

# Chapter 23

## Careers That Combine Culinary and Food Science



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It was August 2019 when Popeye’s launched their fried chicken sandwich with little fanfare or media attention. That was, until rival Chick-fil-A took to Twitter to tout its sandwich as the original. Popeyes retaliated with a gentle tweet dripping with Southern charm, a social media frenzy ensued, and this is where the “Chicken Wars” began (Cobe, 2021). Over 2 years later, the war over chicken sandwiches continues with countless other restaurants joining in. But have you ever thought who is behind new product launches or creates a restaurant’s menu? These trends and products all come to be through the intersection of culinary and food science, supported by consumer insights. Let us focus on the culinary portion of this to better understand how and why chefs have become such an integral part of what food gets launched in retail and chain restaurants? I am specifically talking about research chefs, culinary scientists, and corporate chefs.

### When Did Food Science and Culinary Science Meet?

They have always been together! Traces of ash found in the Wonderwerk Cave in South Africa suggest that hominins were controlling fire at least one million years ago, the time of our direct ancestor *Homo erectus*. Burnt bone fragments also found at this site suggest that *Homo erectus* was cooking meat, arguably making them the first chefs and food scientists (Lawton, 2020).

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Fast forward to today, and we know that when a chef is searing a steak in a hot pan or on a grill, he or she is creating Maillard browning, the process of applying heat to food that results in the food's sugars reacting with the protein (Johnson & Wales University, 2015). Maillard browning along with seasoning creates the delicious flavor we have come to expect from a properly cooked steak. Food scientists can take this "culinary gold standard" and turn it into a myriad of products: flavors, seasonings, etc. for the home cook or a restaurant to enhance or deliver more flavor to their own steak. It is through this unique combination of culinary skills converted into food science principles that the essence of the flame, smoke, char, and ash can be turned into a flavor that can be utilized in everything from smoky seasoning to a marinade for a chain restaurants' grilled chicken to a smoky whipped cream on a dessert.

We also have and continue to see the reverse from chefs where scientific principles are transformed into culinary masterpieces, especially in fine dining. For example, Ferran Adria of the famed three Michelin star El Bulli Restaurant near Roses, Catalonia, Spain, was introduced to "reverse spherification" at the Griffith labs in 2003 (Adrià et al., 2014). Spherification (or reverse spherification) is the process of adding calcium carbonate to a liquid or sauce and piping it into a solution of sodium alginate (or the reverse); the invention of spherification is attributed to English food scientist William J. S. Peschardt, who patented the technique in the 1940s. Peschardt proposed the technique for making "edible imitation cherries and other soft fruits and foodstuffs" (Halford, 2014). Chef Ferran went on to utilize many aspects of food science in his cuisine.

## **What Is a Research Chef and Culinary Scientist?**

The term research chef was coined in the late 1990s by the Research Chefs Association (RCA) and the criteria needed to become a Certified Research Chef® (CRC®). The CRC® designation is available to any qualified culinary professional, including members and non-members of RCA. CRC®s are recognized and acknowledged as being among the most knowledgeable in their field. They are leaders in the food industry and have proven competence in both culinary arts and food product research and development. The criteria needed to receive this certification is a minimum of an Associate Degree in Culinary, 1 year of food service experience, and 3 years of research and development experience (RCA).

The term culinary scientist was coined in 2002 by the RCA. Certified Culinary Scientist® (CCS®) certification confers a new status on experienced food scientists and technologists who have augmented their training by learning about the culinary arts and who use this knowledge in the development of superior food products (RCA, [n.d.](#)).

