Product development, from refining an established product range to developing completely new products, is the lifeblood of the food industry. It is, however, a process fraught with risk, often ending in failure. What are the keys to making the process a success? Based on a wealth of experience gathered over 40 years, Food Product Development provides the answers. After an introductory chapter, the first half of the book considers the four core elements of product development: the overall business strategy which directs product development, the various steps in the product development process itself, the knowledge required to fuel the process and, last but not least, keeping product development focused on consumer needs and aspirations. The second part of the book looks at managing the product development process in practice with four case studies of successful product launches. It also discusses how to evaluate and improve the process to make future product innovation more successful. Filled with examples and practical suggestions, and written by a distinguished team with unrivalled academic and industry expertise, Food Product Development will be an essential guide for R & D and product development staff, and all managers concerned with this key issue throughout the food industry. Mary D. Earle and Richard L. Earle are both Professors Emeritus in Massey University, New Zealand. Mary Earle is a pioneer in product development research, and both she and her husband have worked with industry on numerous product development projects. Allan M. Anderson is Chief Executive of the New Zealand Dairy Research Institute, the central R & D organisation for the New Zealand dairy industry, and has extensive experience of managing successful product development projects.

Sensory evaluation is a scientific discipline used to evoke, measure, analyse and interpret responses to products perceived through the senses of sight, smell, touch, taste and hearing. It is used to reveal insights into the way in which sensory properties drive consumer acceptance and behaviour, and to
design products that best deliver what the consumer wants. It is also used at a more fundamental level to provide a wider understanding of the mechanisms involved in sensory perception and consumer behaviour. Quantitative Sensory Analysis is an in-depth and unique treatment of the quantitative basis of sensory testing, enabling scientists in the food, cosmetics and personal care product industries to gain objective insights into consumer preference data—vital for informed new product development. Written by a globally-recognized leader in the field, this book is suitable for industrial sensory evaluation practitioners, sensory scientists, advanced undergraduate and graduate students in sensory evaluation and sensometricians.

Sensory characterization is one of the most powerful, sophisticated, and extensively applied tools in sensory science. Descriptive analysis with trained assessors has been traditionally used for sensory characterization. Due to the cost of time and money required for its application, several novel methodologies, which do not require training, have been recently developed and are gaining popularity as quick and reliable options for gathering sensory information. These methodologies enable the study of consumers' perceptions of the sensory characteristics of products. However, information on these techniques is scattered in scientific journal articles, which hinders their application and creates a need for a book to assemble the details of the latest advances. Novel Techniques in Sensory Characterization and Consumer Profiling provides a comprehensive overview of classical and novel methods for sensory characterization of food and nonfood products. The book presents the history behind descriptive analysis, describes the most common novel methodologies and detailed information for their implementation, and discusses examples of applications and case studies. It also includes an introduction to exploratory multivariate analysis, addressing the theory and application of some of the most useful multivariate statistical tools applied in the analysis of consumer profiling data sets. Most of the data analysis is implemented in the statistical free software R, making the book accessible to readers unfamiliar with complex statistical software. Chapters examine a range of techniques including the ideal profile method, just-about-right scales in consumer research, free choice profiling, flash profiling, and repertory grid methods. They cover emerging profiling methods, such as sorting, and projective mapping or Napping®. Other techniques less frequently used for sensory profiling are also considered: the application of open-ended questions for sensory characterization, polarized sensory positioning, and the consumer-friendly check-all-that-apply questions. In addition, dynamic sensory characterization methods, useful for studying temporal aspects of in-mouth sensory perception, are described. The final chapter provides a critical comparison of the methodologies discussed, their advantages and disadvantages, and general recommendations for their application.

The olive oil market is increasingly international. Levels of consumption and production are growing, particularly in new markets outside the Mediterranean region. New features of product optimization and development are emerging, and along with them new marketing strategies, which benefit from a clear understanding of the sensory aspects of foods, as well as adequate sensory techniques for testing them. Recently developed sensory methods and approaches are particularly suitable for studying the sensory properties of olive oils and their function in culinary preparation or in oil-food pairing. Each chapter of Olive Oil Sensory Science is written by the best researchers and industry professionals in the field throughout the world. The book is divided into two main sections. The first section details the appropriate sensory methods for olive oil optimization, product development, consumer testing and quality control. The intrinsic factors affecting olive oil quality perception are considered, as well as the nutritional, health and sensory properties, underlining the importance of sensory techniques in product differentiation. The agronomic and technological aspects of production that affect sensory properties and their occurrence in olive oil are also addressed. Sensory perception and other factors affecting consumer choice are discussed, as is the topic of olive oil sensory quality. The second part of this text highlights the major olive oil producing regions of the world: Spain, Italy, Greece, California, Australia/New Zealand, and South America. Each chapter is dedicated to a region, looking at the
geographical and climatic characteristics pertinent to olive oil production, the major regional olive cultivars, the principle olive oil styles and their attendant sensory properties. Olive Oil Sensory Science is an invaluable resource for olive oil scientists, product development and marketing personnel on the role of sensory evaluation in relation to current and future market trends.

