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### REAPing the Benefits of France, Cheese, and EcoGastronomy

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commentary

## REAPing the Benefits of France, Cheese, and EcoGastronomy

—Kayla O'Meara (Edited by Laura Jarvis)

There is an old French proverb that says “*le fromage et pain est medicine au sain.*” Or simply, cheese and bread is medicine for health. As a sophomore French major harboring a secret love of biology and an aspiration to attend medical school, I would have never guessed that I would actually live out the proverb this summer. For eight weeks I was a cheese-making apprentice in the fast emerging field of EcoGastronomy as a part of the University of New Hampshire’s Research Experience and Apprenticeship Program (REAP). REAP is an undergraduate research opportunity awarded to motivated students after their freshman year as a means of exploring a field of interest and the research process in general. Dr. Claire Malarte-Feldman, a professor of French, introduced me to this program in mid-December 2008. I had no idea what I was in for. Yet, by the end of July 2009, I realized that my experience not only afforded me the perfect project, but also started me down a family path nearly fifty years in the making.

Helen Hokanson, my great-grandmother, was a woman ahead of her time. During the 1960s she worked with Rachel Carson, passing out pamphlets endorsing organic farming and condemning the use of chemical pesticides. She soon became a charter member of the Natural Foods Association of New Jersey and was part of a movement to eliminate the use of factory cotton as filler in baby food. An organic farmer and beekeeper, Helen Hokanson fought to protect human health and the environment in an age where few dared to challenge the powerful food industry. She, and others like her, held an ideology that emphasized the benefits of good, clean food grown naturally. In July 2008, my great-grandmother passed away at the age of ninety-eight. This is where her path ended and mine would soon begin.



*The author slicing into the first research cheese, made from milk from Brookfield Farm.*

### Cheese-making

Nearly one year later I began my apprenticeship in the field of EcoGastronomy, or EcoG. This academic mouthful is the study of food and where it comes from. I was lucky enough to be working with Dr. Curran-Celentano, a “forefather” of UNH’s EcoG program, the only one in the nation.

"EcoGastronomy is designed to engage students in this deeper meaning of eating and to position them to become informed food citizens," says Dr. Curran-Celentano. This program, offered as a dual major, features a unique combination of experience in the field, kitchen, and lab to educate students about sustainable agriculture and nutrition with an emphasis on local, regional, and global food systems.

The field of EcoGastronomy seemed to be a great match for my REAP project, as it combined French food and culture with biological principles. Cheese is an integral part of French culture, and cheese-making itself is a very interesting chemical process. Also, the project I would be working on was perfect since I would spend my summer making cheese! Working with Elyse Gordon, a graduate student completing her master's project, I examined the seasonal changes in milk composition as cows moved to and from pasture and how these changes influence the physiochemical and sensory qualities of the subsequent cheese yields. This involved a comparison of five local dairies with an emphasis on feeding practices and cow breeds.

In two months we made twelve farm house cheddar cheeses by hand, using a traditional recipe. After completing a statistical inventory of our homemade cheese, we saw that the differences in milk and cheese composition among these dairies, although only miles apart, were striking. Cows fed fresh grass produced cheese much more yellow in color, and milks from these five dairies produced drastically different cheeses, varying in texture, size, and taste. The differences in color yield in milk and cheese among the dairies can be explained rather easily. Since the pasture is exposed to more sunlight and favorable conditions as the summer season progresses, cows on pasture at organic dairies continue to produce milk and cheese with a progressively more yellow color. In contrast, samples collected at UNH's Fairchild Dairy from cows that are not grass fed had a consistently whiter coloring. One can observe the differences between organic and conventional milk simply by comparing *The Organic Cow* and *Hood* milk. *The Organic Cow* is a slightly more yellow color with subtle herbaceous undertones due to the influence of seasonal pasture.



*Cows in pasture at Sunnyfield Farm in Peterborough, New Hampshire*

The coloration of the cheeses illustrates the very important ecogastronomical concept of traceability: any food should be able to be traced back to its natural geographical roots. Since the five dairies were in different locations, it follows that their products would be slightly different. When compared to this small-scale example of local dairies, the lack of traceability in our modern food culture is startling. Microwaveable dinners and instant breakfasts don't come with a tracking label, only with a list of unrecognizable ingredients and quick cook instructions. How do we know what we are actually eating if we cannot tell where it comes from?

## **EcoGastronomy & Slow Food**



*Fresh linguini tossed in lobster bisque, made by Italian students from the University of Gastronomy.*

Although this project gave me insight into the challenges and commitment of research, it was the time I spent in the UNH nutrition lab that afforded me the greatest learning opportunities. Something about working in the nutrition lab, surrounded by "super-tasters" and "super-foods," attracted me to the undeniable relationship between food and human health. Soon, I was learning about the benefits of organic farming, the importance of shopping locally, and the Slow Food movement. Slow Food is an international movement that promotes the "pleasures of the table" and the appreciation of food as an integral part of culture. This age-old concept has been brought back to life in a fast paced world to reverse the damage of the modern food industry and the devastating effects that industrialization has had on our health and our communities.

