

Guide to

SMART SUPPLEMENT SHOPPING



Wellness™

STRONGER IMMUNITY NOW

MAC & CHEESE MAKEOVER
We Cut Carbs & Calories

- Foods That Protect You
- The One Vitamin to Start Taking
- COVID-19 Defense Tips



EXCLUSIVE RATINGS

Air Fryers, Blenders, Treadmills & More

FEEL GOOD EVERY DAY
WHAT REALLY WORKS

SAY NO TO PROCESSED
Easy Whole-Food Swaps

10 POWER SNACKS
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Your Partner in Health

KEEPING YOUR BODY strong and well is more important than ever. And yet it can be difficult to find health guidance you can trust, especially as our understanding of the COVID-19 pandemic evolves.

But you can count on CR to share reliable, easy-to-follow advice based on the latest medical knowledge from the most respected experts. You can access our ongoing updates at our Guide to the Coronavirus, at CR.org/covid19.

And we've devoted this special issue to important stay-well strategies, from making the best nutrition moves to safer sup-

plement shopping to new pain relief options, the best home fitness equipment—and more.

You can trust our insight because we're nonprofit and independent: We buy all the products we test, and we don't accept any ads. We're always on your side, protecting your interests—and your good health.

—The Editors of *Consumer Reports*

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- 🔴 POOR 🟡 FAIR 🟢 GOOD
- 🟢 VERY GOOD 🟩 EXCELLENT

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Update

Trends, product news, and expert advice

Healthier Frying

An air fryer can deliver all the crispy goodness of your favorite fried foods—with less fat and fewer calories because it cooks with little or no oil. These countertop helpers are easy to use once you've gotten the hang of the process. CR staffers put air fryers to work in their home kitchens; read on for five of their best tips, plus two top models.

Five Tips for Better Air-Frying

- 1. Pat foods dry.** Before frying, dry anything unbreaded that you want crispy or browned.
- 2. Don't overfill the basket.** An air fryer relies on a fan to circulate hot air to cook food quickly. Crowding the basket prevents the hot air from reaching all the food, which could give you uneven and soggy results.
- 3. Check food often.** To avoid overcooking, check on your food every so often while it's cooking. (On some models, this is as simple as pulling out the drawer, but on others, you might need to pause cooking before you do so; consult your manual for specifics.)
- 4. Flip your food.** Use tongs or shake the basket during cooking for more even results.
- 5. Experiment with homemade favorites.** Sure, store-bought fries taste great, but an air fryer makes easy work of the real thing: For crispy homemade french fries, cut potatoes into uniform pieces, and soak in water for 30 minutes. Then drain, rinse, pat dry, and coat lightly with oil before air frying.



TOP-RATED AIR FRYERS

75
 ✓ NuWave
 6 Quart
 37001
 \$130



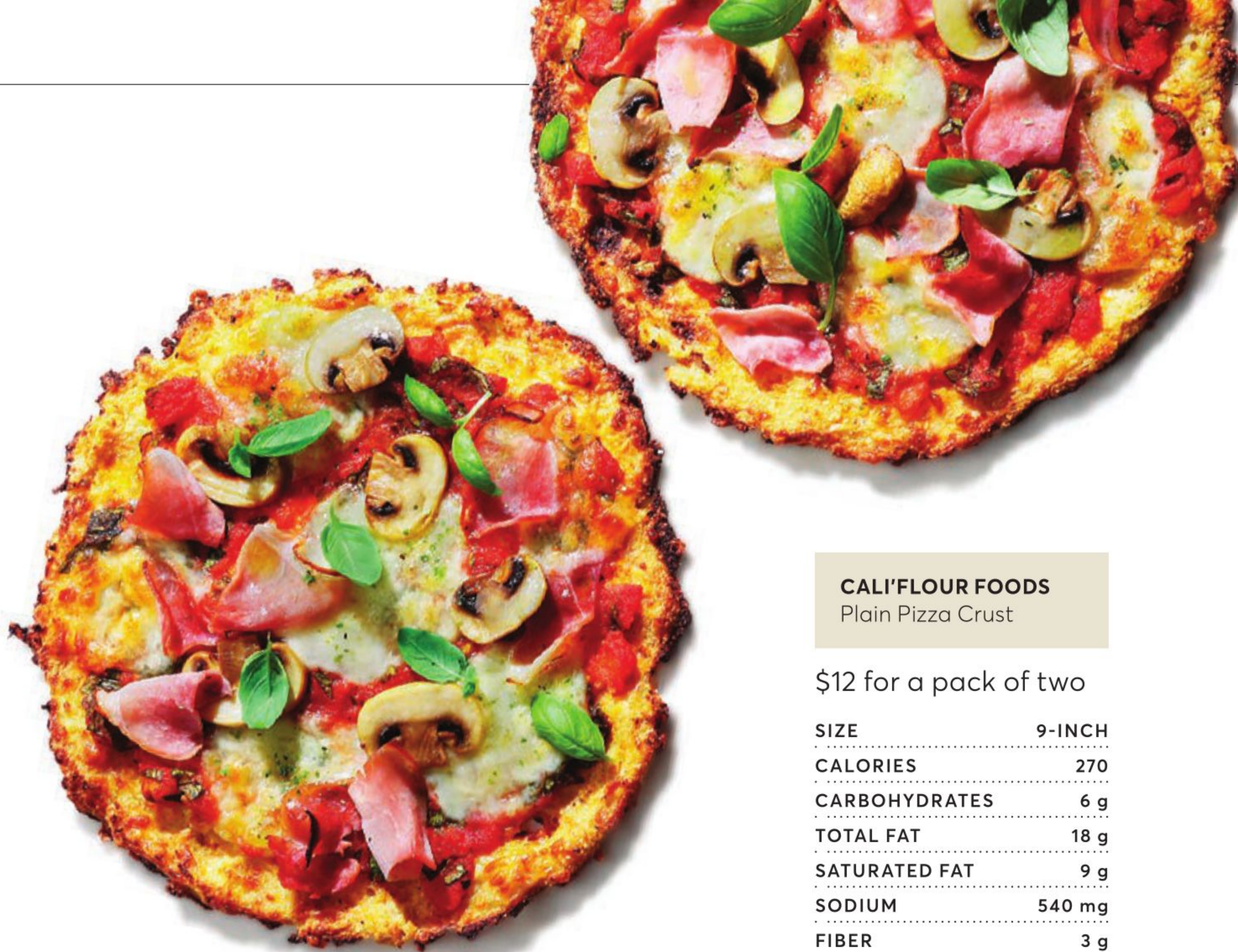
73
 \$ GoWise
 GW22731
 \$80



No-Pill Pain Soothers

Practices such as meditation, medical hypnosis, and cognitive behavioral therapy were linked to less pain and lower opioid doses than control treatments in a review of 60 studies. Relaxation helped in some studies, and guided imagery reduced opioid use. Pain types included postsurgical, back, dental, burn-related, chronic, and cancer-caused. Researchers say that these noninvasive techniques are worth trying but that more research is needed.

PHOTOS, CLOCKWISE FROM TOP LEFT: FRANCESCO MORANDINI/PLAINPICTURE; MATHIAS NEUBAUER/STOCKFOOD; GETTY IMAGES; E DOOSJE/ADOBE STOCK



Is Cauliflower Crustworthy?

There's a healthy-sounding trend in the supermarket: pizza crusts made out of cauliflower. But CR's experts found that the ingredients and nutrition of cauliflower crusts vary widely.

CONSIDER CALORIES

Counts ranged from 120 to 600 for one crust, depending on ingredients: Some have refined grains, eggs and cheese, or bean or nut flours, which add calories.

KEEP AN EYE ON CARBOHYDRATES

A single serving could have anywhere from 2 to 29 grams. That's a big range, because cauliflower isn't carb-heavy. (A cup has 5 grams.) But crusts may contain rice flour, sugar, tapioca starch, and corn starch, which supply carbs.

CONSIDER SODIUM

We saw 180 to 500 mg per serving. Adults shouldn't have more than 2,300 mg of sodium daily.

CALI'FLOUR FOODS

Plain Pizza Crust

\$12 for a pack of two

SIZE	9-INCH
CALORIES	270
CARBOHYDRATES	6 g
TOTAL FAT	18 g
SATURATED FAT	9 g
SODIUM	540 mg
FIBER	3 g

CAULIPOWER

Plain Pizza Crust

\$11 for a pack of two

SIZE	10-INCH
CALORIES	510
CARBOHYDRATES	87 g
TOTAL FAT	15 g
SATURATED FAT	1.5 g
SODIUM	540 mg
FIBER	3 g

REALGOOD PIZZA CO.

Plain Pizza Crust

\$10 for a pack of two

SIZE	10-INCH
CALORIES	600
CARBOHYDRATES	21 g
TOTAL FAT	45 g
SATURATED FAT	9 g
SODIUM	1,500 mg
FIBER	12 g

New Advice On Alcohol

The Dietary Guidelines for Americans advises having no more than one drink per day for women, two for men. But a limit of one may be better for everyone 65 and older, says Benjamin H. Han, M.D., M.P.H., an assistant professor at the New York University School of Medicine. Regardless of your age, too much alcohol can worsen diabetes, high blood pressure, and heart failure, and mixing it with sleep or pain drugs and antidepressants can be dangerous. Cut back or get help if drinking interferes with obligations, you drink and drive, you need ever-increasing amounts of alcohol to feel its effects, or you shake or sweat when you don't drink, Han says.



How to Rescue Dry Hands

If your hands are dry and cracking, take heart: It's simple to solve this uncomfortable problem.

Frequent handwashing can leave your hands dry, irritated, and itchy, and can cause skin cracks—especially for older adults, whose

skin is thinner and more fragile, and holds less moisture, says Justin Endo, M.D., associate professor of dermatology at the University of Wisconsin-Madison. Use cool or warm water instead of hot, and try unscented soap for sensitive

skin. Within a few minutes of washing and drying your hands, moisturize with an unscented cream, ointment, or jelly, such as petroleum jelly. At bedtime, slather on moisturizer, and if you'd like, wear cotton gloves overnight.



Are some salts healthier than others?

While the various types of salt—for example, table, kosher, and sea salt—may impart different flavors in food, they’re very similar from a health point of view, says Amy Keating, R.D., a CR nutritionist.

Sea salt comes from evaporated ocean water and retains some trace minerals, such as magnesium, but not in high enough amounts to have nutritional benefits.

Table salt often has iodine added—a mineral that’s important for preventing thyroid problems—but iodine is also found naturally in dairy products, eggs, seafood, and grains.

As for the sodium levels, “most types of salt—technically sodium chloride—are roughly

40 percent sodium by weight,” Keating says. (Chlorine mostly makes up the rest.) The main reason nutrition labels on salt packages show varying amounts of sodium is because the serving size for salt is listed as a volume (usually $\frac{1}{4}$ teaspoon).

Kosher salt and sea salt often have larger or coarser crystals than table salt; less of it fits on the spoon, so the sodium content appears lower. For example, Morton table salt has 590 mg per $\frac{1}{4}$ teaspoon, coarse sea salt has 580 mg, and coarse kosher salt has 480 mg.

Still, in recipes, if you replace table salt—teaspoon for teaspoon—with coarse sea salt or kosher salt, it may help you cut your sodium intake, and chances are your palate won’t notice a difference. The larger crystals may also deliver a strong salty hit when sprinkled on foods, so you can use less.

How can I protect myself from coronavirus exposure if I need a worker to come to the house?

Even a simple service call can feel fraught with risk. “It’s a reasonable concern, but you could drive yourself crazy,” says Normadeane Armstrong, Ph.D., who specializes in epidemiology and public health. But in the case of home service calls, it’s prudent to adopt the Centers for Disease Control and Prevention’s guidelines for social distancing by at least 6 feet, using face coverings in shared spaces, and frequent, thorough hand-washing, as well as cleaning potentially affected surfaces.

Ask if the worker can call or text you beforehand to review precautions, such as waiting for you to walk a safe distance away after opening the door before entering. Also ask to sign off on the work without exchanging paper or pen to avoid touching common surfaces. Lowe’s, for example, told us that it’s temporarily allowing unsigned receipts.

It also helps to plan how you’ll direct the person through your

home, including where he might put tools. That way you’ll know where to clean after the visit and make sure the worker doesn’t enter rooms or touch items unnecessarily. If tipping with cash, put the money in a sealed envelope on a surface for the worker to pick up. For more advice and updates on COVID-19, go to [CR.org/covid19](https://www.consumerreports.org/covid19).

Polarized sunglasses will protect my eyes, right?

Polarized lenses can help you see better on bright days, thanks to the light-blocking filters they contain. They do this by reducing glare caused by light reflecting off a shiny horizontal surface, such as the ocean or a snowy field. But on its own, polarization won’t shield your eyes from the sun’s ultraviolet (UV) rays, which have been linked to problems such as cataracts, macular degeneration, and even cancerous growths. So be sure that any polarized pair you’re interested in also has a UV protection label, says Scott Brodie, M.D., Ph.D., a professor of ophthalmology at NYU Langone Health in New York City. The American Academy of Ophthalmology recommends sunglasses that block UVA and UVB light as completely as possible, which will be labeled “100 percent UV protection” or “UV400.”



ILLUSTRATIONS: SERGE BLOCH



LEARN

We have more than 140 in-house experts who research, test, and compare. Submit your questions at [CR.org/askourexperts](https://www.consumerreports.org/askourexperts) ... and watch for the answers.



Can a Healthy Gut Boost Your Mood?

A growing number of studies suggest that food choices may have an effect on your emotions

YEARS OF RESEARCH have demonstrated that a healthy diet can help cut the risks of illnesses, from diabetes to heart disease to some cancers. Now, more and more studies suggest that food choices may also affect emotions—even for the 8 percent of American adults who report struggling with depression, according to data from a recent National Health and Nutrition Examination Survey. “Research shows that what you eat does impact your mood,” says Umadevi Naidoo, M.B.Ch.B., director of Nutritional and Lifestyle Psychiatry at Massachusetts General Hospital in Boston.

A study published in April 2019 in the *European Journal of Nutrition* found that people with depression who scored high on the Alternate Healthy Eating Index (consuming a diet rich in produce, whole grains, nuts, and omega-3 fatty acids) were less likely to have a recurrence of symptoms over an 11-year period.

And an analysis of 16 studies—which included almost 46,000 people—published in 2019 in the journal *Psychosomatic Medicine* found that adults who followed overall healthy diets, such as

high-fiber, veggie-focused eating plans, were less likely to have depression symptoms.

Just how much food choices may affect mood is not clear, partly because nutrition research findings can be difficult to pin down. But patterns are emerging.

The Gut-Brain Link

If you've ever had a "gut-wrenching" experience, you know that your gastrointestinal system is sensitive to your emotions. Specifically, it's your microbiome—the ever-changing mix of good and bad bacteria in your

gastrointestinal tract, according to a study published in February 2019 in the journal *Nature Microbiology*. When researchers looked at the microbiomes of more than 2,000 adults, they found that those who were depressed had lower levels of some "healthy" gut bacteria.

"We know that the good bacteria in your gut produces a lot of neurotransmitters implicated in mood, like norepinephrine and gamma-aminobutyric acid (GABA)," says Drew Ramsey, M.D., a psychiatrist at Columbia University College of Physicians and Surgeons in New York City and author of *"Eat Complete"* (Harper Collins, 2016).

And though the mood-related hormone serotonin is usually thought of as a brain chemical, more than 90 percent of it is made in your gastrointestinal tract.

The Concern With Ultraprocessed Foods

Studies have associated diets high in "ultraprocessed" foods—such as soft drinks, instant soups, and packaged chicken nuggets—with a higher risk of obesity and cardiovascular disease.

There may be links to mood, too. A study published in May 2019 in the *European Journal of Nutrition*, which examined the diets of almost 15,000 people, found that those who ate the most ultraprocessed foods had a

33 percent higher risk of depression than those who ate only minimal amounts.

"These foods tend to be lower in essential nutrients such as omega-3 fatty acids and B vitamins that play a crucial role in brain health," says Samantha Heller, R.D., a nutritionist in New York.

Highly processed foods also typically contain little fiber, Heller says, and fiber helps keep your microbiome—and possibly your mood—in better balance. Many are also loaded with sugar and additives, such as artificial flavoring. Such substances "feed the bad bacteria in your gut, which in turn can impact your mood," Naidoo says.

■ **An example:** A 2017 review published in the journal *Scientific Reports* found that men who consumed the most sugary foods and drinks were almost 25 percent more likely to have depression.

Eat Your Way Happy?

There's no guarantee that specific foods will make you happier, but experts have some suggestions that may be beneficial:

■ **Start small.** Begin with easy changes, such as replacing sugary desserts with fresh fruit and a bit of dark chocolate.

■ **Focus on whole foods.** Make fresh and unpackaged foods, such as produce and whole grains, the



centerpiece of your diet, and limit highly processed items to one a day (or less), Naidoo says. (For more on the differences between whole foods vs. processed foods, see “From Whole to Processed,” on page 52.)

■ **Check ingredients lists.**

Ultraprocessed foods usually have long ones and additives such as artificial flavors; added sugars, such as corn or malt syrup; and preservatives.

■ **Go veggie.** Getting more produce may be good for body and mind. A U.K. study published in January 2019 in the journal *Social Science and Medicine* found that the more fruits and vegetables people ate, the better their mental well-being over a three-year period. “Even just making sure that you incorporate five servings of fruits and vegetables in your diet every day can reap benefits,” Naidoo says. Best bet: Focus on veggies such as watercress, spinach, mustard greens, lettuces, and Swiss chard, and fresh herbs (plus, shellfish like clams and mussels). All earn a high Antidepressant Food Score, which Ramsey created based on available data on the effects of specific nutrients on mood.

■ **Coddle your microbiome.** Include foods that contain live “good” bacteria cultures (aka probiotics)—such as yogurt, kefir, and fermented veggies like sauerkraut—in

‘Include foods that contain live “good” bacteria culture (aka probiotics) ... in your daily diet.’

