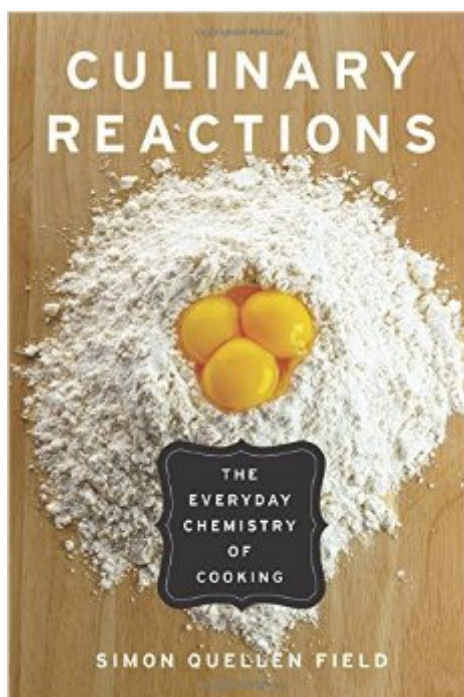


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# Culinary Reactions: The Everyday Chemistry Of Cooking



## Synopsis

When you're cooking, you're a chemist! Every time you follow or modify a recipe you are experimenting with acids and bases, emulsions and suspensions, gels and foams. In your kitchen you denature proteins, crystallize compounds, react enzymes with substrates, and nurture desired microbial life while suppressing harmful microbes. And unlike in a laboratory, you can eat your experiments to verify your hypotheses. In *Culinary Reactions*, author Simon Field explores the chemistry behind the recipes you follow every day. How does altering the ratio of flour, sugar, yeast, salt, butter, and water affect how high bread rises? Why is whipped cream made with nitrous oxide rather than the more common carbon dioxide? And why does Hollandaise sauce fall for "clarified" butter? This easy-to-follow primer even includes recipes to demonstrate the concepts being discussed, including Whipped Creamsicle Topping (a foam), Cherry Dream Cheese (a protein gel), and Lemonade with Chameleon Eggs (an acid indicator). It even shows you how to extract DNA from a Halloween pumpkin. You'll never look at your graduated cylinders, Bunsen burners, and beakers . . . er, measuring cups, stovetop burners, and mixing bowls . . . the same way again. Simon Field is the author of *Why There's Antifreeze in Your Toothpaste*, *Gonzo Gizmos*, and *The Return of Gonzo Gizmos*, and is the creator of the popular Web site [www.scitoys.com](http://www.scitoys.com).

## Book Information

Paperback: 288 pages

Publisher: Chicago Review Press (November 1, 2011)

Language: English

ISBN-10: 1569767068

ISBN-13: 978-1569767061

Product Dimensions: 6 x 0.6 x 9 inches

Shipping Weight: 15.2 ounces (View shipping rates and policies)

Average Customer Review: 4.2 out of 5 stars [See all reviews](#) (91 customer reviews)

Best Sellers Rank: #24,339 in Books (See Top 100 in Books) #47 in [Books > Science & Math > Agricultural Sciences > Food Science](#) #52 in [Books > Cookbooks, Food & Wine > Cooking Education & Reference > Essays](#) #57 in [Books > Reference > Encyclopedias & Subject Guides > Cooking](#)

## Customer Reviews

I like science, and love cooking. So *Culinary Reactions : The Everyday Chemistry of Cooking* by Simon Quellen Field is very exciting to me. The idea is to explain in clear and easy language how

the chemicals in our foods react and behave to create what we eat. From the liquid nitrogen frozen ice cream in the introduction, to the very end where he explains why salt and ice freeze ice cream and all the information in between, he's managed it very well. The chapters each cover a specific topic, and there is some overlap in the examples used. Like making cheese involves making a protein gel using protein chemistry and can be flavored using molds which are covered in the biology chapter. The language is clear and scientific. He explains the way molecules interact to create foams such as bread and meringues, how beer and vinegar are made, how specific cultured bacteria can create inhospitable environments for more dangerous bacteria. The affects of acids and bases on recipes, including a very clear explanation of the difference between the two. Yes, it's science, but it's easy to read and understand. There are few cooking projects that show the chemical processes at work. A whipped topping that's stabilized with the addition of xanthan gum, a homemade cheese with instructions for two great, inexpensive and easy to build cheese presses, a turkey that's is surface sterilized to be cooked for a very long time at below boiling point temperatures to keep it super juicy, extracting DNA from pumpkins and fruit, and lemonade with color changing grape juice "chameleon eggs".

Culinary Reactions explores the scientific principles behind everyday recipes. Don't be intimidated by the word science mixed in with this description, the way he explains the process is fun and easy to understand. The author starts out with the basics of chemistry in the kitchen including the importance of measuring and weighing ingredients. He also talks about the importance of using quality ingredients and how to estimate calories. Each chapter is broken down by the type of reaction involved: Foams, Emulsions, Oils and Fats, Solutions, Crystallization, Protein Chemistry, Biology, Scaling Recipes Ups and Down, Heating, Acids and Bases, Oxidation and Reduction; and Boiling, Freezing and Pressure. Culinary Reactions isn't really a cookbook although you will find recipes scattered throughout the book. The breakdown of the chemical reactions may not necessarily tell you what to expect in each chapter unless you're familiar with cooking chemistry. As an example, Foams includes things like marshmallows, whipped cream and ice cream. The book explains why each reaction occurs so I learned that proteins in these foams are changed from their natural state (denatured) and attract and repel different things which eventually causes them to stick to different things and form a film that holds their shape. Each chapter includes diagrams of various molecular structures so you can see the actual chemical reaction that takes place. There are also several shaded boxes that include chemistry lessons you can read for more information on specific processes discussed in the chapter. This is perfect for those of us that either never took chemistry

or haven't thought about it for years... just in case you don't remember what a covalent bond actually is.

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