## Education and Certifications

There are many institutions that offer Culinary Arts (AS, BS [for those who have some college credits and wish to obtain a BS with an emphasis in culinary or baking and pastry art]), Applied Food Science (BS), Hospitality (for those who wish to pursue a career in restaurant or hotel management), Baking and Pastry Arts (AS, BS), Beverage, and hybrid degrees: Sustainable Food Systems (BS), Culinary Nutrition (BS [for those who wish to pursue a career in culinary with an emphasis on nutrition]), Culinary Science & Product Development (BS [for those who wish to go into food manufacturing research and development]), and Culinary Arts and Food & Beverage Industry Management (BS) at Johnson & Wales University and the Culinary Institute of America (CIA) (Explore JWU Programs | Johnson & Wales University, [n.d.](#)). The CIA also offers ProChef Level I, II, and III certification. This certification is designed as a career development path for food service professionals and can be a prerequisite for some food industry culinary programs (Culinary Institute of America, [n.d.](#)). Finally, there is the American Culinary Federation (ACF) that offers certification in Culinary/Savory (CFC, CC, CSC, CCC, CEC, and CMC), similarly for Pastry, and for Education and Administration (CCE, CCA) (American Culinary Federation, [n.d.](#)).

## Culinology Degree

In 2002, the RCA introduced a novel concept to the food product development community: a unified academic experience combining both culinary arts and food science training. Students now have the opportunity to learn both disciplines and combine their knowledge and skill set to practice Culinology®—the blending of these two fields. Through RCA-approved undergraduate degree programs in the United States and Malaysia, students learn how closely the two components interconnect. These programs offer a well-rounded, interdisciplinary curriculum that focuses on culinary arts and

food science but also incorporates other elements of food product development, such as business management, nutrition, processing technology, and government regulations to name a few.

These 16 RCA-approved Culinology<sup>®</sup> undergraduate degree programs each offer unique features and advantages for prospective students. Some programs are offered at a single university, while others are offered through a partnership by two neighboring schools. These partnering models allow students to transfer their culinary coursework to a nearby institution where they can continue their studies in Culinology<sup>®</sup> and earn their undergraduate degree in the field (RCA, [n.d.](#)).

Jeff Cousminer, a chef and founding member of the RCA, maintains that the food industry continuously sees the benefit of having research chefs and culinary scientists as part of the research and development team. Their culinary background brings not only innovation but drives efficiency, shortens development times, and adds a better understanding of back of house (BOH) operations, all of which leads to a better tasting and more on trend products for both retail and food service channels (Cousminer, [2017](#)).

## RCA

Founded in 1996 by a group of research chefs dedicated to overcoming challenges facing the food product development professional, the Research Chefs Association (RCA) has grown to more than 2000 members. Even though it is called the Research Chefs Association, it attracted many food scientists from very early on as they were working side by side with chefs (Cousminer, [2017](#)). Today, RCA is the premier source of global and inclusive culinary and technical information for the food industry, with a professionally diverse membership including chefs, food scientists, and other industry professionals who are shaping the future of food research and development.

Chef Jeff Cousminer is one of the founding members of the RCA and co-wrote the charter in 1995. At this time, there were chefs working in research and development, but the American Culinary Federation (ACF) would not certify chefs that were not working in restaurant/hotel kitchens (Cousminer, [2017](#)).

RCA is a forward-thinking, vibrant, energized organization whose members benefit by being part of a dynamic community of equitable food professionals who work toward a common goal: the blending of culinary arts and food science. Their mission is to cultivate collaborations between the chefs and food science professionals who develop food to increase innovation, quality, and speed to market (RCA, [n.d.](#)).

## **Innovation Process**

The innovation process is integral to food manufactures', CPGs', and food service chains' growth because the outcome of a well-executed innovation process will generate the best and appropriate concept (menu item, ingredient, retail product, flavor, etc.) that is grounded in consumer insights and focus group data and vetted through manufacturing, supply chain, and/or back of house operations. The typical innovation process begins with the consumer as they are the ones who will ultimately pay money for what is created. Marketing will generate an innovation brief that is grounded in the customer-specific consumer insights and the customer-specific operations (back of house or manufacturing). There will be a focus, either on specific trends or new menu categories. From there, supplier Chefs and Research Chefs will generate concepts, and these will be voted on through internal voting or focus groups. Next, the suppliers will create proto-cepts, a prototype of the concept. These proto-cepts will then be voted upon either internally or via a focus group. The proto-cepts voted the highest will be vetted from an operational standpoint and then will move into development and commercialization. If we look at a fried chicken sandwich, for instance, this could involve anything from a new sauce on an existing sandwich to an entirely new menu item: marinated and coated chicken filet, bun, pickles, sauce, etc.

