

# Determination of fat content of milk and milk products (Gerber method) —

## Part 2: Methods

UDC 637.1:543.85:542.3:620.1

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- Association of British Preserved Milk Manufacturers
- Association of Public Analysts
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- Creamery Proprietors' Association
- Department of Trade and Industry (Laboratory of the Government Chemist)
- Ice Cream Alliance Limited
- Intervention Board for Agricultural Produce
- Joint Committee of the Milk Marketing Board and the Dairy Trade Federation
- Milk Marketing Board
- Milk Marketing Board for Northern Ireland
- Ministry of Agriculture, Fisheries and Food
- Royal Association of British Dairy Farmers
- Royal Society of Chemistry
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This British Standard, having been prepared under the direction of the Dairying Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 July 1989

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First published, August 1936  
First revision, July 1955  
Second revision, March 1969  
Third revision, July 1989

The following BSI references relate to the work on this standard:  
Committee reference DAC/3  
Draft for comment 87/52833 DC

ISBN 0 580 17015 2

## Amendments issued since publication

| Amd. No. | Date of issue | Comments |
|----------|---------------|----------|
|          |               |          |
|          |               |          |
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# Contents

|                                                                | Page               |
|----------------------------------------------------------------|--------------------|
| Committees responsible                                         | Inside front cover |
| Foreword                                                       | ii                 |
| 1 General                                                      | 1                  |
| 2 Milk                                                         | 1                  |
| 3 Homogenized, sterilized and UHT milks                        | 3                  |
| 4 Partly skimmed milk, buttermilk and whey                     | 4                  |
| 5 Skimmed milk                                                 | 4                  |
| 6 Cream                                                        | 5                  |
| 7 Dried milk                                                   | 6                  |
| 8 Cheese                                                       | 7                  |
| Appendix A Amyl alcohol                                        | 9                  |
| Figure 1 — Position of pipette in butyrometer                  | 2                  |
| Figure 2 — Meniscus reading                                    | 3                  |
| Table 1 — Relevant methods for various milks and milk products | 1                  |
| Table 2 — Corrections for butyrometer readings                 | 3                  |
| Table 3 — Colour development values                            | 9                  |
| Publications referred to                                       | Inside back cover  |

## Foreword

This Part of BS 696, having been prepared under the direction of the Dairying Standards Committee, supersedes BS 696-2:1969 which is withdrawn.

The Gerber is almost universally used for the routine determination of the fat content of milk and milk products in European countries and, to a lesser extent, in America, Australia and New Zealand. It is therefore of great importance that a method using standardized apparatus should be available so that results obtained in different laboratories and by different workers are comparable. This is essential with milk and milk products where there is considerable interchange between different factories, dairies and countries.

This revision of Part 2 takes into account the changes introduced in Part 1, the revision of which is being published simultaneously.

For milks containing about 2.5 % to 4.5 % of butterfat, the Gerber method gives results which are in close agreement with those obtained by the more accurate Röse-Gottlieb method described in BS 1741-3.

BS 696 should enable all laboratories to produce results which are comparable, and of adequate accuracy for commercial needs. It should be remembered, however, that the methods proposed are designed for routine purposes only.

While they give results in general agreement with gravimetric methods, they cannot be considered substitutes for these. Gravimetric methods should still be used for special purposes.

The apparatus for the Gerber test is specified in BS 696-1.

It is assumed in the drafting of this standard that it will be used and applied by those who are appropriately qualified and experienced. The procedures described in this standard are intended to be carried out by suitably trained and/or supervised personnel.

This Part of BS 696 calls for the use of substances and procedures that may be injurious to health if adequate precautions are not taken. In particular, attention is drawn to the need for protection especially of hands and eyes, and avoidance of mouth pipetting of sulphuric acid and amyl alcohol.

This standard refers only to its technical suitability and does not absolve the users from statutory obligations relating to health and safety.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

## 1 General

### 1.1 Scope

This British Standard describes methods for the determination of fat content in the milks and milk products given in Table 1 by the Gerber method.

