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MAGAZINE

## These traditional diets can lead to long lives

Meals developed over generations based on whole grains, greens, nuts, and beans offer the promise of eluding disease and staying healthy.

BY DAN BUETTNER

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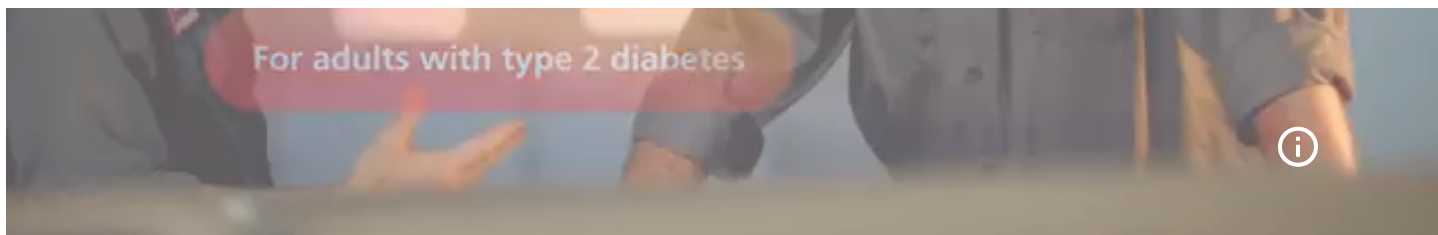
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More than 14 years have passed since Dan Buettner first wrote about the world's longest-lived people for the magazine. Today he's still uncovering the secrets of centenarians in regions he calls the blue zones. He recently returned to four of them to learn more about the foods that contribute to this remarkable longevity, collecting time-tested recipes and investigating why certain foods seem to promote long lives.

### Sardinia, Italy

— ADVERTISEMENT —





## Home to the world's highest concentration of male centenarians

Ninety-nine-year-old Assunta Podda vigorously stirs an earthen pot and flashes a toothy smile. “Minestrone,” she explains with a swooping hand gesture.

I peer into the mélange of beans, carrots, onions, garlic, tomatoes, fennel, kohlrabi, herbs—all under a golden veneer of olive oil. Behind her, a shaft of evening light angles through a window and illuminates a table with a medieval spread: sourdough loaves, foraged greens, a carafe of garnet red wine.

“Sit,” she insists, deploying the region’s generous albeit predatory hospitality. I join her family and Gianni Pes, an epidemiologist who studies the region.

Podda’s traditional embroidered blouse, filigreed necklace, and black sweater contrast sharply with her nimble movements: With the steady hand of a younger woman, she pours wine into stout glasses and ladles steaming soup into dishes.

“Now eat.”

We’re on the eastern slopes of Sardinia’s Gennargentu mountains in Arzana, a village in a region with the world’s highest concentration of male centenarians. In the years after World War II, 38 people in this village—one out of every 100 of their peers—have reached a century.

Pes discovered this phenomenon in the late 1990s. Since then, he’s meticulously interviewed more than 300 centenarians, using extensive questionnaires. He believes that steep streets, zeal for family, reverence for elders, a matriarchal culture in which women bear most of the family stress, and a simple traditional diet explain much of this longevity. Pes says he’s found that the spouses of centenarians live longer than the siblings of centenarians, suggesting to him that diet and lifestyle may make a bigger difference than genes.

Pes, who favors blue-framed glasses and a silver goatee, slurps a spoonful of soup. “*Delizioso!*” he proclaims, glancing admiringly at Podda, who closes her eyes and shrugs.

Minestrone serves up essential amino acids, a potpourri of vitamins, and a range of fibers. Pes has found that centenarians have specific strains of bacteria in their digestive systems that convert fiber into unusually high levels of odd-chain fatty acids. These saturated fats are associated with a lower risk of heart disease and may prevent cancer.

Cruciferous vegetables, like the cabbage and especially kohlrabi that find their way into almost every bowl of Sardinian minestrone, also may play a role. After observing the high percentage of centenarians with goiters—a condition that accompanies a low-functioning thyroid—Pes speculates that thiocyanate from a steady diet of kohlrabi may blunt thyroid function. That may help Sardinians live longer by reducing their rate of metabolism, Pes says, just as a lighter with a low flame lasts longer.

In Seùlo, another centenarian-blessed village, Pes and I visited a century-old community bakery. A dozen women were making the distinctive bread eaten with most meals. We watched them build a blazing fire in a brick bread oven and knead dough with strong

arms, their faces flushed. The senior baker, a short, vigorous octogenarian named Regina Boi, hovered over the process in her black dress and head scarf, dispensing advice and signaling when the dough was ready and the oven hot enough.