This work introduces the concept of reformulation, a relatively new strategy to develop foods with beneficial properties. Food reformulation by definition is the act of re-designing an existing, often popular, processed food product with the primary objective of making it healthier. In recent years the concept of food reformulation has evolved significantly as additional benefits of re-designing food have become apparent. In addition to targeting specific food ingredients that are considered potentially harmful for human health, food reformulation can also be effectively used as a strategy to make foods more nutritious by introducing essential macro/micro-nutrients or phytochemicals in the diet. Reformulating foods can also improve sustainability by introducing "waste" (and underutilized) ingredients into the food chain. In light of these developments, reformulating existing foods is now considered a realistic and attractive opportunity to provide healthy, nutritious, and sustainable food choices to the consumers and likewise improve public health. Indeed reformulation has now become essential in many cases for redressing the health properties of foods that are popularly consumed and significantly affecting public health. This edited volume covers aspects of food reformulation from various angles, exploring the role of the food industry, academia, and consumers in developing new products. Some of the major themes contributors address include methods of reformulating food products for health, improving the nutritional composition of foods, and challenges to the food industry, including regulation as well as consumer perception of new products. The book presents several case studies to clarify these objectives and illustrate the difficulties encountered in the process of developing a reformulated product. Chapters from experts in the field identify emerging and future trends in food product development, and highlight ways in which these efforts will help with increasing food security, improving nutrition and health, and promoting sustainable production. The editors have designed the book to be useful for both industry professionals and the research community. This interdisciplinary approach incorporates a wide spectrum of food sciences (including composition, engineering, and chemistry) as well as nutrition and public health. Food and nutrition professionals, policy makers, health care and social scientists, and graduate students will also find the information relevant.

A Handbook for Sensory and Consumer Driven New Product Development explores traditional and well established sensory methods (difference, descriptive and affective) as well as taking a novel approach to product development and the use of new methods and recent innovations. This book investigates the use of these established and new sensory methods, particularly hedonic methods coupled with descriptive methods (traditional and rapid), through multivariate data analytical interfaces in the process of optimizing food and beverage products effectively in a strategically defined manner. The first part of the book covers the sensory methods which are used by sensory scientists and product developers, including established and new and innovative methods. The second section investigates the product development process and how the application of sensory analysis, instrumental methods and multivariate data analysis can improve new product development, including packaging optimization and shelf life. The final section defines the important sensory criteria and modalities of different food and beverage products including Dairy, Meat, Confectionary, Bakery, and Beverage (alcoholic and non-alcoholic), and presents case studies indicating how the methods described in the first two sections have been successfully and innovatively applied to these different foods and beverages. The book is written to be of value to new product development researchers working in large corporations, SMEs (micro, small or medium-sized enterprises) as well as being accessible to the novice starting up their own business. The innovative technologies and methods described are less expensive than some more traditional practices and aim to be quick and effective in assisting products to market. Sensory testing is critical for new product development/optimization,
ingredient substitution and devising appropriate packaging and shelf life as well as comparing foods or beverages to competitor’s products. Presents novel and effective sensory-based methods for new product development—two related fields that are often covered separately Provides accessible, useful guidance to the new product developer working in a large multi-national food company as well as novices starting up a new business Offers case studies that provide examples of how these methods have been applied to real product development by practitioners in a wide range of organizations Investigates how the application of sensory analysis can improve new product development including packaging optimization

Explains the basics of food technology and new product development from initial planning through formulation, market research, manufacturing and product launch Carefully outlined test protocols plus quantified sensory, financial and feasibility analysis Recaps key technical concepts across the entire food science curriculum Developed as a comprehensive guide to how food products are planned, budgeted, manufactured and launched, this original textbook forms a cohesive introduction to all phases of food product development. A unique feature of the book is that it reviews the main concepts of food chemistry, ingredient functionality, additives, processing, quality control, safety, package labeling and more—virtually the entire food technology curriculum. With this specialized information as context, the book spells out the procedures needed to formulate, cost-justify and test market safe and profitable new products that meet regulatory guidelines and consumer expectations. The technical exposition is highlighted by case studies of novel food items introduced by U.S. companies. Syllabus-ready and furnished with back-of-chapter questions and projects, the volume is highly suited for university courses, including the capstone, as well as in-house and team training short courses in industry.

Discrimination Testing in Sensory Science: A Practical Handbook is a one-stop-shop for practical advice and guidance on the performance and analysis of discrimination testing in sensory science. The book covers all aspects of difference testing: the history and origin of different methods, the practicalities of setting up a difference test, replications, the statistics behind each test, dealing with the analysis, action standards, and the statistical analysis of results with R. The book is written by sensory science experts from both academia and industry, and edited by an independent sensory scientist with over twenty years of experience in planning, running and analyzing discrimination tests. This is an essential text for academics in sensory and consumer science and any sensory scientist working in research and development in food, home, and personal care products, new product development, or quality control. Contains practical guidance on the performance and analysis of discrimination testing in sensory and consumer science for both food and non-food products Includes the latest developments in difference testing, including both new methods and state-of-the-art approaches Features extensive coverage of analysis with a variety of software systems Provides essential insight for academics in sensory and consumer science and any sensory scientist working in research and development in food, home, and personal care products, new product development, or quality control

