

# Lost in Translation

Why *real* fruits and vegetables beat juices, powders, and purées

BY DAVID SCHARDT

People who eat more fruits and vegetables have a lower risk of heart disease, stroke, and cancers of the mouth, throat, and esophagus.<sup>1-3</sup> How do researchers know? They compare the diets of people who get those diseases with the diets of people who don't.

And scientists know that fruits and vegetables can help prevent some problems, like obesity and hypertension, because when people are told to eat more fruits and vegetables, they lose more weight and have lower blood pressure than those who aren't told to eat more.<sup>4,5</sup>

In all of those studies, researchers are talking about fruits and vegetables that are "mainly in unprocessed or minimally processed forms," says Eric Hentges, director of the U.S. Department of Agriculture's Center for Nutrition Policy and Promotion in Alexandria, Virginia. Some studies count juice as fruit, but none would include juice-sweetened cookies or crackers made with dehydrated vegetables.

"The science behind the recommendations to eat more fruits and vegetables is based upon consuming less-processed forms," notes nutritionist Jennifer Seymour of the Centers for Disease Control and Prevention (CDC) in Atlanta.

That's because something is always lost when produce is processed.

## Fiber & Bulk

"The Dietary Guidelines Committee recommended whole fruits—and limited amounts of fruit juice," says Janet King, a professor of nutrition at the University of California.

Why?

"It was primarily to increase fiber intakes," says King, who chaired the committee. (People should eat 20 to 40 grams of fiber a day, says the Institute of Medicine.)

**A**mericans should eat 5 to 13 servings of fruits and vegetables every day, say the U.S. Dietary Guidelines.

That may seem like a lot, but a serving isn't all that much. It's typically a piece of fruit, ½ cup of cut-up veggies or fruit, or 1 cup of raw leafy greens.

Even so, food processors are trying to convince consumers that they can get their servings without having to reach into the vegetable or fruit bin.

Companies are baking dried vegetables into crackers. They're adding vegetable bits to salty side dishes. They're mixing vegetable juice with fruit juice. (See "Your Serve," p. 11.)

But are those foods equal to *real* fruits and vegetables?

Most of the fiber in fruit is lost when it's turned into juice. For example, a small apple contains about 3½ grams of fiber. You'd have to drink 18 cups of apple juice to get that much. And it takes 6 cups of orange juice (with or without pulp) to reach the 3 grams of fiber in an orange.

Fiber is also lost when fruits are turned into purées, which show up in juices, bars, and other foods that claim to deliver

servings of fruit.

What does fiber do? It can keep you regular; may lower the risk of heart disease, diabetes, and some cancers; and seems to curb hunger.

For example, when people were given either apple juice or an apple with the same number of calories, they consumed the juice 11 times faster, their insulin levels rose higher, and they felt less full.<sup>6</sup> The same happened with orange juice versus oranges.

"Satiety is an important aspect of eating fruits and vegetables because they can fill you up with fewer calories," says Seymour. "That can be key to controlling weight."

It's not just the fiber that makes produce filling. Fruits and vegetables also have low calorie density—that is, relatively few calories for their bulk. That's partly because they're mostly water.

But apple juice and soda are also largely water, and *they* don't help people lose weight. In fact, studies suggest that caloric beverages promote weight gain because their calories don't "register" as food in the brain's satiety centers.

It seems that water has to be incorporated into the food to help curb appetite. In a new study that isn't yet published, researchers at Penn State University gave 59 normal-weight men and women

125 calories' worth of one of four foods—apple slices (1½ apples), applesauce, apple juice with added fiber, or apple juice with no fiber.

Fifteen minutes later, when the participants were served cheese tortellini with tomato sauce, those who had eaten the apple consumed about 190 fewer calories than those who had consumed the applesauce or either juice.

In another Penn State study, researchers told roughly 100 obese women to lower their calorie density

## The Bottom Line

- Don't rely on juices or foods with added fruit or vegetable purées or powders for your daily servings.
- Eat your fruits and vegetables fresh or frozen if you can, and canned if you can't. Raisins, prunes, dried apricots, dates, and other dried fruits are also fine, though they deliver a concentrated dose of calories (and get stuck in your teeth).
- Limit fruit juice to no more than 8 ounces a day.

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by eating less fat or less fat and more “water-rich” foods—fruits, vegetables, and soup. After a year, those who ate more water-rich foods had lost more weight (17 pounds vs. 14 pounds) and reported less hunger.<sup>4</sup>

But when companies add “fruit” to processed foods, they’re often adding fruit juice, which separates the water from the rest of the fruit. The cell walls

and peel—in other words, much or all of the fruit’s bulk and fiber—remain in the juicer. Something similar happens when companies turn fruit into concentrated fruit purée.