Boi had provided the starter dough, a gooey froth resembling curdled milk that her family has cultivated for generations. The starter contains yeast and native *Lactobacillus* bacteria. The yeast and lactobacilli produce carbon dioxide that leavens the bread, and the lactobacilli also break down the carbohydrates to produce lactic acid. The acid imparts a sour taste, but more important, Pes tells me, the bread's carbohydrates enter the bloodstream 25 percent slower than those of plain white bread.

As dinner with Podda's family winds down with a spirited exchange of village gossip, Pes, in a flush of revelry, raises his glass and belts out the signature toast of the island, delivered in the local dialect: "A kent' annos!" "May you live to 100!"

"And may you be here to count the years!" the family bellows. A beat later, Podda softly repeats it. Indeed, since our dinner together, she's celebrated her 100th birthday.

## Nicoya, Costa Rica

**Adults here have the longest life expectancy in the Americas.**

When Pes began his study of centenarians, he denoted areas with long-lived residents with blue marks on a map. He noticed such a profusion in Sardinia's Nuoro Province that he began to refer to the area as the "blue zone." I met Pes while canvassing the world in search of longevity hot spots, and I adopted his term for similar areas I uncovered: Nicoya, Costa Rica; the Greek island of Ikaria; Japan's Okinawa island; and a community of Seventh-day Adventists in Southern California.

I've examined dietary surveys of each region and inventoried their foods of the past century. Until the late 20th century, these diets consisted almost entirely of minimally processed plant-based foods—mostly whole grains, greens, nuts, tubers, and beans. People ate meat on average only five times a month. They drank mostly water, herbal teas, coffee, and some wine. Notably, they drank little or no cow's milk; soda pop was largely unknown to them. As globalization spreads, processed foods, animal products, and fast foods are supplanting the traditional diets. Not surprisingly, chronic diseases are on the rise in the blue zones.

A healthy diet is just one part of a web of longevity-promoting factors that also include having a circle of lifelong friends, a sense of purpose, an environment that nudges one into constant movement, and daily rituals that mitigate stress.

(Take a look at how diets stack up around the world.)

I found all of those factors in Costa Rica's Nicoya region, as well as what might be the world's healthiest breakfast, in an open-air building with a vaulted red-tiled roof blackened with smoke.

Every morning at daybreak in the city of Santa Cruz, María Elena Jiménez Rojas and a dozen or so other women at Coopetortilla stoke wood fires in long, clay ovens and stir cauldrons of spicy beans. Rojas, wearing a smudged apron over an immaculate white T-shirt, pinches off a golf ball-size piece of corn dough, plops it down on waxed paper, and rotates it with mechanical precision into a round patty. She slaps it onto a hot clay plate called a *comal*, where it roasts briefly before expanding into a puffy pancake and collapsing into a perfect tortilla.

Three women mix black beans with onions, red peppers, and herbs. The beans will cook to tender perfection and then be mixed with rice and sautéed bell peppers, onions, and garlic to produce a uniquely Costa Rican version of *gallo pinto*.

Nearly 30 years ago, Rojas tells me, the cooperative was just a tortilla shop. But young single mothers came to her for work, and she's helped dozens lift themselves out of poverty.

A few minutes before 6 a.m., the first customers file in. They sit on benches at long, green tables, where waitresses, wearing simple dresses and flip-flops, serve giant cups of weak coffee, plates of gallo pinto, and baskets of warm tortillas. As lilting ranchera music drifts in from a distant radio, customers fill their tortillas with beans, top them with hot sauce called *chilero*, and wash them down with black coffee, savoring a recipe for longevity reflecting thousands of years of culinary genius.

Costa Rica's blue zone is a roughly 30-mile-long strip that runs along the spine of the Nicoya Peninsula; it doesn't include the tourist resorts on the coast. The region consists mostly of dry pastureland and forests. Until about 50 years ago, people here were mostly subsistence farmers or ranch hands, supplementing a corn-and-bean diet with tropical fruits, garden vegetables, and, occasionally, wild game and fish.

The region's Chorotega people, who most influenced the diet, have been eating essentially the same food for millennia. That may help explain why adults here have the longest life expectancy in the Americas and men older than 60 have the lowest reliably measured rate of mortality for their age group in the world.

Corn tortillas might contribute to that longevity. They are an excellent source of grain, with complex carbohydrates rich in vitamins, minerals, and fiber. The wood ash the women add when they soak the corn breaks down the cell walls of the kernels and releases niacin—which helps control cholesterol.

Black beans contain the same pigment-based antioxidants found in blueberries. They're also rich in colon-cleansing fiber.

The magic comes in pairing corn with beans. Our bodies need nine amino acids—the building blocks of protein—to make muscle. Animal products such as meat, fish, and eggs provide all nine, but they also contain cholesterol and saturated fat. Together beans and corn provide all of these amino acids—with none of those unhealthy elements.

