Wheat: Chemistry and Technology
Editors Discuss the Current State of Wheat Science

Called the “Wheat Bible” in earlier editions, Wheat: Chemistry and Technology has served several generations of cereal scientists. Wheat science has undergone countless new developments over the past 21 years, and this new fourth edition of Wheat: Chemistry and Technology provides the latest information on wheat grain development, structure, and composition. Due to its recent revision, CEREAL FOODS WORLD asked the book’s editors, Khalil Khan and Peter Shewry, to reflect on the state of wheat chemistry and technology today.

Q. What do you see as the most significant development in wheat science since the last edition was published 21 years ago?

A. There are significant developments in many areas of wheat grain research discussed in this book. However, spanning most of the various subject areas, the application of genomics (and other “omics”) technologies provides a massive volume of information. For example, the sequences of genes and proteins and their expression patterns, with the ultimate aim of understanding the basis of wheat “quality” in its many aspects.

Q. With so much new content on the latest information surrounding wheat grain development, structure, and composition, who were the authors that contributed to this book?

A. More than 40 authors from 10 countries, including Australia (6), Belgium (5), Canada (2), Finland (5), France (5), Israel (1), Italy (2), the Netherlands (2), U.K. (7), and the U.S.A. (6), contributed to this edition, bringing together a who’s who list of experts in the field of grain science.
Q. With it taking so many authors to completely rewrite the book, which chapters or authors surprised you?

A. We would not use the word “surprised”—the authors were carefully selected as experts in their field and it was a labor of love for all of them. On a personal note [Peter Shewry remarked], the chapter that I will use most is the one on Grain Carbohydrates. This is because the subject matter is highly relevant for the use of wheat for biofuel production, which is of current interest in many laboratories worldwide. I would also like to take this opportunity to recognize one of the authors of this chapter, Bruce Stone, who died last year. Bruce was a good friend and colleague, as well as an exceptional scientist.

Q. Who will benefit from Wheat: Chemistry and Technology?

A. The last edition was described as the “bible” for cereal scientists, which means that all will benefit—from students to senior scientists (such as ourselves!). Specifically, the vast array of scientific advances in this monograph, would be useful to professionals who have an interest in how wheat evolved as a grain and crop and its domestication and staple as a human food; those who have an interest in grain morphology, development, structure, and grain mechanical properties; those with interests in advances in wheat and flour quality testing and in flour milling technology; those interested in the gluten protein and in proposed structural models and functional properties in baking; those grain nutritionists with interests in micronutrients and phytochemicals; and those scientists with interests in the biochemical components, such as grain proteins, carbohydrates, lipids, and enzymes, and at the molecular level—the transgenic manipulation of grain quality.

Q. What might students find particularly interesting?

A. Because of its comprehensive background, this book would make a useful supplementary text for classes teaching cereal technology, cereal science, cereal chemistry, food science, food chemistry, milling, and nutritional properties of cereals. Cereal and food science graduate students will find the first chapter, Wheat: A Unique Grain for the World, particularly helpful because it provides a succinct summary of wheat chemistry.

Q. Why did you change the format of the fourth edition?

A. The recent developments in wheat science require the more extensive use of color. Therefore, we decided to redesign the format in order to make it more modern in appearance and allow the use of color where required rather than restricted to sections. Plus, there is so much valuable information in this book that a larger format makes it more reader friendly. We think this has worked well—the book is attractive and a pleasure to use.

Q. Looking ahead, what do you predict are the emerging issues and opportunities in wheat science?

A. The massive advances in technologies in the life sciences over the past 20 years provide new opportunities to gain information on the structure, development, and composition of the wheat grain. The real challenge is to relate this information to the biophysical and biochemical properties that determine grain processing quality. In particular, two specific targets may be identified: to improve the stability of yield and quality in a changing and increasingly unstable environment, and the delivery of health benefits to consumers.

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Peter Shewry has studied cereal seeds for more than 30 years. He received his B.S. and Ph.D. degrees at the University of Bristol and moved to Rothamsted Experimental Station (now Rothamsted Research) in 1974. He was director of Long Ashton Research Station from 1989 until its closure in 2003, after which he rejoined Rothamsted as associate director. He was awarded the Osborne Medal in 2000 and the Rank Prize for Nutrition (jointly with D. D. Kasarda) in 2002. Shewry can be reached at peter.shewry@bbsrc.ac.uk.