“You take a fruit that has significant levels of fiber and potassium and you can process that fruit to a point where it actually has little of either,” says the CDC’s

Jennifer Seymour, who leads a team of experts that is deciding which foods can claim to contain at least one serving of fruit.

“Processed foods that include fruit from concentrated purée will probably not make the grade,” she notes.

### Vitamins & Minerals

In 2004, a scientific panel convened by the Institute of Medicine recommended that adults get at least 4,700 milligrams a day of potassium from their food. That’s largely because potassium can help lower blood pressure.<sup>7</sup> (Potassium helps explain why people who ate the fruit-and-vegetable-rich DASH diet had lower blood pressure.)

Other studies suggest that the potassium in fruits and vegetables can help prevent osteoporosis and kidney stones.

But getting 4,700 mg of potassium a day—nearly twice what Americans now consume—means eating some 10 servings of fruits and vegetables. And “servings” in foods like fruit bars and juices that are mostly apple, grape, or pear won’t help much. When produce is turned into juice or purée, it loses potassium (and vitamin C, which is why companies often add it back).

### Phytochemicals

Produce contains antioxidant phytochemicals—like polyphenols—that could help explain why people who eat more fruits and vegetables are healthier. While researchers don’t know which phytochemicals are critical, they do know that phytochemicals are lost when you peel or purée fruit.

“Juices generally retain less than 50 percent of the bioactive compounds found in the whole fruit,” notes Luke Howard, who studies fruit processing at the University of Arkansas in Fayetteville. In some studies, it’s as little as 20 percent.

“A lot of these substances are found in the skin and seeds and are physically removed during the pressing operation,” says Howard. “No way is fruit juice the same as whole fruit.”

As for powdered fruits and vegetables, “It’s worth being very skeptical about the notion that a powder—even if it still retains certain vitamins, minerals, or phytochemicals—would be the same as the original food,” says Seymour.

<sup>1</sup> *Am. J. Clin. Nutr.* 72: 922, 2000.

<sup>2</sup> *JAMA* 282: 1233, 1999.

<sup>3</sup> WCRF/AICR, “Food, Nutrition, Physical Activity, and the Prevention of Cancer,” Washington, DC, 2007.

<sup>4</sup> *Am. J. Clin. Nutr.* 85: 1465, 2007.

<sup>5</sup> *N. Engl. J. Med.* 336: 1117, 1997.

<sup>6</sup> *Lancet* 8040: 679, 1977.

<sup>7</sup> *J. Hypertens.* 9: 465, 1991.

## Juice Plus Commission

Is Juice Plus+ “the next best thing to fruits and vegetables,” as its promoters claim?

The fruit-and-vegetable-powder capsules are sold by NSA of Collierville, Tennessee, through a multi-level marketing network. (People find friends and relatives to sell Juice Plus+, those people find friends and relatives, and everybody gets a cut of the money made by the people downstream from them.)

NSA is coy when it comes to how many servings of fruits and vegetables are in a daily dose (four capsules) of Juice Plus+.

That’s not surprising, since it takes a lot of pills to replace food. For example, once dehydrated, a serving of fruit or vegetable (say, a half-cup of broccoli, carrots, or apples) would fill some 15 capsules. (Dehydration shrinks fresh produce by roughly 90 percent.)

NSA spokesperson John Blair told us that, according to company tests, “the nutrient value in the [four] capsules exceeds what you’d get out of 12 ounces of fresh squeezed juice.” The company says that it adds extra vitamins C and E, beta-carotene, and folate to Juice Plus+ to “achieve uniform levels,” but it won’t say how much. (The extra C and E and folate aren’t listed on the label as added ingredients, as required by law.)

Bottom line: there’s no way to know how much of the 12,500 IU of beta-carotene, 230 mg of vitamin C, 45 IU of vitamin E, and 420 mcg of folate in a daily dose of Juice Plus+ comes from its fruit and vegetable powders and how much is added by NSA. (If those nutrients matter, you can buy them far more cheaply elsewhere.)

Does *anything* in Juice Plus+ matter? Twelve studies have been published and 13 more are planned or in progress (almost all of them funded by NSA), according to the company. “Most of the completed studies show that people who take Juice Plus+ have higher antioxidant levels in their blood and reduced oxidative stress,” says Blair.

But only half of the studies compared Juice Plus+ to a placebo, and the Juice Plus+ wasn’t always better at increasing antioxidant levels or lowering oxidative stress. What’s more, there’s no solid evidence that high antioxidant levels can prevent disease.

