MODERNIST CUISINE at Home



The new book from the creators of

NODERNIST CUISINE

The Art and Science of Cooking

the most widely acclaimed cookbook of 2011

2012 Winner, Cookbook of the Year
2012 Winner, Cooking from
a Professional Point of View



—2012 James Beard Foundation Book Awards

"A masterpiece . . . the most important cookbook of the first 10 years of the 21st century."

—2011 GOURMAND WORLD COOKBOOK AWARDS



Winner, **Visionary Achievement** Winner, Professional Kitchens

Winner, Design

—2012 International Association of Culinary Professionals Cookbook Awards

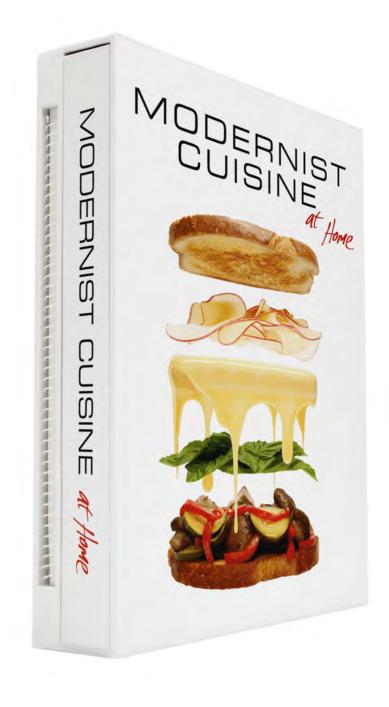


Praise for Modernist Cuisine at Home:

Modernist Cuisine at Home offers useful techniques and solutions that expand our abilities, and it provides us with a practiced and thorough understanding of why things happen the way they do. Most importantly, it ignites a curiosity within and compels us to ask ourselves not "What should we make for dinner?" but rather, "What can we make for dinner?"

Modernist Cuisine at Home will provide another quantum leap in our understanding and in our relationship with the food we like to cook.





Modernist Cuisine at Home is destined to change the way we cook—and the way we use recipes. For all of us who cook regularly, this book opens up a whole new world of possibilities. It is full of insights that encourage us to try something new, and that teach us something on every single page.

-Martha Stewart



The culinary revolution that has transformed restaurant menus around the world is making its way into home kitchens. The six encyclopedic volumes of *Modernist Cuisine*, by Nathan Myhrvold with Chris Young and Maxime Bilet, are the definitive reference for this revolution. Now Myhrvold and Bilet have produced a lavishly illustrated guide for home cooks, complete with all-new recipes tailored to suit all skill levels.



Modernist Cuisine at Home is destined to set a new standard for home cookbooks. The authors have collected in this 456-page volume all the essential information that any cook needs to stock a modern kitchen, to master Modernist techniques, and to make stunning recipes. The book includes a 228-page Kitchen Manual that reproduces every recipe in a spiral-bound, waterproof companion.

Drawing on the same commitment to perfection that produced *Modernist Cuisine*, *Modernist Cuisine at Home* applies innovations pioneered by The Cooking Lab to refine classic home dishes, from hamburgers and wings to macaroni and cheese. More than 400 new recipes and variations are included, most with step-by-step photos that make it easy to bring dining of the highest quality to your own dinner table.



PART ONE: STOCKING THE MODERNIST KITCHEN

Cooking like a Modernist chef at home requires the right set of tools, but they are less expensive and easier to find than you might think. You can buy everything you need to cook all the recipes in this book from cooking stores and well-known online vendors—and for less than the cost of granite countertops or a fancy new oven. Part One of *Modernist Cuisine at Home* provides an authoritative guide to which features are worth paying extra for, and which aren't, on essential gear such as:

- digital scales
- digital thermometers
- sous vide water baths
- silicone mats and molds
- microplanes
- blenders
- mixers and frothers
- ice-cream makers

- blowtorches
- jaccards and injectors
- sieves and strainers
- · whipping siphons
- juicers
- dehydrators
- combi ovens
- pressure cookers

Modernist Cuisine at Home also helps you to get the best out of the kitchen appliances that you already own. Learn how to use your microwave oven to steam fish and vegetables to perfection, make exceptional beef jerky, and fry delicate herbs. Use a few simple steps to calibrate your oven for more predictable, even baking. See how to turbocharge your kettle-style grill to sear chops and vegetables quickly without overcooking them—and how to tame the heat of the grill to slow-cook a chicken or a steak to just the right degree of doneness.



