://www.fil-idf.org)

Printed in Switzerland

## Contents

Page

Foreword.....	iv
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 Principle.....	2
5 Reagents.....	2
6 Apparatus .....	4
7 Sampling.....	5
8 Preparation of test sample.....	5
8.1 Dried milk and dried whey .....	5
8.2 Caseins and caseinates .....	5
8.3 Cheese .....	5
8.4 Whey cheese .....	6
9 Procedure .....	6
9.1 Preparation of the copperized cadmium column .....	6
9.2 Checking the reducing capacity of the column .....	6
9.3 Regeneration of the column .....	7
9.4 Preparation of test portion.....	7
9.5 Extraction and deproteinization.....	8
9.6 Reduction of nitrate to nitrite .....	8
9.7 Blank test.....	8
9.8 Determination.....	9
9.9 Preparation of calibration graph .....	9
10 Calculation and expression of results.....	9
10.1 Nitrite content.....	9
10.2 Nitrate content.....	10
11 Precision.....	10
11.1 General.....	10
11.2 Repeatability.....	10
12 Test report .....	11
Bibliography .....	13

## Foreword

**ISO (the International Organization for Standardization)** is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this part of ISO 14673|IDF 189 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14673-1|IDF 189-1 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF), in collaboration with AOAC International. It is being published jointly by ISO and IDF and separately by AOAC International.

This first edition of ISO 14673-1|IDF 189-1, together with ISO 14673-2|IDF 189-2 and ISO 14673-3|IDF 189-3, cancels and replaces ISO 4099:1984, ISO 6736:1982, ISO 6739:1988, ISO 6740:1985 and ISO 8195:1987, which have been technically revised.

ISO 14673|IDF 189 consists of the following parts, under the general title *Milk and milk products — Determination of nitrate and nitrite contents*:

- *Part 1: Method using cadmium reduction and spectrometry*
- *Part 2: Method using segmented flow analysis (Routine method)*
- *Part 3: Method using cadmium reduction and flow injection analysis with in-line dialysis (Routine method)*

## Foreword

**IDF (the International Dairy Federation)** is a worldwide federation of the dairy sector with a National Committee in every member country. Every National Committee has the right to be represented on the IDF Standing Committees carrying out the technical work. IDF collaborates with ISO and AOAC International in the development of standard methods of analysis and sampling for milk and milk products.

Draft International Standards adopted by the Action Teams and Standing Committees are circulated to the National Committees for voting. Publication as an International Standard requires approval by at least 50 % of National Committees casting a vote.

International Standard ISO 14673-1 | IDF 189-1 was prepared by Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 5, *Milk and milk products*, and the International Dairy Federation (IDF), in collaboration with AOAC International. It is being published jointly by ISO and IDF and separately by AOAC International.

All work was carried out by the Joint ISO/IDF/AOAC Action Team, *Minerals and minor compounds*, of the Standing Committee on *Minor components characterization of physical properties*, under the aegis of its project leader Mr G. Bråthen (NO).



# Milk and milk products — Determination of nitrate and nitrite contents —

## Part 1: Method using cadmium reduction and spectrometry

**WARNING** — The use of this International Standard may involve hazardous materials, operations and equipment. This standard does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish safety and health practices and determine the applicability of regulatory limitations prior to use.

### 1 Scope

This part of ISO 14673|IDF 189 specifies a method for the determination of the nitrate and nitrite contents of milk and milk products by cadmium reduction and spectrometry. The method is applicable to

- whole and partly skimmed and skimmed dried milk;
- hard, semi-hard and soft cheeses;
- processed cheese;
- whey cheese, caseins and caseinates and dried whey.

The method may be performed using automatic equipment, in particular by segmented flow analysis (SFA) or flow injection analysis (FIA), thus reducing cadmium contamination in laboratory work places and waste water.

NOTE These methods are described in ISO 14673-2|IDF 189-2 and ISO 14673-3|IDF 189-3, respectively.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 14673|IDF 189. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 14673|IDF 189 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 648, *Laboratory glassware — One-mark pipettes*

ISO 835-1, *Laboratory glassware — Graduated pipettes — Part 1: General requirements*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*