Sensory evaluation is applied in very diverse and sometimes unexpected sectors. Nonfood Sensory Practices aims to show how sensory professionals from sectors other than food have embraced sensory evaluation methods for product development and communication of their products’ sensory properties. This book is thus intended as a first assessment of what is happening in nonfood sectors. It will open perspectives to those sensory professionals who wish to apply and adapt their expertise in food sensory science to other types of products, as well as to those working in nonfood sectors but with lesser background in sensory evaluation. Many nonfood products are intrinsically complex. They can be used in diverse ways, often in strong interaction with context and unlike food over several hours, days or months. This book shows how sensory professionals have adapted to these specificities, not to mention specific needs in terms of panel management and different ways to deal with...
consumers, users, customers or even sometimes with patients. First chapters present general methodological principles that will allow readers to fully apprehend the use of sensory practices. Then, contributions from many professionals in nonfood sectors will help to realize and promote the potential added value of sensory evaluation to their own field of application. Presents methodological specificities and solutions for the sensory evaluation of non-food products Includes case studies that help readers understand how to adapt food-centric sensory methods developed for non-food applications Triggers new ideas and further useful developments for the sensory evaluation of food products and the study of food-related consumer behaviors

Berry-AMA Book Prize FINALIST 2011! “The Right Sensory Mix” is one of the four best marketing books in 2011 according to the American Marketing Association Foundation. The Berry-AMA Book Prize is awarded annually be the Foundation (AMAF) and recognizes books whose innovative ideas have had significant impact on marketing and related fields. For additional information about the Berry-AMA Book Prize, visit Berry-AMA Book Prize. Why do some people drink black coffee and others stick to tea? Why do some people prefer competitors’ products? Why do we sell less in this country? Many companies fail to acknowledge and analyze disparities observed among customers and simply put them down to culture or emotion. New neuroendocrinological research proves that consumers are rational: They just have a different biological perception of the same stimulus! Their preferences, behavior, and decisions are strongly influenced by the hundreds of millions of sensors monitoring their body and brain. People with more taste buds are for example sensitive to bitterness and are more likely to drink their coffee with sugar or milk, or to drink tea. After reading the book, managers will be able to: • Understand and predict consumers’ behavior and preferences • Design the right sensory mix (color, shape, taste, smell, texture, and sound) for each product • Fine-tune their positioning and product range for every local market • Systematically increase their innovation hit rate

Understanding what the consumer wants and will accept are two of the most significant hurdles faced by anyone in new product development. Whether the concern is the proper mouth-feel of a potato chip, the sense of freshness” evoked by a chewing gum, or the weight and texture of a cosmetic, if the consumer doesn't find the product acceptable, it won't sell. Sensory evaluation testing is the process that establishes the consumer acceptability of a product. It can help identify issues before general production is begun and potentially bring to light issues that hadn't previously been considered a factor in the success of the project. Emphasizes the importance of a scientific sensory methodology used to measure and understand consumer perception Illustrates the importance of planning, managing, and communicating product sensory information in a way that is actionable to developers and marketers Presents demonstrated methods for test selection, application and measurement, and testing with the right consumer, including more typical usage environments Includes worked examples for interpreting and displaying results

Sensory testing has been in existence ever since man started to use his senses to judge the quality and safety of drinking water and foodstuffs. With the onset of trading, there were several developments that led to more formalized testing, involving professional tasters and grading systems. Many of these grading systems are still in existence today and continue to serve a useful purpose, for example in assessing tea, coffee, and wines. However, there has also been a growing need for methods for well-replicated, objective, unbiased sensory assessment, which can be applied routinely across a wide range of foods. Sensory analysis seeks to satisfy this need. Sensory analysis is not new to the food industry, but its application as a basic tool in food product development and quality control has not always been given the recognition and acceptance it deserves. This, we believe, is largely due to the lack of understanding about what sensory analysis can offer in product research, development, and marketing and a fear that the discipline is "too scientific" to be practical. To some extent, sensory scientists have perpetuated this fear by failing to recognize the industrial constraints to implementing sensory testing procedures. These Guidelines are an attempt to redress the balance.

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The food and beverage industries today face an intensely competitive business environment. To the degree that the product developer and marketer—as well as general business manager—can more fully understand the consumer and target development and marketing efforts, their business will be more successful. Sensory and Consumer Research in Food Product Design and Development is the first book to present, from the business viewpoint, the critical issues faced by sensory analysts, product developers, and market researchers in the food and beverage arena. The book’s unique perspective stems from the author team of Moskowitz, Beckley, and Resurreccion, three leading practitioners in the field, who each combines an academic and business acumen. The beginning reader will be introduced to systematic experimentation at the very early stages, to newly emerging methods for data acquisition/knowledge development, and to points of view employed by successful food and beverage companies. The advanced reader will find new ideas, backed up by illustrative case histories, to provide yet another perspective on commonly encountered problems and their practical solutions. Aimed toward all aspects of the food and beverage industry, Sensory and Consumer Research in Food Product Design and Development is especially important for those professionals involved in the early stages of product development, where business opportunity is often the greatest.

Sensory analysis is an important tool in new product development. There has recently been significant development in the methods used to capture sensory perception of a product. Rapid Sensory Profiling Techniques provides a comprehensive review of rapid methods for sensory analysis that can be used as alternatives or complementary to conventional descriptive methods. Part one looks at the evolution of sensory perception capture methods. Part two focuses on rapid methods used to capture sensory perception, and part three covers their applications in new product development and consumer research. Finally, part four explores the applications of rapid methods in testing specific populations.

