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Fresh

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CONTRIBUTORS



Laura Adiletta spent every summer in her grandmother's Appalachian kitchen and garden, eating Southern staples, such as homemade biscuits and gravy. While writing and editing, she started cooking in kitchens from California to Connecticut. Laura calls Cleveland home now and hopes to keep spreading the locavore movement through her editorial and catering services firm EatloCLE.



Kate Atherton graduated from RISD with an illustration degree. She is a Cleveland native who lives and works here on her personal art, commissions and collaborations with local arts organizations. She loves being in theatre here, the Cleveland Orchestra, and drawing her friends. See her work at kateatherton.com.



Laura Watilo Blake is an internationally published, award-winning photographer and journalist specializing in soft adventure and cultural travel stories. "Food is an important part of travel for me," she says. "From preparation to partaking, food has a way of quickly revealing the customs, habits, and social norms of another country. And it's one of the best ways for travelers to connect with other cultures. We all have to eat."



Amber Gallihar Boyes is a senior account executive at Marcus Thomas LLC and serves on the North Union Farmers Market Board of Directors. A local food fanatic and passionate home cook, she lives with her husband, John, in Shaker Heights and stays inspired through her travels near and far.



Kristian Campana is the creator and writer of Ohio-Festivals.net, a blog where he has documented over 300 festivals in Ohio since 2009. He resides in Oberlin with his wife, Julia, and their son, Max, who will most likely become a funnel cake junkie once he has more teeth.



John Corlett is MetroHealth's vice president of Government Relations and Community Affairs, and before that he was Medicaid director for the State of Ohio. He is passionate about everyone having access to good and healthy food, a board member of The Cleveland Foodbank, and a 20-year resident of Detroit-Shoreway.



Emily Ellyn's culinary training started at home on a farm in Ohio. As a child, her family raised chickens, turkeys, pigs, cows, donkeys, and horses and planted, grew, harvested, and preserved much of the family's food. Since then her culinary career has taken her to Paris, The Culinary Institute of America, Food Network, and even an appearance on "The Simpsons."



Ben Gammie is a third-generation apple farmer who recently left corporate America to join his father at Quarry Hill Orchards, their 130-acre spread in Erie County where he lives with his beautiful wife and two children. When not tending the harvest, Ben enjoys skinny-dipping in the farm's swimming hole and going for romantic tractor rides.



Jeff Hagan became a vegetarian at age 12 and only 30 years later actually learned to cook vegetarian. He lives in Cleveland's North Collinwood neighborhood (it's where the Beachland Ballroom is) and is the editor of the quarterly alumni magazine for Oberlin College, where he attended college and was part of Tank, a 90-member dining co-op.



Rachel Hoskins is a copywriter at Twist Creative, a songwriter and performer for the band Attack Cat, and writer for WethePeopleMAG.com. She lives with her husband in Cleveland Heights where she enjoys reading David Sedaris, shopping at the Shaker Square Farmers Market, and riding her bike with a basket.



Melissa McClelland is a freelance food, prop, and set stylist based in Cleveland Heights. She has been a chef in Boston and Burlington, Vermont, as well as a recipe tester and developer for *Eating Well* Magazine. Her current work can be viewed at PhotoStylistCleveland.com.



As chief of sustainability for the City of Cleveland, **Jenita McGowan** is responsible for finding ways to reduce the ecological footprint and expenses. For her, the responsibility is personal too, which is why you can find her all over town (yes, you probably just saw her pedaling by) promoting sustainable practices including Sustainable Cleveland 2019.

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THE DISH ON THE MAILLARD REACTION

BY EMILY ELLYN • ILLUSTRATED BY KATE ATHERTON

I've been told that I am the home economics teacher you've always wanted. As a chef and culinary educator, I started the Retro Rad cooking movement to encourage all of you to dig through your mother's recipe boxes, dust off your pressure cookers and crock pots, and take the old and make it new.

Recently I was asked to explain what actually happens while food is being cooked. What is the "magic" that occurs when we brown our food and sear it to perfection?