The first 100 pages of the book are a trove of useful information, such as:

- how to test the accuracy of a thermometer, and why it's time to switch to digital;
- how to use (and not to use) a blowtorch;
- why tenderizing your meat with a jaccard makes it juicier;
- how to marinate meats faster and more evenly by injecting the brine;
- the myriad uses for a whipping siphon beyond whipped cream;
- how to make fruit leather that doesn't stick to your teeth;
- why induction cooktops can boil water twice as quickly as gas stoves do;
- why those expensive copper pans may not be worth the price;
- how to deep-fry without a deep fryer;
- how to stop worrying and get the most out of your pressure cooker;
- how to cook sous vide at home with improvised equipment, a special-purpose water bath, or a home combi oven;
- techniques for packaging foods, with or without a vacuum sealer, for cooking sous vide;
- how to compress fruits and vegetables;
- how to check the core temperature of vacuum-sealed foods;
- safety tips for avoiding food contamination;
- how Modernist ingredients can add power to your pantry;
- times and temperatures for cooking a wide range of meat and seafood; and
- how to find the best ingredients that grow in your neck of the woods.

HOW TO Use an Edge Sealer

Edge sealers bring vacuum sealing within reach of most home cooks. An edge sealer requires specially textured bags. It doesn't handle liquids



Use a premade textured bag, or make your own by cutting a suitable length of waffle-textured plastic from a roll and using the seal-only option to close one end. Flip the top 4 cm / 1¼ in of the bag inside out to keep it clean and prevent a faulty seal.



Place the open end of the bag in the vacuum sealer so that it rests on the sealing strip and extends into the vacuum reservoir (on some models, this happens automatically when you insert the bag into the sealer). Stretch the bag flat across the sealing strip as you place it to prevent any wrinkles, which cause a poor seal.

Using an impulse sealer

An impulse sealer only seals; it doesn't remove air. But this stapler-looking tool has its advantages. Impulse sealers cost about half as much as edge sealers. And they are handy tools for sealing oven bags and making custom-sized sous vide bags from a bulk roll of plastic: two options that work better for storage and high-temperature cooking than zip-top bags do. An impulse sealer can also seal liquids without risking the mess that usually occurs when using an edge sealer.

well, but you can freeze or otherwise solidify liquids before sealing them (see page 57). Seal food only when it is cold.



2 Fill the bag with food, and unfold the lip of the bag. Delicate foods, such as salmon, will keep their shape better if you first wrap them in cling film.



Close the lid, and engage the vacuum pump (on a FoodSaver, for example, press the Seal button). The pump will stop on its own. Although it is possible to seal liquids by pressing the Seal button to stop the vacuum just before the liquid gets sucked in, it makes quite a mess if your timing is off. For extra security, you can place a second seal about 5 mm/¼ in above the first seal.



WAYS TO USE A MICROWAVE OVEN

There's more to microwaving than just making popcorn and reheating leftovers. Chapter 22 on Dishes for the Microwave

(see page 342) presents a variety of recipes that illustrate the strengths of this tool.



Cooking

High power best for: steaming vegetables (see Sichuan Bok Choy, page 346, and Microwaved Eggplant Parmesan, page 344); quickly softening dense vegetables that are high in water content, such as artichokes, potatoes, and onions

Low and moderate power best for: seafood (see Microwaved Black Cod with Scallions and Ginger, page 348); tender meats



Defrosting or Melting

Low power best for: thawing frozen food; melting butter and other fat-rich foods, such as chocolate



Dehydrating

Moderate power best for: drying fruit and vegetable leathers; making jerky (see Microwaved Beef Jerky, page 350, and Crispy Beef Strands, page 352)



Frying

Moderate power best for: crisping herbs (see Microwave-Fried Parsley, page 354) and tender greens, such as carrot tops



Warming

Low and moderate power best for: reheating previously cooked foods to serving temperature