Complying with food regulations and, more importantly, quality standards, requires practical and reliable methods to estimate a product’s shelf life. Emphasizing the importance of the consumer’s perception of when food has reached the end of its shelf life, Sensory Shelf Life Estimation of Food Products provides a tool for adequately predicting sensory shelf life (SSL). The book delineates the basics of sensory analysis and how it applies to shelf-life studies and includes discussions of experimental design aspects, survival analysis methodology, and its extensions. It provides detailed instructions and software functions for performing SSL estimations, accompanied by data sets and the R Statistical Package functions that are available for download. The author presents the cut-off point methodology used to estimate SSL when the survival analysis methods get complicated. He includes a chapter on accelerated storage covering kinetics, calculations of prediction confidence intervals and potential pitfalls. He also examines extensions of survival analysis statistics to other areas of food quality such as optimum concentration of ingredients and optimum cooking temperatures. Microbiologically stable foods, such as biscuits or mayonnaise, will have their shelf-life defined by the changes in their sensory properties. Many fresh foods, such as yogurt or pasta, after relatively prolonged storage may be microbiologically safe to eat but rejected due to changes in their sensory properties. Shelf life in most food products is determined by sensory issues instead of microbiological or chemical concerns. This book offers key techniques for experimental design, storage, consumer testing procedures, and calculations. It includes methods for accelerated storage experiments, thoroughly explains statistical data treatment, and includes practical examples.

During the past thirty years, companies have recognized the consumer as the key driver for business and product success. This recognition has, in turn, generated its own drivers: sensory analysis and marketing research, leading first to a culture promoting the expert and then evolving into the systematic acquisition of consumer-relevant information to build businesses. Sensory and Consumer Research in Food Product Design and Development is the first book to present, from the business viewpoint, the critical issues faced by business leaders from both the research development and business development perspective. This popular volume, now in an updated and expanded second
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Sensory evaluation methods are extensively used in the wine, beer and distilled spirits industries for product development and quality control, while consumer research methods also offer useful insights as the product is being developed. This book introduces sensory evaluation and consumer research methods and provides a detailed analysis of their applications to a variety of different alcoholic beverages. Chapters in part one look at the principles of sensory evaluation and how these can be applied to alcoholic beverages, covering topics such as shelf life evaluation and gas chromatography – olfactometry. Part two concentrates on fermented beverages such as beer and wine, while distilled products including brandies, whiskies and many others are discussed in part three. Finally, part four examines how consumer research methods can be employed in product development in the alcoholic beverage industry. With its distinguished editor and international team of contributors, Alcoholic beverages is an invaluable reference for those in the brewing, winemaking and distilling industries responsible for product development and quality control, as well as for consultants in sensory and consumer science and academic researchers in the field. Comprehensively analyses the application of sensory evaluation and consumer research methods in the alcoholic beverage industry Considers shelf life evaluation, product development and gas chromatography Chapters examine beer, wine, and distilled products, and the application of consumer research in their production

The food and beverage industries today face an intensely competitive business environment. To the degree that the product developer and marketer – as well as general business manager – can more fully understand the consumer and target development and marketing efforts, their business will be more successful. Sensory and Consumer Research in Food Product Design and Development is the first book to present, from the business viewpoint, the critical issues faced by sensory analysts, product developers, and market researchers in the food and beverage arena. The book’s unique perspective stems from the author team of Moskowitz, Beckley, and Resurreccion, three leading practitioners in the field, who each combine an academic and business acumen. The beginning reader will be introduced to systematic experimentation at the very early stages, to newly emerging methods for data acquisition/knowledge development, and to points of view employed by successful food and beverage companies. The advanced reader will find new ideas, backed up by illustrative case histories, to provide yet another perspective on commonly encountered problems and their practical solutions. Aimed toward all aspects of the food and beverage industry, Sensory and Consumer Research in Food Product Design and Development is especially important for those professionals involved in the early stages of product development, where business opportunity is often the greatest.

The field of sensory science has grown exponentially since the publication of the previous version of this work. Fifteen years ago the journal Food Quality and Preference was fairly new. Now it holds an eminent position as a venue for research on sensory test methods (among many other topics). Hundreds of articles relevant to sensory testing have appeared in that and in other journals such as the Journal of Sensory Studies. Knowledge of the intricate cellular processes in chemoreception, as well as their genetic basis, has undergone nothing less than a revolution, culminating in the award of the Nobel Prize to Buck and Axel in 2004 for their discovery of the olfactory receptor gene super family.
Advances in statistical methodology have accelerated as well. Sensometrics meetings are now vigorous and well-attended annual events. Ideas like Thurstonian modeling were not widely embraced 15 years ago, but now seem to be part of the everyday thought process of many sensory scientists. And yet, some things stay the same. Sensory testing will always involve human participants. Humans are tough measuring instruments to work with. They come with varying degrees of acumen, training, experiences, differing genetic equipment, sensory capabilities, and of course, different preferences. Human foibles and their associated error variance will continue to place a limitation on sensory tests and actionable results. Reducing, controlling, partitioning, and explaining error variance are all at the heart of good test methods and practices.

Sensory Analysis for the Development of Meat Products: Methodological Aspects and Practical Applications highlights the application of sensory analysis in the development of meat products. It presents the background and historical aspects of sensory evaluation on the characterization and development of meat products. Divided into two sections, the book discusses fundamental concepts, methodological approaches, statistical analysis, innovative methods, and presents case studies using these approaches. Chapter include definitions, applications, literature reviews, recent developments, methods and end of chapter glossaries. Researchers in sensory analysis and meat processing, as well as new product developers, will benefit from this comprehensive resource on the topics discussed. Discusses the use of sensory analysis as a tool for the development of meat products Explores characterization, quality, processing, new ingredients, shelf life, consumer studies, and the health aspects of meat products, with a special focus on sensory attributes Contains case studies that highlight sensory approaches and methods in the context of meat products

This book provides comprehensive information on all aspects of consumer affective testing, including principles, application and implementation of consumer affective tests, data collection, statistical analysis, and interpretation of results. New approaches not previously covered in the literature include: 1) methodologies for testing of young children and the elderly and issues related to testing with individuals in these age groups, 2) an in-depth discussion of the development and maintenance of a consumer database, 3) qualitative consumer research methods, 4) simulated supermarket setting tests, and 5) use of mobile laboratory in consumer tests.

