

A COURSE IN FOOD ANALYSIS

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A course in food analysis by Andrew L. Winton

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ANDREW L. WINTON

**A COURSE IN
FOOD ANALYSIS**

**WORKS OF
ANDREW L. WINTON.**

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The Microscopy of Vegetable Foods.

With Special Reference to the Detection of Adulteration and the Diagnosis of Mixtures. By ANDREW L. WINTON, Ph.D., with the Collaboration of Dr. JOSEF MOELLER, Professor of Pharmacognosy, and Head of the Pharmacognostical Institute of the University of Vienna, and KATE BARBER WINTON, Ph.D. xiv + 701 pages, 6½ by 10, 635 figures. Cloth, \$6.50 net.

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A COURSE IN
FOOD ANALYSIS

BY
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ANDREW L. WINTON, Ph.D.

AUTHOR OF THE MICROSCOPY OF VEGETABLE FOODS; REVISER OF
LEACH'S FOOD INSPECTION AND ANALYSIS; TRANSLATOR OF
HANAUSEK'S MICROSCOPY OF TECHNICAL PRODUCTS.

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1917

PREFACE

THE purpose of this book is first to start the chemical student on the right road to the intelligent use of more extensive works and thereby become a professional food analyst, and second, to meet the needs of the general student who takes up food analysis partly for mental and manual discipline and partly because of its bearing on subjects such as agriculture, food manufacture, nutrition, and household economics. Although the detailed instructions may seem more adapted to the wants of the student of the second class, whose training may have been limited to class room and laboratory work in general chemistry, it is believed that no one will find them too explicit.

The fact that a course in qualitative analysis requires a full semester of laboratory work and an abridged course in quantitative analysis another semester deters many who would otherwise avail themselves of the excellent systematic training these subjects afford. Such students may find that an introductory course in food analysis, requiring but forty laboratory periods such as this book contemplates, furnishes not only the requisite discipline, but also a general insight into the composition and microscopic structure of products needed in everyday life.

While inorganic methods have a certain degree of sameness, being largely based on precipitation or titration, the methods of food analysis include extraction, polarimetric, colorimetric, centrifugal, and distillation processes, thus furnishing training in versatility. Although the methods selected are but a few of those in the literature, they are the ones most generally used and least liable to become obsolete through change in trade practices or official rulings. After they have been thoroughly

mastered the analyst should be able to undertake at once the bulk of the work of most food laboratories. In order that he may have a clear conception of the whole subject and be able to use intelligently the literature, the principles of other important methods are briefly considered.

As some of the apparatus is not ordinarily found in the analytical laboratory care has been taken in describing it so that it can be accurately specified in ordering from the dealer. Lists of apparatus, reagents, and materials for analysis, required for the course, are given in the appendix.

While the chapters are arranged in their logical sequence, thus seeking gradually to develop the subject and bring out clearly general principles, a rigid adherence to this order by all the members of a large class would necessitate the duplication of expensive apparatus. To meet this difficulty the matter has been so arranged that it can be divided into five sections, each of which can be assigned to a group of six students, and thus one saccharimeter, one refractometer, one Westphal balance, one tintometer, one calorimeter, one polarizing microscope, six ordinary microscopes, and certain pieces of multiple apparatus be made to do duty for a class of thirty students.

Although the laboratory work may seem at first sight more than can be carried out in the time allowed, the author knows from experience that with reasonable diligence on the part of the student it can be accomplished in a satisfactory manner provided he is not called upon to prepare reagents or standardize solutions.

As an example in ethics too often neglected, if for no other reason, care has been taken in describing methods to give the names of authors and original references, although unnecessary foot notes have been avoided. Analyses of typical foods have been drawn from the compilations of Atwater and Bryant, Doane and Lawson, Farrington and Woll, Jenkins and Winton, and Koenig, also from the bulletins of Frear, Given, and Broomell, Merrill and Mansfield, and others. The constants of fats and oils are largely those given by Lewkowitsch.

Grateful acknowledgment is also due the author's friends Dr. C. A. Browne, Prof. E. M. Chamot, Prof. T. F. Hanausek, Prof. Josef Moeller, and others for the use of cuts. Free use has been made of matter in Leach's Food Inspection and Analysis, both that inserted by Mr. Leach during his lifetime and by the author in his revisions. The efforts of friends are thus again joined in the same cause.

WILTON, CONN.,

March, 1917.

CONTENTS

The star designates sections devoted to laboratory work.

CHAPTER I

	PAGE
INTRODUCTION.....	1-9
Foods: Animal, 1; Vegetable, 2; Mineral, 4; Calories, 4. Food Analysis: Province; Limitations; Literature, 5; Laboratory Work, 7; Division of Class, 8.	

