

CONTENTS

Foreword by Jeffrey Steingarten xi

Acknowledgments xvii

Introduction: *The Case for Science Inspired by the Kitchen*
CÉSAR VEGA, JOB UBBINK, AND ERIK VAN DER LINDEN i

one The Science of a Grilled Cheese Sandwich
JENNIFER KIMMEL 7

two Sound Appeal
MALCOLM POVEY ii

three Mediterranean Sponge Cake
CRISTINA DE LORENZO AND SERGIO LAGUARDA 18

four Spherification:
Faux Caviar and Skinless Ravioli
CÉSAR VEGA AND PERE CASTELLS 25

five Konjac Dondurma:
Designing a Sustainable and Stretchable “Fox Testicle” Ice Cream
ARIELLE JOHNSON, KENT KIRSHENBAUM, AND ANNE E. MCBRIDE 33

six Stretchy Textures in the Kitchen: *Insights from Salep Dondurma*
TIM J. FOSTER 41

seven Moussaka as an Introduction to Food Chemistry
CHRISTOS RITZOULIS 45

eight The Sticky Science of Malaysian Dodol
ALIAS A. KARIM AND RAJEEV BHAT 52

nine The Perfect Cookie Dough
AKI KAMAZAWA AND H. ALEXANDER TALBOT 59

ten To Bloom or Not to Bloom?
AMELIA FRAZIER AND RICHARD HARTEL 65

eleven Bacon: *The Slice of Life*
TIMOTHY KNIGHT 73

twelve Scandinavian “Sushi”: *The Raw Story*
PIA SNITKJÆR AND LOUISE M. MORTENSEN 83

thirteen Maximizing Food Flavor by
Speeding Up the Maillard Reaction
MARTIN LERSCH 91

fourteen Lighten Up!
The Role of Gases in the Culinary Experience
MATT GOLDING 100

fifteen The Meringue Concept and Its Variations
PETER WIERENGA, HELEN HOFSTEDE, ERIK VAN DER LINDEN,
SIDNEY SCHUTTE, AND JONNIE BOER 108

sixteen Why Does Cold Milk Foam Better?
Into the Nature of Milk Foam
JULIA MALDONADO-VALDERRAMA,
PETER J. WILDE, AND MARÍA J. GÁLVEZ-RUIZ 117

seventeen Ice Cream Unlimited:
The Possibilities of Ingredient Pairing
ELKE SCHOLTEN AND MIRIAM PETERS 123

eighteen Egg Yolk: *A Library of Textures*
CÉSAR VEGA 134

nineteen Ketchup as Tasty Soft Matter:
The Case of Xanthan Gum
THOMAS VILGIS 142

twenty Taste and Mouthfeel of Soups and Sauces
JOHN R. MITCHELL 148

twenty-one Playing with Sound: *Crispy Crusts*
PAULA VARELA AND SUSANA FISZMAN 155

twenty-two Baked Alaska and Frozen Florida:
On the Physics of Heat Transfer
ADAM BURBIDGE 166

twenty-three

On Superb Crackling Duck Skin: *An Homage to Nicholas Kurti*

CHRISTOPHER YOUNG AND NATHAN MYHRVOLD 176

twenty-four

Sweet Physics:

Sugar, Sugar Blends, and Sugar Glasses

NATALIE RUSS AND THOMAS VILGIS 186

twenty-five

Coffee, Please, but No Bitters

JAN GROENEWOLD AND EKE MARIËN 196

twenty-six

Turning Waste into Wealth:

On Bones, Stocks, and Sauce Reductions

JOB UBBINK 206

twenty-seven

Restructuring Pig Trotters:

Fine Chemistry Supporting the Creative Culinary Process

JORGE RUIZ AND JULIA CALVARRO 217

twenty-eight

Innovate:

Old World Pizza Crust with New World Ingredients

THOMAS M. TONGUE JR. 224

twenty-nine

Eating Is Believing

LINE HOLLER MIELBY AND MICHAEL BOM FRØST 233

thirty

Molecular Gastronomy Is a Scientific Activity

HERVÉ THIS 242

thirty-one

The Pleasure of Eating:

The Integration of Multiple Senses

JUAN-CARLOS ARBOLEYA, DANIEL LASA, OSWALDO OLIVA,

JAVIER VERGARA, AND ANDONI LUIS-ADURIZ 254

thirty-two On the Fallacy of Cooking from Scratch
CÉSAR VEGA AND DAVID J. MCCLEMENTS 264

thirty-three Science and Cooking:
*Looking Beyond the Trends to Apply a Personal, Practical
Approach*
MICHAEL LAISKONIS 273

Contributors 289

Index 299