—Drew Ramsey, M.D.

your daily diet, Ramsey says. And eat foods with prebiotics, a fiber that feeds good gut bacteria. Good sources include garlic, leeks, asparagus, onions, chicory root, and Jerusalem artichoke.

■ **Look to the Mediterranean.**

Some research supports the role of a Mediterranean-like diet—one that’s rich in fruits, veggies, whole grains, fatty fish, nuts, and olive oil. A possible reason: The diet contains plentiful amounts of folate and vitamin B12,

which have been associated with a reduced risk of depression, says Konstantinos Aryropoulos, M.D., Ph.D., a psychiatrist at the Hellenic Open University in Greece. Mediterranean-style diets may also reduce inflammation, which some research has linked to a higher depression risk.

Make Mealtime More Enjoyable

When it comes to eating for a better mood, it’s about more than what’s on the end of your fork, Heller says. Try the following:

■ **Dine with others some of the time.** Older adults who eat alone are more susceptible to depression, according to a 2015 study published in the medical journal *Age and Ageing*. If it’s challenging to find meal companions, invite a neighbor over for a meal or

check out community or senior center programs.

■ **Choose colorful foods and arrange them nicely.**

A pretty plate is key if you find that your appetite is smaller than it once was. “We are visual eaters, so when you see food, your salivary glands start up, which stimulates appetite,” says Vandana Sheth, R.D.N., C.D.E., a spokesperson for the Academy of Nutrition and Dietetics.

■ **Eat mindfully.** A 2018 study published in the *Journal of Affective Disorders* found that people who do this have lower rates of depression. So at mealtime sit, don’t stand, and avoid munching in front of the TV, Sheth says. And take the time to savor each bite, chewing slowly so that you can enjoy all the flavors and textures of your food.

When You Need More Help With Mood

A better diet is a good first step but may not be enough. Periodic feelings of anxiety, sadness, or irritability are normal, as is occasional trouble sleeping or appetite changes. But if any of the above persist for more than two weeks, see a doctor,

says Drew Ramsey, M.D.

Start with your primary care doctor, who can screen you for depression and check for medical issues that may be impacting your mood, such as a thyroid disorder. If your doctor thinks you may be depressed, she may

refer you to a therapist for talk therapy and/or to a psychiatrist to discuss medication therapy.

If you’re unsure whether you need help, you can take a short self-assessment at the Anxiety and Depression Association of America’s website.



10 Ideas for Easy, Nutritious Snacks

Enjoy between-meal eating
that's actually good for you

WHEN YOU HEAR the word “snack,” chances are you think about chips and cookies, and therefore believe snacking is something to be avoided. But eating between meals can be good for you—if you make healthful choices. And as you get older, you may actually need to snack to compensate for eating less at meals. “Medication, depression, changes in taste and smell, and a drop in activity level can all cause a decline in appetite,” says Lauri Wright, Ph.D., chair of the department of nutrition and dietetics at the University of North Florida in Jacksonville.

When you eat less at one sitting, it can be difficult to get the energy, vitamins, and minerals needed from three meals alone. “Snacking—or eating six mini meals a day instead of only three—can fill in the gaps,” Wright says.

In a study published in the *Journal of the Academy of Nutrition and Dietetics*, snacks contributed significantly to the overall intake of many important nutrients. For example, they supplied 18 percent of the

calcium and magnesium, 16 percent of the vitamin E and potassium, and 15 percent of the vitamin C older adults took in each day. In addition, the amount of these nutrients and others increased as the frequency of snacking increased. Other research shows that snacking also boosts protein intake. Of course, you don't want to go overboard and graze all day. Use these tips to help you snack right.

Know Your Nutrients

A diet rich in vitamins and other nutrients can help prevent disease and support everything from your bones to your heart. Experts suggest using snack time as an opportunity to increase your intake of the following:

- **Vitamin B12.** Because blood cells need this nutrient, a deficiency can result in anemia. Fortified cereals, yogurt, eggs, and lean meat are all good sources of vitamin B12.
- **Vitamin D.** This nutrient is crucial for bone health, your body needs sunlight to make it. You might not get enough during the colder months or if you spend little time outdoors. “It also becomes harder for the body to synthesize and absorb vitamin D as you age,” says Erin Morse, R.D., the chief clinical dietitian at UCLA Health’s department of nutrition. Salmon is

a vitamin D powerhouse, and milk, yogurt, and eggs are also good sources.

■ **Fiber.** “Decreased activity, dehydration, and certain medications can lead to constipation,” Morse says. “Fiber helps prevent this.”

In addition, soluble fiber can help lower cholesterol levels. Fruit and vegetables, whole grains and whole-grain bread and cereal, nuts, and beans are all rich in fiber. Soluble fiber is found in apples, beans, and oats, among other foods.

■ **Protein.** Protein is crucial for preserving muscle mass, which can decrease as you age. Wright suggests upping your protein intake and spreading it out. “Your body regenerates muscle throughout the day, and it needs protein to do that,” she says. “Instead of only having protein at one meal, eat a

Conquer That Craving

Skip that fatty or sugary snack. Try a swap from Wesley Delbridge, R.D.N., spokesperson for the Academy of Nutrition and Dietetics.



INSTEAD OF Potato chips
TRY Air-popped popcorn and a handful of nuts
WHY You still get a satisfying crunch and a little salt. And corn, a whole grain, provides fiber. Plus, the nuts contain protein and healthy fat.



INSTEAD OF A doughnut
TRY A slice of whole-wheat toast with 1 tablespoon of nut butter and sliced strawberries
WHY Whole grains provide fiber, almond butter has protein and healthy fat, and berries add sweetness with fewer sugars than jam.



INSTEAD OF A candy bar
TRY Walnuts and 70 percent cacao dark chocolate
WHY Dark chocolate is lower in sugars than the milk variety. Pairing it with walnuts (which contain healthy omega-3 fats) makes this snack nutritionist-approved.



INSTEAD OF Cookies and milk
TRY Whole-grain cereal and milk
WHY Many cereals are fortified with nutrients such as iron and B vitamins, and they're lower in sugars than cookies.

serving at least three times a day.” Power picks are lean meat, cheese, yogurt, beans, and eggs. (For ideas on plant-based proteins, see “How to Get More Protein—From Plants,” on page 32.”

■ **Potassium.** This mineral plays an important role in heart and kidney functioning. It’s abundant in bananas, prunes, beans, sweet and white potatoes, yogurt, and fish.

Follow This Formula

To get all the nutrients your body needs, try to snack on a variety of different types of foods, and go for a combination of protein and carbohydrates at every snack.

“Your body burns carbohydrates more quickly,” Wright says. “Protein provides a slower, more sustained energy release to help you feel full longer.”

And don’t shy away from fat! Healthy fats in snacks—such as those in avocados, hummus, nuts and seeds, and olive oil—will boost satiety. Plus, fat is key for the absorption of vitamins A, D, E, and K.

Beware of Spontaneity

Though meals are usually planned in advance, a majority of snacks aren’t, according to a 2014 study published in the Journal of the American College of Nutrition. That spontaneity can lead you to go for ease

BLEND UP GOOD-FOR-YOU SMOOTHIES

CR’s testers put about 70 blenders through their paces. Here are a few top performers well suited to making smoothies for snacks.



✓ **Vitamix Professional Series 750**
\$650

88



✓ **Vitamix 7500**
\$450

83



Ⓢ **Ninja SmartScreen Duo with Fresh Vac CT661V**
\$170

81

rather than nutrition.

“People think of snacks as prepackaged items, like chips,” Morse says. “We need to switch the mindset and consider nourishing foods we prepare.”

But that doesn’t mean you need to whip up complicated recipes or eat unfamiliar ingredients. Proof: these expert-approved, healthful, easy options.

■ **Banana and peanut butter.** It’s the ideal combination of protein, carbs, and healthy fat—plus potassium.

■ **Plain yogurt, whole-grain cereal, and berries.** This tasty parfait layers up fiber, protein, calcium, and potassium.

■ **Oatmeal, chia seeds, and chopped apple.** Mix protein- and nutrient-packed seeds into hot cereal for a flavorful, fiber-filled mini meal. The apple adds potassium plus a hit of natural sweetness.

■ **Turkey and avocado on a slice of whole-wheat bread.** Mini sandwiches can be a perfect portable snack.

■ **Lentil soup.** Try snacking on smaller portions of your favorite healthful meals, like bean soups. (Choose lower-sodium versions if you opt for a canned variety.)

■ **Baked sweet potato with olive oil and cinnamon.** Keep a few whole baked tubers in the fridge so that you can easily heat and eat.

■ **Whole-grain crackers with hummus.** Hummus has protein and healthy fats,

and the crackers supply some fiber. (For more on the benefits of hummus, chickpeas, and other pulses, see “Surprising Superfoods,” on page 22.)

■ **Roasted spiced chickpeas.** Rich in both protein and fiber, chickpeas are easy to prepare for a healthy snack. You can season them with cinnamon, garam masala, or whatever herbs and spices you like, and roast them in a toaster oven or crisp them in an air fryer.

■ **Homemade smoothies.** Smoothies from juice bars or the supermarket may be loaded with added sugars. Making them yourself lets you control the ingredients. Just keep some nut butter, frozen fruit, and plain yogurt on hand and it will only take a few minutes to whip one up in your blender. See three of our top-rated blenders at left.

■ **Certain energy bars.** Sometimes you really need a grab-and-go snack. In those cases, if you choose carefully, an energy bar can be a good option. Many have overly processed ingredients and added sugars, so look for one with 150 to 200 calories, 3 grams of fiber, 3 to 6 grams of protein, and few, if any, added sugars (such as cane sugar or brown-rice syrup) in the ingredients list. In CR’s assessment of 33 energy bars, it found six that earned a score of Very Good for nutrition.



Healthy Eating Tips From Across the Globe

Mix up your menu (and improve your nutrition) with these smart strategies from around the world

AS MUCH AS many of us relish eating, it's easy to fall into a rut and feel bored with our usual repertory of meals. "That's when it's time to shake things up and try something new and different," says Penny M. Kris-Etherton, Ph.D., R.D., a distinguished professor of nutrition at Penn State University. For inspiration, look at how people eat in other cultures. By incorporating a few healthy strategies from around the world, you can improve your own diet. Think of it as a foodie vacation that you can take without ever leaving the comfort of your own kitchen.

OKINAWA

Aim to Feel About 80 Percent Full

The residents of this chain of islands off the coast of Japan have some of the longest life spans in the world. One reason may be their practice of *hara hachi bu*, which translates to “eat until you’re 80 percent full.”

Why it’s healthy: “This is another way to look at portion control,” says Kris-Etherton. “It’s about paying more attention to what you’re eating, how much you’re eating, and recognizing your internal hunger and fullness cues.” So rather than mindlessly consuming everything on your plate just because it’s there, do an appetite check after every few bites. “Stop when you feel satisfied, not stuffed.”

INDIA

Add Plant Proteins

In India, the word “dal” can mean lentils or the traditional thick stew or soup made from them. Dal is a staple of Indian cuisine, and there are good reasons to make it one of yours as well. **Why it’s healthy:** Lentils and other pulses (a category that includes chickpeas, dried peas, and beans) are high in protein, fiber, potassium, and folate. They’re also low in calories and have almost no fat. “Diets rich in lentils and other legumes are linked to lower rates of diabetes and cardiovascular

Diets rich in lentils and other legumes are linked to lower rates of diabetes and cardiovascular disease.



disease,” says Becky Ramsing, R.D.N., senior program officer at the Johns Hopkins Center for a Livable Future. Research shows that eating legumes regularly has many health benefits. For instance, a 2014 analysis of 26 studies, published in the *Canadian Medical Association Journal*, found that those who ate about a half-cup of pulses (including lentils) daily lowered their LDL (“bad”) cholesterol by 6.6 mg/dL. Other research shows that they may help protect against type 2 diabetes and promote weight loss. (For more benefits, see “Immunity Power,” on page 22.)

ITALY

Slow Your Pace

When Italians gather around the dining table, they’re in no hurry to get up. Meals aren’t just an opportunity to eat food, they’re a reason

to relax and connect with friends and family.

Why it’s healthy: “When you slow down your meal, you’re taking the time to enjoy interacting with company,” says Kris-Etherton. “The social aspect becomes more of a priority rather than just eating all that you possibly can as fast as you can.” Research has also shown that it can take about 20 minutes for the release of satiety hormones that signal to your brain that you’re full. “If you eat too fast, that mechanism hasn’t kicked in yet,” says Kris-Etherton. “So you override your natural satiety triggers and overeat.” A 2019 study in the journal *Nutrients* tested this by having participants eat a 600-calorie meal in either 6 minutes or 24 minutes. Two hours after the meal, those who ate slower reported feeling more full and had a greater suppression of ghrelin, the hormone that triggers hunger. At 3 hours post-meal, the slower-eating group had consumed 25 percent fewer snack calories than those who ate quickly.

GREECE

Don’t Be Afraid to Eat Healthy Fats

To the inhabitants of Greece, the Mediterranean diet isn’t so much a diet as a way of life. And that’s easy to do in there, where the most important components of the diet are plentiful. One

cornerstone of the Mediterranean diet is a focus on healthy fats: olive oil, avocados, fatty fish, and nuts.

Why it’s healthy: In a 2018 study, people ages 65 and older who ate a Mediterranean diet had a 25 percent lower risk of dying from any cause during the study period. Rather than avoiding foods that are high in monounsaturated and polyunsaturated fats, you should embrace them—as long as you’re eating them instead of healthier saturated fats. A 2014 study looking at the Mediterranean diet supplemented with extra-virgin olive oil or nuts found that those eating extra healthy fats had a 30 percent reduced risk of cardiovascular disease compared with those on a low-fat diet. But even healthy fats are high in calories, so it’s important to eat them in place of—rather than in addition to—something else. For example, snack on a handful of nuts instead of a handful of potato chips.

MEXICO

Have a Bigger Lunch

In traditional Mexican culture (and in many South American countries), the midday meal is the largest one of the day, and what we think of as dinner is usually more of a moderate evening snack.

Why it’s healthy: “Eating a large lunch and a small

dinner seems to be metabolically healthy,” says Susan Roberts, Ph.D., senior scientist at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University. Research has shown that eating a bigger meal late in the day leads to higher overall cholesterol, higher LDL cholesterol, and higher triglycerides. Studies have also found a connection between eating then and higher body weight. “A large meal too

close to bedtime can also trigger heartburn and affect your sleep because your body is busy working on digestion instead of focusing on falling asleep,” Kris-Etherton says.

FRANCE

Treat Yourself, Just a Little Bit

The French don’t deprive themselves of desserts—nor do they overdo it. The secret? Eating small portions of sweets that truly satisfy.

Why it’s healthy: Portion control is a one important part of a healthy diet, especially when you’re trying to lose weight (or at least trying not to gain weight).

“French people must be eating fewer calories, because they have much lower rates of obesity than Americans,” says Roberts. “But they don’t seem to do it by counting calories.” Rather, they’ve learned the value of savoring a just a few bites of fine chocolate instead of mindlessly munching on half a box of cookies.

“The lesson here is that if you’re craving something, have it and enjoy it,” says Ramsing. “When we don’t eat what we’re craving, we typically end up eating more of something less desirable.”

VIETNAM

Start the Day With a Soup Course

Pho, a broth soup with rice noodles, vegetables, and sometimes a small amount of meat, is a breakfast staple in Vietnam.

Why it’s healthy: A bowl of hot soup is a very satisfying way to start the day, and it can be an easy way to sneak a serving or two of vegetables into a meal that often contains none. And unlike many traditional American breakfast foods, most soups are low in sugars and saturated fats. A bowl of soup usually provides a high volume of food for a low

number of calories. “The mixture of liquids and solids in some soups make it both hunger-suppressing and high in satiety,” Roberts says. One drawback of canned and box soups is the considerable amount of sodium. So make your own or look for low-sodium options.

BRAZIL

Stick to Whole Foods

When the Brazilian government issued its most recent dietary guidelines in 2014, they were lauded by many nutrition pros as forward-thinking. Instead of aiming for specific amounts of nutrients, they emphasized eating more whole foods and avoiding ultra-processed ones. In other words, they recommend eating the way Brazilians—and the rest of us—used to eat before fast-food restaurants and pre-packaged meals dominated our diets.

Why it’s healthy: Adopt this back-to-basics way of eating and you’ll automatically reduce calories, because processed foods pack a lot of them into a small amount of food. You’ll also increase your fiber intake because you’ll be eating more whole grains, fruit, and vegetables. And you’ll limit the amount of sodium, sugars, and unhealthy saturated fats you eat. (For more on following a whole-food diet, see “From Whole to Processed” on page 44.)



WHAT IS AVAXHOME?

AVAXHOME-

the biggest Internet portal,
providing you various content:
brand new books, trending movies,
fresh magazines, hot games,
recent software, latest music releases.

Unlimited satisfaction one low price

Cheap constant access to piping hot media

Protect your downloadings from Big brother

Safer, than torrent-trackers

18 years of seamless operation and our users' satisfaction

All languages

Brand new content

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AvaxHome - Your End Place

We have everything for all of your needs. Just open <https://avxlive.icu>



Should You Try a Keto Diet?

It's popular for those trying to lose weight, but experts say this eating plan has some drawbacks

THE KETOGENIC DIET, which involves consuming very few carbohydrates—typically only 20 to 50 grams per day—and getting 70 percent or more of your calories from fats, has become the trend du jour for weight loss.

But are there risks that might outweigh the benefits? According to Carol Kirkpatrick, Ph.D., M.P.H., clinical associate professor and director of the Idaho State University Wellness Center, the jury's out. "We just don't have evidence to say that it's a 'safe' dietary pattern to follow long term," she says. Here's what you need to know.

How Keto Works

The premise behind the keto diet is that it forces your body to draw energy from the fat in the foods you eat and from stored body fat rather than from carbohydrates.

Usually, your body converts the carbohydrates you eat into glucose, its preferred source of fuel. Your

brain, the most active organ in your body, consumes about two-thirds of the glucose you produce; the rest is used by your other organs, muscles, and cells.

