

# Preface

Emulsifiers have traditionally been described as ingredients that assist in formation and stabilization of emulsions. The definition, however, may be expanded to include mixing of mutually insoluble phases. Foams (gas in liquid or solid) and dispersions (solids in liquids or other solids) may be stabilized by emulsifiers. For this reason, the terms emulsifier and surfactant are used interchangeably.

The first emulsifiers were naturally occurring surface-active proteins, such as egg or casein. With advances in chemical and engineering technologies, the array of emulsifiers has been greatly expanded. Applications to food products have enabled the widespread distribution of packaged foods. Selection and design of emulsifiers was done by experienced product developers who were familiar with the behavior and interactions of each emulsifier. Over the past few decades, tremendous progress has been accomplished in the fundamental understanding of emulsions, dispersions and foams.

This book has focused on the design and application of emulsifiers as versatile food ingredients. The second edition has updated and expanded applications, from both theoretical and practical perspectives. The first three chapters describe design, synthesis, analysis, and commercial preparation of emulsifiers. Synergistic and antagonistic interactions with other food ingredients, such as carbohydrates, proteins, and water, are discussed in the next three chapters. The remainder of the book provides detailed descriptions of food product categories and quality benefits obtained by emulsifier systems. Dairy, infant nutrition, bakery, confectionery, and margarine products are included. Chapters on nutrition improvement (e.g., fat reduction) and processing techniques have been included.

Innovation in the food industry is progressing rapidly in response to economic, demographic, nutritional, and regulatory pressures. Many third world countries are undergoing dramatic economic development. This could stimulate demand for convenient packaged food products. At the same time, a contrarian trend toward natural, minimally processed foods is occurring in developed countries. An aging population has created a demand for functional foods. Some products (e.g., yogurt) are delivery vehicles for therapeutic agents. Global trade has stimulated calls for uniform safety and nutrition regulations. Food emulsifiers are versatile ingredients that may be valuable tools to address these challenges.

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