Puffing

High power best for: puffing snacks, such as tapioca puffs or Indian *papadum*; puffing grains, such as barley or popcorn

COOKING UNDER PRESSURE

Why does a pressure cooker work so well? Because it gets so hot inside—about $121 \,^{\circ}\text{C}/250 \,^{\circ}\text{F}$ when the pressure gauge shows 1 bar/15 psi. Whether you're cooking a stock, braising a stew, or fixing a pot of beans, the temperature of these water-laden foods ordinarily won't exceed the boiling point of water, $100 \,^{\circ}\text{C}/212 \,^{\circ}\text{F}$, until they dry out—which you usually want to avoid. But that just isn't hot enough to get some of the crucial flavor-forming reactions going quickly or to rapidly break down the cell walls of many plant foods. Raising the pressure gets around this roadblock.

High-pressure steam rapidly transfers heat to the surface of any food not submerged in liquid.

The lid locks with a bayonet-style mechanism that cinches against the sides of the cooker. Frequent overpressurization can damage this mechanism and render the cooker useless. Other designs use bolts that clamp around the outside.

At high elevations, the air pressure is lower, so water boils at a lower temperature. In Denver (elevation 1.6 km/5,280 ft above sea level), water boils at 95 °C/203 °F. In Chamonix, France (elevation 1 km/3,400 ft), it boils at 97 °C/206 °F; in Cuzco, Peru (elevation 3.4 km/11,200 ft), it boils at 89 °C/192 °F. Food cooked in both open pots and pressure cookers takes slightly longer to cook at high-elevation locations, but the temperature is still higher in a pressure cooker than it is in an uncovered pot.

The handle locks as well, to prevent the lid from opening while the contents are under pressure.





PART TWO: THE RECIPES

Modernist Cuisine at Home boasts more than 400 recipes and variations, each carefully chosen to demonstrate how even the most familiar dishes—pizza and paella, steak and roast chicken, cheeseburgers and chicken noodle soup—can be elevated to offer a memorable culinary experience by applying Modernist techniques in the home kitchen. The largest chapter in the book, titled Basics, is devoted to recipes for 118 stocks, sauces, oils, condiments, and spice mixes that you can use as the foundation or finishing touch for almost any dish you make. Another chapter on Custards and Pies guides you through a simple but powerful set of techniques for making desserts that span the gamut from thin crème anglaise to classic cream pies.

Each of the remaining 17 chapters in Part Two focuses either on a modern technique, such as steaming in the microwave oven, or on the reimagination of a classic home-cooked dish. The 145 main recipes are just the starting point: well over 260 variations, substitutions, make-ahead tips, and "while you're at it" bonus recipes extend the core recipe into new directions and show you how to explore your own culinary ideas. Our showstopping recipe for Mac and Cheese, for example, offers five alternative cheese mixes, a "fat-free" version, a way to make fondue and cheese slices that melt perfectly, and five ideas for grilled cheese sandwiches that are tasty enough for a three-Michelin-star restaurant, yet easy enough to make at home.



The main recipes in the book are all presented both in a compact form and also in more detail with original photographs that illustrate what you should expect to see at key steps. All of the instructions are reproduced on waterproof paper in the wire-bound Kitchen Manual for easy reference. *Modernist Cuisine at Home* makes it easier than ever to learn how to use the new precision cooking tools and techniques to make meals that are uncompromising in their quality and turn out great every time.

Among the amazing recipes and techniques you'll find are:

- how to use a pressure cooker to make stocks in a fraction of the usual time while capturing more of the flavor;
- gravies and a hollandaise sauce that are wonderfully rich, perfectly smooth, and never curdle;
- an uncanny strawberry marinara sauce;
- how to pressure-render animal fats to give them a roasted flavor;
- how to caramelize onions with less effort;
- perfect eggs and breathtaking omelets that remove the guesswork for stress-free breakfasts, even for a crowd;
- how to achieve dry-aged steak flavor without the expense of dry-aging;
- how to cook steak perfectly every time, whether you're in the kitchen, the backyard, or tailgating in a parking lot;
- a flawless cheeseburger and an ultrafrothy milk shake;
- chicken wings made better with Modernist techniques, plus seven great sauces and coatings for them;
- how to outfit your home oven to make pizzas as crispy as you would get from a wood-fired brick oven;
- a full-flavored macaroni and cheese that doesn't break down into an oily mess;
- easier paths to terrific risotto that don't require slaving over the stove;
- eggplant parmesan, black cod with scallions and ginger, instant chocolate cake, and other dishes that will turn your microwave into a hero; and
- a no-compromise vegan gelato that even dairy lovers will prefer.