At very low levels of carbohydrate intake, however, your body can't make much glucose, and your liver begins to convert fatty acids

into substances called ketone bodies. The ketone bodies provide an alternative source of energy for your brain and other cells.

You may think of the keto diet as a new trend, but it has been around for almost 100 years. Its original purpose wasn't weight loss but controlling epileptic seizures before medications for epilepsy were developed.

Although scientists aren't sure why the diet reduces seizures, even today it's an option for treating epilepsy in children and adults, says Kelly Roehl, M.S., R.D.N., an advanced-level dietitian and instructor at Rush University Medical Center in Chicago who works with patients to

manage epilepsy, other neurologic disorders, and weight.

Effects on Your Health

Research suggests that people who follow a keto diet do drop pounds. A 2013 analysis published in the *British Journal of Nutrition* (BJN) that evaluated 13 studies found that people who adhered to it lost more weight than those who followed a low-fat diet, at least in the short term. And Roehl notes that her patients who follow the diet for epilepsy tend to lose weight as a side effect.

But following this overly restricted form of a low-carb diet probably isn't worth it for most. For one thing, some carbs—especially fruits,

vegetables, beans, and whole grains—are important parts of a healthy diet and are known to reduce the risk of a number of diseases.

In addition, the keto diet can be a very difficult plan to follow, and most people “may not need to go to that extreme to get the benefits,” says David Ludwig, M.D., a professor of pediatrics at the Harvard Medical School and a professor of nutrition at the Harvard T.H. Chan School of Public Health in Boston.

It also might not be better than other diets for long-term weight loss. According to a recent scientific statement about carb-restricted diets from the National Lipids Association, very-low-carb diets led to more weight loss than low-fat diets in the short term (about six months), but only when both diet plans also severely restricted calories. And beyond six months, “that difference was essentially gone,” according to Kirkpatrick, who is the lead author of the report, and the two types of diets produced similar results. The analysis also noted that the initial weight loss from low- and very-low-carb diets appears to be primarily due to loss of body water and that restricting carbohydrates appears to result in greater loss of lean body mass—meaning muscle—not loss of fat mass.

The keto diet also has a

number of drawbacks. For example, in the BJN study, people who followed the diet had increased LDL cholesterol, the kind of cholesterol that leads to a buildup of plaque in your arteries and can raise your risk of cardiovascular disease.

Feeling foggy or lethargic is common during the first few weeks of following the plan, a result of significantly reducing glucose (which fuels the brain and muscles). It takes a few days for the body to switch over to using ketones for energy.

You may also be more prone to dehydration and electrolyte imbalances because following a keto diet can cause your body to excrete more water than you otherwise would. There’s an increased risk of kidney stones, and, like other low-carb diets, keto may cause bad breath, constipation, and headaches.

More serious: There’s a risk of ketoacidosis. That’s when the body produces more ketones than it can use for energy, and they build up in the blood, becoming toxic. If untreated, ketoacidosis can cause heart attacks, kidney failure, or fluid in the brain.

The fact that the body can derive energy from ketones is an evolutionary adaptation that helps people survive during periods of starvation, when glucose isn’t available to power the brain, says

WHAT YOU EAT ON KETO

The few carbs you eat come from non-starchy veggies. A typical meal plan for Roehl’s clients might include:

BREAKFAST

An egg cooked in butter, with heavy cream, feta cheese, spinach, and mushrooms.

LUNCH

A green salad with avocado, a hard-boiled egg, bacon, and cheese, with olive oil and red wine vinegar.

DINNER

Zucchini “pasta” and baked chicken with an Alfredo sauce made with heavy cream and Parmesan cheese, or an olive oil and pesto dressing.

SNACK

Almonds, celery and cream cheese, plain 4 percent fat Greek yogurt and strawberries.

Charlotte Vallaey, M.S., a nutritionist and a senior food and nutrition policy analyst at Consumer Reports. “We don’t yet know the impact of keeping the body in that state over long periods of time,” she says. People with type 2 diabetes should consult a healthcare provider with experienced with

keto to help you avoid unpleasant, even dangerous side effects.

A Better Plan

A healthy diet includes minimally processed whole grains, legumes, fruit, and vegetables. It does make sense to cut back on or eliminate certain carbs—refined grains and added sugars—and highly processed foods.

A diet that includes a moderate amount of healthy carbs is probably the best way to go, according to a study published in 2018 in *Lancet Public Health*. The researchers found that study participants who ate a lot of carbs (more than 70 percent of daily calories) as well as those who ate very little (less than 40 percent of calories) had shorter life spans than those who consumed a moderate amount. The sweet spot was 50 to 55 percent of calories from carbs, which is 250 to 275 grams for someone eating 2,000 calories a day.

If you do decide to replace some carbohydrates with fat, take care to choose the right types. In the study, low-carb diets were linked with a higher risk of death during the study period if people swapped carbs for animal-based fats and protein. But those who replaced carbs with fat and protein from plants—such as avocados, olive oil, nuts, and seeds—had a lower risk of dying.



Healthy Habits We've Learned From COVID-19

Washing our hands better, cooking more at home, and using telemedicine can help protect us now and later.

THE PAST FEW months have been scary and challenging, especially for older adults and anyone at risk of complications from COVID-19. But sheltering in place has given us a chance to learn better strategies for infection protection, to cook at home more often, to check in with physicians more frequently via telemedicine—and even for gratitude and reflection. Though we don’t know exactly what the next few months will bring in terms of the coronavirus, what we’ve learned may help us with whatever comes.

■ **We Keep Germs at Bay**

Proper hand-washing can help prevent up to 40 percent of diarrhea-related illnesses and up to 21 percent of respiratory infections (like COVID-19), according to the Centers for Disease Control and Prevention.

And thanks to frequent reminders from the CDC and other groups, we’ve learned to do it often and well: lathering soap all over our wet hands, including the backs, between fingers, and under nails, for at least 20 seconds, then rinsing and drying them with a clean towel.

We’ve also embraced infection-control habits such as avoiding sick people if possible, keeping tissues handy, and tossing those tissues right away after coughing or sneezing into them.

“I’m amazed. People ask me to wash my hands when I come into [their] home all the time,” says Dwayne Dobschuetz, M.S.N., R.N., an advanced practice nurse in geriatrics home care at Northwestern Memorial Hospital in Chicago. His patients

also tell him they disinfect their countertops and door-knobs daily.

■ **We ‘See’ Our Doctors in New Ways** In March, with many medical offices closed and hospitals and urgent care centers overburdened, Medicare and certain private insurers expanded their coverage of telemedicine. While virtual healthcare isn’t appropriate for everything or everyone, evidence suggests that it can play an important role.

And research points to high satisfaction levels. A 2019 study by Massachusetts General Hospital, published in *The American Journal of Managed Care* and involving 254 patients, found that about 75 percent rated a telehealth consultation as good as or better than an in-person appointment.

Some doctors also notice the benefits. “With telemedicine, we can ‘see’ more patients,” says Nisha Rughwani, M.D., an associate professor of geriatrics and palliative medicine at the Icahn School of Medicine at

Mount Sinai Hospital in New York City. “We need to allow time between in-person visits to thoroughly clean and disinfect a room, [so we] cannot have the same volume we previously did.”

■ **We Eat a Bit Better** We’ve begun eating at home most of the time because of the pandemic, and a survey of 1,005 people by Hunter, a marketing firm, found that 54 percent of Americans have been cooking more. A January 2020 study published in the journal *Public Health Nutrition* suggests that people who cook and eat at home tend to have healthier diets.

The Hunter survey also

found that 57 percent of Americans said they were wasting less food during the pandemic and that 60 percent reported searching for recipes that use ingredients they already had on hand.

“The hope is that even as restaurants gradually open up, people will continue to cook at home because it’s less expensive, healthier, and also relaxing,” says Bruce Rabin, M.D., Ph.D., a professor of pathology, psychology, and psychiatry at the University of Pittsburgh School of Medicine.

■ **We’re Safely Social** Social isolation is a major risk factor for dementia, says Gary



Keep your brain active, whether it's reading a daily newspaper or joining a virtual book club or playing board games.

Small, M.D., director of the UCLA Longevity Center in Los Angeles. But when we can't see people in person, technology can help. A 2019 study in *The American Journal of Geriatric Psychiatry* found that older adults who use tools such as Skype have a significantly lower risk of depression than others.

"Most of the seniors I see were already isolated before the pandemic, but now it's really encouraged them to embrace technology and not be afraid," Dobschuetz says. For example, one of his patients regularly plays games with his adult children and friends on Zoom.

If you aren't getting out

much, try doing virtual activities with friends at least two or three times a week.

Keep your brain active, whether it's reading a daily newspaper or through more social pastimes, such as joining a virtual book club or playing board games.

A 2018 study in *JAMA Psychiatry* of more than 15,000 older adults found that those who participated in daily intellectual activities such as card games had a lower risk of developing dementia. "They all allow you to think critically and interact with others," Small says.

Mahjong, which can be played with others online, is a great option, Small adds.



In fact, a March 2020 study in the journal *Frontiers in Neurology* found that people older than 65 who played mahjong three times a week for 12 weeks showed improvements in executive function compared with a control group.

■ **The Advantages of Age**
Just as fine wine improves over the years, the ability to weather difficulties grows stronger with time. Going through life's crises may help us become more resilient and patient, Rabin says. "These attributes are like muscles," he adds. "They become stronger the more you use them."

Gratitude helps, too. A 2019 review in the *Journal of Positive Psychology* found that the attitude was consistently higher in older adults. This may help explain the outpouring of support that essential front-line workers have received from seniors.

"I've been blown away by the level of appreciation I've seen from my patients, the emails and phone calls I've gotten thanking me for being there for them," Rughwani says.

And this attitude may have health benefits. A study in the *Journal of Health Psychology* found that women who kept a "gratitude journal" for two weeks reported better moods and sleep, and had lower blood pressure than others.

Keep Disinfecting Key Areas Daily

In the case of a local outbreak of an infection such as COVID-19, you'll want to keep your home as sanitized as possible. The Centers for Disease Control and Prevention recommends cleaning and disinfecting high-touch areas—tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks—daily if someone is ill or you think they may be. Household disinfectants such as Clorox Disinfecting

Wipes or those with at least 70 percent alcohol are effective, the CDC says.

You can make your own disinfecting solution by adding 1/3 cup bleach to a gallon of water. If possible, wear disposable gloves or designate a pair of latex or rubber gloves for cleaning only. As soon as you take them off, wash your hands.

Don't forget your cell phone, adds Charles Gerba, Ph.D., professor of microbiology and

immunology at the University of Arizona in Tucson. "Even if you use a headset, since most phones have touch screens, germs can easily spread from your phone to your hands, which can trigger infection if you touch your face," he says. He recommends wiping your phone with 70 percent alcohol wipes several times a day, including each time you come in from outdoors. (A screen protector will prevent possible damage to your phone.)

Healthy Moves

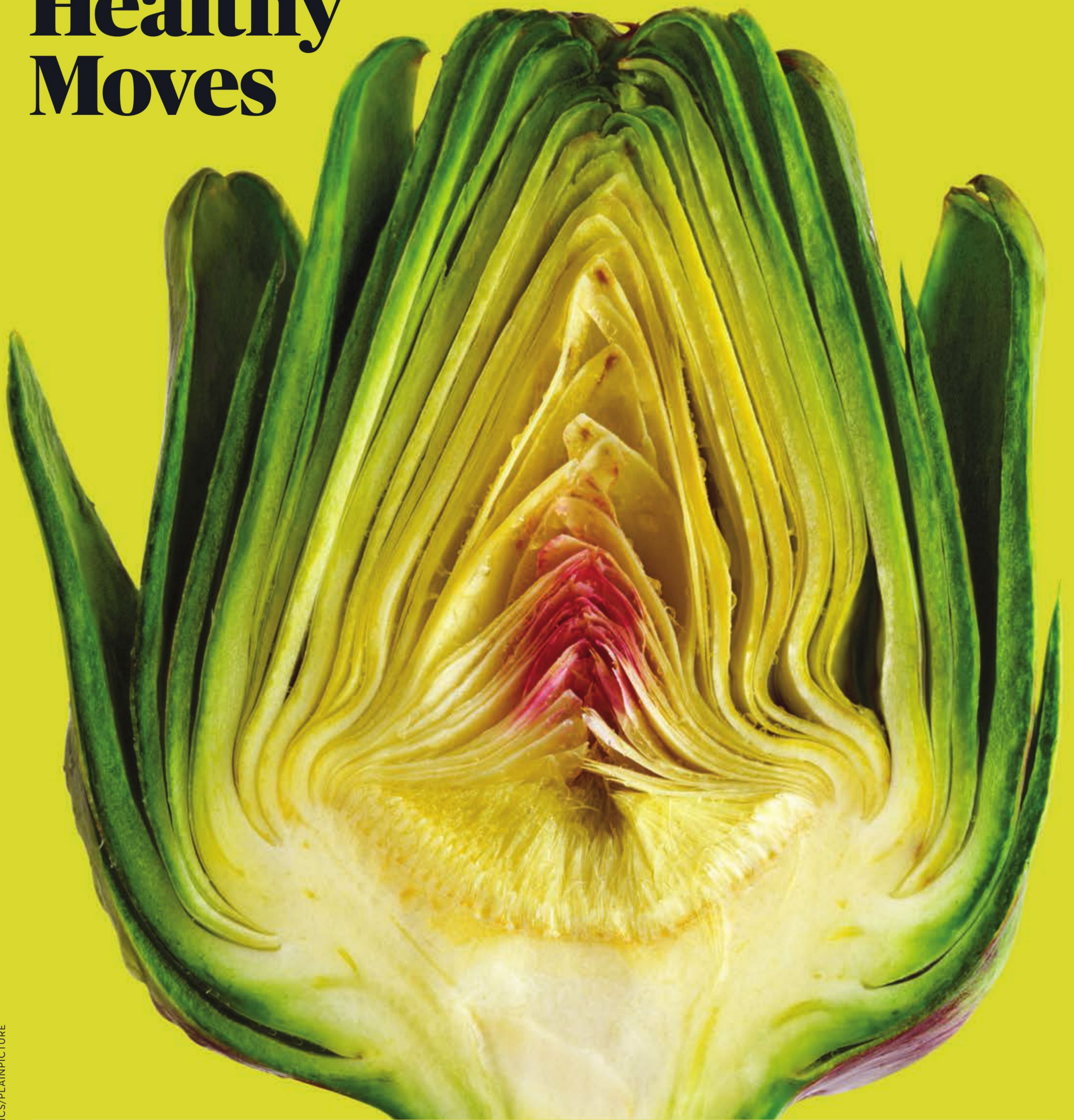


PHOTO: BATISTA MOON STUDIO/DESIGN PICS/PLAINPICTURE

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IMMUNITY

A close-up photograph of green leafy vegetables, likely kale or collard greens, with numerous small water droplets on their surfaces. The leaves are vibrant green and show detailed vein patterns. A central stem runs vertically through the middle of the frame.

POWER

A healthy diet can help build your body's ability to fight infections

Defense Plan
Choose whole, minimally processed food that's mostly cooked at home.

Staying healthy and avoiding infections have never been more important. Social distancing can help keep other people's germs from landing on you, and frequent hand-washing will kill them if they do reach you. But what can you do to improve your body's ability to fight off germs if—despite your best efforts—you pick them up?

What you eat can make a big difference in how well your immune system functions—especially as you age. “It’s really important for older people to have very nutrient-dense diets,” says Katherine L. Tucker, Ph.D., director of the Center for Population Health at the University of Massachusetts Lowell. Immune responses decline with age, and many older adults have chronic low-level inflammation and underlying health conditions, like heart disease and diabetes, that can also hamper the body’s defenses. And they may become less efficient at absorbing many infection-fighting vitamins and minerals.

Getting your immune system in battle-ready shape won’t happen overnight. “I don’t think you can suddenly change your diet today and tomorrow your immune system is happier,” says Philip C. Calder, Ph.D., a professor of nutritional immunology at the University of



Southampton in the United Kingdom. But shoring up your diet now can pay off in the long run with fewer sick days and better overall health.

How Immunity Works

Made up of an intricate network of molecules, cells, tissues, and organs, the immune system is on patrol everywhere in the body. It's divided broadly into two parts. The innate immune system, is on the front lines—in skin, saliva, the GI and respiratory tracts, and elsewhere—and acts quickly to thwart foreign invaders. The other part, the adaptive (or acquired) immune system, works over days to track down the invaders that have breached the first-line defenders and helps develop antibodies against them.

Because the components of the immune system are so varied, keeping it healthy means getting an array of vitamins and minerals, which often work together in dozens of immune-boosting roles. Vitamin A, for example, is important for healthy skin and GI-tract cells. Vitamins C and E are

PHOTOS, PREVIOUS SPREAD FROM LEFT: ROBERTA DALL'ALBA/OFFSET; SOPHIA HSIN/STOCKSY. PHOTOS, THIS SPREAD FROM LEFT: CLAIRE BENOIST/THE LICENSING PROJECT; PAUL GROSSMANN/GETTY IMAGES

WHAT ABOUT SUPPLEMENTS?

Supplements for the immune system have been flying off store shelves recently. But experts warn against using them in most cases. You run the risk of getting too much of a nutrient. Too much zinc, for example, can block copper absorption, and high levels of folate can mask a vitamin

B12 deficiency. Herbal and other remedies, like elderberry tincture and colloidal silver (silver molecules suspended in liquid), which have been advertised on social media as a way to destroy the coronavirus, are unproven and potentially harmful. IP-6 (phytic acid), touted as

an antioxidant, can lead to calcium, iron, and zinc deficiencies, and polyphenols from green tea extracts may reduce the absorption of iron, folate, and vitamin C. It's best to get the nutrients you need from food so that you don't lose out on other beneficial ingredients, like



Grains for Gut Health

The fiber in whole grains helps feed the healthy bacteria in your digestive system.

phytonutrients. The exception is vitamin D. Because more than 80 percent of older Americans don't get enough from diet alone, Katherine L. Tucker of the University of Massachusetts Lowell recommends taking a supplement. The daily need for people ages 51 to 70 is 600 IU; over 70, it's 800 IU.



