Dairy Fat Products and Functionality

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Editors

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Preface

Bovine milk fat is an important dairy component which is consumed by human infants and adults via various dairy products such as milk, milk powder, cream, cheeses, and butter. Apart from the major physiological role of milk fat in delivering human nutrition and providing health benefits, milk fat also plays as a pivotal functionality controlling role in many dairy products. The biological membrane surrounding milk fat globules has been found to have interesting applications in food formulation innovations, human nutrition, and paediatrics. Therefore, understanding the fundamental science and technology of milk fat is of great importance not only from a scientific point of view but also with regard to the economic impact of milk fat, especially in fat-rich products. The intention of this book is to provide readers with recent and outstanding literature in important areas of dairy fat containing products and functionality. This book represents a valuable source of information for students, academics, and industry personnel who work in the fields of dairy lipids and dairy fat products.

In this book, 24 chapters have been organised into three main themes: (1) dairy fat chemistry and nutrition, (2) dairy fat physics and materials science, and (3) dairy fat processes and products. In the first theme, fascinating insights into milk fat globule membrane such as structure, lipidomic characterisation, and applications are presented. Physiochemical characterisation, lipase action, adulteration, and digestibility of milk lipids are also covered. The second theme provides excellent fundamentals in physical properties of milk fat such as crystallisation, rheology, and microstructure aspects. It also highlights relatively new research areas driven by material science approach in dairy fats, where innovative dairy products and the new generation of dairy ingredients can be tailor-made. Cutting-edge topics on tribology of dairy fat products, oil structuring in dairy fat products, manipulation of differentiated-sized milk fat globules, and production of human milk fat substitutes from dairy fats are featured in dedicated chapters. The third theme presents comprehensive reviews on the relationship among processes—structure—functionality in dairy fat products towards new developments in manufacturing processes and health-promoting dairy products. The last theme also focuses on the importance of

milk fat as a key quality controlling factor in the manufacturing of butter, ghee, dairy cream, dairy powder, cheeses, and aerated products.

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