
International Standard 5548

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Caseins and caseinates — Determination of lactose content — Photometric method

Caséines et caséinates — Détermination de la teneur en lactose — Méthode photométrique

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5548 was developed by Technical Committee ISO/TC 34, *Agricultural food products*, and was circulated to the member bodies in March 1979.

It has been approved by the member bodies of the following countries :

Australia	France	New Zealand
Austria	Germany, F. R.	Romania
Belgium	Hungary	South Africa, Rep. of
Bulgaria	India	Spain
Canada	Israel	Thailand
Chile	Kenya	Turkey
Cyprus	Korea, Rep. of	United Kingdom
Czechoslovakia	Libyan Arab Jamahiriya	Yugoslavia
Egypt, Arab Rep. of	Malaysia	
Ethiopia	Netherlands	

No member body expressed disapproval of the document.

Caseins and caseinates — Determination of lactose content — Photometric method

1 Scope and field of application

This International Standard specifies a photometric method for the determination of the lactose and other soluble carbohydrates content of caseins and caseinates containing less than 2,0 % of total soluble carbohydrates.

2 References

ISO/R 707, *Milk and milk products — Sampling*.

ISO 3310/1, *Test sieves — Technical requirements and testing — Part 1 : Metal wire cloth*.

3 Definition

lactose content of caseins and caseinates : The content of total soluble carbohydrates, expressed as anhydrous lactose as a percentage by mass, determined by the procedure described in this International Standard.

4 Principle

Dissolution of a test portion

- in hot water in the case of caseinates;
- in hot water with the addition of sodium hydrogen carbonate in the case of acid caseins;
- in hot water with the addition of pentasodium triphosphate in the case of rennet casein.

Precipitation of the casein with acetic acid and sodium acetate solution at pH 4,6, followed by filtration to obtain a protein-free solution of the carbohydrates. Addition of phenol solution and concentrated sulphuric acid to an aliquot portion of the filtrate, thus producing a colour which is proportional to the amount of carbohydrate present, and photometric measurement at a wavelength of 490 nm.

5 Reagents

All reagents shall be of recognized analytical quality. The water used shall be distilled water or water of at least equivalent purity.

5.1 Sodium hydrogen carbonate (NaHCO_3) (for analysis of acid casein).

5.2 Pentasodium triphosphate ($\text{Na}_5\text{P}_3\text{O}_{10}$) (for analysis of rennet casein).

5.3 Hydrochloric acid or sulphuric acid, $c(\text{HCl})$ or $c(1/2 \text{H}_2\text{SO}_4) = 0,1 \text{ mol/l}$.

5.4 Acetic acid, 100 g/l solution.

5.5 Sodium acetate solution, $c(\text{CH}_3\text{COONa}) = 1 \text{ mol/l}$.

5.6 Phenol, 80 % (m/m) solution.

Heat a mixture of 8 g of phenol and 2 g of water until the mixture is homogeneous.

5.7 Sulphuric acid, concentrated, ($\rho_{20} 1,84 \text{ g/ml}$).

5.8 Lactose, 20 g/l solution.

Weigh $2,105 \pm 0,001 \text{ g}$ of lactose monohydrate, corresponding to 2,00 g of anhydrous lactose, into a 100 ml volumetric flask, dissolve in water, make up to volume and mix well. Store the solution at 0 °C.

6 Apparatus

Usual laboratory equipment, and in particular :

6.1 Analytical balance.

6.2 Conical flasks, of capacity 100 ml.

6.3 One-mark pipettes, of capacity 1, 2 and 10 ml.

6.4 Micropipettes, of capacity 0,2 ml, with 0,001 ml divisions.

6.5 Graduated pipettes, of capacity 25 ml.