Pick a Variety

Mix up the type and color of your produce to get a wide selection of nutrients.

antioxidants that protect cells and tissues from the flood of damaging free radicals produced when the immune system is fighting off an invader. Making new immune cells and initiating an immune response requires B vitamins (B6, B12, and folate). Other nutrients that fuel your immune system are copper, iron, magnesium, omega-3 fats, protein, selenium, vitamin D, and zinc.

The Power of Plants

Eating too many foods high in saturated fats, sugars, and salt can weaken immunity. In addition to multiple nutrients and phytochemicals, plant-based foods also provide fiber, which feeds the healthy bacteria in your gut, which aid immunity.

FRUITS AND VEGETABLES. They supply most of the body's need for vitamins A and C, which are important germ fighters. Produce is also generally rich in antioxidants, which tamp down inflammation and protect immune (and other) cell membranes from damaging oxidation. Aim for at least 2½ cups of vegetables and 2 cups of fruit per day.



Tucker recommends having at least one green vegetable every day, such as spinach, kale, Swiss chard, broccoli, arugula, or cabbage. Bell peppers, potatoes, sweet potatoes, and carrots are also high in vitamin A and/or C. Citrus fruits are high in C, as are tomatoes, strawberries, and kiwifruit. **NUTS AND SEEDS.** These are great sources of crucial vitamins and minerals, fiber, protein, and healthy fats. Vitamin E is a potent antioxidant, and most people don't come near the daily need (15 mg). Tucker suggests munching on a handful of sunflower seeds or almonds every day.

Almonds also provide copper and magnesium, which studies show are involved in DNA repair and antibody production. Sunflower seeds have selenium, copper, folate, and zinc. (Deficiencies of zinc account for 16 percent of lower respiratory infections across the globe.) Hazelnuts, pistachios, and walnuts are brimming with vitamin B6.

BEANS AND WHOLE GRAINS. Beans and whole grains contribute nutrients and contain fiber to help replenish healthy intestinal bacteria. Lentils are a good source of copper, folate, and iron; garbanzos and black beans provide zinc; and cranberry beans are high in folate. Whole-grain breads and cereals and whole grains themselves (barley, bulgur, wheatberries, oats, and quinoa, among others) supply B vitamins, copper, iron, magnesium, and zinc.

HEALTHY OILS. Oils, such as olive, flaxseed, and canola, supply omega-3 fats, which help keep inflammation in check and regulate immune cell activity. A tablespoon or two of an oil-based dressing can also help your body absorb antioxidant carotenoids (which the body converts to vitamin A) and other nutrients in greens and other vegetables.



Choose Healthy Meat and Dairy

Some vitamins and minerals are more accessible in animal foods than in plant foods. Zinc, for example, is more readily absorbed from seafood and meat than from beans and whole grains. Adequate protein also has the building blocks for immune cells.

MEAT AND FISH. While you don't need either on your plate at every meal—a few times a week is fine—they do supply key nutrients. Lean meat and poultry have ample B vitamins (especially vitamin B12), iron, selenium, and zinc. Shellfish is a good source of zinc, copper, and selenium. And fatty fish like salmon, tuna, and mackerel are important sources of omega-3 fats as well as B vitamins, selenium, and vitamin D, which may protect against upper respiratory tract infections and over-responses by the immune system.

DAIRY FOODS. They add to your stores of vitamin A, some Bs, zinc, magnesium, and selenium. Fortified dairy products—such as milk and yogurt—can supply hard-to-get vitamin D. Yogurt (plain is best so you avoid added sugars) is also teeming with probiotic bacteria, which help keep the intestinal microbiome healthy.





COMFORT FOODS MADE HEALTHY

CR'S TEST-KITCHEN EXPERTS SHARE TIPS THAT HIKE THE NUTRITION IN YOUR FAVORITE DISHES

Nutrition experts usually don't advise using food to soothe nerves—but these aren't normal times. For about a quarter of Americans, eating and cooking have become a way to manage boredom and stress during the pandemic, according to the market research firm Datassential. And the pros say that's not all bad, especially if you're dishing up at home. "A shift toward cooking with real whole-food ingredients is a great step toward less reliance on packaged processed foods," says Amy Keating, R.D., a CR nutritionist.

And even if your home-cooking efforts have emphasized feel-good go-tos like mac and cheese or lasagna, that's okay. "Comfort foods that are made healthier and served with a salad and a side of vegetables can still make us feel just as good," Keating says.

In fact, research shows that a few healthy tweaks can make comfort-food recipes even more comforting. Studies have found a link between higher intakes of produce, whole grains, and nuts and improved mood.

So we asked CR's chefs and nutrition experts for tips to make five favorite comfort foods better for you—and just as delicious. Bonus: You can use these suggestions to healthy up any go-to recipe. Read on to learn how.



1 Lighten Your Lasagna

■ **Reduce the ricotta.** It's delicious but so rich that you can swap in a lower-calorie substitute for some of it and still have a luscious dish. Replace some (or even all) of the ricotta cheese with cottage cheese puréed in a blender. That will save you 220 calories and 15 grams of saturated fat per cup when you compare full-fat ricotta with low-fat (2 percent) cottage cheese.

■ **Go lower-fat.** Use part-skim cheese rather than dairy made with whole milk. You'll still have a little fat to add flavor (and help you absorb vitamins from the veggies) but less saturated fat.

■ **Minimize the meat.** If your recipe calls for meat in the sauce, consider using less or skipping it altogether. Even slimmed-down, lasagna is rich and doesn't need more than a taste of meat at most.

■ **Watch the sauce.** Use a low-sodium jarred tomato sauce or reduce the salt in your home-

made recipe. There's already a lot of flavor (and some salt) in the cheese and other ingredients, plus you can add more herbs like oregano and basil for still more flavor.

■ **Nix the noodles.** Try zucchini slices instead of pasta sheets. "Slice zucchini lengthwise into quarter-inch slices, salt, spread out, and let sit for at least 15 minutes," says Claudia Gallo, a professional chef and member of CR's food testing team. "Then blot dry and roast or grill in a single layer on a baking sheet for 15 minutes, and use the slices in place of the noodles." Or try substituting one pasta layer with a layer of sautéed vegetables: chopped asparagus, chopped broccoli florets, sliced mushrooms, and/or chunks of zucchini. You can also add chopped spinach, either fresh or frozen (thawed and squeezed dry). It'll keep your lasagna moist and add vitamins and minerals.

2 Give Mac and Cheese a Makeover

■ **Pick the right pasta.** Try whole-grain pasta instead of refined to increase the fiber count by 3 grams per cup of pasta. Or try a combination of whole-grain and traditional pasta, as we did for our mac and cheese recipe, at right).

■ **Add eggs.** "Replace half the noodles with scrambled egg whites," suggests Perry Santanachote, associate content creator in CR's home and appliance department, who is also a recipe developer. "For a recipe that calls for a pound of macaroni, you'd use a half-pound of the pasta plus 3 cups of cooked egg whites. The firm eggs feel and taste just like al dente pasta when they're coated in cheese sauce. And you'll cut calories and carbs and increase protein."

■ **Lower fat.** Cut fat but retain flavor by using cottage cheese puréed in a blender in place of some of the recipe's cream or cheddar cheese. Also consider replacing some of the whole-milk and full-fat cheese with low-fat versions.

■ **Add veggies.** To make a healthier but still creamy cheese sauce, add cooked, puréed cauliflower or butternut squash. They boost the thickness of cheese sauce and add a nutritional boost. For more flavor and more vitamins, add steamed broccoli or cauliflower florets, peas, or chopped tomatoes.



CAULIFLOWER MAC & CHEESE

- 1 (14.5-ounce) box refined wheat or whole-wheat elbow macaroni (or 1/2 box each regular and whole-wheat)
- 1/2 head cauliflower, trimmed and cut into small florets
- 2 slices whole-wheat bread
- 1 tablespoon olive oil

- 4 tablespoons grated Parmesan cheese
- 8 ounces sharp cheddar, grated
- 4 ounces low-fat cream cheese
- 1/2 cup fat-free half-and-half
- 1/2 teaspoon salt
- 1/2 teaspoon freshly ground black pepper

1. Heat oven to 350° F.
2. Bring large pot of water to boil. Add macaroni and cauliflower, and cook according to instructions on the macaroni package or packages (different types may have different cooking times). Reserve 1/2 cup cooking water, then drain macaroni and cauliflower.
3. Pulse bread, olive oil, and 1 tablespoon of the

- Parmesan cheese in a food processor until coarse crumbs form. Set aside.
4. Place cheddar, cream cheese, 3 tablespoons Parmesan cheese, half-and-half, salt, and pepper in the macaroni cooking pot. Add macaroni and cauliflower. Stir until well-combined and cheese is melted. Add reserved cooking liquid.
 5. Place in greased

9x13-inch baking dish. Top with breadcrumb mixture. Bake until bubbling and the crumbs are browned, about 15 to 20 minutes.
Serves 8

Per serving: 370 calories, 16 g fat, 8 g saturated fat, 45 g carbohydrates, 0 g fiber, 3 g sugars, 16 g protein, 460 mg sodium

3 Make a Healthier Soup

■ **Reduce the salt.** When making soup, start with a lower-sodium canned broth or stock. You might be better off with a stock. In CR's tests of chicken broths and stocks, we found that regular broths can contain up to 350 mg more sodium per cup than stocks of the same brand. If you're making your own stock, flavor it with herbs and vegetables—then add salt after it's cooked, if necessary.

■ **Think vegetable-forward.** Add sautéed or frozen veggies to soups for flavor and nutrition. Chopped carrots, celery, and/or peas work well in many broth- and tomato-based soups. Thicker cream soups, bean- and lentil-based soups, and chowders can stand up to chunks of sweet potatoes and root vegetables, bell peppers, and greens. Onions, garlic, and herbs are versatile options.

■ **Go with the grain.** In place of egg noodles or pasta, drop in some fiber-rich cooked whole grains like farro, brown rice, or barley.

■ **Add healthy fats.** “Stir in a spoonful or two of ground flaxseed per serving at the end,” Santanachote says. They're rich in plant-based protein and omega 3 fatty acids, which are good for heart health. Plus, they can add a little extra thickness to the soup's texture. You can also flavor the soup just before serving with a swirl of olive oil to add flavor and healthy monounsaturated fats.



MIX-AND-MATCH SOUP

Making your own soup is healthier (and arguably tastier) than reaching for a typically high-in-sodium canned soup. You don't even need a recipe. Just follow this mix-and-match soup template.

STEP 1: Start With a Base

In a large pot, sauté one to three of the following aromatics in oil or butter until soft: 2 carrots, chopped; 1 small onion, chopped; 1 stalk celery, chopped; 3 cloves garlic, chopped; 1 tablespoon chopped ginger; ½ cup chopped fennel;

½ cup chopped shallots; ½ cup bell peppers; and ½ cup chopped leeks.

Carefully pour 6 cups of low-sodium chicken or vegetable broth or stock (or a mix of broth and water) into the pot.

STEP 2: Spice It Up

Stir in ½ to 1 teaspoon of one of the following spices: curry powder, cayenne pepper, cumin, oregano, thyme, rosemary, or smoked paprika.

STEP 3: Pick Some Veggies

Use cooked, canned, or frozen.

Pick two or more of these vegetables (use a total of 2 cups). If you choose to add leafy greens, add them toward the end of cooking so that they don't turn a dull green. Consider: arugula, acorn or butternut squash, broccoli, cabbage (shredded), carrots, cauliflower, corn, escarole, green beans, kale, mushrooms, peas, potato, spinach, sweet potato, swiss chard, tomatoes, and zucchini.

STEP 4: Add a Grain

Use 1½ cups cooked grains (preferably whole), such as one



4 Build a Better Meatloaf

■ **Pick your protein.** Traditionally made with fatty ground beef or a “meatloaf mix” of beef, pork, and veal, this classic comfort food can be high in saturated fat. For a lighter option (with all of the rich flavor), sub in lower-fat ground turkey or chicken breast for at least some of the meat.

■ **Make it with less meat.** Replacing half the meat with chopped, sautéed mushrooms can help stretch your meat and add fiber, vitamins, and minerals while reducing the dish’s overall fat content. “Use a meaty one, like portobellos or baby bellas,” says Ellen Klosz, a nutritionist and test program leader at CR.

■ **Find a healthier filler.** Work in whole grains by swapping out

the usual white breadcrumbs for whole-wheat ones or rolled oats ($\frac{3}{4}$ cup per 1½ pounds of meat).

■ **Add your own flavorings.** Instead of a prepared meatloaf spice mix that could be high in sodium, add your own flavor layers with sautéed garlic and onions, and dried or fresh herbs like thyme, oregano, rosemary, and parsley.

■ **Dress it up with vegetables.** Adding finely chopped sautéed veggies, such as carrots, beets, eggplant, or even dark greens, can add richer flavor as well as phytonutrients to your meatloaf.

■ **Skip the toppings.** Forgoing that blanket of bacon strips, mushroom soup, or ketchup will help keep added fat, sodium, or sugars to a minimum.



of these: barley, bulgur, couscous, farro, millet, pasta, quinoa, rice, or wheatberries.

STEP 5: Add a Protein

Use 1 cup chopped cooked beef, chicken, fish, or pork. Or try 1 cup tofu, edamame, or cooked or canned (drained) beans (any type).

STEP 6: Simmer

Set the heat to medium, and simmer for 10 minutes or until heated through. Taste; if necessary, add salt or more spices. You’ll have about six servings that will keep in the fridge for three to four days.



CHILI COOK-OFF

Dutch Oven vs. Multi-Cooker vs. Slow Cooker

5 Charge Up Your Chili

- **Pick poultry.** Replace beef or pork with lower-in-saturated-fat ground turkey or chicken breast. You won't notice a difference in texture or richness amid all the bold chili flavors.
- **Swap out some meat.** Try replacing half (or all) of the meat your recipe calls for with cooked beans or bulgur. These foods provide healthy fiber and increase the volume of the meal, both of which help keep you fuller longer. Plus, it will cut calories and saturated fat. For example, if a recipe calls for 2 pounds of ground beef (4 cups) and you replace half of it with 2 cups of beans, you'll cut the calories by about 164 and the saturated fat by about 16 grams in your chili, or about 27 calories and about 3 grams of saturated fat per serving.
- **Add all kinds of beans.** If you're making vegetarian chili, double the amount of beans. Or if you're using a recipe that doesn't call for beans at all, add some in to increase the dish's plant protein and filling fiber.

(There's about 14 grams of protein in 1 cup of beans.) Any type of bean you have on hand is fine—all are nutritious and tasty. Using a variety can keep things colorful and maximize your intake of nutrients.

- **Mix in more veggies.** Try including a cup or two of cubed sweet potatoes, pumpkin, or butternut squash to add fiber and the antioxidant beta carotene, which your body converts to vitamin A. Or add fiber-rich frozen or canned corn during the last few minutes of cooking.




- **Go green.** Serve your chili over sautéed kale or spinach. It's a great way to get more dark leafy greens—some of the most nutritious foods around—into your diet, and it's lower in calories than rice or cornbread.

- **Use substitutes for sour cream.** It's tasty but high in calories and saturated fat. Instead, try topping your chili with mashed avocado or nonfat Greek yogurt mixed with a dash of chili powder and a little chopped onion.

You can make chili any number of ways, including using a Dutch oven, a slow cooker, or a multi-cooker. But which one turns tough chuck meat and dried beans into the best mouth-watering chili? To find out, we cooked batches of chili using all three methods (testing the multi-cooker in both slow-cooker and pressure-cooker modes).

To appeal to a variety of tastes, we opted for a classic beef chili recipe with diced tomatoes, chicken broth, chili powder, cumin, dried oregano, cocoa, and jalapeño peppers. We used chunks of chuck roast (instead of ground beef) and dried, unsoaked pinto beans (instead of canned beans) to gauge each appliance's ability to cook these tough-to-tenderize ingredients. Then we conducted a blind taste test with 10 CR staffers, who ranked each batch based on color, aroma, flavor, texture, and heat.

Here's what we found, along with a few tips for getting the best results no matter which method you choose.

	TIME REQUIRED	HOW WE COOKED IT	TASTING NOTES	COOKING TIPS
<p>DUTCH OVEN CHILI</p>  <p>✓ Le Creuset Signature \$340</p> <p>83</p>	<p>2½ hours (30 minutes to sear the meat and vegetables, plus 2 hours in the oven)</p>	<p>We browned the beef and lightly cooked the vegetables in the Dutch oven on the stovetop before adding everything else (diced tomatoes, chicken broth, and spices) and cooked it in an oven set to 300° F for 2 hours.</p>	<p>This chili was thick and dark brown, and scored the lowest grade for color and one of the lowest for texture. But what it lacked in looks was more than made up for in flavor. Our tasters scored the chili fairly high for aroma, flavor, and heat. The chili tasted deep and layered with enough sweetness to balance out the bitterness and heat. But the beans were not as flavorful and were still a bit hard.</p>	<p>Presoak the beans. We didn't soak them to keep the testing fair across the board, but doing so will prevent them from being undercooked and help them absorb some of the chili flavor. To prevent excessive evaporation (and a dry chili), tightly cover the pot in aluminum foil before putting on the lid.</p>
<p>SLOW-COOKER CHILI</p>  <p>✓ Hamilton Beach Temp Tracker 33866 \$70</p> <p>87</p>	<p>4½ hours (30 minutes to sear the meat and vegetables, plus 4 hours to slow-cook on the high-heat setting)</p>	<p>We seared the chuck and lightly cooked the vegetables in a skillet on the stove. We transferred them to the slow cooker, added the remaining ingredients, and slow-cooked on high heat for 4 hours.</p>	<p>This batch had a layer of oil on top, no matter how many times we stirred it, so points were docked for that. Similar to the slow-cooked batch made in the multi-cooker, this chili lacked aroma and heat. It averaged a C for flavor because it tasted flat, though it was still beefier than the batch slow-cooked in the multi-cooker, perhaps because we browned the beef on the stove first.</p>	<p>Prevent a greasy chili by draining the fat rendered from the beef after browning.</p>
<p>MULTI-COOKER CHILI</p>  <p>✓ Zavor LUX LCD \$160</p> <p>83</p>	<p>In pressure-cook mode: 1½ hours (30 minutes to sear the meat and vegetables, 15 minutes to build pressure inside the cooker, and 45 minutes to cook). In slow-cook mode: 4½ hours (30 minutes to sear the meat and vegetables, plus 4 hours to slow-cook on the high-heat setting)</p>	<p>For both modes, we seared the chuck and lightly cooked the vegetables using the multi-cooker's sauté function—and found that the pot steamed the beef instead of browning it. After adding the remaining ingredients, we locked the lid in place and slow-cooked the chili on high heat for 4 hours or pressure cooked it on high pressure for 45 minutes.</p>	<p>The pressure-cooked batch looked delicious but had a strangely metallic flavor—and the chili burned on the bottom. The slow-cooked version was a crowd favorite. "It has the best texture, and the meat falls apart nicely," said one taster. But the chilies seemed to have lost their flavor during cooking. Had the beef browned well, the overall flavor might have deepened.</p>	<p>To get a proper sear on the meat, try browning it in small batches. Our recipe said to brown the meat in two batches, 10 minutes each, but four batches would have been better. That doubles the prep time, though. Or you can sauté the meat and vegetables in a pan.</p>

CHILI COOK-OFF WINNER

For making great chili, it's a tie between the Dutch oven and the multi-cooker in slow-cook mode. Each requires some tweaking in the cooking methods, though. The Dutch oven chili had the best aroma, heat, and flavor, but it looked less than appetizing due to its dry texture. And the longer it sat, the

thicker it got. Our tips (above) should help keep your chili from drying out. The chili we cooked in the multi-cooker in slow-cook mode was picture-perfect. But the flavor and aroma fell flat. Again, you can use our tips for better results. And don't forget the toppings!



