Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.
AN INVESTIGATION OF FACTORS AFFECTING THE COMPOSITION OF MILK AND OF METHODS FOR THE ANALYSIS OF MILK COMPONENTS.

by

G.M. WALLACE

A thesis presented to Massey University
in partial fulfilment of the requirements of the degree of

DOCTOR OF PHILOSOPHY

Massey University,
Palmerston North,
New Zealand.

1966
This thesis is presented in two main parts.

(1) A study of the solids-not-fat content of milk and of some methods for the determination of Solids-not-Fat and Protein.

(2) A study of sampling frequency and the prediction of protein production in milk from dairy cows based on a restricted frequency of sampling.
INDEX

PART I

PART I : INDEX

PART II

PART II : INDEX
PART I.

A STUDY OF THE SOLIDS-NOT-FAT CONTENT OF MILK AND OF SOME METHODS FOR THE DETERMINATION OF SOLIDS-NOT-FAT AND PROTEIN.
PART I : INDEX

Introduction 6
Meeting the minimum legal requirements for S.N.F. 9
Analytical Investigations 10
A. The quantitative relationship in the dilution of sulphuric acid in the region of density 1.84 - 1.80. 12
B. The development of the hydrometric method for determining the S.N.F. content as a more precise analytical method. 13
   (a) Design of a nomograph relating S.N.F. fat and density. 14
       A nomograph for calculating S.N.F. content of milk from density hydrometer readings and fat percentage. 15
   (b) Examination of the hydrometric technique. 15
       Application of the hydrometric method of analysis to the estimation of solids-not-fat production. 17
       Use of hydrometric technique in estimating S.N.F. content of milk. 18
C. An investigation of the amido black technique for protein analysis and of its potential as a routine method. 19
Conclusion 21
Appendix - The use of the amido black technique for protein analysis. 23

Results I. Steinsholt technique
   (A) Suitability of dye 24
   (B) Determining blank 24
   (C) Relationship with Kjeldahl values 25
   (D) Effect of delays in reading 27
   II. Miniaturised technique 29
   III. Application of miniaturised technique to commercial samples. 30
   IV. Estimation of protein content of commercial samples by modified miniaturised technique. 31
Discussion 34
References 37
Appendices (a) Protein analysis by amido black (Steinsholt) 38
(b) Official Friesland Method (Posthumus) 40
(c) Modified Steinsholt technique 41
(d) Miniaturised modified Steinsholt technique 42
(e) Effect of variation of technique on precision of measurement. 43