Overall conclusions

We noted at the outset that this book was neither an attempt to describe all, nor indeed many, of the processes which are used in the food industry, nor to describe the whole of chemical engineering. Instead, we have tried to outline the key physical and physico-chemical principles which underpin food processes, and we have then tried to show how simple (for the most part) mathematical descriptions – models – can be developed and interpreted on the basis of these principles. The overall intention has been to demonstrate how quantitative understanding is important for process selection, design and operation.

We have laid great stress on the development and use of simplified models. There are several reasons for this emphasis. First, we believe, and have tried to show, that simplified models can provide a very good first basis for assessing processes and their efficiency. Often, a good estimate is sufficient to answer a technical question about the feasibility of a particular process or the advantages of one process technology over another. Even where simplified descriptions are no longer adequate you will find it useful to be able to produce order of magnitude estimates as a check. This is perhaps even more important today when highly sophisticated computer programmes are used routinely for process design and analysis: apparent sophistication or impressively presented results are, in themselves, no guarantee of reliability. Second, there are many food processes where the data available – such as physical properties – are poor. Models are no better than the data they rely on. On the other hand, rough models which recognize the limitations of their data can be very useful. Finally, recognizing that often mathematics can be off-putting, we have tried to minimize the amount of mathematics used in the text. We hope that those who persevere with the mathematics will find that this book gives them a set of tools with which food processes can be analysed.

Having said all that, we hope that the text will prove useful not only to students and professionals in the food industry, but also to chemical engineers. For the latter group we hope that the book will awaken an interest in the problems and challenges posed by food processing, which is after all the largest sector of manufacturing industry and, arguably, the one with most direct impact on our quality of life.

We will be very pleased to receive comments and suggestions on the text. Even though the process of bringing the book to completion has been desperately slow, we are conscious of the many inadequacies that still remain.

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