BREAKFAST EGGS

Poached, scrambled, shirred, coddled, sunny-side up, over easy, deep-fried, hard-boiled, soft-boiled, baked . . . in omelets and *oeufs* à la coque, quiche and cocottes, flans and frittatas . . . there seems to be no end to the delicious ways one can prepare eggs. We showcase only a few of them, but by applying the principles in this chapter, you can master any egg dish.

We also love eggs because they represent an ideal way to communicate one of the most important ideas of Modernist cooking: the beauty of cooking with precise temperature. The difference in taste and texture between a runny yolk and a rubbery one is a consequence of a remarkably small difference in cooking temperature. The photos on pages 142–143 illustrate the progression of a cooked egg from an almost raw, pasteurized state to a very firm, brittle, hard-cooked state. You can see that egg yolks start to coagulate when the temperature rises above 62 °C / 144 °F, and they become progressively firmer as they warm until they're finally hard-boiled, at about 80 °C / 176 °F.

The traditional way to hard-boil an egg is to boil it for a specified amount of time. That works on average, but it's inconsistent because of the many variables at play, such as the size and starting temperature of the egg, as well as the volume of water in the pot.

A better approach is to use a water bath, a thermometer, and an understanding of the way the viscosity of the egg increases as its temperature rises. Once you become familiar with the temperatures that cause each state, you can deftly create any texture—from creamy to custardy to fudge-like—every time, perfectly.

THE SCIENCE OF EGGS AS GELS

A cooked egg is a gel, in which water is trapped within a mesh of cross-linked proteins. You can transform a fluid, raw egg into a semisolid state either by heating it or by subjecting it to chemical agents, such as acids, alkalis, or minerals like salt and calcium. Cooking and pickling whole eggs, and freezing egg yolks, all cause irreversible gelling—once the gel is set, the egg will never return to a fluid state. That's a fascinating, and useful, property.

The linking ability of the proteins in eggs is so potent that they can bind together even when the egg is in powdered form or is mixed with lots of other ingredients. The gelling power of eggs is what holds together the constituents of a muffin batter, the flour granules in some pasta doughs, and the elements of a sweet dessert custard, a quiche, or a *chawanmushi* (a savory Japanese egg custard). It also helps to bind the ground meat in meatloaf and some sausages. The egg's versatility as a gelling agent is unmatched by other ingredients in conventional cooking, and it provides a fun and flexible component for Modernist cooking as well.

HIGHLIGHTS



The best omelet we've made yet has a very rich texture, is delicately thin, and serves as a perfect platform for flavorful fillings.

see page 146



Create a beautiful, stable foam by using a whipping siphon. Eggs foam so well because they are rich in proteins that stabilize the bubbles, and the nitrous oxide used to charge the siphon dissolves easily into the fatty mixture of cream, butter, and yolk.

see page 144



Eggs are mostly water, and you can reconstruct an egg by replacing that water with any flavorful liquid. In our Striped Mushroom Omelet, we start with albumin powder (egg white without the water), and then we add liquid in the form of a mushroom puree.

see page 148



An egg yolk becomes spherical when cooked at 72 °C/162 °F. One fun reciper serve perfectly round egg yolks with a sauce made from the egg white. It's a Modernist version of deviled eggs.

see page 152

FURTHER READING IN MODERNIST CUISINE



Forming foams with eggs: see pages 4.247, 251, 255

Emulsions of eggs: see pages 4.226-229

How to make omelets in a combi oven: see page 4.95

Recipes for pickled and preserved eggs, including a "century" egg: see pages 4.82–83

Plated-dish recipes for eggs: see pages 5.209–221

FRENCH SCRAMBLED EGGS

YIELD: four to six servings (380 g)