Researchers are looking into whether the combination may preserve cellular health too. Stanford social epidemiologist David Rehkopf and Costa Rican demographer Luis Rosero-Bixby have found that Nicoyans have longer telomeres on average than Costa Ricans overall. Telomeres are protective “caps” on the ends of DNA strands, which wear down over time, a rough marker of biological age. Rehkopf, who joined me in Costa Rica, told me that Nicoyans seem to be up to a decade younger biologically than their chronological age. Another group with longer than average telomeres? The poor—who may be more likely to subsist largely on beans, tortillas, *chilero*, and black coffee.

At Coopetortilla, I dig into my breakfast, chasing *chilero*-topped beans wrapped in fresh tortillas with gulps of coffee. Sweat beads on my forehead, and tears roll down my face. “Are you okay?” Rojas asks, flashing me a look of sincere concern. “Don't worry,” I say. “These are tears of joy.”

## Okinawa, Japan

**Residents are three times as likely to reach 100 as Americans.**

Half a world away on Okinawa, I prepare to sample yet another contender for the world's healthiest breakfast at the Daiichi Hotel in Naha with Craig Willcox, another researcher seeking dietary clues to longevity.

On Okinawa, as compared with the United States, residents are three times as likely to reach 100, women suffer about half the rate of breast cancer, both sexes are afflicted by a third to a quarter the rate of heart disease, and elderly people die from Alzheimer's dementia at a tenth to a twelfth the rate.

Each morning the hotel founder, Yoshiko Shimabukuro, 91, a short energetic woman, and her daughter Katsue Watanabe, a certified vegetable sommelier, prepare plant-based dishes from some 50 ingredients, about half of which are unique to Okinawa. Before us, in appetizer-size plates and bowls, lies a starburst of colorful foods, many of which helped create what remains, by several measures, the world's longest-lived population despite a decline in the health of younger generations.

Willcox, an anthropologist and gerontologist, points out that everything in this 20-course meal—including tofu soup, carrot salad, a boiled fern called otani-watari, and papaya stir-fry—is light on calories. Okinawan food, he tells me, is nutritionally dense and calorically poor, while in the U.S. it's the reverse.

With his twin, Bradley, and their mentor, Makoto Suzuki, Willcox has written books that lay out most of what we know about the island's traditional diet. The brothers showed up in Okinawa in 1994 interested in studying centenarians and hooked up with Suzuki. For a quarter century the trio has chronicled what people here eat and investigated why it helps them elude disease. Now I'm getting a hands-on lesson.

Willcox points a chopstick at a tofu stir-fry with sea green crescents of goya, or bitter melon, a key ingredient in goya champuru, a classic Okinawan dish. Goya is high in vitamins A and C, folate, and powerful antioxidant compounds that can help protect your cells against damage, he says. It's anticancer, protective of liver and cell membranes, a free radical scavenger, inhibiting of bacteria such as *E. coli*, and capable of lowering blood sugar. I bite down on a piece, unleashing a flavor explosion redolent of chewing a mouthful of aspirin—only more piquant. As with beer, which people often don't like at first, the bitter taste grows on you.

With a tuft of sandy brown hair and round spectacles that make him look like a middle-aged Harry Potter, Willcox moves on to the tofu, which is denser and more cheeselike than other Japanese tofu. As the protein centerpiece of the daily Okinawan diet, it often replaces less healthy proteins, such as meat or eggs. Traditionally made with seawater, Okinawan tofu is rich in calcium, magnesium, zinc, and other minerals that most Americans lack in their diet. It's also high in genistein and in daidzein, which metabolizes into equol. Genistein and equol are isoflavonoids that Willcox notes are associated with reducing the risk for cancer and cardiovascular disease.

Willcox hoists a porcelain cup containing a bright yellow brew. "Turmeric tea," he says. He takes a sputtering sip and explains that dozens of studies have shown the active ingredient in turmeric can help our bodies protect against diseases, including cancer, heart disease, and dementia. Islanders have co-opted the Japanese trick of using pungent flavors, such as turmeric, to enhance the taste of healthy vegetables. Most recipes rely on dashi, a rich broth commonly made from bonito flakes or sea kelp. Dashi can convert a pile of vegetables into an explosion of deliciousness, resulting in a dish with fewer calories than a hamburger but with five times the nutrients—and it tastes good enough to eat every day.

As I fill up my plate with more delicacies, Willcox fixes on a glutinous mass of seaweed resembling green spaghetti. Islanders consume more than a dozen varieties of seaweed, which he calls "sea vegetables." This particular one, mozuku, boasts an abundance of fucoidan, an anticancer, antiviral compound that Willcox says may help reverse inflammation, manage blood sugar, and also grow blood vessels.

Even more intriguing, another compound in seaweeds, called astaxanthin, has been linked to a gene that, when activated, seems to tell cells to clean up waste and reduce inflammation, which are at the root of the majority of age-related diseases.