WHY FROZEN MEA

FROZEN ENTRÉES HAVE GOTTEN A HEALTHY MAKEOVER. WE ATE AND RATE



LS ARE NOW HOT

30 OF THEM TO FIND OUT IF YOU SHOULD STOCK UP.



PREVIOUS SPREAD

1
✓ Healthy Choice
Power Bowls
Falafel & Tahini
77

2
✓ Amy's Light & Lean
Quinoa & Black Beans with
Butternut Squash & Chard
80

3
Stouffer's Fit
Kitchen Protein
Bowls Cali Chicken
64

4
✓ Green Giant
Harvest Protein
Bowls Asian Style
73

5
✓ Sweet Earth
Curry Tiger
75



2 —

6
 Healthy Choice Café
 Steamers Tortellini
 Primavera Parmesan

60



PHOTOS: PREVIOUS SPREAD, THIS PAGE, AND FOLLOWING SPREAD: SAM KAPLAN

A

As Americans seek to limit the number of trips to the grocery store due to the coronavirus pandemic, they've been giving frozen meals a closer look.

Along with filling their cupboards with long-lasting staples like canned beans, fish, and soup, consumers have been stocking up on frozen meals. Sales increased by 48 percent in April this year compared with the same month last year, and were still up more than 13 percent in late June, according to the American Frozen Food Institute.

That coincides with a growing interest in packaged foods that have healthier, less-processed ingredients—as well as a willingness to sample a wider variety of cuisine. “Manufacturers of frozen meals have been hitting the reset button and changing a lot about their product offerings in order to meet consumers where they are,” says Dewey Warner, senior food and nutrition analyst at Euromonitor International, a market research company. These kinds of meals are largely what’s driving the growth in sales. “Salisbury steak and potatoes may be a tough sell, but consumers may be interested in a fire-grilled Sriracha steak bowl,” Warner adds.

As a result, we decided to check out

the newer offerings in the freezer case. There are still plenty of old-school dishes—lots of meat-and-potatoes “man dinners” and petite, bland diet meals. But we found just as many that feature global flavors, plant proteins such as beans and tofu, and fewer processed ingredients.

“Consumers see frozen meals as an easy way to experiment with these trends,” says Ellen Klosz, the CR nutritionist who oversaw our testing. “So we opted to evaluate 30 meals that fit into these categories rather than ‘classic’ frozen meals.”

Our food experts found plenty of choices that are healthier and much tastier than you may have imagined. And while none of the meals in our tests received our highest taste rating, 18 were rated Very Good. Here are the changes we noted.

More Grains and Fiber

Portion sizes for frozen meals in general are still pretty small. The total amount of food in the entrées we tested ranged from ¾ to 2 cups. And the calorie counts

for this newer generation of frozen entrées are, in some cases, similar to those for old-style favorites. Stouffer's Chicken à la King, for instance, has 360 calories and Marie Callender's Chicken Parmigiana has 440, while Evol Vitalize Grilled Chicken with Grains and Vegetables (in our ratings) has 410.

The difference is in the nutritional quality of the ingredients. The new breed of frozen dinners includes high-fiber whole grains, beans, vegetables, and even nuts and seeds. The Vitalize Grilled Chicken, for example, has plentiful brown rice, lentils, and vegetables—and 8 grams of filling fiber. In fact, when we measured and weighed the amount of vegetables, legumes, and whole grains in the meals, we found that most of them had 1 to 1½ cups of those healthy ingredients, and about half of the meals had 8 to 20 grams of fiber. (Daily fiber needs range from 25 to 31 grams.) In contrast, Stouffer's Chicken à la King is mostly white rice with chicken chunks in a cream sauce and has no fiber whatsoever.

Fewer Additives

A healthier frozen meal should have “mostly whole-food ingredients like quinoa, veggies, legumes, lean beef, chicken, and seafood,” says Nancy Farrell Allen, R.D.N., a spokesperson for the Academy of Nutrition and Dietetics. Though technically speaking, frozen meals are processed foods, many of the ones in our ratings wouldn't be considered ultraprocessed. “Ultraprocessed means the ingredients are far from their natural state—think soy protein isolate instead of tofu,” Klosz says. They also tend to be loaded with added sugars, sodium, and ingredients that you wouldn't use at home, such as phosphates, flavorings, and gums. The distinction is important; eating too many ultraprocessed foods may raise the risk of obesity, heart disease, and other health problems. “We took these factors into consideration in calculating our nutrition score,” Klosz says.

A LITTLE SOMETHING ON THE SIDE

If the average frozen meal doesn't fill you up, try preparing one of these simple, satisfying accompaniments.

BULK UP THE DISH

- Microwave 2 cups of frozen cauliflower rice and mix into your frozen meal
- Sprinkle a handful of nuts or seeds on top
- Steam ½ cup of frozen shelled edamame or another frozen or fresh vegetable to add to your meal

SERVE ON THE SIDE

- A slice of 100 percent whole-grain toast with 1 tablespoon of nut butter
- A red bell pepper, sliced, with ¼ cup of hummus
- A microwaved sweet potato topped with cinnamon and nutmeg
- Sliced tomato and fresh mozzarella
- A green salad with sliced vegetables and nuts or seeds
- A zucchini cut into rounds and microwaved, then sprinkled with olive oil, Parmesan cheese, and dried oregano

International Flavors

American palates have become more adventurous, and the offerings in the freezer case read like menus at Asian, Indian, Mediterranean, and other international restaurants. Flavorful ingredients that are standard in global cuisines, such as serrano peppers, tahini, tamari, tomatillo, fenugreek leaves, and turmeric, are now regularly featured. The vegetable choices in the meals we tested were nicely varied, too, including butternut squash, chard, and sweet potatoes, in addition to tried-and-true carrots and broccoli.

And while grains in the old-style meals are limited to white rice or pasta, you can now find brown rice and other whole grains, such as quinoa, red rice, farro, or wheatberries, and legume pasta.

The plant-based trend is well represented in the frozen meal category, and meals made only with vegetables, whole grains, and beans tended to score the highest in our ratings, especially if the vegetables were flavorful and had a firm texture, and the seasonings tasted fresh (not dried) and were well-blended.

But meals with chicken were more likely to get lower taste scores. “The meat was often dry and chewy,” Klosz says. “Possibly this is because chicken's texture may be affected when it's processed and reheated.” What's more, the best-tasting chicken dishes—Saffron Road Chicken Pad Thai with Rice Noodles and Good Food Made Simple Chicken Black Bean—scored only a Fair for nutrition.

Spices, Not Sodium

Though frozen meals have traditionally been high in sodium, we found several lower-sodium options. “In many of the dishes,” Klosz says, “the combination of ingredients and spices added so much flavor that you didn't need all the salt.”

Of the 18 that got a rating of Very Good for taste, 13 had 600 mg of sodium or less. (The U.S. Dietary Guideline for sodium is less than 2,300 mg per day.)

1 —



— 2



1
 ✓ Birds Eye
 Steamfresh
 Superfood Blends
 Chickpeas & Spinach
 76

2
 ✓ Healthy Choice
 Simply Steamers
 Mediterranean-Style
 Lentil Bowl
 77

Ratings > Frozen Meals

Product	Overall Score	Pricing		Rating		Nutritional Information							Flavor & Texture Description	
		Price per package	Package size (oz.)	Nutrition score	Sensory score	Calories	Total fat (g)	Saturated fat (g)	Protein (g)	Carbohydrates (g)	Fiber (g)	Added sugars (g)		Sodium (mg)
✓ Amy's Light & Lean Quinoa & Black Beans with Butternut Squash & Chard ^{1 2}	80	\$5.50	8	↑↑	↑	240	5	0.5	10	38	11	0	440	Distinct pieces of squash and chard with flavors that come through nicely. Hints of garlic and ginger. Contains plenty of beans.
✓ Performance Kitchen So Cal Kale & Bean ²	80	\$5.50	10.25	↑↑	↑	300	7	0.5	10	53	11	0	360	Slightly sweet, with some tang from red-wine vinegar and a little heat. Shitake mushrooms and raisins add a unique, appealing taste.
✓ Kashi Plant-Powered Bowl Sweet Potato Quinoa ²	79	\$4.50	9	↑↑	↑	270	6	1.0	9	48	12	4	280	Complex and flavorful mix of red quinoa, brown rice, and vegetables. Slightly sweet and piquant tomato base. Jalapeños add heat.
✓ Healthy Choice Simply Steamers Unwrapped Burrito Bowl ^{1 2}	78	\$3.50	9	↑↑	↑	270	4	1.0	9	50	12	1	350	Spicy, flavorful rice and bean dish in a slightly tart tomatillo sauce. Heat builds.
✓ Healthy Choice Simply Steamers Mediterranean-Style Lentil Bowl ^{1 2}	77	\$3.50	9	↑	↑	250	5	0.5	13	39	10	2	600	Flavorful blend of red peppers, carrots, spinach, and plentiful lentils and chickpeas in a sauce with hints of garlic, oregano, and black pepper.
✓ Healthy Choice Power Bowls Falafel & Tahini ²	77	\$3.50	9.6	↑	↑	360	13	1.5	11	49	10	2	600	Well-blended flavor in this mix of falafel (chickpea patties with spices), mixed grains, greens, and vegetables in a tahini (sesame seed) sauce.
✓ Birds Eye Steamfresh Superfood Blends Chickpeas & Spinach ²	76	\$4.00	10	↑↑	↑	320	7	1.0	9	51	10	0	450	Mild-tasting, with fresh citrus flavors and a hint of herbs and black pepper.
✓ Amy's Bowls Harvest Casserole ^{1 2}	76	\$5.50	10	↑	↑	360	10	1.5	17	51	9	2	660	Big bean flavor; slightly tangy sauce with notes of soy, miso, and ginger. Pumpkin seeds add crunch. Sparse tofu pieces.
✓ Performance Kitchen Great Karma Coconut Curry ²	76	\$5.50	10	↑	↑	330	15	5.0	10	45	9	1	390	Curry sauce is fairly spicy and a little sweet with a hint of coconut. Unique mix of regular and green chickpeas and black lentils.
✓ Kashi Plant-Powered Bowl Chimichurri Quinoa ²	76	\$4.50	9	↑	↑	240	7	1.0	10	41	12	0	330	Blend of potatoes, peppers, quinoa, corn, and kale with bold, spicy-hot flavors. Chimichurri sauce was zingy with a vinegar note.
✓ Sweet Earth Curry Tiger ²	75	\$4.00	9	↑	↑	330	17	9.0	15	32	8	5	400	Strong curry flavors with a little heat. Plenty of vegetables and lentils. Seitan pieces (a meat alternative made from wheat gluten) were slightly chewy rather than tender.
✓ Performance Kitchen Mighty Masala & Greens ²	74	\$5.50	10	↑	↑	300	13	3.5	11	41	9	0	390	Fairly spicy with a coconut note. Cashews were sparse and slightly soft. Plentiful vegetables with brown rice and lentils.
✓ Green Giant Harvest Protein Bowls Asian Style ²	73	\$3.00	10	↑	↑	280	8	1.0	14	42	8	6	580	Hearty mix of edamame, red peppers, and carrot sticks. Al dente grains added a satisfying texture.
✓ Lean Cuisine Origins Coconut Chickpea Curry ^{2 3}	73	\$3.50	9.25	↑	↑	260	7	3.0	11	38	20	0	700	Zesty curry-style sauce. Hints of coconut and slight heat. Mostly chickpeas with some grains; sparse veggies.
✓ Amy's Bowls Light in Sodium Brown Rice & Vegetables ^{1 2}	72	\$5.50	10	↑	↓	260	9	1.0	9	36	5	0	270	Mild-tasting overall, with pleasant caramelized onion flavors. Tofu was slightly chewy rather than tender.
✓ Evol Vitalize Grilled Chicken with Grains & Vegetables	68	\$3.50	8.5	↑	↓	410	22	4.0	19	41	8	0	530	Tangy cheese sauce. Mostly tender white meat seasoned chicken pieces but some were tough, and there weren't a lot of them.

Product	Overall Score	Pricing		Rating		Nutritional Information							Flavor & Texture Description	
		Price per package	Package size (oz.)	Nutrition score	Sensory score	Calories	Total fat (g)	Saturated fat (g)	Protein (g)	Carbohydrates (g)	Fiber (g)	Added sugars (g)		Sodium (mg)
Amy's Light in Sodium Indian Mattar Paneer ¹	66	\$5.50	10	↓	↑	370	11	4.0	13	54	6	0	390	Complex flavors. Tomato-based sauce was well-balanced with garlic, turmeric, and Indian spices.
Stouffer's Fit Kitchen Protein Bowls Cali Chicken	64	\$4.00	10	↑	↓	340	11	2.0	24	37	7	0	570	Whole-grain rice blend with veggies, and slightly dry and chewy white meat chicken. Garlic and black pepper sauce had hints of lime. Some heat.
Marie Callender's Cheesy Chipotle Rice & Beans Bowl	62	\$6.00	11.5	↓	↑	370	11	5.0	12	56	7	0	780	Flavorful. A smoky note with a hint of sweetness from corn and spicy heat. Reminiscent of burrito filling.
Frontera Chicken Fajita Bowl	60	\$4.00	11.3	↑	↓	260	2.5	0.5	22	36	8	5	700	Sweet, slightly smoky, tangy sauce with some tomato flavor. Plentiful vegetables. Slightly chewy dry chicken pieces detracted from the overall taste.
Healthy Choice Café Steamers Tortellini Primavera Parmesan	60	\$5.00	9.5	↑	↓	260	7	2.5	10	38	5	3	510	Veggies with good flavor were a highlight, but the variable texture of the tortellini and slight dried herb notes in the sauce detracted from the taste.
Lean Cuisine Origins Sicilian-Style Pesto with Lentil Pasta ^{2,3}	59	\$3.50	8.5	↑	↓	320	8	1.5	15	47	5	4	470	Sweet tomato "pesto" was more like sauce with big garlic and black pepper flavors. Slight bitter note. Tasted notably of dried spices.
Sweet Earth Filipino Adobo Chik'n ^{1,2}	57	\$4.00	8.5	↑	↓	170	2.5	0.5	12	23	2	2	590	Flavors weren't well-blended and vegetables were muted by a sour brown gravy. Seasoned "chik'n" (soy protein-based) was slightly spongy.
Healthy Choice Power Bowls Chicken Feta & Farro	56	\$3.50	9.5	↑	↓	310	9	2.0	23	34	6	<1	600	Had a spicy, tangy, garlicky sauce with black pepper. Pleasantly chewy farro, but chickpeas were dry and chicken was tough and dry.
Healthy Choice Simply Steamers Chicken & Vegetable Stir Fry	55	\$3.50	9.25	↓	↓	190	4	1.0	23	15	4	6	500	Plentiful tender and moist white-meat chicken; large vegetable pieces in a well-blended sauce of sweet soy, ginger, and garlic. Vegetable flavor and texture were just so-so.
Performance Kitchen Orange Mango Chicken	54	\$5.50	9.0	↓	↓	250	10	1.0	13	28	3	3	350	Tropical flavors of mango and a hint of coconut. Sauce had a sweet-tart taste with ginger notes. Slight heat. Some chicken pieces were dry.
Lean Cuisine Origins Mushroom & Vegetable Shepherd's Pie ³	50	\$3.50	8.5	↓	↓	150	3	1.5	6	25	4	1	680	Visually unappealing, but the variety of mushrooms added a pleasant flavor so it tasted better than it looked. The thick brown gravy tasted like it came out of a jar.
Smart Ones Crustless Chicken Pot Pie	44	\$3.30	9	↓	↓	190	3.5	1.5	18	20	3	0	560	A mediocre dish. The dumplings and some of the chicken pieces were chewy, not tender.
Good Food Made Simple Chicken Black Bean	40	\$5.00	9.5	↓	↑	350	12	6.0	19	41	4	0	710	A hearty dish in a tangy tomato-based sauce. Notable lime flavor. Shredded chicken was tender and well-seasoned, but there wasn't a lot.
Saffron Road Chicken Pad Thai with Rice Noodles	40	\$4.00	10	↓	↑	430	11	2.0	19	64	2	13	650	Flavorful sweet-spicy peanut, garlic, and soy sauce nicely coated the plentiful noodles. Chicken pieces were slightly dry. Chili pepper adds heat.