TIME ESTIMATE: 45 minutes overall, including 10 minutes of preparation and 35 minutes unattended

STORAGE NOTES: serve immediately after dispensing from the siphon

LEVEL OF DIFFICULTY: easy

SPECIAL REQUIREMENTS: sous vide setup, 500 mL whipping siphon, two cartridges of nitrous oxide GOES WELL WITH: Steamed Herb Omelet (see page 146), Sous Vide Steak (see page 194)

This ultrarich dish is one of our favorites. We create a texture as smooth as custard, having no lumps whatsoever, by using an immersion blender. Then we aerate the eggs in a whipping siphon to make them foamy and light. We also love the pudding-like texture of

nonaerated eggs; see the variation below. Serve the eggs as a breakfast entree, as a filling for omelets, or as a side dish for the ultimate steak and eggs.

INGREDIENT	WEIGHT	VOLUME	SCALING	PROCEDURE
Eggs	200 g	4 large	100%	① Preheat a water bath to 72 °C/162 °F.
Egg yolks Unsalted butter, melted	60 g 60 g	3-4 yolks 65 mL/4½ Tbsp	30% 30%	② Mix all ingredients, and blend until smooth by using a whisk or immersion blender.
Whole milk Salt	60 g 4 g	60 mL/¼ cup 1 tsp	30% 2%	③ Place the mixture in a zip-top bag, remove as much air as possible from the bag by using the water-displacement method (see page 58), and seal it.
				 4 Cook sous vide until just set, about 35 minutes. 5 Transfer to a bowl, and puree until smooth using an immersion blender.
				⑥ Pour into a whipping siphon, charge with two cartridges of nitrous oxide, and dispense.



TO MAKE AHEAD

After step 5, place cooked eggs in a bag or siphon, and hold in a $55\,^{\circ}\text{C}/131\,^{\circ}\text{F}$ water bath for up to 1 hour. Continue with step 6 to serve.





4 Indiana American



VARIATIONS

Scrambled Egg Pudding

Prefer a velvety, pudding-like texture that's not aerated? Increase the temperature in step 1 to $74\,^{\circ}\text{C}/165\,^{\circ}\text{F}$, and decrease the cooking time in step 4 to about 30 minutes. This yields a firmer texture. After step 5, spoon the pureed eggs from the bowl, and serve immediately.

Olive Oil Scrambled Eggs

Increase the egg yolks to a total of $80 \, \text{g}/5-6$ yolks, and replace the butter with extra-virgin olive oil. We use this as a filling in our Espagnole omelet (see variation on the next page).

Mini Egg Cups

Fill the bottom of warm ramekins with Shiitake Marmalade (see page 151). Top with the scrambled-egg foam. Garnish with grated cheddar or Gruyère. This makes a terrific amuse-bouche or snack for special guests.

OMELET FILLINGS

Eggs pair well with so many flavors that the variety of tasty filling combinations for omelets is almost infinite. The classic combinations below have stood the test of time. They are still among our favorites. Try these fillings, or others you develop, in place of the French Scrambled Eggs and chives in the Steamed Herb Omelet recipe on the next page. The Raviolo filling can be served open-faced or sandwiched between two omelet sheets. Quantities shown below yield four servings.



Florentine Omelet Filling

Horendine Officiet III	'''5	
Creamed Spinach see page 199	140 g	½ cup
Ricotta cheese	80 g	5 Tbsp
Parmigiano-Reggiano, grated	16 g	4 Tbsp
Lemon zest, grated	1.6 g	$\frac{1}{2}$ tsp





Alsatian Omelet Filling

Alsacian Officiet Filling		
Pressure-Caramelized Onions see page 127	140 g	½ cup
Muenster or Camembert cheese, rind removed and cut into a long strip		2 cups
Black Forest ham, julienned	48 g	⅓ cup
Thyme leaves	1.6 g	½ tsp





Espagnole Omelet Filling

Lapugnote Officiet Film	' 5	
Tomato Sofrito see variation on page 112	140 g	½ cup
Olive Oil Scrambled Eggs see variation on the previous page	80 g	3/4 cup
Chives, minced, or seasoned herbs	8 g	2 Tbsp