Success here does not come from being a creative chef or food scientist; success comes from the blending of the two. Innovation isn't just a creative idea, it's a creative idea that actually sells (J.Miller, personal communication, January 11, 2015). Successful concepts are innovative and have been created through an understanding of consumer insights, culinary instinct (taste and recipe development and back of house operations), and a commercialization mindset (foresight for taking the concept from kitchen to lab, scale-up in manufacturing, and supply chain). This is how successful research chefs and culinary scientists innovate.

## **My Journey to Becoming a Research Chef**

I was at the University of Wisconsin–Madison doing a Bachelor of Science in Food Science and was getting into the practical or lab aspect of the program. I remember finding it fascinating applying the curriculum to actual food. I had also begun to cook a lot more and experiment with new recipes and combinations for my friends and worked for a local burger bar as a

prep-cook. At this same time, I was simultaneously introduced to the RCA and given a copy of *What Einstein Told His Cook: Kitchen Science Explained* by Robert L. Wolke and Marlene Parrish. I had found my calling; I wanted to be a research chef. From there, I joined the organization and started putting the plan in place.

My plan was to go to culinary school (Johnson & Wales), but before diving in, I thought I had better work in a restaurant full-time to better understand the challenge ahead of me and understand if I have a passion for culinary. The answer was a resounding yes!! I had spend my time between classes and restaurant shifts cold-calling research chefs through the RCA's membership directory, [www.culinology.org](http://www.culinology.org). Through this networking, I gained a lot of insight on their journey, what it takes to be considered for a role as a research chef, as well as the day-to-day life of a research chef.

After graduation, I worked for another few years in restaurants before I applied for an entry-level food technologist role at Leprino Foods. I got the job, and it was my culinary background that made me stand out. About 6 months later, I became their first chef/research chef and built out a team from there. I had also successfully applied for my CCS and CRC certification. In 1999, I took a role (in the evenings) as an adjunct professor at Johnson & Wales University in Denver to teach a Product Development course.

The most important lesson I learned during my early years as a research chef is the importance of understanding the customer and the consumer and ensuring that all products can be commercialized and re-created on a massive scale. Being a creative chef is only one piece of innovation. As I mentioned above, innovation is creativity that works and sells.

For the past 9 years, I have been at Kerry and serve as the director of Culinary. I am very active in the RCA and being on the RCA's Board. I also continue to learn whether it be trends, insights, flavors, culinary techniques, new manufacturing operations, and business strategy.

## Industry Interviews and Commentary

I connected with Cara Dennis, CCS, senior food scientist at Ken's Foods, who has a BS in Forensic Science and Chemistry and an MS in Food Science. I asked her thoughts on if having a CCS/CRC/culinary training/background has a positive effect in new product development (NPD)? Why?

Having the CCS and culinary background has an infinite effect in NPD. It allows me to ask better technical questions up front for product stability (i.e., holding conditions, reheating practices). I also have a better understanding when a chef describes making a BOH recipe with a roux, rather than cornstarch or fire-roasted

over stewed tomatoes. I find myself to be more creative and interested in new trends and flavors, which comes through in ideations or brainstorming with customers. (Leahy 7/27/2021a)

One key point here is the understanding of BOH operations. By obtaining culinary training and restaurant experience, whether it is fine dining or working as a short-order cook, you gain a great understanding of and the importance of BOH operations. When a culinary team or a product development team receives a customer innovation brief from a chain/restaurant, many times BOH operations will be listed, and having experience or an understanding of BOH operations and flow really shortens development time. This is even more imperative today as restaurants are trying to survive in a COVID/post-COVID reality; with labor shortages and inconsistent sales, developing concepts/ingredients that simplify BOH operations is paramount.

