

Contents

PREFACE	XI
ACKNOWLEDGMENTS	XV
1 The Evolution of Cooking (2 Million–12,000 Years Ago)	I
Fire, cooking, and the evolution of humans	I
The taste, smell, and flavor of food	2
<i>How many basic tastes are there?</i>	4
<i>Recipe: Linguine with clam sauce</i>	7
The impact of cooking on the human brain	8
<i>The microscopic world of starch in food</i>	9
<i>What happens to food after we eat it?</i>	12
Early methods of cooking food	14
2 The Dawn of Agriculture Revolutionizes Cooking (12,000 Years Ago–1499)	19
The dawn of agriculture changes everything	19
<i>Explaining gluten</i>	22
The greatest technological advance of all time	25
The emergence of agriculture catalyzes advances in cooking	26

<i>What is so special about water in food?</i>	28
<i>What is temperature, and how does it differ from heat?</i>	31
<i>Recipe: Bone-in pork spareribs with hoisin barbeque sauce</i>	34
The first scientific theories evolve	36
3 Early Science Inspires Creativity in Cooking (1500–1799)	41
<hr/>	
Science is reborn during the sixteenth and seventeenth centuries	41
<i>The difference between waxy and mealy potatoes</i>	43
The rebirth of science—now we’re really cooking!	46
<i>Making stock of things</i>	48
<i>Saucy emulsions and emulsifiers</i>	52
<i>Recipe: Christine’s rich brown gravy</i>	54
The scientific method illuminates a new path	56
<i>Thomas Keller and the science of butter-poached lobster</i>	60
4 The Art of Cooking Embraces the Science of Atoms (1800–1900)	67
<hr/>	
The atomic theory changes science forever	67
<i>Numbers both large and small</i>	69
Science enters the realm of cooking	71
<i>Recipe: Baked haddock with special breadcrumb topping</i>	77
The art of cooking embraces the science of cooking	78
<i>Does braising meat really make it juicier?</i>	81
<i>The many lives (and uses) of baking soda</i>	84

5 Modern Science Transforms the Art of Cooking (1901–Present)	91
Flavor rules	91
<i>Terroir—A taste of place</i>	98
<i>Recipe: Julia Child's brown-braised onions</i>	102
Modern methods of cooking	103
<i>Soft Matter—the science of gels</i>	107
<i>Star power</i>	110
Cooking is the perfect embodiment of art and science	112
6 Cooking Science Catches Fire!	115
Cooking science goes viral	115
Science brings a new vision to cooking healthy food	117
Cooking science enhances the nutritional quality of food	119
<i>Fighting cancer with cruciferous vegetables</i>	122
<i>Recipe: Tomato sauce with red bell peppers</i>	129
<i>Recipe: Delicious, healthy mashed cauliflower</i>	132
<i>To market, to market</i>	133
7 The Good, the Bad, and the Future of Cooking Science	139
Good carbohydrates and bad carbohydrates	139
<i>Recipe: White bean and roasted chicken chili</i>	141
<i>Winter vegetable—the science of pasta</i>	144
Good fats and bad fats	147
<i>Fats and oils—when structure dictates function</i>	149
<i>Cooking with olive oil</i>	156

Are there good proteins and bad proteins?	159
<i>Diffusion confusion</i>	162
The future of cooking science	165
BIBLIOGRAPHY	167
INDEX	175