Close your eyes and breathe in deeply. While you exhale, imagine the smell of meat grilling, dim sum pan-frying, fish broiling, coffee roasting, and bread baking. Every human feels a primordial "perking up" when they experience this sensation. As proteins start heating up, your surroundings become aromatic, and all your senses are activated. Your eyes open wide and your ears tune in to explain the dark toasty notes filling your nostrils.

It's all the result of the Maillard reaction and caramelization.

Until the early 1900s, not much thought was given to the heating or "browning" of food. That began to change in 1912 when French chemist Louis-Camille Maillard identified that the amino acids in proteins found in our food react with reducing sugars when introduced to elevated temperatures. In doing so, he set the foundation for food science and changed the way we look at steak forever.

There are basically two types of reactions that occur when food is heated, the aptly named Maillard reaction and caramelization. Both are referred to as nonenzymatic browning and differ from enzymatic browning, which occurs through chemical changes without heat, like fermentation.

We are playing Mad Scientist every time we tie on aprons and turn up the heat. Those special odors, flavors, textures, and colors that occur during the browning of our food are the result of what Nobel Prize winner Jean-Marie Lehn refers to as

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"the most widely practiced chemical reaction in the world."

The Maillard reaction is the effect amino acids and sugars produce when the surface temperature of food is raised to more than 300°. What begins as a simple chemical reaction quickly becomes very complicated. The molecules produced keep reacting in ever more complex ways and generate literally hundreds of various molecules. These rearranged amino acids and sugars exude the potent aromas, tastes, and colors associated with roasting, baking, and frying.

Though similar in effect and often appearing simultaneously, there is one very distinct difference between caramelization and the Maillard reaction. Caramelization occurs when sugars react with sugars. A basic example of caramelization is the browning of a crème brûlée. Sugars chemically reorganize between 310°–338°. As the heat increases, the electrons break apart and reorganize causing a noticeably darker color, richer flavors, and more intense aromatics.

So, what determines which reaction will occur? The ratio of the Maillard reaction to caramelization that takes place depends on the amino acid/protein and sugar/carbohydrate content of the foods you are cooking. Carrots and onions for example, have lots of sugars, so roasting these root vegetables will result in considerably more caramelization than Maillard compounds. Seared steak, on the other hand, will have become browned and flavor-enriched mostly from the Maillard reaction.

When cooking, high temperatures are key and the food must be fairly dry on its outside surface. Foods cooked by wet methods will only reach 212°, the boiling point of water. This means, when creating that delicious seared flavor, boiling and steaming are out while roasting, broiling, grilling, sautéing, and frying are in. Pat meat and veggies dry with a paper towel before placing in the oven or a hot skillet. Also, be sure not to crowd





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the skillet or roasting pan, which may cause moisture to accumulate.

As delicious as it is, you might think that raising the temperature even higher would enhance caramelization and the Maillard reaction. It does to a point, but above 355° a different set of reactions occurs. The technical term is *pyrolysis*, but we all call this burning. Although a lot of us like foods a little charred, with too much pyrolysis comes bitterness. The black compounds that pyrolysis creates may also be carcinogenic, so go easy on the charring.

Harold McGee, author of *On Food and Cooking*, reminds us that there is much to be learned when it comes to the chemistry of cooking. We find references to the Maillard reaction and caramelization in most basic cooking methods. However, there are numerous chemical reactions taking place when food is browning and they are still “not very well understood.” 

GIVE YOURSELF A HAND WHEN DETERMINING DONENESS



Rare: The internal temperature of rare beef is about 140°. When meat is rare, it will feel soft and yielding, like the flesh between your thumb and index finger when you pinch them together.



Medium Rare: The internal temperature of medium rare beef is about 150°. When meat is medium rare, it will feel a bit resistant to the touch, like the flesh between your thumb and middle finger when you pinch them together but less soft and yielding than rare.



Medium: The internal temperature of medium beef is about 160°. When meat is medium, it will feel increasingly taut, like the flesh between your thumb and ring finger when you pinch them together but less soft and yielding than medium rare.



Well-Done: The internal temperature of well-done beef is about 170°. When meat is well done, it will yield only slightly to the touch, like the flesh between your thumb and little finger when you pinch them together, but less soft and yielding than medium.