HOW WE TEST: Overall Score is based on nutrition and sensory quality. CR evaluated 30 frozen meals representing different types of

international cuisines for **nutrition**, **sensory quality** (taste and texture), physical quality (amount of vegetables, whole grains, legumes, protein, fruit,

and nuts), and price. In choosing the products to be tested, we looked for those that featured vegetables, whole grains, and legumes, or any

combination of those ingredients, with or without chicken.

FROM WHOLE



DIFFERENT FOODS take turns being the dietary demon du jour, and currently, processed and “ultraprocessed” foods are the latest to come under the hot glare of scientific scrutiny. It’s certainly warranted. Research has linked ultraprocessed foods to a higher risk for obesity, heart disease, and cancer. Intriguing new work even suggests that they may actually encourage overeating, possibly because their particular mash-up of ingredients disrupts the hormones that control hunger, or it scrambles the gut-brain signals that tell us how much to eat. Some processing is relatively benign and even enhances healthy properties. But generally speaking, the farther your food gets from its original “whole” version, the less good it is for you. We’ve illustrated the journey of a few common foods from their least processed to their ultraprocessed forms to show you exactly where and how the nutritional degradation occurs.



Tomatoes

Ideally, for the best taste you want a tomato that’s grown in your own backyard or at a nearby farm. Supermarket tomatoes are picked while they’re still green so that they don’t get overripe during the trip to the store. They might be refrigerated during transit to further delay ripening—which can also reduce flavor. Some are treated with ethylene, a plant hormone naturally found in tomatoes, to encourage even ripening.

→ TO PROCESSED



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1 CANNED TOMATOES

Picked at peak ripeness, tomatoes destined for canning are washed, prepared (peeled by means of steam or chemicals, then packed whole, diced, crushed, puréed, etc.), and put in liquid (usually water or tomato juice). The cans are heated to kill any bacteria, and then cooled. This processing actually makes lycopene (an antioxidant in tomatoes that's linked to a lower incidence of heart disease, prostate cancer, and other diseases) easier to absorb. Additives may include salt, herbs and spices, citric acid, and calcium chloride.

2 TOMATO PASTA SAUCE

As with canned tomatoes, those used in jarred or canned sauces are harvested when ripe, then cooked down. Depending on the recipe, however, there may be a lot more than tomatoes in the jar—and not all of it healthy. In CR's recent test of jarred sauces, about half contained 400 mg of sodium or more per half-cup serving. Many had added sugars, too.

3 KETCHUP

Typical ketchups, made largely of tomato concentrate plus sugars, salt, vinegar, and various spices, can pack a lot of sugar and sodium into a tiny serving. Heinz's classic, for instance, lists tomato concentrate as its first ingredient, but its third and fourth are high-fructose corn syrup and corn syrup, followed by salt and natural flavoring. One tablespoon has 4 grams of sugars and 160 mg of sodium.



Wheat Berries

These are whole-wheat kernels straight off the stalk with the husk removed. Boiling them—which is considered a form of processing—is an easy way to make them edible.

1 WHOLE-WHEAT PASTA

Both regular and whole-wheat pasta are often made from durum wheat flour (which is higher in protein than some other types of flour), sometimes enriched with iron and B vitamins. But whole-wheat pasta is less processed because it's made from whole-wheat durum flour, which means it retains the fiber and all of the other nutrients in the whole grain.

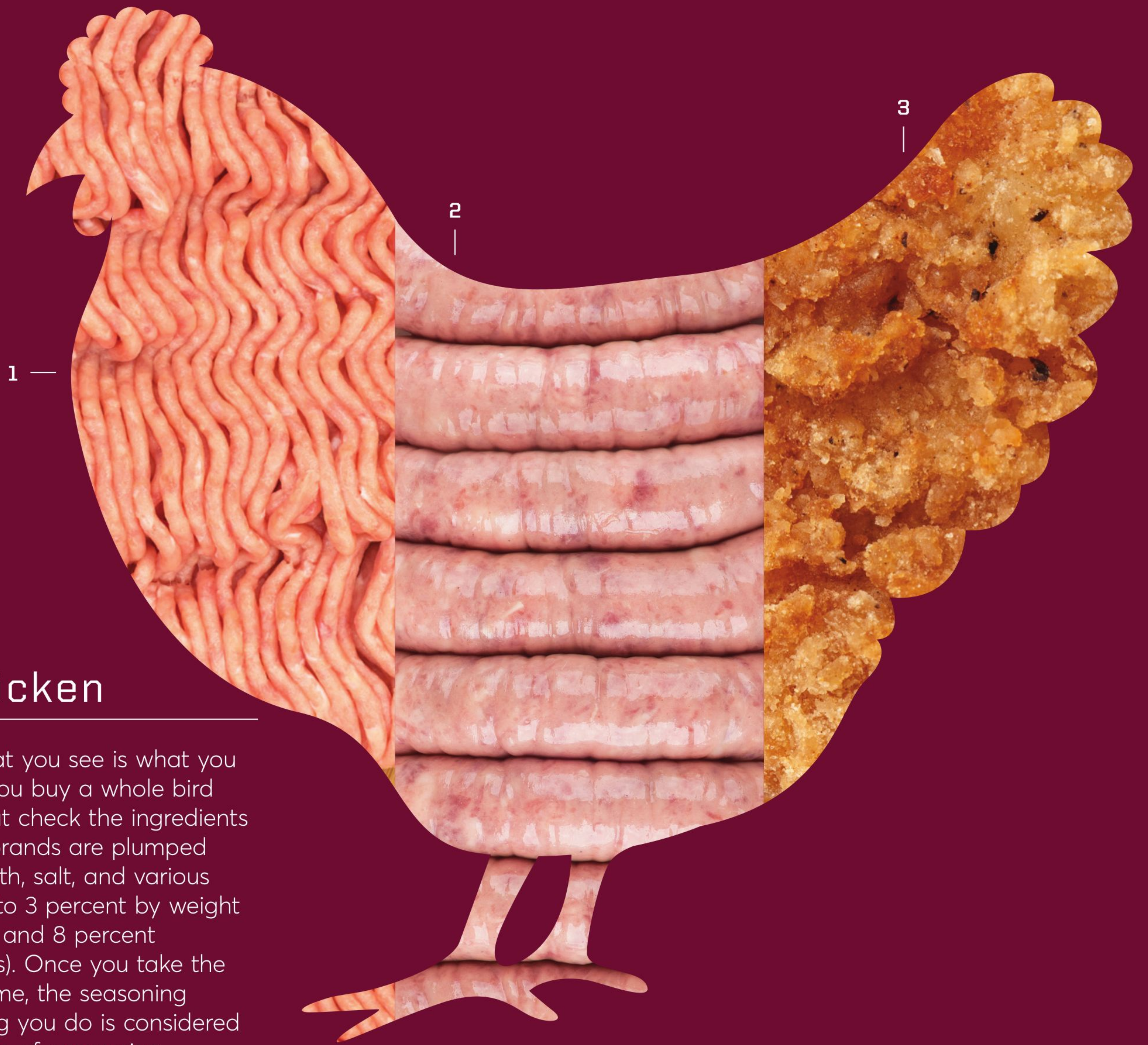
2 100% WHOLE-WHEAT BREAD

The whole grain in this bread is whole wheat in flour form, and it's an excellent source of fiber. Homemade bread may consist of little more than flour, yeast, water, and a bit of salt. But packaged whole-wheat breads may contain sugar, wheat gluten, preservatives such as calcium propionate (to prevent mold), and unspecified natural flavors.

3 "WHEAT" OR "HONEY WHEAT" BREAD

Wheat bread is most definitely not the same as whole-wheat bread. It may contain some whole-grain flour, but it's primarily white bread. Made with mostly refined wheat flour, its often lengthy ingredients list may also include sugar, dough conditioners such as sodium, and stearyl lactylate. A slice usually has just 1 gram of fiber; a whole-wheat slice has 2 to 3 grams.





Chicken

Usually what you see is what you get when you buy a whole bird or parts, but check the ingredients list. Some brands are plumped up with broth, salt, and various flavors (up to 3 percent by weight for bone-in and 8 percent for boneless). Once you take the chicken home, the seasoning and cooking you do is considered to be a type of processing.

1 GROUND CHICKEN

By law, it must be entirely made from the type of poultry specified. Per the USDA's preference (though not law), it should contain "whole muscle material" (drumsticks, thighs, necks, etc.), and other components, like skin and fat, should be present in "natural proportions." Other animal parts, like giblets, should be excluded. If the label reads "ground chicken meat," it can't contain any skin, and ground chicken breast must be solely breast meat.

2 CHICKEN SAUSAGE

The meat and spice mixture that makes up sausage is often stuffed into a casing made from pork. Chicken sausage may have nitrites or nitrates added to prevent bacterial growth and give it color and flavor. These additives, even the natural-sounding "celery powder," can convert into potentially carcinogenic nitrosamines. Plus, sodium levels tend to be very high.

3 CHICKEN NUGGETS

This finger food usually consists primarily of breast meat (with or without rib meat) sometimes augmented by dark meat or skin for flavor and texture, and sometimes marinated for flavor. The meat is chopped and formed into "nugget" shapes, which are then seasoned, breaded (generally with refined flour), and fried, often with extra fat and sodium added along the way.

Peanuts in the Shell

After the peanut plants are pulled out of the ground, they're left to dry in the field for a few days. The peanuts are then removed from the vine and may be further dried under forced hot air. If salted, they have probably been soaked in a brine and dried again.



1 ROASTED PEANUTS

Dry-roasted, packaged, ready-to-eat peanuts are shelled, roasted, blanched with hot air or water to remove the skins, and split into halves. If they're oil-roasted, they're blanched first and then roasted in oil (coconut, cottonseed, or peanut; the ingredients list will say). Both dry- and oil-roasted peanuts may contain salt. Nutritionally, both types are similar to fresh peanuts in the shell—except for that added sodium.

2 PEANUT BUTTER

Some of the stuff that comes in jars is minimally processed—it might be ground peanuts with a dash of salt—so you'll need to stir before use. But many brands on the shelf include hydrogenated oils, in part to keep the peanut butter from separating. And many also contain added sugars.

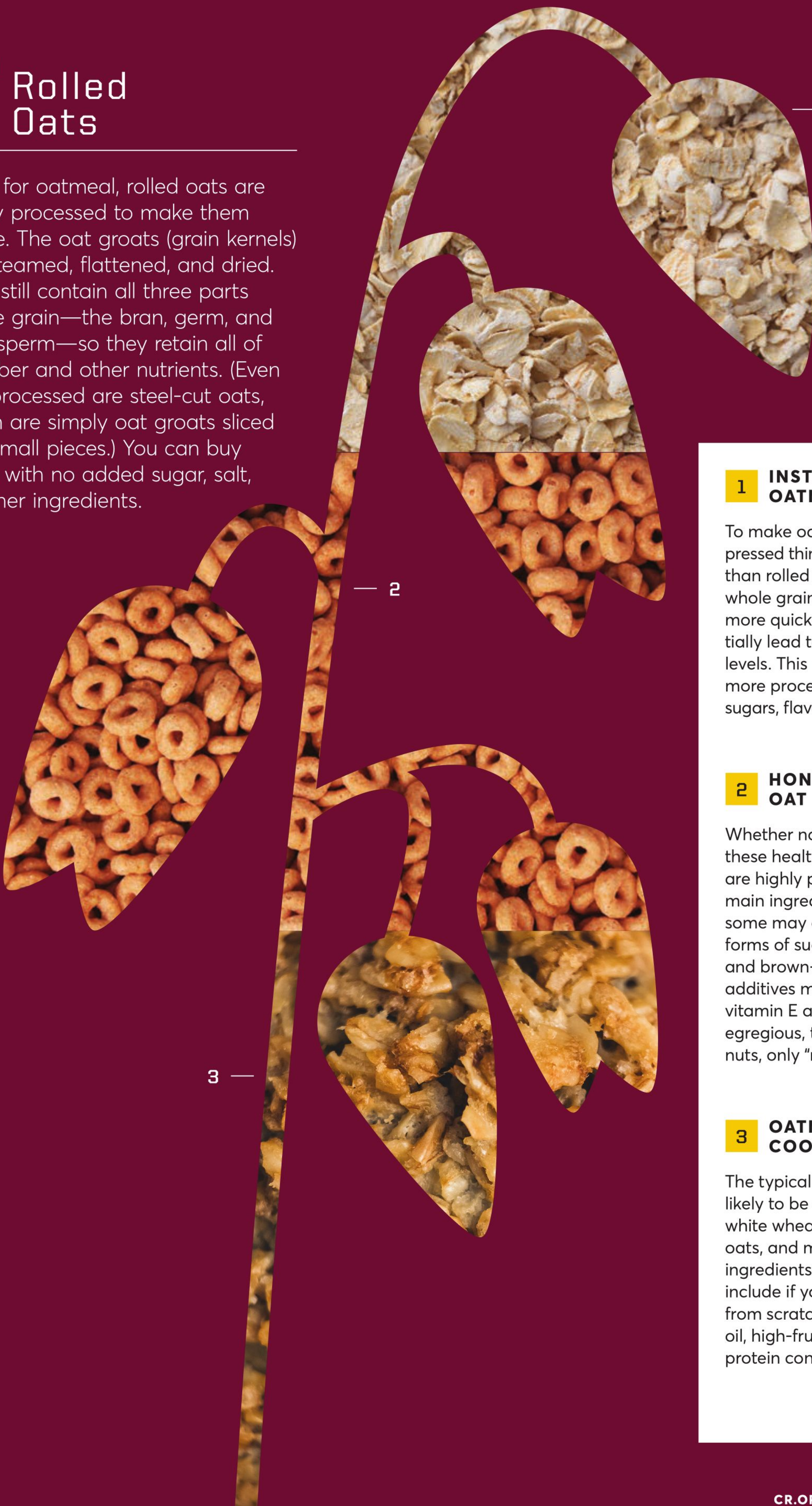
3 PEANUT BUTTER PROTEIN BAR

Peanut butter is little more than flavoring in many bars, such as Clif Builders Crunchy Peanut Butter Protein Bar. It contains 20 grams of protein, but much of that is from its first ingredient, soy protein isolate, which is protein powder that has been extracted from the soybean and concentrated. Next comes an avalanche of sugars. You don't get actual peanuts until halfway through the list, which also has peanut flour, salt, soy lecithin, and other additives.



Rolled Oats

Used for oatmeal, rolled oats are lightly processed to make them edible. The oat groats (grain kernels) are steamed, flattened, and dried. They still contain all three parts of the grain—the bran, germ, and endosperm—so they retain all of the fiber and other nutrients. (Even less processed are steel-cut oats, which are simply oat groats sliced into small pieces.) You can buy them with no added sugar, salt, or other ingredients.



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1 INSTANT OATMEAL

To make oats “instant,” they’re pressed thinner and steamed longer than rolled oats. They’re still a whole grain but can be digested more quickly, which may potentially lead to spikes in blood sugar levels. This processing is light, but more processed versions add sugars, flavorings, and preservatives.

2 HONEY NUT OAT O’S CEREALS

Whether name-brand or generic, these healthy-sounding cereals are highly processed. Though the main ingredient is whole oat flour, some may contain three or more forms of sugar, such as sugar, honey, and brown-sugar syrup. Other additives may include salt, oils, and vitamin E as a preservative. Still more egregious, there may be no actual nuts, only “natural almond flavor.”

3 OATMEAL-RAISIN COOKIES

The typical packaged cookies are likely to be made primarily with white wheat flour rather than whole oats, and may contain processed ingredients you probably wouldn’t include if you were making them from scratch, such as hydrogenated oil, high-fructose corn syrup, whey protein concentrate, and soy lecithin.



THE HEALTH BENEFITS OF LEAFY GREENS

These nutritional power plants are well worth making a mainstay of your diet, but it's important to know how to keep yourself safe from foodborne illness.

M

MAYBE YOU'VE HEARD about food-poisoning outbreaks linked to leafy greens—and even have been tempted to cut them out of your diet. But that would be a shame.

Nutritionists agree that the health benefits are substantial. In a Centers for Disease Control and Prevention study that calculated nutrient density for almost 50 fruits and vegetables, 17 of the top 20 were leafy greens. Research

shows that a diet that contains plenty of leafy greens is linked to a reduced risk of heart disease, certain cancers, macular degeneration, and type 2 diabetes. They may also help to keep memory sharp as a person ages. There are several ways to serve up safer raw greens, and cooking will kill harmful bacteria. But it is important to be aware of the potential dangers.

Leaf Lessons

Between 2006 and 2019, lettuce, leafy greens, and bags of spring mix were involved in at least 46 multistate *E. coli* outbreaks that have sickened hundreds of people, according to the CDC. Most recently, romaine lettuce has been the culprit in many outbreaks, including the largest and deadliest *E. coli* outbreak in the spring of 2018. There were outbreaks again in the fall of 2018 and 2019. Some research shows that greens cause more cases of food poisoning than any other food, including beef.

The constant drumbeat of romaine-related *E. coli* outbreaks has made Americans very worried about eating lettuce. In a 2019 nationally representative Consumer Reports survey of 1,003 Americans, 52 percent said they were concerned about getting sick from leafy greens—more than those who are worried about poisonings from beef, chicken, or eggs. Sales of romaine, which was until recently the most popular lettuce in the

U.S., are down in the wake of the 2018 outbreaks, dropping about \$98 million to \$465 million from their \$563 million peak in 2017, according to data from market research firm Nielsen. (Iceberg has regained the No. 1 spot.)

Meanwhile, lettuce growers and the Food and Drug Administration have been trying to figure out where—from farm to fork—the potentially deadly bacteria are finding their way into and onto lettuce leaves.

Frank Yiannas, deputy commissioner for food policy and response at the FDA and the agency's top food official, told CR: "FDA has been working tirelessly to prevent these [outbreaks]. But we're going to work harder. It's a high priority for the agency and a high priority for me personally."

