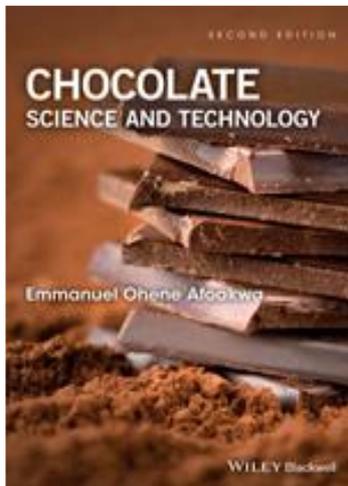


BOOK REVIEW

by

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amikhala@gmail.com**Audrine Mikhala Makaka****Title:** Chocolate Science and Technology 2nd Edition**Author:** Emmanuel Ohene Afoakwa PhD.**Press:** 2016 ©John Wiley & Sons, Ltd.

Chocolate science and technology is an entertaining yet technical book that appeals not only to the confectionery industry but to any food scientist, technologist and “sweet tooth” eager to know what it entails to make chocolate. It is an improvement of the First Edition that had a limited focus on the quality of premium chocolate. The book explores innovative manufacturing process that the chocolate industry has adopted so as to produce sugar-free, single-origin, chocolates.

The twenty chapters are well derived and chronologically presented. It begins with the origin and taxonomy of chocolate through to cultivation, production and consumption patterns. The book details the processing of cocoa as well as the science and organic chemistry involved for quality and premium chocolate products in subsequent chapters.

It is clear that the book targets an audience of the scientific realm, particularly food scientists and to lesser extent botanists/cocoa-bean farmers. The book can also be used as a learning tool for students/persons who wish to be food scientists in the confectionery industry.

The tone and style of writing depicts a learned and informed author. Dr. Emmanuel Ohene Afoakwa is a professor of Food Science and Technology at the University of Ghana and the head of the University’s Department of Nutrition and Food Science.



Prior to this, he worked for Nestlé in their Product and Technology Center in York, United Kingdom. He holds certificates in International Food Law and Regulation as well as Food Quality Management Systems. To crown it all, he is a trained and Licensed Food Auditor at the World Food Safety Organization, which supports the EU, ISO and corresponding accreditation schemes in the implementation of food safety management systems.

Stemming from the author's rich background in food science and technology, Dr. Afoakwa takes the reader through the intricacies of chocolate beginning with the origin of the name and the first chocolate beverage (*chocolatl*) from the Mayans and Aztecs. Readers also get to learn about the history and discovery of native cacao species in tropic humid forests. The author gives a clear picture on how the cocoa plant spread from its origin in the Amazon and Orinoco valley of South and Central America to other parts of the globe, particularly West Africa during the 17th Century, setting the stage for future economies in the region. The author is keen to point out that in Ghana (his country of birth); cocoa is the country's second highest foreign exchange earner and source of livelihood to more than one million cocoa farmers.

One of the main points the author relays is that, the confectionery industry changes with variations in the taste of the consumer ergo; consumer dictates market trends which in turn affect production. In this case, consumers have grown accustomed to high quality chocolate, and are more aware of its health and nutritive benefits in foods. They want more than the basic nutrition out of a food item. Anti-oxidants and flavonoids, which reduce the risk of cancer by decreasing Low-Density- Lipoprotein (LDL) otherwise known as "bad cholesterol", is one of the beneficial components of high quality chocolate discussed. This has led to increasing demand for dark chocolate with high cocoa content, which represents 13% of the total global chocolate market. The term 'organic produce' is another major factor that influences consumers' choice in products. The author has clearly defined the requirements and measures needed to be able to label cocoa beans and a chocolate product as 'organic'.

When it comes to quality and flavor of the end product, several factors that influence the end product from cultivation to packaging are outlined in the book. The author elaborates on the particulars of cultivating good quality cocoa beans in the third, fourth and fifth chapters including cacao breeding techniques; common pests and diseases; and cocoa bean composition. Chocolate enthusiasts are familiar with issues associated with fat bloom and fat crystallization, which spell "doom" for chocolatiers and pose a great challenge in the confectionery world. Dr. Afoakwa offers solutions to these challenges, including outlining temperatures ideal for chocolate tempering and storage for each type of chocolate so as to overcome the aforementioned challenges. The book offers additional advice on troubleshooting key issues that arise during the chocolate production process.

In Chapters six to nine, the author delves into cocoa processing technologies. These chapters are particularly helpful to food scientists, technologists and chocolatiers, as it dwells on terminologies, conditions and equipment that apply to different types of

chocolate products. Notably, chapter nine has some interesting facts on the number and types of bulk chocolate sweeteners and their nutritive benefits.

Chapters eighteen and nineteen have been solely dedicated to food safety issues, spanning physical, chemical and microbial hazards, which are of uttermost importance. These chapters outline regulations and conditions that ensure a manufactured food product is suitable and safe for consumption. The guidelines elaborated in the two chapters work towards ensuring high standards of safety regardless of whether the chocolate is artisan, homemade or from mass factory production. The bottom line is that standards of hygiene have to be maintained and these have been well conveyed in grave detail by the author in these chapters.

Dr. Afoakwa concludes by giving his views on chocolate manufacturing technology operations and processes. He offers recommendations on what and where further research on chocolate should be focused especially in the confectionary industry.

The author seems to have improved the previous edition based on the additional credible content and sources of evidence that well articulate and convey the book's messages. Dr. Afoakwa's enthusiasm for chocolate is evident throughout the book's content and gives invaluable information about processing and manufacturing of cocoa and its products.

Throughout the book, pictorial references and schematic diagrams showing the flow of processes simplify them thus facilitating reader comprehension. Having colored pictures integrated in the texts rather than in the plate section would have further enhanced the reading experience. Still, the pictures do give life to the book. I personally appreciate the author for including nutrition benefits of chocolate. However, I would have loved to see mention of any negative attributes that come with consumption of chocolates for readers to know the 'other side of the coin'.

The second edition of Chocolate Science and Technology is available both as a hard cover printed copy and an e-book which can be accessed and bought at Wiley Blackwell website using the link provided: <http://eu.wiley.com/WileyCDA/WileyTitle/productCd-1444357336.html>. The book costs are a fairly high for students who are some of the target audience, but the availability of the book in institution libraries make it accessible for this academic lot.

I strongly recommend Chocolate Science and Technology as a reference material as well as a learning tool. Due to the nature of the multifaceted aspect of chocolate processing that requires different disciplines involved from the cultivation of raw material to processing and consumption of end product, this book caters for a large target audience.