Eggs, cooked sous vide, whites removed see steps 1-3, page 152		4 eggs
Bacon lardons, crispy	32 g	⅓ cup
Chives, minced	5 g	2 Tbsp
Pecorino cheese, grated	16 g	4 Tbsp
Black pepper, coarsely	1.6 g	½ tsp







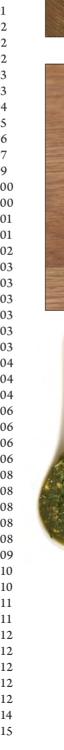




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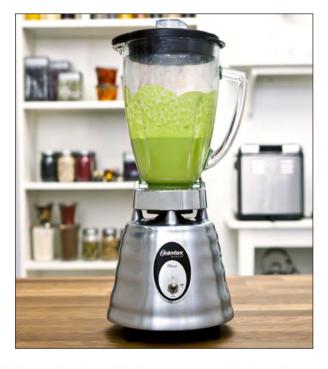














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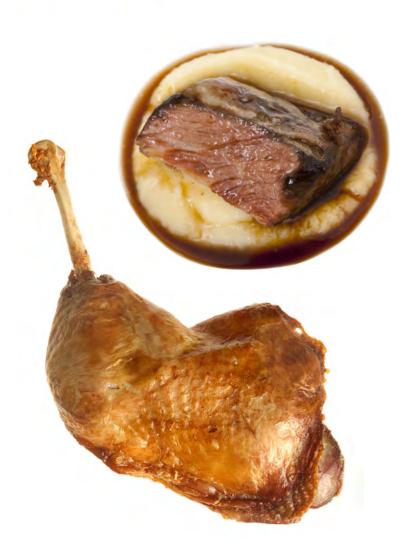












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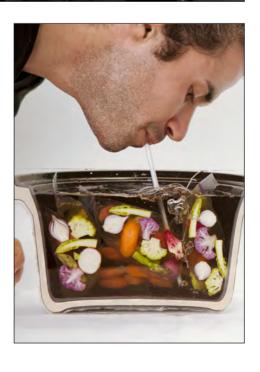
















The photography, research, and recipe development for Modernist Cuisine at Home took place in the team's kitchen laboratory in Bellevue, Washington.

AUTHORS



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Myhrvold is also chief executive officer and a founder of Intellectual Ventures, a firm dedicated to creating and investing in inventions. In addition to stimulating the invention of others, Myhrvold is himself an active inventor, with more than 250 patents issued or pending—including several related to food technology.

Before founding his invention company, Myhrvold was the first chief technology officer at Microsoft. He established Microsoft Research,

MAXIME BILET joined The Cooking Lab in 2007 as head chef and is a coauthor of *Modernist Cuisine*. He directs the research and development of recipes and culinary techniques with a team of three other full-time chefs and several part-time assistants. He is a coinventor on 10 pending patents that resulted from his experiments. Bilet also supervises the photo studio and has overseen styling of the unique food photography of both *Modernist Cuisine* and *Modernist Cuisine* at Home. He has led the culinary team's dinners and events in Seattle and abroad. Bilet and the team have served the food of *Modernist Cuisine* to influential culinary thinkers, chefs, students, and journalists.

Scoffier magazine named Bilet one of the best emerging chefs in 2011, and Forbes magazine named him one of the top "30 under 30" in the food and wine industry. He has been a featured speaker at Madrid Fusión, the Epicurean Classic,

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Myhrvold competed on a team that won first place in several categories at the 1991 World Championship of Barbecue, including first prize in the special pasta category for a recipe that he developed on the day of the contest.

After working for two years as a stagier at Seattle's top French restaurant, Rover's, Myhrvold completed culinary training with renowned chef Anne Willan at the École de Cuisine La Varenne. In addition, he has worked as Chief Gastronomic Officer for Zagat Survey, publisher of the popular Zagat restaurant guidebooks.

Myhrvold's formal education includes degrees in mathematics, geophysics, and space physics from U.C.L.A., and Ph.D.'s in mathematical economics and theoretical physics from Princeton University. In his postdoctoral work at Cambridge University, Myhrvold worked on quantum theories of gravity with the world-famous cosmologist Stephen Hawking.

