

WHAT WE EAT

Building bones, no dairy case needed

Prunes, onions and other produce seem to help. Next up is figuring out the details.

By SUSAN BOWERMAN
 Special to *The Times*

If you were asked to name a few foods that promote healthy bones, you'd probably list dairy products for their bone-building calcium and vitamin D.

It's a lot less likely that prunes, onions and fermented soybeans would come to mind.

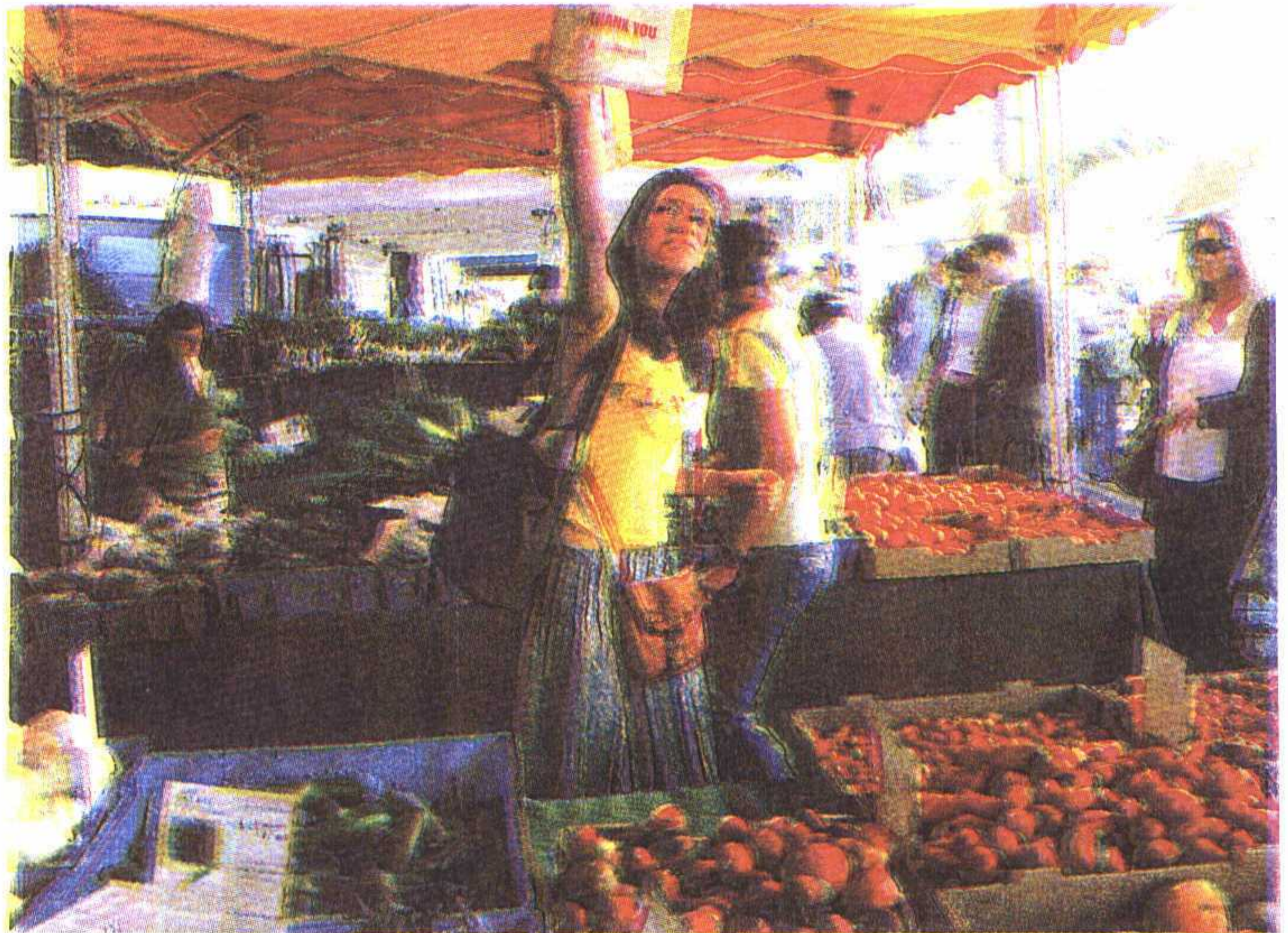
In fact, it has been known for some time that a high intake of fruits and vegetables helps keep bones strong and prevents fractures as people age.