CHAPTER II

DAIRY PRODUCTS.....	11-31
Milk: Composition, 11; Colostrum; Value; Standards, 12; Sampling, 13; *Practice Material; *Specific Gravity, 14; Solids, *Dish Method, 15; *Asbestos Method, 16; Fat; *Babcock Test, 18; *Formoldehyde, 20; *Ether Extraction, 21; *Calculated Solids; *Boric Acid; Protein; Lactose, 25. Butter: Composition; *Preparation of Sample, 26; *Water; *Fat; *Card; *Ash, 27; Gooch Crucible, 28. Cheese: Composition, 29; Analysis, 30. Condensed Milk: Analysis, 30. Ice Cream, 30; Analysis, 31.	

CHAPTER III

MEAT AND FISH.....	33-40
Meat, Fish, and Eggs: Constituents, 33; Composition, 34. Meat Extracts, 34. Preservatives, 36. *Sulphur Dioxide, 38.	

CHAPTER IV

NATURAL VEGETABLE FOODS AND MILL PRODUCTS.....	41-81
Groups of Constituents, 41; Criticism of Methods; *Practice Material, 42. Composition: Cereals; Legumes; Oil-seeds, 44; Vegetables; Fruits; Nuts, 45; Spices, 46. Sample: *Drawing, 46; *Preparation, 48; *Care of, 49. Moisture: Variation; Consideration of Methods, 50; *Drying in Hydrogen, 52; Method for Spices, 55. Fat: Constituents, 55; Principles of Methods; *Ether Extraction, 56; Method for Spices, 59. Crude Fiber: Nature, 59; *Henneberg Method, 60. Protein: Nature, 63; *Kjeldahl Method, 65; Standard Acid and Alkali, 70; Gunning-Arnold Modification, 72. Ash: Constituents, 72; *Method, 73. *Nitrogen-free Extract, 74. Starch: Chemical Properties, 74; *Method, 75.	

	PAGE
<i>Pentosans</i> , 77. Flour : Testing, 77. Yeast , 78. Baking Powder : Constituents, 78; Reactions; *Practice Material, 79; Tests for * <i>Sul-</i> <i>phates</i> ; * <i>Phosphates</i> ; * <i>Aluminum Salts</i> , 80; * <i>Starch</i> , 81.	
CHAPTER V	
MICROSCOPIC EXAMINATION OF VEGETABLE FOODS.....	83-125
Introduction: Province, 83; Microscope, 84; Microscopic Accessor- ies, 85; *Calibration of Micrometer, 86; Mounting, 87; Observation, 88. Microscopy of Starches: Nature of Starch Grains, 88; * Wheat Starch ; * Oat Starch ; * Bean Starch ; * Corn Starch ; * Potato Starch ; * Cassava Starch , 92. Typical Foods: *Practice Material, 93; * Wheat , 94; * Rye , 99; * Oats , 100; * Corn , 101; * Buckwheat , 103; * Peas , 105; * Cotton Seed , 106; * Flax Seed , 110; * Black Pepper , 112; * Cayenne Pepper , 114; * Cinnamon , 115; * Ginger , 116; * Coffee , 118; * Cocoa , 120; * Tea , 122. * Mixtures , 122.	
CHAPTER VI	
SACCHARINE PRODUCTS.....	127-138
Sugar : Characters, 127; Saccharimeter, 128; * <i>Polarization</i> , 130. Molasses, Syrups, and Honey : Composition; *Practice Material, 133; * <i>Sucrose</i> by Polarization, 134; * <i>Solids</i> by Refraction, 135. Maple Prod- ucts , 135. Fruit Syrups : <i>Artificial Colors</i> ; *Practice Material, 136; * <i>Wool Test</i> , 137; * <i>Cochineal Test</i> , 138.	
CHAPTER VII	
FATS AND OILS.....	139-161
Constitution; Oxidation and Halogen Addition, 139; Saponification, 140; Solubility and Volatility of Fatty Acids, 141. Edible Fats and Oils : Constants, 141; *Practice Material, 142; * <i>Specific Gravity</i> with Westphal Balance, 144; * <i>Refractive Index</i> ; Refractometer, 146; * <i>Hal-</i> <i>phen Reaction</i> , 150; * <i>Baulouin Reaction</i> , 151; * <i>Iodine Number</i> , 152; * <i>Saponification Number</i> , 155; * <i>Volatile Fatty Acids</i> , 157; <i>Polenske</i> <i>Number</i> ; <i>Other Constants</i> , 159; Hydrogenation, 161.	
CHAPTER VIII	
FRUITS, FRUIT PRODUCTS, LIQUORS, AND VINEGARS.....	163-178
Constituents: Sugars; Acids, 163; Starch; Oil; Fiber; Alcohol; Solids, 164; *Practice Material 165. Fruit Juices : * <i>Solids</i> , 166; * <i>Sugar</i> , 167; * <i>Acidity</i> , 168. Wine, Cider, and Other Liquors : Fermen- tation, 168; Analysis, 170; Composition, 171; * <i>Alcohol</i> , 172; * <i>Solids</i> ; * <i>Acidity</i> , 174. Vinegar : Kinds, 174; Manufacture, 175; Composition, 176; * <i>Solids</i> ; * <i>Acidity</i> , 177. Various Fruit Products : Analysis, 177; Preservatives, 177.	