Baked Products:
Science, Technology and Practice

Stanley P. Cauvain and Linda S. Young

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We dedicate this book to the memory of our parents
Stanley W. and Theresa P. Cauvain
and
John H. and Doris L. Hughes
and in doing so recognise the importance of their support and encouragement during our formative years.

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Preface

From the start, we recognised that writing one book to cover the world of baked products was an impossible task; there are so many types of products and variants that to cover all the necessary details would require the production of an encyclopaedia. There are many books and papers that cover the details of the various groups of baked products so why produce another one?

Between us we have spent over 65 years working in and with the baking industry on its technology and production processes. During that time our research experiences alerted us to the value for individual companies and the baking industry as a whole of having the body of baking knowledge assembled in appropriate forms. In some cases the most appropriate form is the written word while in others computer-based solutions can be more relevant. Whatever the final form, gathering and systemising the available knowledge is the first and most critical step in the process.

When studying baking technology, one is immediately struck by the complexity and detail that separate the various sub-groups that comprise the world of bakery products; inevitably 'knowledge products' have to address that level of complexity and detail. In all cases, a knowledge of ingredients, recipes, processing methods and equipment is essential to the successful manufacture of products. While appreciating the complexity that characterises bakery products, it is also the case that there are scientific and technical issues which cross the boundaries between the sub-groups.

The need for detailed scientific and technical information in the development of new bakery products is obvious. However, the rules that are used by the developer tend to be product-based rather than technology-based and it was such observations that provided the impetus for this book. One objective was to deal with the common themes that link the various sub-groups of bakery products, as a means of identifying ways of developing new products and processes. This requires thinking 'outside of the boxes' in which we classically put bakery products. In doing so, some of the low-level detail for many individual products is not discussed in this work; to get that detail we

recommend that readers access some of the texts suggested in the Further Reading section.

In attempting this work, we have tried to challenge some of the conventional approaches used in discussing the manufacture of baked products. In doing so we do not wish to denigrate the approaches and work of many individuals who have attempted to discuss this complex subject; we do so more in the spirit of research, to see if, by taking an alternative approach, we can add to the knowledge base that can be applied to the manufacture of baked products. We hope that we have done so and that the approach we have used sparks the creative talents of those working in the baking industry and so bring future benefits to manufacturers and consumers.

Chapter 1

Current Approaches to the Classification of Bakery Products

Introduction

The term 'baked products' is applied to a wide range of food products, including breads, cakes, pastries, cookies and crackers and many other products, and it can be difficult to identify a common thread linking the members of such a diverse group. The most commonly-identified link is that they all use recipes that are based on wheat flour. This definition, though, would need to be expanded to include baked goods such as gluten-free products, used by people with coeliac digestive disorders, or rye bread, which are still considered to be baked products even though they are based on cereals other than wheat. However, the same leniency of definition could hardly be extended to include meringues, which contain no cereal-based material at all, let alone wheat flour, their main components being sugar and egg white. It may be more appropriate to consider that baked products are those products which are manufactured in a bakery, that is the place of manufacture defines the product rather than some ingredient, recipe or process feature.

One view is that baked products should be defined as having undergone heat processing – baking – which causes changes in both form and structure. This is certainly true for the many different base products manufactured in bakeries. Some exceptions to this definition might include Chinese steamed breads, some steamed puddings and doughnuts, which are fried, though all of these products do undergo a heat-conversion process. By using the presence of a heat-processing step to characterise bakery goods we can capture some composite products, such as fruit and meat pies, since the fillings in such products do undergo physical and chemical changes as the result of the input of heat. Not captured in the heat-processed definition of those products made in bakeries would be the fillings and toppings that are applied or used after baking. In this category will fall creams and icings, even