After two hours of learning and eating, I regard the sea of empty dishes. "I feel like a total glutton," I say. "Don't feel guilty," Willcox replies. Our whole meal, he explains, contained fewer than 600 calories—about the same as eating a big cookie

## Loma Linda, California

**Adventists who follow a vegetarian diet tend to live longer than those who eat meat.**

The final stop on my journey is Loma Linda, California, where a community of Seventh-day Adventists has long followed a diet inspired by the Bible. Their guidelines originate from passages such as Genesis 1:29: "And God said, Behold, I have given you every herb bearing seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat."

Adventists who follow the diet tend to live longer. One study showed that life expectancy for Adventists in California was 7.3 years greater for men and 4.4 years greater for women than for similar Californians. Being both vegetarian and Adventist boosted life expectancy by an additional two years.

When I asked researchers studying the diet to find someone who follows it, they sent me to 90-year-old Dorothy Nelson, who answers her door wearing a bright red T-shirt and running shoes, with schoolgirl bangs cut just above her hazel eyes. She welcomes me and leads me to her well-lit kitchen.

Moving with the energy of a Chihuahua, Nelson begins cooking a savory lunch. When I compliment her cooking, she reveals her secret: "This kitchen is seasoned with love."

Over lunch she tells me about her life. When she was younger, she'd had an adventurous career as a pilot-nurse for church missions. Once, while she and her copilot were hopscotching across the Arctic, the plane's engine sputtered, and they plummeted toward the earth, spotting a flat area on an ice floe between Canada and Greenland at the last minute. She figured they'd be all right, "as long as the good Lord wants me around," she recalls. When the plane touched down, it skidded but stayed upright. "I got out and knelt down and thanked the Lord."

The half-frozen pair were picked up five days later. The rescuers gave them hot coffee. "I'd never tasted coffee," she says. Caffeine and alcohol are discouraged for Adventists. Today Nelson limits her adventures to tending her vegetable garden.

As a proponent of vegetarian ways, Nelson is a direct culinary descendant of Ellen G. White, who helped found what became the Seventh-day Adventist Church, a Protestant denomination. In the late 1800s and early 1900s, White first articulated the dietary prescriptions that have since guided this subculture of long-lived Americans.

White praised the consumption of whole grains, fruits, nuts, and vegetables, which "impart a strength, a power of endurance, and a vigor of intellect, that are not afforded by a more complex and stimulating diet." She warned against cooking with grease, spices, and salt, among other things, and discouraged the use of sugar, which "causes fermentation and this clouds the brain and brings peevishness into the disposition." Her recommendations seem remarkably prescient, mirroring today's dietary guidelines from the American Cancer Society and the American Heart Association.

Most of the newest insights on the Adventist diet come from Gary Fraser, an Adventist and researcher at Loma Linda University, and a vegetarian who sometimes eats fish. With his combed-over sandy brown hair, Fraser looks a bit like a scoutmaster. Trained as a doctor, he noticed that Adventists had healthier hearts than non-Adventists, and he began to wonder whether science could validate his diet's health claims. He now leads the Adventist Health Studies, which have monitored the health of tens of thousands of American Adventists.

Their research indicates that, at a given age, vegetarian Adventists are about 12 percent less likely to die than nonvegetarian ones who eat only a small amount of meat. By contrast, among younger Adventists, those who eat the most meat suffer a 46 percent higher rate of premature death than those who get their protein from nuts, seeds, and legumes. "It's clear that a plant-based diet is the way to go," Fraser says.

When I smell Nelson's cooking, I'm inclined to agree. The aromas wafting from her stove make me hungry. After combining black beans with steamed cabbage and cauliflower, she adds slices of browned tofu, sesame seeds, and a dash of soy sauce. It's a satisfying mix of complex carbs, protein, vitamins, minerals, and antioxidants, with fewer calories than a bag of french fries. "I've never tasted meat," Nelson brags.

She tells me she has perfect blood pressure and a resting heart rate of 60. She walks three miles a day.

And there you have it: The vast majority of the calories eaten in the traditional diets in the blue zones come from plant-based whole foods. Grains, greens, nuts, and beans are the four pillars of every longevity diet on Earth.

Nearly half the people who die this year in the U.S. will likely do so from cardiovascular disease, cancer, or diabetes. In blue zones, far fewer suffer from these diseases. Why? For most of their lives, they've simply eaten what was readily available and, luckily for them, it was a whole food, plant-based diet. Trial and error yielded recipes that make these foods taste delicious enough to eat day after day. Therein, perhaps, lies the secret to a healthier you. If you want a good starter recipe, I know a feisty centenarian who makes a mean minestrone.

Best-selling author Dan Buettner reveals recipes to promote longevity in his debut cookbook, *The Blue Zones Kitchen*, available wherever books are sold.

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