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**Título:** Practical Spectroscopy In Agriculture And Food Science

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**Sinopsis**

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This monograph introduces the students and specialists of agricultural and food science to the fundamentals of optical spectroscopy, main principles of modern spectroscopic instrumentation, advantages and practical applications of spectroscopic methods to investigation of agricultural objects such as milk and dairy products, eggs, honey, animal hair, and agronomic plants.

Contents

Fundamentals of Spectroscopy

Optical Radiation; The Interaction of Light and Agricultural Object; Quantum Theory; Atomic Absorption and Emission; Molecular Absorption and Emission; Electronic Energy Levels; Vibrational Energy Levels; Processes of Deactivation; Spectroscopy; Summary

Laser: Principals and Mechanisms of Action

Principle of Action; Pumping; Spontaneous Emission; Stimulated Emission; Absorption; Inversion

of Population; Components of Laser; Formation of Laser Radiation; Properties of Laser Radiation;

Summary

Spectroscopic Methods

Absorption/Transmission Spectroscopy; Light Reflection; Luminescence; Scattering; Summary

Spectroscopic Analysis of Milk and Dairy Products

Properties of Milk; Infrared Spectrophotometry of Milk and Dairy Products; Instrumentation; The

Results of Infrared Spectrophotometry of Milk and Dairy Products; Infrared Spectrophotometer for

Milk Analysis; Near Infrared Spectroscopy of Milk and Milk Components; Instrumentation; The Results of Near-Infrared Spectroscopy of Milk; Fluorescence Spectroscopy of Milk and Milk

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Components; Instrumentation; The Results of Fluorescence Spectroscopy of Milk; Identification of Milk Fluorophors; Fluorometers for Milk Analysis; Laser Light Scattering by Milk Particles; Instrumentation; The Results of Light Scattering by Milk Particles; Summary

**Spectroscopic Analysis of Eggs**

Properties of Eggs; Current Problems of Eggs Quality Evaluation; Absorption/Transmission Spectroscopy of Eggs in Visible Part of Spectrum; Fluorescence Spectroscopy of Eggs; Defectoscopy of Eggshell; Instrumentation; The Results of Spectroscopic Analysis of Eggs and Eggshell; Summary

**Spectroscopic Analysis of Honey**

Properties of Honey; Spectroscopic Analysis of Honey; Honey Samples; Instrumentation; The Results of Spectroscopic Analysis of Honey; Summary

**Spectroscopic Analysis of Animal Hair and Bird Feathering**

Properties of Animal Hair-Covering; Hair Samples; Instrumentation; The Results of Spectroscopic

Analysis of Animal Hair; Selection in Cattle-Breeding; Laser Control of Bird Feathering; Summary

**Spectroscopic Analysis of Agronomic Plants**

Laser Spectrofluorometry of Agronomic Plants; Instrumentation; The Results of Laser Spectrofluorometry of a Single Leaf; Fluorescence Induction Kinetics; Instrumentation; The Results of Detection of Chlorophyll Fluorescence Kinetics; Vector Method of Fluorescence Analysis of Plants Under Stress Conditions; Summary