In the meantime, for those who want to continue to get the health benefits of leafy greens, there are safety guidelines that can reduce the risk. (See "The Safest Ways to Eat Salad," on page 59.)

Salad Under Siege

How did leafy greens—nutrient-packed foods recommended by doctors and nutritionists alike—become so risky? And why is romaine linked to so many of these outbreaks?

It comes down to the modern way we grow, harvest, and package our salad greens. "There are many opportunities along the continuum—from seed all the way to a consumer's plate—for greens to become contaminated," says Ben Chapman, Ph.D., a professor and food safety extension specialist at North Carolina State University in Raleigh.

Part of the reason greens in particular are so problematic is the sheer volume we're consuming. The leafy greens industry ships about 130 million servings per day all year long—enough to supply a daily salad fix to nearly 40 percent of Americans. And almost a quarter of the greens being consumed are romaine lettuce.

Perhaps most important: Salad greens are almost always eaten raw, unlike burgers, eggs, flour, and many other foods that can be contaminated with pathogens but are usually cooked enough to kill any bacteria. "You can destroy *E. coli* and other bacteria with enough heat, but few people are going to cook their lettuce," says James E. Rogers, Ph.D., director of food safety research and testing at CR.

"A food that doesn't have a final consumer 'kill step' presents some extra challenges [for] food safety," says Matthew Wise, Ph.D., deputy chief of the CDC's outbreak response and prevention branch. "That's probably the main driver" among a number of factors that can cause an outbreak, he says.

"We face a real dilemma with leafy greens, especially romaine lettuce," says Rogers. "They're packed with nutrients, so we don't want to discourage people from eating them. But we can't ignore the fact that leafy greens are potentially risky, perhaps one of the riskiest foods."

But, he says, we need answers on what's happening with greens sooner rather than later. "More needs to be done to determine the exact sources of contamination with dangerous bacteria," he says. "Once that's done, the FDA must set strict requirements for growers and processors, which will help prevent people from getting sick."

Though the odds that you'll get sick from eating any single salad are low, Rogers says, they're real. "When you hear about 100 or 200 people contracting a foodborne illness, it may not sound like that many, but for every case of food poisoning that's reported, there are many, many more cases

that never get reported." In fact, according to the CDC, for every reported case of *E. coli* O157:H7 infection, there are probably 26 undocumented.

From Farm to Table

So how do bacteria get into the greens in the first place? To answer that, it helps to understand the critical water needs of greens and how they are sometimes grown near livestock—both of which can open a pathway to contamination.

John Boelts, a farmer in Yuma, owns one of the 60-plus farms that cover a stretch of land from Yuma and the surrounding area to California's Imperial Valley. That's where the vast majority of leafy greens on the market in the U.S. and Canada are harvested in winter. The Yuma growing season begins with the planting of seeds in August in the hot, arid desert. Over the next few months, the dusty brown fields become filled with rows of emerald green heads of romaine, iceberg lettuce, vegetables, and fruits. Harvesting begins in late October.

Lettuce grows best when daytime temperatures are moderate and nights are cool, so as the weather in the Yuma region warms up, lettuce production shifts to California, moving in seasonal increments throughout the Southern Coast, Central Coast, Salinas Valley, and parts of the Central Valley. Although the soil and environment differ in all these regions (including Yuma), one thing they have in common is that they don't get much rain—and greens need a lot of water to grow (as much as 36 inches per acre), so all those lettuce fields require irrigation. At farms around Yuma, such as Boelts', water is channeled from the nearby Colorado River through a system of irrigation canals.

Once the greens grow to maturity, they're harvested, mostly by hand, Boelts says. Growers take samples of the greens to check for harmful bacteria (but they don't check every leaf, which is why the bacteria

sometimes slip through). Some greens are packed right in the field, to be immediately cooled and shipped to stores. Greens that are destined to be bagged or sold in plastic containers—65 percent of Americans buy packaged greens, according to market research firm Mintel—are taken from the field to processing plants, where tons of lettuce from multiple farms are mixed together. There, the lettuce is usually washed in water that contains chlorine or another sanitizer, then rinsed, dried, packaged, and shipped to supermarkets and restaurants across the country.

Contamination From Cattle

What any lettuce farmer will tell you is that he or she fears the animals that live around lettuce fields. That's because *E. coli* O157:H7 and other strains of illness-causing bacteria live in the guts of cattle and other animals, including sheep, deer, wild boar, and even birds.

Although the *E. coli* bacteria don't usually make the animals sick, when they defecate they deposit dangerous bacteria into the soil and water around them. That contaminated soil could later end up mixed with dirt tracked by equipment, people, or animals onto a field full of leafy greens, or rain could wash the bacteria into one of the open irrigation canals that are so important for lettuce-growing regions.

This route to food poisoning has been known about for longer than a decade: In 2006, in an *E. coli* O157:H7 outbreak linked to spinach, federal officials said that a possible source was waste from feral pigs that got into growing fields. Because animals can contaminate their valuable crops, farmers put a lot of effort into keeping them away. "We pay people to stand by fields and scare birds off," Boelts says. "We surround fields with 8-foot-tall fences, prohibiting animals from being on our farm. We're doing everything science says we should," he says.

But contamination still occurs, and experts and research say it's because

[CONTINUED ON PAGE 54]

Salad Superpowers

Eat a variety of types: Most greens have a healthy nutritional profile, but each kind also has its individual strengths



Arugula

Arugula is rich in vitamin K, which helps to prevent osteoporosis and inflammatory disease. Like other cruciferous veggies (i.e., broccoli and brussels sprouts), it has glucosinolates, which may protect against certain cancers. It's tasty in salads or sautéed.



Butter (aka Boston or Bibb)

This family of mild-flavored head lettuce with soft, loose leaves doesn't have quite the nutrient profile of certain darker greens, but 2 cups supplies 85 percent of your daily vitamin K need, along with some iron and vitamin A.



Collards

This cooking green is rich in calcium, fiber, folate, and the antioxidant carotenoids beta carotene and lutein. Sautéing in olive oil, garlic, and a little smoked salt adds flavor and keeps it healthier than the traditional ham hock or bacon preparation.



Iceberg

Though it ranks toward the bottom of the greens list nutritionally, it still provides some potassium, vitamin C, and folate.



Kale

Turn to kale for vitamins C and K, lutein and zeaxanthin (which may help to protect against age-related macular degeneration and possibly cataracts), and cancer-fighting glucosinolates. Use baby and mature kale in salads; the latter can also be cooked in soup or pasta.



Red or Green Leaf

Both are rich in vitamins A and K; green leaf is higher in vitamin C. Red leaf lettuce gets its color from the flavonoid antioxidant anthocyanin, which may help to lower levels of LDL (bad) cholesterol.



Romaine

Beta carotene, which your body converts to vitamin A, and folate are its standout nutrients. It's best in salads or on sandwiches that need crunch, and can also stand up to a quick grilling.



Spinach

This green supplies a hefty dose of vitamin K, potassium, and folate. If you eat it cooked, it will also supply iron and calcium. The oxalic acid it contains reduces absorption of these minerals from raw spinach, but cooking breaks down oxalic acid.



Swiss Chard

A cooked cup of this strongly flavored green gives you all the vitamin K that you need per day, plus vitamins A and C and antioxidant carotenoids and flavonoids. Toss into egg dishes or soups, or sauté with garlic and top with sesame seeds or lemon juice.

fields of leafy greens are sometimes located next door to large cattle farms known as concentrated animal feeding operations (CAFOs).

“It’s because of the proximity of cattle feedlots to fresh produce fields,” says Keith Warriner, Ph.D., a professor in the department of food science at the University of Guelph in Ontario who has studied foodborne illness linked to produce. “In the Salinas Valley, you’ll see cattle roaming the hills.” (Romaine from the Salinas region was linked to the outbreaks in fall 2018 and fall 2019.)

“With every outbreak, there’s a cow somewhere,” says food safety attorney Marler, who has tracked food-poisoning incidents linked to greens for almost 20 years. It has also been suspected that bacteria mix with the soil and become part of the dust, which can be carried by the wind from a CAFO and deposited onto the greens as they grow in the field. But experts and investigators from the FDA and CDC have focused on contaminated irrigation water as the most likely vector. “E. coli-tainted

manure can run off down hills and into rivers, contaminating water sources,” Warriner says.

An FDA investigation to identify the source of the contamination in the spring 2018 outbreak never reached a firm conclusion. But investigators strongly suspect an irrigation canal that reportedly provided water to the 36 romaine fields involved in the outbreak. They found the E. coli outbreak strain in three samples taken from the canal, which is next to a CAFO that houses more than 100,000 cows.

The source of the outbreak just before Thanksgiving in 2018 is also still a mystery, but the FDA did find the strain of E. coli that made people sick in sediment from a water reservoir on one of the California farms that grew contaminated lettuce. It’s possible that droppings from wild animals tainted the water, but there is also a CAFO near the lettuce farm.

“These findings suggest that to solve the lettuce problem, we really have to solve the cow problem,” says Michael

Hansen, Ph.D., senior scientist at Consumer Reports. “Yet even though nearby CAFOs were thought to be the source of the bacteria that caused the outbreaks, under the law the FDA wasn’t allowed to access those feedlots, and that dead-ended the investigation.”

The Riddle of Romaine

The science doesn’t clearly show that any leafy green is more or less risky than another, but some researchers suspect that romaine may be particularly vulnerable to contamination because its leaves are so delicate. “It can get damaged easily, which makes it easier for the bacteria to get into it,” Warriner says.

In fact, when the romaine involved in the spring 2018 outbreak was growing in the fields, the weather turned cold and windy, possibly injuring the leaves. Although other greens have been involved in outbreaks, Warriner says, “some, like kale and spinach, are tougher, and they’re high in natural antimicrobial compounds called thiocyanates. These greens were irrigated with the same water as the romaine involved in the Yuma Valley outbreak of 2018, but they weren’t affected.” Also, while other greens are susceptible for these same reasons, they aren’t produced in the same quantity, so they’re less likely to cause a major outbreak.

Then there’s the math: We eat a lot more romaine than other dark leafy greens. “Romaine lettuce remains beloved in the U.S.,” says Kara Nielsen, a food trend expert in Oakland, Calif. It’s still the second most popular salad green. And it’s everywhere: Romaine serves as the base for Caesar salads and is often in sandwiches, wraps, and burritos. And it’s challenging to find a package of mixed greens that doesn’t contain romaine.

Problematic Packaging

Certain labels proclaim that the greens have been triple-washed. Will that prevent illness? Not necessarily.

CAN LEAFY GREENS CARRY COVID-19?

The risk of becoming infected with the novel coronavirus from any groceries is considered low if you practice good hand hygiene when handling them, says James E. Rogers, CR’s director of food safety research and testing. Wash your hands for at least 20 seconds with soap and water after putting away all

packaging, including paper grocery bags. It’s probably not necessary, but if you want to go the extra mile, wipe the outside of the plastic containers that leafy greens may be packaged in with a disinfectant wipe before putting them away (or spray the outside of plastic bags with disinfectant and let dry before storing). Later, after

opening the bags or containers the leafy greens came in, wash your hands again before continuing with your food prep.

To date, there’s no evidence of food-to-person transfer of COVID-19, says Rogers. But to avoid bacterial contamination, you should continue to wash lettuce and other leafy greens carefully, soaking in vinegar for 10 to 15 minutes, followed by rinsing well in cold water before eating (see “The Safest Ways to Eat Salad,” on page 59).



How to Shop the Lettuce Labels

In reviewing labels on packaged greens, we found a variety of claims. But not all of them are as good as they sound. "The government requires that labels be truthful and not misleading, but it doesn't have regulated definitions for many of the claims," says Charlotte Vallaeys, senior policy analyst in food and nutrition at CR. Here's a primer on the claims we came across most frequently.

Regulated Claims

Country of origin: Perishable produce, including greens, must be labeled with the country where it was grown.

USDA Organic: To carry this label, greens must have been produced on a certified farm that follows defined organic procedures, such as not using synthetic fertilizers or most synthetic pesticides.

Nutrition Facts Label: The Food and Drug Administration doesn't require nutrition labeling on greens unless the packaging makes a claim about nutrients. So if your spinach is stamped with "good source of potassium," it must carry a complete Nutrition Facts Label.

Excellent Source Of/ High In: A serving of the food must contain at least 20 percent of the daily requirement of that nutrient.

Good Source Of: One serving must have between 10 and 19 percent of the daily dose of the named nutrient.

Fresh: According to the FDA, this term "means that the food is in its raw state and has not been frozen or subjected to any form of thermal processing or any other form of preservation." However, the term doesn't address when the greens were harvested, and those that were washed in a mild chlorine solution can be labeled fresh.

Unregulated Claims

Washed/Triple-Washed/Ready to Eat: The FDA doesn't require greens to be washed, but most, even unpackaged ones, get a rinse. A washing claim may mean that greens aren't gritty but doesn't ensure that they're bacteria-free.

Pesticide-Free: There's a lot of potential for ambiguity with this claim: Does it mean that no pesticides were used in the production of the greens or that there is no pesticide residue remaining on greens that were produced with the use of the chemicals? There's no real way to know. If you want greens grown without harmful pesticides, opt for those labeled USDA Organic.

Date harvested and/or region where grown: The FDA suggests that growers of romaine lettuce label their product with this information so that the lettuce can be more easily traced in the case of an outbreak. But this is voluntary and doesn't apply to all leafy greens.

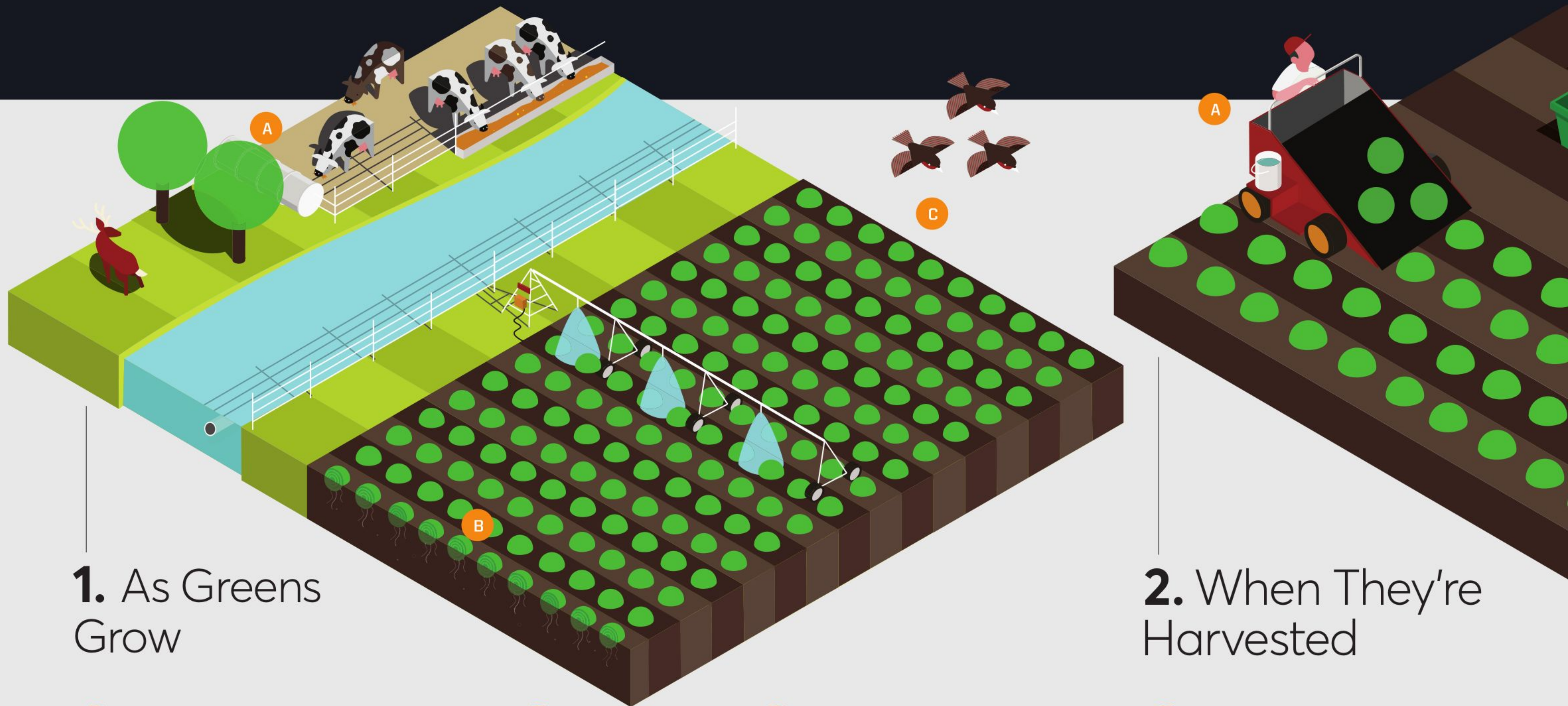
Hydroponically Grown/Hydroponic: Generally speaking, this means that the greens are grown in a greenhouse using a nutrient solution instead of soil, but no federal government agency regulates the term.

Non-GMO: This claim may be true, but it's not all that meaningful. There are no genetically modified greens (including lettuce, spinach, and kale) on the market, so no green is GMO.

No Preservatives/ Free From Artificial Ingredients: Most fresh produce doesn't have preservatives or artificial ingredients, so the claim may be true, but it doesn't set the labeled product apart from other ones.

How Greens Become Contaminated

Harmful bacteria can migrate to the leaves at many points during the growing and production cycle



1. As Greens Grow

A

Toxic E. coli is found in the feces of farm animals, such as cattle and sheep. Bacteria from the waste of animals housed in nearby feedlots

can contaminate the water used to irrigate the field, or it can be carried by the wind and deposited onto the soil or greens.

B

The bacteria can be taken up by the plant's roots as the greens grow. This means the bacteria can get into the plant's leaves.

C

Wild animals or birds flying overhead can also deposit the bacteria onto the fields.

A

Farming equipment that travels over contaminated soil may carry bacteria into the field.

