

Lessons Learned from Purslane

In the early 1980's, when I was serving as chair of the Nutrition Coordinating Committee at the National Institutes of Health (NIH), few realized that green plants are a significant source of omega-3 fatty acids. Plants as a rule, are generally low in fat, and their omega-3 content was thought to be negligible. As fate would have it, I helped revise this thinking. One of my first insights came in the spring of 1985, while I organized and co-chaired the international conference titled "The Health Effects of Polyunsaturated Fatty Acids in Seafoods." This was the first big conference devoted exclusively to omega-3 fatty acids, and it opened the eyes of the scientific community to the vital importance of these long overlooked nutrients. During the conference, I found myself thinking about a common plant called "purslane." Purslane had come to mind because I knew it had been used by traditional societies to treat many of the same health problems that were now responding to omega-3 fatty acids, including inflammation, heart problems, stomach disorders, pain, and fever. For example, Theophrastus (372-287 B.C.), the father of botany, had recommended purslane as a remedy for heart failure, scurvy, sore throats, earaches, swollen joints, and dry skin. On a different continent, northwest Indians were using purslane tea to soothe sore throats and inflammation. Tribes from west tropical Africa were using purslane as a heart tonic and an ointment for boils and burns. In the Punjab and Cashmere, purslane weeds were recommended for inflammation of the stomach and intestinal ulceration.

Surely, I told myself, it was more than coincidence that purslane and so many of the healing properties now being attributed to omega-3 fatty acids. The plant must be a rich source of these nutrients. I convinced my friend and colleague, Norman Salem, Jr., Ph.D., also at NIH, to help me analyze its fatty acid content. But where to find purslane? I knew that it was commonly eaten in Greece, my homeland, and throughout most of Europe, Mexico, and Asia, but in the United States it was considered a noxious weed. To help control this "pest," the U.S. government had gone so far as to import the "purslane sawfly" (*Schizocerella pilicornis*), a fly that thrives on the ubiquitous plant and is capable of gnawing it to the ground.

You can imagine my delight when I found a clump of purslane growing in a highly convenient place: the cracks in the pavement outside my office at NIH. I collected the stalwart plants and submitted them for analysis. The results confirmed my hunch. Purslane is loaded with omega-3 fatty acids. One hundred grams contain 400 milligrams of the plant-based form of omega-3 fatty acids called alpha-linolenic, or LNA—fifteen times more than most commercial lettuce. As an added bonus, it is rich in antioxidants. One serving fulfills the daily requirement of vitamin E and provides significant amounts of vitamin C, beta-carotene, and glutathione.

One of the implications of my discovery, I realized is that purslane and similar wild plants must have contributed a substantial amount of LNA and antioxidants to the diets of early humans. Purslane, in particular, is very widespread. Ranked as the eighth most common wild plant in the world, it was also one of the first plants cultivated by early humans: Purslane seed were found in a cave in Greece that was last inhabited 16,000 years ago.

We know that purslane is not alone in its bounty of omega-3 fatty acids. Following my discovery, other plants were tested for LNA, revealing that they, too, contained significant amounts of this nutrient. Appreciable amounts of LNA have been found in most dark green leafy vegetables, mosses, ferns, and legumes, as well as in many herbs and spices such as mustard, fennel, cumin, and fenugreek. As the research continues, the list is likely to grow.

What Chickens Like to Eat

My findings about purslane soon led to another discovery: The eggs of chickens that graze on wild plants are also rich in omega-3 fatty acids. I gathered this additional insight while visiting my ancestral home on the southwestern Peloponnese in Greece. My family has a large farm with olive trees, fruit trees, a vegetable garden, a goat, and a flock of free-ranging chickens. One day, as I was watching the chickens forage for food, I was surprised to see that they were seeking out grass and green plants. In my ignorance, I asked my father, a physicist and a man with encyclopedic knowledge, what was wrong with the chickens that they “had” to eat greens. Wasn’t their mash giving them enough nutrients? He reminded me that greens, insects, and worms were the natural diet of chickens, and that they ate commercial cornmeal mash only because that’s what we deigned to feed them. As I watched the chickens more closely, I saw that they were particularly attracted to purslane. This made me wonder if the nutritional content of their eggs was different from that of ordinary eggs. I gathered some eggs from the henhouse, hard-boiled them, and brought them back to the NIH for analysis by Norm Salem. The lab tests showed that the eggs from our free-ranging hens contained twenty times more omega-3 fatty acids than standard supermarket eggs. (They had a ratio of omega-6 to omega-3 fatty acids of 1 to 1, while the supermarket eggs had a lopsided ratio of 20 to 1.)

When I researched the literature, I found that my observations about chicken eggs held true for the flesh of free-ranging animals as well: Any grazing animal that is allowed to eat its natural diet of wild plants and greens is far richer in omega-3 fatty acids than an animal kept in confinement and fed an artificial, grain-based diet. For example, Michael Crawford found that the flesh of a wild Cape buffalo that is free to forage in its natural habitat contains one-tenth as much total fat, about half as much saturated fat, but nearly six times more omega-3 fatty acids than a similar cut of meat from a grain-fed steer.” It is as if they were different foods altogether.

A critical insight about the Paleolithic diet had just fallen into place. Whether early humans were eating fish, plants, or land animals, they were being nourished by omega-3 fatty acids. Today, we consume a fraction of this essential nutrient. Surveys show that one-fourth of the U.S. population eats no fish whatsoever. Meanwhile, we eat a third of the amount of green leafy vegetables as our ancestors, and the eggs and meat that we eat comes from animals whose diets are artificially low in omega-3 fatty acids. It has been estimated that we are now eating one-tenth of the amount of omega-3 fatty acids required for normal functioning. Alarming, 20 percent of the population has levels so low that they defy detection. The admonishment to “eat a balanced diet” makes no sense when our food has been stripped of one of its most essential nutrients.