Now nutrition scientists are trying to pinpoint the bioactive compounds in produce that appear to have this effect. And they're testing whether adding particular fruits and vegetables to the diet can keep osteoporosis at bay.

In a study underway at Florida State University, older women who have osteoporosis will be adding either a daily handful of dried apples or about 10 dried plums to their diet for a year. The investigators are betting that the prune eaters will have measurable restoration in their bone mass based on observations they made in a similar but shorter study.

Although that study was too brief to measure changes in bone density — something the new study will allow — the women who ate 10 dried plums daily had significantly higher blood levels of two compounds (the hormone IGF-1 and the enzyme BSAP) that are associated with greater rates of bone formation.

What do prunes offer that other dried fruits don't? Various substances, and scientists don't yet know which among them is most important. Prunes contain small amounts of calcium and magnesium — both bone-building minerals — and some natural



ANNE CUSACK *Los Angeles Times*

PROTECTIVE: Produce such as prunes, onions and fermented soybeans apparently promote bone health. And scientists are working on figuring out what specific substances in them are responsible.

acids that could improve mineral absorption.

They are a rich source of antioxidant polyphenols, which also could be bone protective. They're also rich in boron, a bone-building mineral that is often lacking in the diet. (Boron prevents excretion of calcium and magnesium, which allows these minerals to be deposited in bone tissue.)

Fiber, too, could be important in the bone-produce connection: Plant foods are rich sources of this. Studies have focused on a group of fibers known as fructans, which are plant carbohydrates found in some leaves, roots and tubers.

One fructan, inulin, is fermented by certain beneficial bacteria in the intestine, producing a more acidic environment that favors calcium absorption.

Inulin is found in leeks, garlic, artichokes, jicama and, especially, onions. This may explain some findings by researchers at the University of Bern in Switzerland who tested the benefits of various vegetables on bone.

Rats consuming a diet designed to mimic our typical Western fare — high in refined starch, sugar and fat — preserved more bone mass during a period of four weeks when dried vegetables were added to their chow. Brussels sprouts, tomatoes, garlic, parsley, carrots and

a salad mixture all provided some benefit, but onions were the clear winner.

Onion-fed rats increased their total bone mineral content by more than 17%. However, they were fed the human equivalent of about a quart of chopped onions a day. Further studies should help reveal the lowest beneficial dose.

There is also a growing body of research on the role played by vitamin K, which influences the binding of calcium to bone. Most of the vitamin K we consume is in a form called phyloquinone, found in green vegetables such as broccoli, lettuce and spinach. Another form, menaquinone, is obtained in much smaller amounts from certain foods (butter, cheese, liver, egg yolk) but can also be made by bacteria in our intestines.

One of the menaquinones, MK-7, shows particular promise in promoting bone health. It's found in abundance in *natto* — a fermented soybean product and Japanese dietary staple with a sticky texture and strong cheesy odor that may make it a hard sell for American taste buds.

A recent study in Japan followed nearly 1,000 women for three years to determine the effects of *natto* and other soy products on bone mineral density. *Natto* had the strongest protective effect: It reduced bone loss

at the top of the thighbone by more than 80% — and, interestingly, this benefit increased as the women got older.

These women ate more than four packs of *natto* a week; each pack contains about 350 grams (about 12 ounces) of MK-7.

Soy products also contain isoflavones, which have been shown to protect bone in some studies.

But other soy foods were not nearly as protective as *natto*, leading researchers to lean toward vitamin K as the source of the bone protection.

If fermented soybeans don't appeal, try miso, another fermented soy food rich in MK-7. It's sold as a paste and available in specialty grocery stores.

Stir a bit into boiling water for a quick soup, or thin with a little wine or broth and try it as a marinade for fish or poultry. Add sliced onion and you have a potentially bone-building brew.

Although fruits and vegetables are known to reduce the risk of cancer and heart disease, many people still fall short in consuming enough of them. Perhaps if we add osteoporosis prevention to the list of reasons to consume a plant-rich diet, it will push us to actually do so.

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