Another major component of a customer innovation brief is working on emerging flavor trends. The ability to understand new trends and consumer insights, to create the culinary gold standard, and to translate it into a product or ingredient that can be both commercialized and function in specific customers' BOH operations is key to executing an innovation brief properly. I push for every concept that my team and I create to be grounded in consumer insights and culinary instinct.

I also connected with Chris Stein, CCS corporate innovation chef at Brakebush Brother's, Inc. Chris has a BA in Biology. I asked him the same questions: Do you think having a CCS/CRC/culinary training/background has a positive effect in new product development? Why?

Without question. The impact that Culinology has had on the food industry in the last 25 years is unmistakable. The Culinary piece inherently improves the quality of products being developed as those products are now pushed to meet certain criteria from an organoleptic perspective that may otherwise be missed when things are approached purely scientifically. Chefs help create authentic flavor experiences by ensuring products are utilizing appropriate ingredients and mimicking traditional cooking methods & processes. Conversely, a Chef may be able to prepare an amazing dish, but if that dish cannot be reproduced to scale and maintain quality and integrity, then it won't be successful. That's where Food Science comes in, helping to safely and appropriately bring those Chef-inspired products to life for millions of consumers. Culinology is the bridge between those two worlds and gives you all the tools needed to develop and commercialize exceptional products. (Leahy 8/2/2021b)

Finally, I spoke to Flannery Lucas, CCS, RD & A senior scientist at Kerry. Flannery has a BS in Culinary Science from Iowa State University. My first question for Flannery was, "How has obtaining your CCS helped you in your product development career?"

My CCS certification has helped me greatly in my career as a product developer. When our culinary team engages our customers on new culinary trends, I can be part of that gold standard development to help translate that on the industrial side.

I followed that up with, “Do you think having a CCS/CRC/culinary training/background has a positive effect in new product development? Why?”

Yes, as a food scientist in product development I truly believe that the CCS certification and training has a positive influence. Not only does it provide a network and supportive community to engage with but allows me to bridge the world of culinary arts to the science side. It has allowed me to work with marketing, chefs, baristas, and mixologists to show the customer the world of trends and exciting innovation and then translate that for their consumer through application work. Working in the kitchen and the laboratory is seamless and the knowledge of both science and art is imperative to developing a great tasting and functional product. (Leahy 8/12/2021c)

## The Future

As mentioned above, restaurants from all levels of dining are trying to survive in a pandemic/post-pandemic reality with labor shortages and inconsistent supply chains. They need to ensure that their menu is streamlined from an executional and financial perspective while also providing the tastiest experience for their consumer. The ability to tap into culinary experience for a product development or culinary team will prove to your customers that your product development team understands trends, consumer insights, back of house operations, and taste development.

## Summary

The food industry knows what Culinology is, and many job postings ask for or say it is desirable to have a Culinology degree (Cousminer, 2017). There is no doubt that being at the intersection of these two disciplines will open more doors in your career. The industry sees how efficiency and economy gained from those who are at the intersection of these two disciplines: from creation to commercialization to manufacturing, the development time is significantly less and there is a broader understanding of taste (Cousminer, 2017). As I hire for my team, as well as our broader research and development team, I absolutely agree.



If you are interested in becoming a research chef, I highly recommend joining the RCA at [www.culinology.org](http://www.culinology.org) to understand more and broaden your career in the food business. At a minimum, you can take advantage of the connections gained from the RCA's membership directory and network. As with any discipline, real-world, hands-on experience is key for pursuing a culinary degree as many of the skills, intuition, and instinct can only be gained from working in restaurant/kitchens. To that point, I offer up this quote from Michael Faraday, "It is not enough to know the principles, one needs to know how to *manipulate*" (This, 2012). From personal experience, there is such gratification when I see menu items advertised on media that I created and developed at some of the largest food chains both domestic and internationally!! My advice to you is to network, and if you have the passion, follow it!

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