

# Accelerating New Food Product Design and Development

SECOND EDITION

Edited by Jacqueline H. Beckley,  
Leslie J. Herzog and M. Michele Foley

**IFT** | Press



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# **Accelerating New Food Product Design and Development**



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**Second Edition**

*Edited by*

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# DEDICATION

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To current and future product designers and developers who seek knowledge from those who learned their lessons by doing the work they have written about. To the business people and educators who are seeking a better understanding regarding how the world of food gets to a table – better, faster, more focused on the needs of the end users.



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# PREFACE

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Innovation today goes beyond new products. To be successful, organizations need to innovate to reinvent every area of the business – systems, processes, technologies, strategies, and business models. This book addresses innovation in developing new products with a focus on challenging the *status quo*, changing how we think about our work, and adapting to meet the business needs. The authors provide unique perspectives based on their personal experiences to the challenging world of new product development. If you want to innovate faster, it's worth taking the time to read through these chapters – you're sure to find a valuable nugget that will change the way you think about your work. Today and tomorrow.

## **How to read this book**

Part I is titled “Understanding Product Development in Today’s Food Industry.” The content in this chapter has strategic implications from a historical, organizational, relational, and philosophical perspective.

Part II is titled “Accelerating Food Product Design and Development.” The content relates to many aspects of implementation of current thinking in food product design from brand, market, process, people, package, and management orientation.

Part III, titled “Optimizing Food Product Design and Development,” provides the reader with more tactical approaches to product design and development. The tactics are made tangible through very specific examples of high level quantification methods used regularly in the implementation phase of product development.

Please enjoy our book. It was fascinating to create this Second Edition.



# Chapter 1

## INTRODUCTION

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*Jacqueline H. Beckley, Leslie J. Herzog, and M. Michele Foley*

“It is hard to fail, but it is worse never to have tried to succeed.”

— Theodore Roosevelt, 26th President of the United States

This book is about change. Its first edition was based on three extremely popular symposia conducted at the Institute of Food Technologists’ annual meetings in the summers of 2004 and 2005. The symposia were developed for the Product Development and the Marketing & Management Divisions and were designed to provide some clarity about the life of food scientists and what tools and thinking these individuals might provide for the future. From those symposia, we were encouraged to create a book and thus the beginning of the *Accelerating* series.

In this second edition, we have kept many of the original chapters and most of our contributing authors thought updates were valuable. A lot has changed in the world of product design and development and in the food industry since 2007. So, update the chapters we have!

Parts I and II are geared toward management and strategy of business people and scientists. Part III today provides updated views on the product development process and includes classic chapters on quantitative methods that are still being used or just might be valuable to re-read for new ways to adapt the new data all of us are using to go fast.

This book fits well within a series of books that Blackwell has published over the last several years. The book has been designed with food industry professionals in mind. In editing the original chapters and adding new ones, the authors were thinking of the following individuals as potential readers:

*Accelerating New Food Product Design and Development*, Second Edition.  
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Director, vice president, or chief technology officer of a product development group  
Investors and owners in new start-up food ventures  
People looking to reinvent food – from the retail perspective through to the consumer experience  
Bench scientists who work to make the product successful  
Professors who teach students to be successful business leaders  
Quality assurance specialists who are responsible for the certification of safe products in a manufacturing facility  
Marketing and marketing research managers  
Products researchers  
Food industry consultant  
Sensory scientists  
... And many more.

Why this very broad definition of our audience? The food industry has a long classic tradition, yet needs to move into the experience-based world of today to maintain relevance with the consumer. Many in the business are concerned about the reemergence of a term called zero based budgeting or ZBB. Why? It seems like it is going to constrain everything. But given its roots in the 1970s (which you can read about in some of our chapters) – it makes perfect sense if you want to accelerate design and development *and* make them sustainable from a financial perspective.

This book seeks to begin to address some of the comments made to the editors during its preparation:

“Most companies are more interested in spending money ‘safely’ without results, than finding the results to save them yet needing to spend money in unconventional ways.” ... read Chapter 7.

“Following the process is more important than finding the solutions.” ... read Chapter 2.