About the Second Edition: " a clear and thorough understanding of how the industry as a whole competes, succeeds, and in some instances fails to bring new products to the marketplace. delivers helpful information in a concise, organized style, bringing together diverse elements of the food industry that are all important for a new product introduction into the marketplace. [a] should-have reference book for anyone involved in developing new food products working in or with the food industry." —Journal of Product Innovation Management, Vol. 23, No. 3 See what’s new in the Third Edition: Examination of modern marketing techniques such as neuromarketing technology, test market modeling software, and social network marketing Exploration of economic challenges and how to do more with less to combat rising food commodity prices and lower carbon footprint Cohesive overview of all aspects of new food product development technologies and advances In-depth review of techniques of new product development and simulated test markets Expanded discussion of the problems specific to product development for the food service industry With new material highlighting the latest trends and science in marketing and electronic communication and their combined effect on market research, New Food Product Development: From Concept to Marketplace, Third Edition, describes stages of development in detail, beginning with sources of ideas and moving through development, final screening, and introduction into the marketplace. Drawing on his extensive experience in new food product development, the author outlines ways a company can organize for new product development and optimize available resources. He focuses on the roles, functions, and interactions of the members of the food product development team, other company departments, and outside resources in the food product development process. A well-grounded, broad
perspective in the fundamentals of the new food development process in industry, this new edition of a bestseller clearly delineates cost-effective best practices for bringing new products to market.

The pillars of good consumer and sensory studies -- Sensory profile of a product: mapping internal sensory properties -- The foundations of consumer evaluation -- Study plans and strategy: sustainable short, mid and long-term vision -- Real-life anticipation with market factors: concept, price, brand, market channel -- Internal studies versus sub-contracting

The sensory properties of foods are the most important reason people eat the foods they eat. What those properties are and how we best measure those properties are critical to understanding food and eating behavior. Appearance, flavor, texture, and even the sounds of food can impart a desire to eat or cause us to dismiss the food as unappetizing, stale, or even inappropriate from a cultural standpoint. This Special Issue focuses on how sensory properties are measured, the specific sensory properties of various foods, and consumer behavior related to which properties might be most important in certain situations and how consumers use sensory attributes to make decisions about what they will eat. This Special Issue contains both research papers and review articles.

Human sensory perception of clothing involves a series of complex interactive processes, including physical responses to external stimuli, neurophysiological processes for decoding stimuli through the biosensory and nervous systems inside the body, neural responses to psychological sensations, and psychological processes for formulating preferences and making adaptive feedback reactions. Clothing biosensory engineering is a systematic and integrative way of translating consumers' biological and sensory responses, and psychological feelings and preferences about clothing, into the perceptual elements of design. It is a link between scientific experimentation and commercial application to develop economic solutions to practical technical problems. Clothing biosensory engineering quantifies the decision-making processes through which physics, mathematics, neurophysiological and engineering techniques are applied to optimally convert resources to meet various sensory requirements: visual/thermal/mechanical. It includes theoretical and experimental observations, computer simulations, test methods, illustrations and examples of actual product development. Describes the process of Clothing biosensory engineering in detail Quantifies the decision making processes applied to optimally convert resources to meet various sensory requirements Includes theoretical and experimental observations and examples of actual product development

This volume provides an overview of the latest research findings on the physics, physiology, and psychology of food oral consumption, as well as the experimental techniques available for food oral studies. Coverage includes the main physical and physiological functionalities of the mouth; the location and functionalities of various oral receptors; the main sequences of eating and drinking, and the concomitant food disintegration and destabilisation. Chapters also explain oral processing and its relation to flavour release and texture perception, and there is an introduction to the principles of food rheology as they relate to eating. Food Oral Processing is directed at food scientists and technologists in industry and academia, especially those involved in sensory science and new product development. It will also be of interest to oral physiologists, oral biologists and dentists. The book will be a useful reference for undergraduate and postgraduate students of these disciplines.

A comprehensive review of the techniques and applications of descriptive analysis Sensory evaluation is a scientific discipline used to evoke, measure, analyse and interpret responses to products perceived through the senses of sight, smell, touch, taste and hearing. It is used to reveal insights into the ways in which sensory properties drive consumer acceptance and behaviour, and to design products that best deliver what the consumer wants. Descriptive analysis is one of the most sophisticated, flexible and widely used tools in the field of sensory analysis. It enables objective description of the nature and
magnitude of sensory characteristics for use in consumer-driven product design, manufacture and communication. Descriptive Analysis in Sensory Evaluation provides a comprehensive overview of a wide range of traditional and recently-developed descriptive techniques, including history, theory, practical considerations, statistical analysis, applications, case studies and future directions. This important reference, written by academic and industrial sensory scientist, traces the evolution of descriptive analysis, and addresses general considerations, including panel set-up, training, monitoring and performance; psychological factors relevant to assessment; and statistical analysis. Descriptive Analysis in Sensory Evaluation is a valuable resource for sensory professionals working in academia and industry, including sensory scientists, practitioners, trainers and students, and industry-based researchers in quality assurance, research and development, and marketing.