The EcoG program also afforded me another incredible learning opportunity, this time of international significance. Thanks to an exchange program hosting Italian students from the University of Gastronomy in Italy, I was included in several eye-opening field trips and lectures. The students even cooked us a fantastic meal one afternoon, using only local ingredients to create a menu of lobster risotto, fresh linguini made from scratch tossed in lobster bisque, chopped greens and swiss chard in olive oil, and desserts such as strawberry shortcake, crème sauce, and cheesecake with a strawberry-rhubarb topping. Coupled with the expertise of my mentor and supervising graduate student Elyse, these experiences in the nutrition department made me hungry for more.

## Independent Research

My mentor, Dr. Joanne Curran-Celentano, is renowned for her work with dietary carotenoids and their remarkable benefits for human health. Carotenoids are a class of 700 fat-soluble nutrients that produce the colors in foods such as carrots, pumpkins, sweet potatoes, tomatoes, and other deep green, yellow, orange, and red fruits and vegetables (Vitamins). Notably, carotenoids are powerful antioxidants. As many people are aware, antioxidants play a significant role in boosting immune response, including cancer prevention.

Inspired by Dr. Curran-Celentano's numerous studies, I used a portion of my REAP grant to perform independent research on these incredible fat-soluble compounds, found in milk and cheese. While studying anti-carcinogenic compounds in milk fat, I stumbled upon a fatty acid called conjugated linoleic acid. Conjugated linoleic acid, or CLA, is found abundantly in milk produced by animals such as cows and goats. Since CLA comes directly from the pasture and occurs naturally in most milks and cheeses, its health benefits are impressive. It has repeatedly demonstrated powerful anti-cancer and anti-inflammatory effects as well as a role in cardiovascular disease prevention (Wahle et al 2004). A certain form of CLA may even reduce adiposity, or fat stores. This means that eating cheese rich in CLA may burn fat deposits, including belly fat. (Kong et al 2007). Recently, studies on this topic have investigated CLA as a potential protection against heart disease; such findings generate a positive outlook for the future (Center for Disease Control).

## And the French?

Equipped with knowledge about these health benefits and miracle compounds found in dairy products, I used the rest of my REAP experience to pursue an inquiry of the French and their world-famous consumption of cheese. French people are often stereotyped as being notably slender. Furthermore, in what is known as the French Paradox, this nation consumes as much saturated fat as the US but has among the lowest rates of heart disease in the world (Shafer, M.). In addition, the southern regions of France have arguably the lowest incidence of cancer in all of Europe (European Union Department of Health). Could this be due to France's artisan cheese culture and the health benefits of carotenoids and CLA? If so, could a high consumption of artisan cheese help fight devastating illnesses such as cancer, obesity, and heart disease that plague millions of Americans? Very limited research has been conducted on this topic thus far and could prove to be an excellent project for further study. In fact, as I will be spending my junior year abroad in Dijon, France, I hope to investigate this phenomenon myself. I also plan to continue working with my mentor and Elyse to someday conduct my own research on the effects of CLA on population health.

This summer, my cheese-making apprenticeship and exploratory research in the field of EcoGastronomy undoubtedly became a life changing experience. I entered the REAP program with an open mind and an empty head, but I left with a passion for something entirely unexpected. I like to think that maybe everything has come full circle, and what my great-grandmother started nearly fifty years ago has found its way back to me, straight through my stomach and into my heart.

*I would like to thank Joanne Curran-Celentano for her excellent mentoring and research expertise; Elyse Gordon for showing me the ropes and putting up with my absent-mindedness on a daily basis; Susan Jalbert for being the voice of reason in all situations; Paul Tsang for setting me up with my REAP project; Claire Malarte-Feldman for her REAP recommendation and continuing aide; and my mom for her infinite support throughout this entire experience.*

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## **Author Bio**

*Always soaking up information around her, Keene, New Hampshire, native **Kayla O'Meara**'s thirst for knowledge led her to the University of New Hampshire's REAP program for summer research. Her collaboration with cheese-maker and graduate student Elyse Gordon led to a broader curiosity for food and its impacts on the human body, which launched Kayla's research and introduced her to unexpected and delightful experiences in the nutrition lab and UNH's EcoGastronomy program.*

*O'Meara, a sophomore French major contemplating a medical career, always knew she enjoyed the research process but says she never knew how complex it could be. Facing obstacles during her independent research opened her eyes to how hard it can be but also to how rewarding. She emerged with a newfound appreciation for food and its nutritional makeup. This motivated honors student hopes to extend her inquiry of food, science, and EcoGastronomy—and penchant for artisan cheese—abroad in France during her junior year.*

## **Mentor Bio**

*University of New Hampshire Professor **Joanne Curran-Celentano** has mentored many students in her twenty-plus years on the faculty, but working with Kayla O'Meara on her REAP project was a different experience. Since O'Meara was to be an apprentice on a graduate student's Master's project, Dr. Curran-Celentano decided that "what we do, she will do." O'Meara unfortunately broke her leg early in the summer, but a cast and crutches "did not even slow her down," Dr. Curran-Celentano noted. "We were delighted to have her with us." (Kayla was, however, not allowed to go into pastures to sample grasses.) Dr. Curran-Celentano specializes in the nutritional sciences and is a member of the Department of Molecular, Cellular, and Biomedical Sciences.*