“What bothers me as an action oriented young professional? People in middle to upper management who are unable to make decisions. They fear making the wrong decision or taking a chance, so instead they make no decision at all. This makes the speed at which business takes place very slow, which around here usually results in our missing big opportunities in the marketplace.” ... read Chapter 12.

“When companies are in trouble, their decision making goes from smart to stupid, from rational to irrational.” ... read Chapter 14.

“I strongly believe that in a system of 25 employees, all working on the same project (launch for example) that only 8 of these people are connected well enough to make things happen. The rest of the 25 are the ones who are

constantly looking for help on how to do things, or whom to see to get certain job specific duties completed. They always end up at the desk of one of these 8 ‘connected’ people, who then have to direct them as to whom to see in order to get this done; which more times than not is one of the other 8 ‘doers.’ So wasteful!” Comments by a young packaging engineer at a highly successful and profitable consumer package goods’ company. ... read Chapter 15.

At the time of the symposia, given during two IFT Annual Meetings, many of the writers of these chapters were speakers. They were very specially selected for their range of expertise in the field and for their capability to speak authoritatively on their subjects. It is very rare to get this type of person to write a book chapter. They just won’t take the time. *But they did for this book. And for you.* So, we hope you enjoy the unique perspective that each of these writers takes on his or her storytelling journey.

## **Why Read a Chapter? Why Read a Part? Why Read the Book?**

### ***Part I: Understanding Product Development in Today’s Food Industry***

The world of food continues to change. It is influenced by the way in which information is shared by individuals, companies, and teaching institutions. Here is why you should read Chapters 2–9:

Chapter 2: Diane Toops was an extremely productive food journalist for over 24 years. She passed away in 2012 while still being a productive writer for *Food Processing* magazine. This chapter provides a valuable historical perspective for the journey of the food industry in America from the turn of the last century until early 2000s. This wonderful overview of the key benchmarks in the history of the food industry will provide the reader with a rapid way to see that innovation is not new, but a path the food industry has been on for years and years and years.

Chapter 3: Lynn Dornblaser has been a food journalist for several decades. A number of years ago, she left the print media business (which she and our previous chapter author Diane Toops were colleague trailblazers in) to join a firm called Mintel. Since that time, Lynn has been tracking trends, fads, and all forms of food related topics on a global basis. Reading this chapter gives you a reason to understand why you need to pay attention to trends and not dismiss them as ...FADS!

Chapter 4: Large and small companies augment their knowledge base through the use of active partnerships with companies and individuals who have specific expertise in how to effectively manufacture foods for today’s marketplace. Through the extensive use of examples, Dr. Feicht illustrates various ways to utilize outside resources.

Chapter 5: Research and Development (R&D) organizations are always under pressure to complete more development projects with less resources and fewer people resources. The business climate requires R&D personnel to bring more to their jobs than traditional technical knowledge. The editors, who have extensive industrial experience (both large and small food businesses), have updated this chapter to provide insight on the broad spectrum of skills and capabilities within the R&D organization necessary for companies to compete successfully with limited resource.

Chapter 6: Suppliers of flavors and ingredients play an essential role for product development. This chapter, by individuals at a leading flavor and fragrance company, provides a straightforward and explicit description of the fine dance that exists today between customers and their suppliers with emphasis on the essentials needed to develop a cooperative and mutually beneficial relationship. As the authors suggest, one can then embrace strategic partnership for successful new product launches.

Chapter 7: This chapter offers the opportunity and insight on how leveraging an ingredient supplier who may offer greater success and faster on-shelf presence to capture sustainable market share. The focus is on what the *supplier* sees and what some of the challenges are, and how a client company might be able to further leverage suppliers to help get to the endgame of successful products and their launches faster.

Chapter 8: Starbucks is often acknowledged to be one of those companies that has managed to stay ahead of the curve of profitability and meeting consumer demand. As with many companies the path has not always been a straight trajectory, however, Starbucks has done extremely well over the long term with \$1000 invested when they began their stock offering in 1992, now worth \$230,846 as of October 2015! (The original IPO offer was \$17 a share, they have had six two for one splits, with a net yearly return of 26.68%.) Thus, the perspective updated by the editors from Dr. Larry Wu original chapter provides a unique intimate view on some of the hows and whys of this happening... several years after the speech and the original chapter.