Paris des Chefs, the International Culinary Center of New York, the Experimental Cuisine Collective Symposium, Maker Faire, and the Seattle Culinary Academy, among others. He and his work have also appeared in television programs, including "The Martha Stewart Show" and "Modern Marvels."

Bilet completed his baccalaureate at the Lycée Français of New York and his B.A. at Skidmore College in creative writing and art. He graduated with highest honors from the ICE culinary school in New York City. He became head chef at Jack's Luxury Oyster Bar at the age of 22 and later worked with Heston Blumenthal in the development kitchen at The Fat Duck.

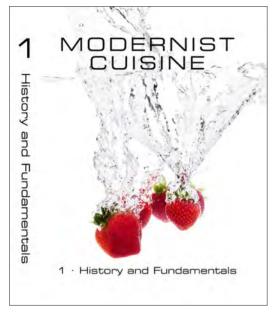
Bilet is an active volunteer with the Hunger Intervention Program's community kitchen, the Gossett Place youth center, and the Quick! Help for Meals program led by Peter Clarke and Susan Evans of the University of Southern California.



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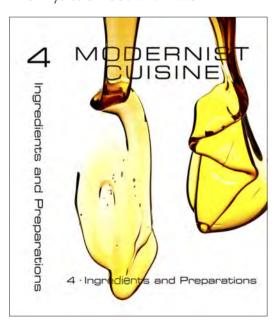
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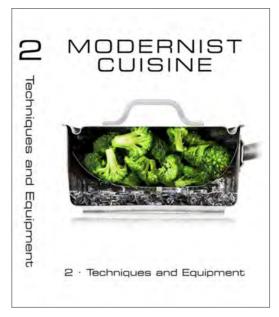
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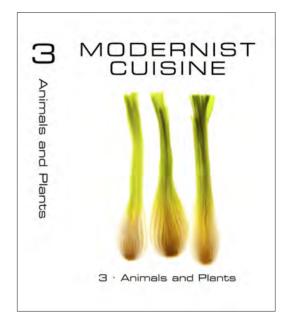
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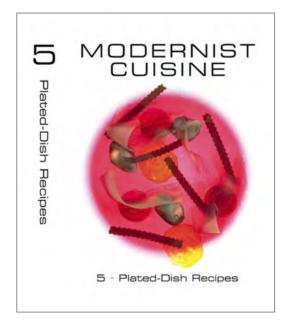
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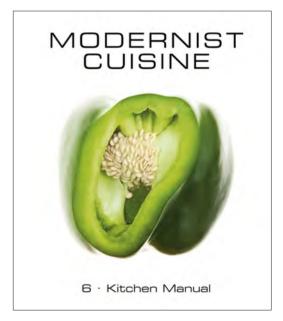
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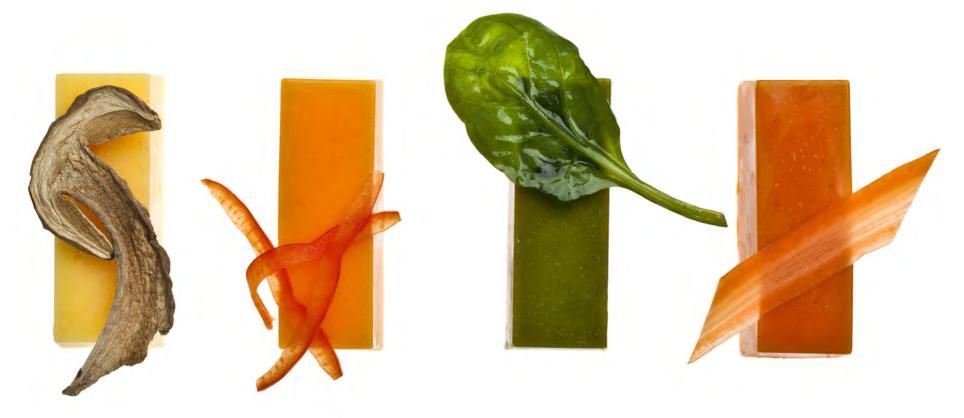
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