STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 2300.2.11—1990
Methods of chemical and physical testing for dairying industry
Method 2.11: Liquid milks—Determination of density and estimation of solids-not-fat (SNF)—Hydrometer method

RECONFIRMATION NOTICE

Technical Committee FT-024 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 22 November 2016.

The following are represented on Technical Committee FT-024:

Australian Chamber of Commerce and Industry
Australian Institute of Food Science and Technology
Meat and Livestock Australia
National Association of Testing Authorities Australia
National Measurement Institute

NOTES

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Australian Standard®

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PREFACE

This Standard was prepared by the Standards Australia Committee on Chemical Analysis of Dairy Products to supersede AS N40 *Density hydrometers for use in milk*, Part 2-1962: *Methods*, which was an endorsement of British Standard BS 734: Part 2:1959.

The method given in this Standard is confined to measuring density of milk with fat in the liquid state. The method for measuring density when the fat is in the solid state which was also given in the superseded Standard is not commonly used and has been omitted.

The tables for reading off SNF content have also been deleted and an equation is used for estimating SNF content.

FOREWORD

The density of milk, held at 20°C or below after leaving the cow, slowly increases to a maximum (Recknagel phenomenon), due mainly to the gradual solidification of the fat. The density of a milk will therefore vary with the duration and temperature of storage. This variation can be overcome by ensuring that the fat is either completely in the liquid state or completely in the solid state.

The original method had as its theoretical basis the equation established in 1895 by H. Droop Richmond which relates the milk's total solids content to its fat content and specific gravity (measured at 15.5°C with the fat in the solid state). Richmond's equation was modified to allow for substitution of density at 20°C for specific gravity at 15.5°C. No allowance was made for the change in state of the fat, although the density of a milk is less when the fat is in the liquid state than when in the solid state. This omission was deliberate, since it was known that when Richmond's equation is applied to density readings obtained with the fat in the solid state, it gives higher figures for total solids than those obtained by modern gravimetric methods. However, subsequent investigations showed that the use of the modified equation with the fat in the liquid state over-compensates for the high figures obtained by Richmond's method, and usually gives lower results for total solids than those obtained gravimetrically. Other investigations have been carried out in which the density was determined with fat in the solid state.

This standard method measures the density of milk when the fat is in the liquid state and the equation for calculating solids-not-fat is only for use with such density readings and not for density measurements when the fat is solid. The equation gives values that are, on average, in close agreement with those obtained by gravimetric methods.

The basis of calibration of the hydrometers, namely density in grams per millilitre at 20°C in a liquid with a surface tension of 46 mN/m, has become established in the dairy industry and is retained in this Standard. The value 46 mN/m is an average for the surface tension at 20°C of freshly formed surfaces of milk, i.e. the surface obtained by pouring milk into a vessel until some has overflowed. The surface tension of such milk surfaces may vary by about ±4 mN/m from the mean value of 46 mN/m. If the milk is not allowed to overflow, the surface has a slightly lower and more variable surface tension.