This is the first book that describes and explains food development from the point of view of the consumer rather than from the top down approach.

Developing New Functional Food and Nutraceutical Products provides critical information from conceptualization of new products to marketing, aiming to present a solid understanding of the entire process through detailed coverage of key concepts, namely innovation, regulation, manufacturing, quality control, and marketing. Chapters provide insights into market and competitive analysis, product design and development, intellectual property, ingredient sourcing, cost control, and sales and marketing strategies. Examines key considerations in product development Provides a streamlined approach for product development Addresses manufacturing and quality control challenges Includes key lessons for a successful product launch and effective marketing

During the past thirty years, companies have recognized the consumer as the key driver for business and product success. This recognition has, in turn, generated its own drivers: sensory analysis and marketing research, leading first to a culture promoting the expert and then evolving into the systematic acquisition of consumer-relevant information to build businesses. Sensory and Consumer Research in Food Product Design and Development is the first book to present, from the business viewpoint, the critical issues faced by business leaders from both the research development and business development perspective. This popular volume, now in an updated and expanded second edition, presents a unique perspective afforded by the author team of Moskowitz, Beckley, and Resurreccion: three leading practitioners in the field who each possess both academic and business acumen. Newcomers to the field will be introduced to systematic experimentation at the very early stages, to newly emerging methods for data acquisition/knowledge development, and to points of view employed by successful food and beverage companies. The advanced reader will find new ideas, backed up by illustrative case histories, to provide another perspective on commonly encountered problems and their practical solutions. This book is aimed at professionals in all sectors of the food and beverage industry. Sensory and Consumer Research in Food Product Design and Development is especially important for those business and research professionals involved in the early stages of product development, where business opportunity is often the greatest.

Food companies face the challenge of high product failure rates with 75%-90% of new food and beverage products failing within one year of launch. A majority of these products are either copy-cat, line extensions, or reformulation of existing market products. New product development (NPD) is mainly guided by marketing teams with short-term business horizons (e.g., create a new flavor for an existing product, change the color or shape, "create news", short-term sales increase, etc.) at the expense of the true product innovations wanted and needed by consumers. The scientific insights of consumer needs and behavioral and psychological science are generally complicated, less understood, and marketing teams often overlook consumer-relevant aspects. Thus, considerable work is directed at finding new technologies or processes that can create a new product without knowing whether that new product will actually fulfill consumer needs. A comprehensive sensory science-based system for
new food product development is required. This research is one part of a strategy to develop example strategies for sustainable, successful food product development to meet the needs of both consumers and industry. The overall research objectives were set in partnership with the industry to produce new snack ideas to create "global" product concepts. In this project, products were targeted at international markets to address larger consumer needs. The strategy for ideation and product roadmaps was driven by a detailed assessment of international market products. The initial rounds of research included products from diverse markets (e.g., the United States, China, India, Ghana, Mexico, Colombia, Italy, Thailand). After careful consideration of the market potential, the innovative orientation of Japan (JP) and South Korea (Republic of Korea) (SK) markets, in addition to those of the U.S. were chosen for further product exploration, assessment, and ideation. Food companies are continuously exploring international markets for new flavors, textures, packaging concepts, and products for inspiration. An effective way of gathering information is to conduct on-site research but international research presents many new challenges. Therefore, the first study was designed to determine and address the methodological challenges of conducting a product category assessment in an unfamiliar country (JP). The results (published) highlight the onsite challenges and potential solutions required to conduct international research in an unfamiliar country. For example, the country's culture, law, language, customs, identity, people, product category of interest, data collection, product procurement, sampling, evaluation, and product shipment. Overall, the basic process template developed in this study is a valuable tool to perform a product category analysis in an unfamiliar country. The primary focus of this research was on texture which serves as a focus for the development of snack foods because flavor generally is easy to manipulate across various countries for similar snack products. A sensory texture lexicon for descriptive panels applicable to various processed and unprocessed snack foods (e.g., crackers, chips, vegetables, yogurt, etc.) was needed to profile snacks on sensory parameters. Thus, the second study (published) developed a multi-parameter and multi-sense sensory texture lexicon with trained descriptive panels. Eighty-five different snack and snack-like foods from eight countries were evaluated in detail. The results included the translation of the developed lexicon terms, definitions, techniques, and references terminologies into four major international languages (English, Hindi, Mandarin, and Spanish). Researchers and manufacturers can use the developed lexicon to assess snack food categories in various countries and can profile any new snack food developed to see if it matches or deviates from the target texture. In studies across countries and cultures, it is important to understand consumer terminologies and factors that can affect terminology when consumers describe their experience, concerns, and needs in snack foods. This research examined conceptual perception and linguistic barriers as key limiting factors in the cross-cultural food product development process which reduces the validity and general applicability of research results. The texture terms developed by sensory scientists are easy to translate at a scientific level to produce consistent information across cultures but are far too technical to be used to describe products to consumers. Thus, the third study (published) combined linguistic and contextual perception to explore consumer texture vocabularies. The results demonstrated that the vocabulary used by consumers to describe sensory characteristics of snack foods depends on context, culture, previous exposure, was specific to products, etc. We found divergent understanding and use of terms in each culture meaning that translation of English sensory terms without context can be problematic for non-English speaking cultures. The research results are important to understand as global companies want to market their new innovative products to local consumers as well as consumers in other cultures. The fourth study explored the robust JP and SK snack food markets to generate new snack concepts for global marketplaces. Ninety-six JP and 124 SK snack foods were categorized using sensory science tools such as product categorization, projective mapping (PM), and descriptive profiling. This research work demonstrated how developers can find white space in the marketplace by sorting in-market products using a 2-dimensional PM. Descriptive analysis was used to identify the main sensory attributes of the JP and SK snacks. The principal component analysis of descriptive data allows accessing product positioning and comparison of products in the marketplace to discover white spaces. Sensory profiles obtained from a wide range of snack foods can inspire researchers to create
new product concepts with different and multi-sensory profiles. This work created a framework to
discover white spaces in the marketplace and nurture new snack texture concepts to fill the identified
white spaces by exploiting the main sensory attributes as product characteristics. In NPD, researchers
frequently use statistical methods such as cluster analysis to segment consumers into groups based on
some measure of product acceptance or to group products by sensory characteristics. However,
researchers overlook the stability of clusters produced by clustering methods. Some statistical
clustering methods can provide different results simply by re-running the analysis. The objects in the
clusters (consumers or products) can change clusters, which influence the final solution and
interpretation of data. The fifth study applied hierarchical agglomerative clustering (HAC), k-means
(KM), and fuzzy clustering (FC) to a large descriptive sensory data set and compared cluster results
obtained from these methods. The clustering frequency matrix was produced for KM solutions, and
attributes (objects) were reorganized into groups via manual clustering (MC). Results showed that
using various clustering methods and producing a clustering frequency matrix could be valuable in
identifying reliable clusters in large data sets. The study concludes that results from one clustering
trial and one method may not be reliable. Therefore, researchers must validate results using other
cluster methods. The outcomes of this study can help to enhance confidence in results produced by
clustering applications. Overall, the results of this research can help build sustainable product
development systems based on examples using various food products and objectives for new food
product development. By applying the research results industry and research institutions can make
important progress in product development, and solve many complex issues related to the product
development process.