**Table 1 — Relevant methods for various milks and milk products**

| Product                         | Relevant clause |
|---------------------------------|-----------------|
| Milk                            |                 |
| raw                             | 2               |
| pasteurized                     | 2               |
| homogenized                     | 3               |
| sterilized                      | 3               |
| UHT                             | 3               |
| Separated milk                  |                 |
| partly skimmed                  | 4               |
| skimmed                         | 5               |
| buttermilk                      | 4               |
| whey                            | 4               |
| Cream                           | 6               |
| Dried milk powder               |                 |
| whole                           | 7               |
| Reconstituted dried milk powder |                 |
| whole                           | 2               |
| partly skimmed                  | 4               |
| skimmed                         | 5               |
| Cheese                          | 8               |

### 1.2 Reagents

**1.2.1 Sulphuric acid**, density  $\rho_{20} = 1.815 \pm 0.003$  g/mL, i.e. 89.5 g to 91.0 g of  $\text{H}_2\text{SO}_4$  per 100 g. The acid shall be colourless, or not darker in colour than pale amber, and shall not contain impurities which will affect the determination.

**1.2.2 Amyl alcohol**, complying with Appendix A.

**1.2.3 Water**, complying with grade 3 of BS 3978.

### 1.3 Apparatus

**1.3.1 Lock stopper with key**, complying with section three of BS 696-1:1989.

**1.3.2 Pipette**, complying with the appropriate requirements of section four of BS 696-1:1989, or *automatic dispenser*, to deliver 10 mL of sulphuric acid.

**1.3.3 Pipette**, complying with the appropriate requirements of section four of BS 696-1:1989, or *automatic dispenser* to deliver 1 mL of amyl alcohol.

**1.3.4 Shaking stand**, for butyrometers.

**1.3.5 Centrifuge**, complying with section 6 of BS 696-1:1989.

**1.3.6 Water bath(s)**, capable of being controlled at  $20 \pm 2$  °C, at 20 °C to 30 °C, at 35 °C to 40 °C and at  $65 \pm 2$  °C.

**1.3.7 Thermometers**, nominal range 0 °C to 100 °C, with a maximum error of  $\pm 1$  °C.

NOTE Thermometers of designation D complying with BS 1704:1985 are suitable.

## 2 Milk

NOTE The method described in this clause is applicable to unhomogenized raw and pasteurized milks and to reconstituted whole dried milk powder.

### 2.1 Apparatus

**2.1.1 General.** In addition to the apparatus listed in 1.3, the items given in 2.1.2 and 2.1.3 are required.

**2.1.2 Gerber (8 %) butyrometer** for testing milk, or, where milk or higher fat content (e.g. ewe's milk) is being tested, *Gerber (10 %) butyrometer*, complying with section 2 of BS 696-1:1989.

**2.1.3 Standard milk pipette**, complying with the appropriate requirements of section 4 of BS 696-1:1989, calibrated to deliver 10.94 mL of water.

### 2.2 Preparation of sample

Adjust the temperature of the milk sample to 20 °C to 30 °C, if necessary using the water bath controlled at 20 °C to 30 °C (1.3.6). Mix the milk thoroughly but gently by repeatedly inverting the sample bottle to ensure a homogeneous distribution of the fat without causing undue frothing or any churning of the fat. If there is difficulty in dispersing the cream layer or the milk shows evidence of slight churning, warm the milk slowly to 35 °C to 40 °C, with gentle mixing in the water bath controlled at 35 °C to 40 °C (1.3.6).

Quickly adjust the temperature of the milk to about 20 °C, for example by cooling the sample under cold running water.

NOTE If at this stage the milk contains white particles or free fat, the determination will not yield a reliable value for fat content.

Allow the milk to stand in the water bath controlled at  $20 \pm 2$  °C (1.3.6) for 3 min to 4 min after the final temperature adjustment to allow air bubbles to rise. From this point it is necessary to proceed without interruption.