Only one (company-sponsored) study looked at illness. Susan Percival of the University of Florida in Gainesville and colleagues gave 59 healthy law students either Juice Plus+ pills or dummy pills for 2½ months and had them record cold symptoms or any other signs of illness.<sup>1</sup> (Neither the researchers nor the students knew who was getting what.) The Juice Plus+ takers got sick just as often as the placebo takers.

Juice Plus+ will cost you \$40 a month, with a minimum purchase of a four-month supply. Interested? We’ve got this friend who happens to be a distributor...

<sup>1</sup> *J. Nutr.* 136: 2606, 2006.



## YOUR SERVE



### Neither Honest Knorr Healthy

"2 Full Servings of Veggies," claims the pouch of Knorr Sides Plus Teriyaki Noodles with Asian Style Vegetables.

But to get that much, you have to eat the entire pouch (two servings of side dish), according to the tiny print.

That means 680 calories (mostly from white flour) and close to a day's sodium (roughly 1,400 mg).

And the Alfredo Pasta Primavera flavor ends up with half a day's saturated fat (9 grams).

That's quite a price to pay for two servings of vegetables.

And what servings they are—dried vegetable pellets that don't cook up to look (or taste) like what you'd get if you started with fresh veggies.

A bag of potato-and-rice crisps with "½ serving of real vegetables in every ounce." A drink with a "full serving vegetables, full serving fruits" in every glass. A pasta side dish with "2 full servings of veggies."

Adding concentrated, puréed, or powdered fruits and vegetables to juices and snacks may help companies extend their lines. And, in some cases, it may produce (marginally) better foods. Just don't think of them as substitutes for the real thing.



### Wise Up

"Get your daily servings of fruit" from Tropicana FruitWise strips and bars, says the Web site. The strips deliver one serving of fruit, the bars two (they weigh twice as much), according to Tropicana. Both are mostly apple purée concentrate and apple juice concentrate, with other purées and concentrates, depending on the flavor (Cherry, Raspberry, Strawberry, etc.).

Since purée is less processed than juice, FruitWise probably delivers more of what's in real fruit than fruit juice does. But fruit it ain't. The beauty of fruits (and vegetables) is that they fill you up without loading you down. Calorie-dense foods like FruitWise squeeze their calories (70 in each ⅓-ounce strip and 140 in each 1½-ounce bar) into very little food.

FruitWise but CalorieFoolish.

### Flat Line

Frito-Lay's Flat Earth Garlic & Herb Field Baked Veggie Crisps contain "½ Serving of Real Vegetables in Every Ounce," boasts the bag.

Turns out the crisps are mostly rice flour and potato flakes, which are about as good for you as white rice and mashed potatoes. (Rice flour is the main ingredient in all three Flat Earth Veggie Crisps and all three Flat Earth Fruit Crisps.)

As for the vegetables: the Garlic & Herb Field crisps have more corn oil, modified corn starch, and oat flour than pumpkin, more sugar and maltodextrin than dehydrated onion, and more salt than tomato paste.

That explains why the 24 crisps that it would take to supply a full serving of vegetables have 260 calories, far more than a serving of real vegetables (20 to 60). That many crisps also deliver 380 mg of sodium, versus essentially zero sodium in most fresh vegetables.

"With a tasty blend of potato, rice and vegetables, these 'Impossibly Good' veggie crisps make it possible to have great taste and nutrition," says the bag.

Impossibly good? Unless Frito-Lay is talking about real vegetables, *impossible* is more like it.



### Con Fusion

V8 100% Vegetable Juice provides "an easy, delicious way to help you get the vegetable nutrition you need every day," says the bottle. Yet drinking V8 isn't like eating vegetables.

The "2 full servings of vegetables per 8 oz. glass" come with 480 mg of sodium—a third of a day's limit. And most of the vitamins touted on the label of V8 Essential Antioxidants are added by Campbell.

V8's new marketing-gimmick partner is no more authentic.

"Full Serving Vegetables, Full Serving Fruits"

in every 8 oz. glass, say bottles of V8 V.Fusion. But none of the three flavors (Peach Mango, Pomegranate Blueberry, and Strawberry Banana) deliver any fiber.

As for the "No Sugar Added" claim: to your body, the apple or white grape juice concentrate that's the main ingredient in V8 V.Fusion's "re-constituted fruit juice blend" is like white sugar.

"V8 V.Fusion juice makes it easy to get vegetable and fruit goodness YOU NEED TO THRIVE!" says the bottle.

If we were you, we'd thrive somewhere else.