Sensory Evaluation of Sound provides a detailed review of the latest sensory evaluation techniques,
specifically applied to the evaluation of sound and audio. This three-part book commences with an
introduction to the fundamental role of sound and hearing, which is followed by an overview of
sensory evaluation methods and associated univariate and multivariate statistical analysis techniques.
The final part of the book provides several chapters with concrete real-world applications of sensory
evaluation ranging from telecommunications, hearing aids design and binaural sound, via the latest
research in concert hall acoustics through to audio-visual interaction. Aimed at the engineer,
researcher, university student or manager the book gives insight into the advanced methods for the
sensory evaluation with many application examples. Introduces the fundamental of hearing and the
value of sound Provides a firm theoretical basis for advanced techniques in sensory evaluation of
sound that are then illustrated with concrete examples from university research through to industrial
product development Includes chapters on sensory evaluation practices and methods as well as
univariate and multivariate statistical analysis Six application chapters covering a wide range of
concrete sensory evaluation study examples including insight into audio-visual assessment Includes
data analysis with several associated downloadable datasets Provides extensive references to the
existing research literature, text books and standards

Research on the development of human infants has revealed remarkable capacities in recent years.
Instead of stressing the limitations of the newborn, the modern approach is now more optimistically
based on an assessment of the adaptive capabilities of the infant. Innate endowment, coupled with
interaction with the physical and social environment, enables a developmental transition from
processes deeply rooted in early perception and action to the cognitive and language abilities typical
of the toddler.; This book reviews a number of issues in early human development. It includes a
reconceptualization of the role of perception at the origins of development, a reconciliation of
psychophysical and ecological approaches to early face perception, and building bridges between
biological and psychological aspects of development in terms of brain structure and function. Topics
covered include basic exploratory processes of early visual systems in early perception and action;
face perception in newborns, species typical aspects of human communication, imitation, perception
of the phonetic structure of speech, origins of the pointing gesture, handedness origins and
development, theoretical contributions on perception and cognition, implicit and explicit knowledge in babies; sensory-motor coordination and cognition, information processing and cognition, perception, habituation and the development of intelligence from infancy.

This book is a practical guide to sensory evaluation methods and techniques in the food, cosmetic and household product industries. It explains the suitability of different testing methods for different situations and offers step-by-step instructions on how to perform the various types of tests. Covering a broad range of food and non-food product applications, the book is designed to be used as a practical reference in the testing environment; a training manual for new recruits into sensory science, and a course book for students undertaking industrial training or academic study.

Sensory analysis is not new to the food industry, but its application as a basic tool in food product development and quality control has not been given the recognition and acceptance it deserves. This, we believe, is largely due to the lack of understanding about what sensory analysis can offer in product research, development and marketing, and a fear that the discipline is 'too scientific' to be practical. To some extent, sensory scientists have perpetuated this fear with a failure to recognize the constraints of industry in implementing sensory testing procedures. These guidelines are an attempt to redress the balance. Of course, product 'tasting' is carried out in every food company: it may be the morning tasting session by the managing director, competitor comparisons by the marketeers, tasting by a product 'expert' giving a quality opinion, comparison of new recipes from the product development kitchen, or on-line checking during production. Most relevant, though, is that the people responsible for the tasting session should know why the work is being done, and fully realize that if it is not done well, then the results and conclusions drawn, and their implications, are likely to be misleading. If, through the production of these guidelines, we have influenced some people sufficiently for them to re-evaluate what they are doing, and why, we believe our efforts have been worthwhile.

