

[EARTHTALK]

BY THE EDITORS OF E MAGAZINE

Aerosol cans: Are they OK to use now?

Q: What's the deal nowadays with aerosol spray cans? I thought that the ozone-depleting chemicals used in them were eliminated back in the 1970s. Is this true? If so, what is now used as a propellant? Are aerosols still bad for the ozone layer?

— Sheila, Abilene, Texas

A: The aerosol spray can has a storied history in the United States. Invented in the 1920s by US Department of Agriculture scientists to pressurize insect spray, American soldiers eventually used the technology to kill mosquitoes in the South Pacific during World War II. Use of the cans for consumer applications took off during the ensuing decades, until the mid-1970s, when ozone depletion first came to the public's attention.

Consumer aerosol products made in the US have not contained ozone-depleting chemicals — also known as chlorofluorocarbons (CFCs) — since the late 1970s, first because companies voluntarily eliminated them, and later because of federal regulations. All consumer and most other aerosol products made or sold in the US use propellants like hydrocarbons and nitrous oxide, which do not deplete the ozone layer. Aerosol spray cans produced in some other countries might still use CFCs, but they cannot legally be sold in the US.

According to the industry's trade group, the National Aerosol Association, aerosol manufacturers in Europe and other parts of the world initially did not follow the US in removing CFCs. "The fact that aerosols made in underdeveloped countries may contain CFCs has caused confusion in press reports and in the public mind about the stratospheric ozone/aerosol link," reports the group.

The 1987 Montreal Protocol, a landmark international agreement signed by 191 nations, had the goal of phasing out the production and use of CFCs and other ozone-depleting chemicals. Scientists report that the phaseout is now about 90 percent complete.

Of course, just because those deodorant sprays and shaving cream cans aren't depleting the ozone layer doesn't mean they are good for the environment. They still contain hydrocarbons or compressed gases or both that are notorious for their contribution to global warming. Every time you hit the spray button, you enlarge your carbon footprint, ever so slightly.

Modern-day, CFC-free aerosol sprays also emit volatile organic compounds (VOCs) that contribute to ground-level ozone levels, a key component of smog. The state of California is now regulating consumer products with VOCs — and aerosol sprays are not the only targets: Fingernail polish, perfumes, mouthwashes, pump hair sprays, and even roll-on and stick deodorants also emit them.

Got an environmental question? Write: *EarthTalk*, c/o E — The Environmental Magazine, Box 5098, Westport, CT 06881. Or e-mail: earthtalk@emagazine.com.



JAYBEE

MORINGA OLEIFERA: While this vegetable tree can grow to be 30 feet tall, gardeners may prune it annually to keep its edible leaves and long thin seedpods within easy reach.

'Drumstick' tree tackles hunger

UNDERUSED MORINGA MAY BE TROPICS' NUTRITION SUPERSTAR.

By VIJAYSREE VENKATRAMAN
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As a child growing up in India, I greeted the appearance of one particular vegetable on my plate with exaggerated distaste: tender seedpods from the moringa tree, locally known as "drumsticks." Imagine my surprise when I heard a health worker from sub-Saharan Africa describe this backyard tree as a possible solution to malnutrition in tropical countries — he called it a "miracle tree," no less.

Ounce for ounce, says Lamine Diakite, a Red Cross official from French Guinea in West Africa, moringa leaves contain more beta carotene than carrots, more calcium than milk, more iron than spinach, more Vitamin C than oranges, and more potassium than bananas. Its protein content is comparable to that of milk and eggs, and its leaves are still available for harvest at the end of the dry season, when other food may be scarce. Malnourished children gained weight when put on a timely dietary supplement made from the leaves, Mr. Diakite says. He passed around pouches of the green, hennalike powder at a recent international summit in Boston.

Until a decade ago, moringa was not widely known in Africa. Its leaves (boiled like spinach) were an occasional vegetable. Immigrant Indians prized the long, slender seedpods (stewed or cooked like green beans) as a delicacy. "But its nutritional value, newly 'discovered,' has been known for a long time," says Lowell Fuglie, an international development administrator who has been instrumental in popularizing the moringa in Africa for the past 10 years. Laboratory analysis has corroborated traditional knowledge about the plant. It now awaits further validation by western science.

But even those who know moringa is edible don't always exploit its nutritional value, particularly beneficial to those eating a carbohydrate-heavy diet (meat is often costly in Africa). Senegalese people using moringa leaves to make *mboum* sauce, for example, discard the cooking water, which contains many nutrients, Mr. Fuglie says. His interest was sparked by research findings collated by the nonprofit Educational Concerns for Hunger Organization (ECHO). "Seeing moringa described as the most nutri-

tious of all tropical vegetables," says Fuglie, whose father worked for USAID in Africa, "I wondered why there was so much malnutrition in regions where the tree is easily grown and used."

Species of moringa are native to the Indian subcontinent and pockets of Asia and Africa. One species in particular, *Moringa oleifera*, which has especially edible leaves, has become naturalized in other regions, says Mark Olson, an evolutionary biologist. Moringa growing wild on Mexico's Pacific coast probably arrived long ago via the Philippines when Spanish galleons sailed between Manila and Acapulco, he says. He has traveled to remote areas to document the dozen or so species of the diverse, hardy native of the dry tropics. "It's very hard to kill the moringa with drought or heat," he says. Protein-rich plants like soybeans and legumes cannot survive such conditions or thrive in poor soil.

The fact that the leaves — and not just the seedpods and seeds — are edible makes moringa a desirable crop. The seeds also yield oil that could be used as biofuel, and ground seeds can help purify water. Parts of the tree are used in traditional medicine. It also grows rapidly (good for reforestation), reaching a mature height of 30 feet, though often it's pruned annually to be as short as five feet, to keep leaves and seedpods within easy reach. It would be difficult to find a low-maintenance tree that offers more, says Fuglie.

In the 1980s, development workers began to hear of the tree. Its popularity grew by leaps when Fuglie began to promote the shade-dried leaf powder as a food supplement, says Martin Price, director of ECHO. Reports from Fuglie's pilot nutrition project were persuasive.

Still, there have been no clinical human trials to quantify the moringa's role in fighting malnutrition, says Jed Fahey of Johns Hopkins University. He is a volunteer for Trees for Life International, a group that promotes planting moringas. Based on centuries of human consumption, however, a strong case can be made that eating the leaves causes no harm, says Dr. Fahey, a phytochemical researcher.

But because there is no definitive dietary study on the moringa, the scientific community and relief agencies still have reservations. Fuglie predicts that more moringas will be planted once aid organizations are convinced of the leaves' nutrition. Fuglie needs no persuading: If you had to design an affordable source of enriching supplements for the dry tropics, he says, "it may be impossible to come up with anything better than the moringa."

The hardy, drought-resistant tree is an excellent source of calcium, vitamins, and protein, advocates say.