Chapter 9: Yogi Berra, American Baseball Player/manager said: "You can observe a lot just by watching." Young and Harper have been observing and working in the product design and development area for a number of decades for global food companies. In this chapter, they summarize their perspective on Innovation and something that is often confused with it, Invention.

## ***Part II: Accelerating Food Product Design and Development***

To compete in today's marketplace, food product development is under pressure to create innovative new products at a time when there are pressures to cut back on costs, labor, and problem-solving tools. R&D groups are in a

constant mode of development and improvement over the last successes they achieved. Consumers today want choices, but they hate too many choices. They want intelligent marketing but it has to be shorter than a 15-second TV spot. They want uniqueness, but not too different. They want luxury and upscale qualities, but prefer to buy value. Companies need profitability and news, but they need to have it without cost. Research departments have put in new product development processes and encourage their staffs to innovate, yet have reduced the number of suppliers and require that those suppliers provide discounts. Universities have well-trained professors who are under budget constraints. The university programs are good yet lack much grounding in today's business and product development environment. We know that packaging can drive innovation, but we cannot afford the time it takes to get that new film or the mold. What are product developers to do? The trade-offs they face today are tremendous. Chapters 10–15 deal with these subjects and more:

Chapter 10: The tension between marketing and R&D or brands and the products that support them is a long-term battle that continues today. This chapter, on the importance of brand as a foundation for all who wish to have success in the marketplace, is a cornerstone for this next section and attempts to give specifics on approaches that enable acceleration of innovation.

Chapter 11: Both marketers and product developers will have a better understanding of their partnership in driving successful new product development in today's marketplace after reading this chapter.

Chapter 12: We believe that at the heart of accelerating new product development is the way in which new members of the research community are trained. In this chapter, Amanda Kinchla and Dr. Eric Decker provide their views and experiences on how the Department of Food Science at The University of Massachusetts prepares undergraduate and graduate students for careers in product development. They provide insights on what the food industry is seeking in new hires and leverage their partnerships with the food industry to provide opportunities for students to put theory into practice.

Chapter 13: Vahalik and Alfieri present approaches to rapidly understanding the voice of the customer or consumer. The process discussed has worked incredibly well for over two decades. It builds upon the teachings of advocates of rapid, lean, and agile practices. Reviewing the process in total will provide the reader with the strategies they may put into effect in order to become more accurate with consumer understanding whether in the area of food or any other product category.

Chapter 14: Packaging can be an integral part of the product experience. If people hate packaging, they might just hate the product itself and make a decision to not purchase the product ever or ever again. This chapter, written by leaders in the package and product design areas, attempts to provide

a process which allows for integration of package design from the discovery phase of a product, not a secondary consideration at some intermediate stage of the development process.

Chapter 15: Leslie Herzog is a seasoned veteran in the Consumer Packaged Goods (CPG) industry having combined experience in the food industry of over 35 years. From his vantage point and input from other long term observers of this landscape, he explains what works to ensure successful product development teams perform and deliver for companies time and time again.

### ***Part III: Optimizing Food Product Design and Development***

Food scientists are often faced with developing new products such as functional foods marketed toward health-conscious people to meet growing consumer trends. The parameters of the product being developed need to be analyzed in each stage by techniques and processes described previously or through classic approaches that employ data from either instruments or people. Statistical tools are often utilized to determine factors that contribute to product quality, consumer acceptance and rejection, and purchase decisions. The process of developing new products in a systematic way is often time consuming and costly when all factors are taken into consideration. Chapters 16–19 attempt to clarify some of these needs. Several of these chapters should be considered “classic” presentations of methods that may or may not be in “fashion” at the moment. We conclude with a chapter by the editors discussing the past, present, and future of design and development for new food products.

Chapter 16: Since the 1970s, the Product Development Process has been promoted as an approach to make good results more predictive and bad results more avoidable. In this chapter, updated by a researcher who has worked with some of the “best,” we are presented with an updated look at the NPDP process.