Covering all aspects of sensory panel management, this volume describes the different types of sensory panels (for example panels for quality control, descriptive analysis and discrimination tests), discusses the issues involved with sensory testing, and gives detailed information about sensory panel recruitment, training and on-going management. Sensory Panel Management gives both theoretical and practical information from deciding what type of panel to recruit and how to conduct panel training, to creating the best sensory team and how to deal with any issues. Downloads of several of the documents included in the book are available from http://www.laurenrogers.com/sensory-panel-management.html The book is divided into three main sections. The first section looks at the recruitment of sensory panels, covering the process from both a scientific and a human resources angle. The second section deals with the training of a sensory panel. Initial training, as well as method and product specific training is covered. Example session plans for running panel sessions for quality control, discrimination tests, descriptive profiling, temporal methods and consumer tests are included within the specific chapters. Refresher and advanced training such as training panelists to take part in gas chromatography-olfactometry are also included. The third section examines the performance of sensory panels. Chapters within this section explore performance measures and ways of preventing (and dealing with) difficult situations relating to panellists. A final chapter looks at the future of sensory panels. Throughout the book there are short case study examples demonstrating the practical application of the methods being discussed. Sensory Panel Management is a key reference for academics, technical and sensory staff in food companies. Lauren Rogers is an independent sensory science consultant in the UK with more than twenty years of practical experience. She has worked on a wide variety of projects, including shelf life studies, product and flavor optimization, new flavor development and in-depth brand analyses. She is a member of the Society of Sensory Professionals, the Institute of Food Science and Technology’s Sensory Science Group, the Sensometric Society and is also a member of the ASTM Sensory Evaluation Committee (E18). Discusses sensory panels for
testing food and non-food based products Covers best practices for recruitment, selection and training of panels Provides examples of training plans for sensory panels Encompasses experimental design and data analysis of panel results Organized in modular format for practical uses

The field of sensory evaluation has matured in the last half century to become a recognized discipline in the food and consumer sciences and an important part of the food and consumer products industries. Sensory professionals enjoy widespread recognition for the important services they provide in new product development, basic research, ingredient and process modification, cost reduction, quality maintenance, and product optimization. These services enhance the informational support for management decisions, lowering the risk that accompanies the decision-making process. From the consumers' perspective, a sensory testing program in a food or consumer products company helps ensure that products reach the market with not only good concepts but also with desirable sensory attributes that meet their expectations. Sensory professionals have advanced well beyond the stage when they were simply called on to execute "taste" tests and to provide statistical summaries of results. They are now frequently asked to participate in the decision process itself, to draw reasoned conclusions based on data, and to make recommendations. They are also expected to be well versed in an increasingly sophisticated battery of test methods and statistical procedures, including multivariate analyses. As always, sensory professionals also need to understand people, for people are the measuring instruments that provide the basic sensory data. People are notoriously variable and difficult to calibrate, presenting the sensory specialist with many additional measurement problems that are not present in instrumental methods.

Sensory Evaluation Practices examines the principles and practices of sensory evaluation. It describes methods and procedures for the analysis of results from sensory tests; explains the reasons for selecting a particular procedure or test method; and discusses the organization and operation of a testing program, the design of a test facility, and the interpretation of results. Comprised of three parts encompassing nine chapters, this volume begins with an overview of sensory evaluation: what it does; how, where, and for whom; and its origin in physiology and psychology. It then discusses measurement, psychological errors in testing, statistics, test strategy, and experimental design. The reader is also introduced to the discrimination, descriptive, and affective methods of testing, along with the criteria used to select a specific method, procedures for data analysis, and the communication of actionable results. The book concludes by looking at problems where sensory evaluation is applicable, including correlation of instrumental and sensory data, measurement of perceived efficacy, storage testing, and product optimization. This book is a valuable resource for sensory professionals, product development and production specialists, research directors, technical managers, and professionals involved in marketing, marketing research, and advertising.

Consumer acceptance is the key to successful food products. It is vital, therefore, that product development strategies are consumer-led for food products to be well received. Consumer-led food product development presents an up-to-date review of the latest scientific research and methods in this important area. Part one gives the reader a general introduction to factors affecting consumer food choice. Chapters explore issues such as sensory perception, culture, ethics, attitudes towards innovation and psychobiological mechanisms. Part two analyses methods to understand consumers' food-related attitudes and how these methods can be effectively used, covering techniques such as means-end chains and the food-related lifestyle approach. The final part of the book addresses a wide variety of methods used for consumer-led product development. Opportunity identification, concept development, difference testing and preference trials are discussed, as well as the use of techniques such as just-about-right scales and partial least squares methods. Written by an array of international experts, Consumer-led food product development is an essential reference for product developers in the food industry. Introduces the factors affecting consumer food choice Explores issues such as sensory perception, culture and ethics Analyzes methods to understand food related attitudes
Sensory analysis and consumer research are relevant tools in innovation and new product development, from design to commercialization. This Special Issue has collected 13 valuable scientific contributions, including 1 review, 12 original research articles and an editorial. The SI provides an interesting outlook and better understanding of sensorial analysis with the different techniques and consumer research on new product development. Important practical applications have been reported on the development of different novel, functional and enhanced products (meat, fish, biscuits, yogurt, porridge, hybrid meat, molecular products, etc.), which helps increase knowledge in this field. This SI is very useful for both present and future uses for the different players involved in this kind of product development (industry, companies, researchers, scientists, marketing, merchandising, consumers, etc.).

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