Chapter 17: David Moskowitz updating the original Moskowitz and Maier chapter lays out the complete overview of analytical category appraisals for the reader who wants to understand this method thoroughly. This is one of the methodologies that is still viewed by many as a critical step in quantitative new product development.

Chapter 18: The case study approach presented in this chapter allows the reader to fully understand two advanced methods of quantitatively studying consumer response patterns.

Chapter 19: If reviewing one of the classic analysis methods for understanding optimization of a product space written is of interest to you, try



reading this chapter. It was created by a leading expert in the field. This is a classic methods chapter, updated by a current practitioner in the area of statistical design.

Chapter 20: The presentations that these chapters represent are *conversations* that industry professionals who are engaged everyday in work for the food industry would have with you, if they had the time. We have stripped away the clutter that often bogs us down at work (bureaucracy, processes that cost a lot to be implemented and still don't work, and politics of business) to present a summary of thinking at the beginning of a new century. Please enjoy the book.

*Jacqueline, Leslie, Michele*



# **Part I**

## Understanding Product Development in Today's Food Industry



## Chapter 2

# HOW DID THE FOOD INDUSTRY GET (FROM THERE) TO HERE?

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*Diane Toops*

### **Why Read This Chapter?**

Diane Toops was an extremely productive food journalist for over 24 years. She passed away in 2012 while still being a productive writer for *Food Processing* magazine.

This chapter provides a valuable historical perspective for the journey of the food industry in America from the turn of the last century until early 2000s. This wonderful overview of the key benchmarks in the history of the food industry will provide the reader with a rapid way to see that innovation is not new – but a path the food industry has been on for years and years and years.

This is a beautiful valentine that Diane has left for the rest of us! Thank you, Diane.

This chapter discusses the events, technological innovations, trends, and consumer needs that led the food industry from “there” in the late nineteenth century to “here” in the twenty-first century. It also touches on the challenges and opportunities for product developers.

I track trends looking to the future, but looking back over the past 115 years has been quite an education and surprising as well. Some things never change; the overriding trends have been, and continue to be, convenience and good health.

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A 1950s child, I remember that my mom wore a dress and high heels while preparing dinner. She spent her entire day going to the butcher and grocer to buy fresh ingredients, cook them from scratch, and have a balanced meal ready precisely at 6:00 p.m. when my father arrived home from work. Fortunately, feeding my family is a great deal more convenient today.

We know the food industry does not lead trends, it responds to world events and consumer needs by developing innovative technologies and foods that solve problems and deliver what the consumer wants. That is as it should be.

## **Turn of the Century**

Before the turn of the twentieth century, America was a rural, farm-based economy. Seventy percent of the population, some 60 million Americans, farmed the land and most of them ate the vegetables they grew and livestock they raised (Food for Thought, 1998, pp. 1–8).

Today, almost 294 million Americans (USDA, 2004) can purchase an incredible variety of inexpensive foods at their local supermarket. Food processors, retailers, and a sophisticated distribution chain make that possible. In fact, American families last year spent just 10% of their disposable income on food (USDA, 2004). That's probably the lowest percentage in the world.

## **Looking in the Fridge**

Let's compare the contents of the fridge today to those in 1918 (Frigidaire, 2003). Redefining home convenience, Frigidaire introduced the refrigerator in 1918. A peek inside shows everything is fresh, homemade, and nutritious and will quickly spoil (Table 2.1). Today's mom has options; foods have a longer shelf life and are more conveniently packaged, and many foods no longer have to be refrigerated. Eggs are in both refrigerators, but today they might be organic, free-range, brown or white, pesticide-free, or enhanced with omega 3s. Certainly, they will not spoil as quickly.

American food professionals should pat themselves on the back. Through their innovations, products have extended shelf life, and foods are safer, more affordable, and available to people all over the world. That said, let's go back for a quick study of how we got from "there to here."

## **1889 to 1899 – New Options for Mom**

In the late 1890s, millions of immigrants poured in from western and eastern Europe, bringing new cuisines and recipes. The first transcontinental railroad transportation system was completed. To accommodate the needs of a growing population, manufacturing plants proliferated. As more people spent