2. When They're Harvested

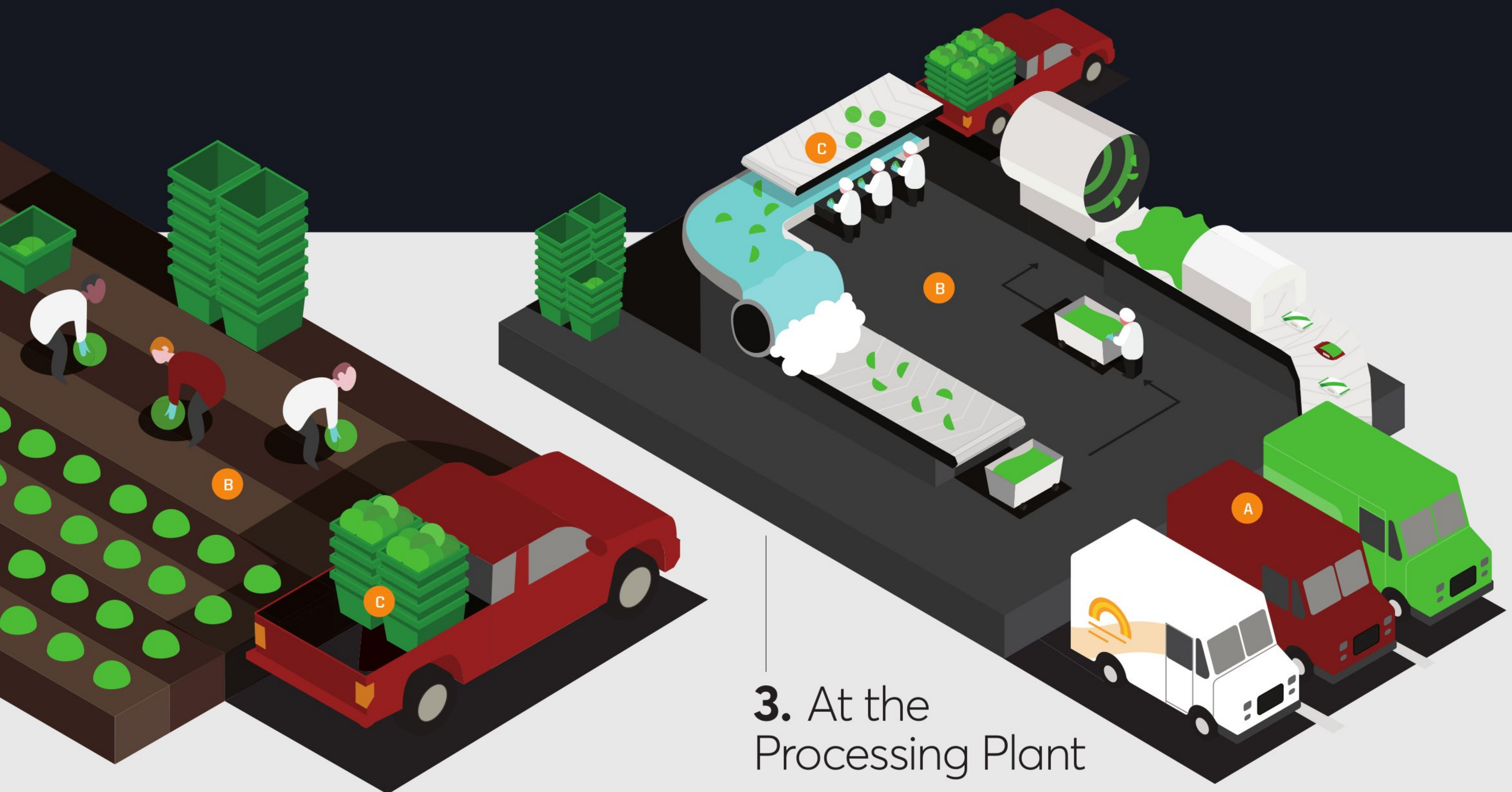
When bacteria such as E. coli come into contact with any type of lettuce, they're almost impossible to wash off completely, according to the CDC and other researchers. That's in part because disease-causing bacteria can get inside the leaves of the greens as they're growing, through contaminated water taken up by the roots. And bacteria can adhere in the grooves in the leaves. "The purpose of washing

greens—in the field or at a processing facility—is simply to remove dirt and grit, not bacteria," says CR's Rogers.

According to CR's own recent lettuce tests (see "Findings From CR's Lettuce Testing," on page 58), washed and bagged lettuce isn't actually any cleaner, bacteria-wise, than whole heads of lettuce. Furthermore, packages with "triple washed" (or a similar claim) on the label had amounts of

bacteria similar to those in packages that direct to "wash before eating."

Although washing packaged greens can remove up to 99 percent of bacteria along with dirt and grit, food safety expert Chapman says even the small amount that remains may make you sick. "Shigatoxin-producing E. coli has a very low infectious dose—as little as 10 microscopic cells are all it takes, according to some estimates," Rogers says.



3. At the Processing Plant

B
Bacteria may be transferred to the greens by workers' hands or gloves, by contaminated harvesting equipment (such as knives), or in storage bins.

C
Harvesting greens involves cutting them, and the cut ends of lettuce secrete nutrients and liquids that can support the growth of bacteria. This can also happen if leaves are bruised or damaged.

A
Greens from many fields and farms are mixed together during processing, meaning that one bacteria-containing batch—or even a few leaves—can end up contaminating many packages of lettuce or greens.

B
Factory workers who don't wash their hands, and equipment that hasn't been properly sanitized, present threats. Greens may be washed in a sanitizing solution, but if water is recycled, it increases the chances of cross-contamination.

C
Greens may be cut or chopped, which provides an opportunity for bacteria to enter the leaves.

And greens destined for packaging carry unique risks: “A bag or box of greens often contains leaves from many different farms that have been mixed together at the processing plant,” says CR’s Hansen. And because the leaves may be cut or shredded, the bacteria have more entry points. “So if there is even a small amount of bacteria-carrying lettuce in the batch, from just one farm, it can contaminate many, many

packages of greens,” he says. In fact, in the 2006 spinach outbreak, the tainted greens were eventually traced back to one section of just one grower’s field.

Also, cut or damaged leaves secrete juices that can feed bacteria, and the juices can collect in the packages.

A Need for More Inspections

The challenge, then, is figuring out which steps will decrease the risk

of contracting food poisoning, says Rogers. He says making salads safer will require close attention by growers and regulators at every step of leafy green production. “Unless something changes in the way greens are grown and processed, outbreaks will continue to happen,” he says.

People within the industry are making ongoing efforts to improve the situation. “We are doing everything we

can as an industry,” says Scott Horsfall, CEO of the California Leafy Greens Marketing Agreement. “It’s a very important and efficient system for the most part, but we are very focused on eliminating the illnesses that do occur.” Upward of 97 percent of leafy greens growers in Arizona and California now follow the standards set by the LGMA, which include mandatory inspections to ensure that they’re following standards—though the results of those audits are not public.

LGMA standards put in place by the Arizona and California LGMAs after 2018 require that if water is going to be used for irrigation in the 21 days before harvest, it needs to be tested at least once and treated if bacteria are found. The minimum buffer zone between CAFOs and fields of leafy greens was tripled, from 400 feet to 1,200 feet, based on research indicating that *E. coli* could travel 600 feet, and fields in California must be at least a mile from larger CAFOs.

Some growers, like Boelts, say they’ve gone even further, ensuring that no irrigation water touches edible portions of any plant and not planting within 2 miles of animal farms. But even these additional safeguards might not be sufficient, according to experts such as

Warriner at the University of Guelph.

The FDA, the leafy greens industry, and researchers at the University of Arizona Cooperative Extension are conducting a study to better understand how produce may become contaminated. “We’re collecting thousands of samples over the course of a few years—soil samples, water samples, air samples, animal footprints—to see if it can further inform what we know about how contamination might occur, and we’re hopeful that it will,” says the FDA’s Yiannas.

But we may never get to a place where lettuce is considered a completely low-risk food. Producers have already made most of the changes that we know would improve food safety, so the next steps are going to be harder to uncover, according to Channah Rock, Ph.D., one researcher on the project. “There’s no such thing as zero risk,” she says.

Getting to the Root Source

“We know it’s a complicated problem,” says CR’s Rogers. “But this system is broken, and there are things that could be done that aren’t being done.”

Although members of the LGMA test and now treat surface water that touches edible parts of plants at

least once in the 21 days before each harvest, according to the organization’s standards, CR thinks more testing is needed. “The FDA needs to implement the stricter water testing rules that were laid out in the Food Safety Modernization Act,” says CR’s Hansen. Those rules, which require more testing of more water samples, were supposed to take effect in 2018, but they have yet to be implemented and are now pushed out to at least 2022. “The delay is unacceptable,” he says.

And under the FSMA, the FDA is supposed to issue a list of high-risk foods—defined as those that are often involved in food-poisoning outbreaks or produced in a way that makes them more likely to contain dangerous bacteria—but has not yet done so. “The FDA should immediately develop this list and put leafy greens on it,” Rogers says. “By law, once a food is deemed ‘high risk,’ the FDA has more authority to require record-keeping and compel recalls,” he says. “That will go a long way toward preventing and controlling foodborne illness.”

CR experts also say that Congress should pass legislation recently proposed by Sen. Kirsten Gillibrand, D-N.Y., and Rep. Rosa L. DeLauro, D-Conn., that aims to strengthen the FDA’s ability to

FINDINGS FROM CR’S LETTUCE TESTING



In spring 2019, CR’s food safety scientists tested 283 samples of bagged and whole heads of six types of leafy greens. While we didn’t find the dangerous *E. coli* O157:H7 implicated in recent romaine lettuce outbreaks, we did find that certain samples contained coliform bacteria. “This type of bacteria doesn’t make people sick, but it’s a sign that feces may have come into contact with the lettuce, and when we see it, it’s considered a harbinger of

possible contamination with harmful bacteria,” says James E. Rogers, Ph.D., director of food safety research and testing at Consumer Reports. There was no difference in bacteria levels between whole head and packaged greens; packaged greens that were labeled “triple washed” had bacteria levels similar to those in packages marked “unwashed.”

Worse: We also found *Listeria monocytogenes*—dangerous bacteria found

in the environment—in six of the samples. CR immediately informed the FDA, the CDC, and the companies. One of the samples had a strain genetically linked to at least two cases of listeriosis reported to the CDC. Listeriosis is rare, but it kills about 20 percent of those affected, compared with less than 1 percent for *E. coli*, campylobacter, and salmonella. For more on our testing, go to [CR.org/listeria0320](https://www.consumerreports.org/listeria0320).

pinpoint the origin of foodborne-illness outbreaks in greens and other produce. The legislation, if passed, would do this by giving the FDA the power to inspect CAFOs to look for the bacteria that could be infecting the lettuce—something it's not legally able to do right now.

Being able to trace the origin of the bacteria is key to halting foodborne outbreaks, says CR's Rogers. After the 2018 outbreaks, the FDA requested that romaine lettuce producers voluntarily list the region of origin on their packages—and many did. The theory is that if lettuce is labeled and an outbreak occurs, retailers will know exactly what to pull from store shelves and consumers will be able to check labels before buying or eating greens.

This kind of labeling is a positive step and should be made mandatory, Rogers says, but “it relies on the shopper knowing first that there's been an outbreak, and then remembering which part of the U.S. is involved, and then checking the label for information. That's a lot to ask of consumers.”

People also need to be alerted to food-poisoning outbreaks and recalls more quickly, Rogers says. When the FDA knew of a possible outbreak of *E. coli* linked to romaine in September 2019, the agency waited six weeks after beginning its investigation before revealing to the public that there was a problem. “I think it's immoral not to tell the public about contamination as soon as it's known,” says food safety attorney Marler. “It undermines the public health agencies' credibility.”

Why the delay? The FDA says that by the time they were made aware of the outbreak, the lettuce was past its expiration date and was no longer on store shelves, so it believed there would be no new illnesses.

But, says CR's Hansen, “Given the continuing problems with romaine, and the seriousness of O157:H7, the FDA should have made an announcement sooner and let consumers decide for themselves if they wanted to continue to eat romaine.”

The Safest Ways to Eat Salad

Even though leafy greens appear to make more people sick than many other foods do, some experts point out that the overall chances of them causing food poisoning are still extremely low. “There's generally a high level of safety around these food items, so we don't want consumers to view these outbreaks as a reason not to eat fresh fruits and vegetables,” says Matthew Wise at the Centers for Disease Control and Prevention.

But the fact is, consumers are increasingly wary. In CR's poll, 25 percent of those who were aware of the 2018 outbreaks said they eat lettuce less often now than before. CR's experts offer these steps to improve the safety of the greens you eat until the industry can make greens less risky.

■ **Cook your greens until wilted.**

This will kill harmful bacteria, but it's a solution only for sturdier greens, such as spinach, kale, collards, and Swiss chard. It's especially important for people who are more likely to be seriously affected by food poisoning: the elderly, young children, pregnant women, and those with compromised immune systems. “These people may want to consider not eating raw leafy greens at all,” says James E. Rogers, CR's director of food safety research.

■ **Consider buying whole head lettuce.** Even though the data show that whole heads of lettuce not labeled “washed” don't necessarily have lower bacteria levels than packaged greens, their inner leaves aren't exposed to as many sources of contamination and are not handled as much as greens that are bagged, which further reduces the opportunities for contamination.

■ **Keep packaged lettuce cold and eat it soon.** “As you would with meat and poultry, don't let bagged lettuce stay out of the fridge for too long, because bacteria multiply at room temperature,” Rogers says. In addition, the longer lettuce sits in bags or containers, the

more opportunity bacteria have to grow, so buy packages with expiration dates as far in the future as possible and don't buy more than you can eat in a few days. If even a few leaves look damaged, slimy, or bruised, don't eat any of the greens in that package.

■ **Consider buying hydroponic or greenhouse-grown greens.** These are less likely to be contaminated by bacteria from animal droppings in soil or water, although they're not risk-free. Their cleanliness depends on the source of the water used and whether proper food safety practices are followed by people who handle the greens, Rogers says.

■ **Soak your greens in vinegar.** Microbiologist Carl Custer, who spent his career at the Department of Agriculture's Food Safety and Inspection Service, says research shows that soaking greens in vinegar or a vinegar-water solution will reduce bacteria levels but won't kill all bacteria. Still, he advises dousing your greens with white vinegar and letting them sit for 10 minutes, then rinsing. Your greens may be a little vinegary-tasting, but most salad dressings contain vinegar anyway. Salad rinses are often designed to clean greens of dirt or chemicals, not to kill harmful bacteria.

■ **Stay informed.** The Food and Drug Administration and the Department of Agriculture (which regulates meat, poultry, eggs, and some seafood) post outbreak information on Twitter; you can follow them at @FDAfood and @USDAFoodSafety. On both agency websites, you can also sign up for email alerts.

■ **Report any suspected food poisoning.** If you think you got sick from food, contact your local health department and ask to speak with the environmental health specialist or sanitarian. You can also contact the FDA or USDA directly. For more information, go to CR.org/foodpoisoning0320.

SHOP SMARTER FOR SUPPLEMENTS



Turmeric ... echinacea ... ginger ... beetroot. Plant-derived supplements (known as botanicals) make many health enhancement claims, and yet the market is largely unregulated. If you're currently taking these, or considering taking them, our testing and expert advice will help you shop wisely—and more safely.



CLOCKWISE
FROM TOP LEFT

GREEN TEA

BEETROOT

CHAMOMILE

GINGER

ECHINACEA



THE PROMISE OF SUPPLEMENTS is pretty powerful: That they'll ease your pain, boost your immunity, settle your stomach, strengthen your heart, sharpen your memory, and more. Little wonder, then, that supplement sales in the U.S. reached \$46 billion in 2018 and were predicted to exceed \$52 billion by 2020. In fact, 68 percent of Americans take supplements at least once a week, according to a recent nationally representative Consumer Reports survey of 2,006 adults.

So it's perhaps remarkable that there's not, to date, a lot of solid evidence that supplements do what people hope they will. Manufacturers are not required to demonstrate to the government that their products are effective or safe before they are sold—as they must with prescription and over-the-counter drugs, such as Advil. People have long used botanicals like echinacea to help with infections such as the common cold, and turmeric to curb inflammation and pain. But both—despite showing promising results in lab settings—fail to provide significant benefits over a placebo in most structured clinical trials. For example, an August 2019 review looked at 19 clinical trials of turmeric and its active compound, curcumin, to see whether either could reduce inflammation in patients with chronic inflammatory diseases, such as osteoarthritis. It found no sign that either had a significant effect. "There are simply not good studies that support a lot of supplement claims," says Robert McLean, M.D., a rheumatologist at Yale New Haven Hospital and president of the American College of Physicians.

Among the most widely used supplements in our survey are multivitamins and vitamins, followed by fish oil, calcium, and probiotics. But the market for botanicals—a category of supplements derived from plants—has grown from about \$4.2 billion in 2000 to more than \$8.8 billion in 2018, according to Nutrition Business Journal. Our survey found that among people who had taken supplements in the previous year, 38 percent had taken at least one botanical.

One reason supplement sales may remain stubbornly robust is because "there's a strong placebo effect," McLean says. "People will feel better if they think they're going to feel better."

That means consumers are often left guessing about efficacy. Suyash Raj, a research technician, concedes "it's very hard to quantify" the exact effect of the two botanical supplements he takes. But he has looked at studies to research their safety, and says they seem to help him with stress. "I feel better," he says—adding that "of course that could be a placebo [effect]." Similarly, Stacy Bond, a writer and public radio producer, now takes multiple supplements to help deal with a few health concerns. While she says she's not sure they're all effective, "there's something, I think, maybe before I was lacking that I'm now getting from the supplements."

Also muddying the evidentiary waters: Research shows that people who buy supplements tend to be healthier than the average person in the first place.

CR's survey also found that 48 percent of Americans believe supplements have been tested for safety by the Food and Drug Administration, even though the agency does not do comprehensive testing of them. Another 71 percent believe supplements are safe. But many pose dangers, says Pieter Cohen,

Who Takes Supplements and Why?

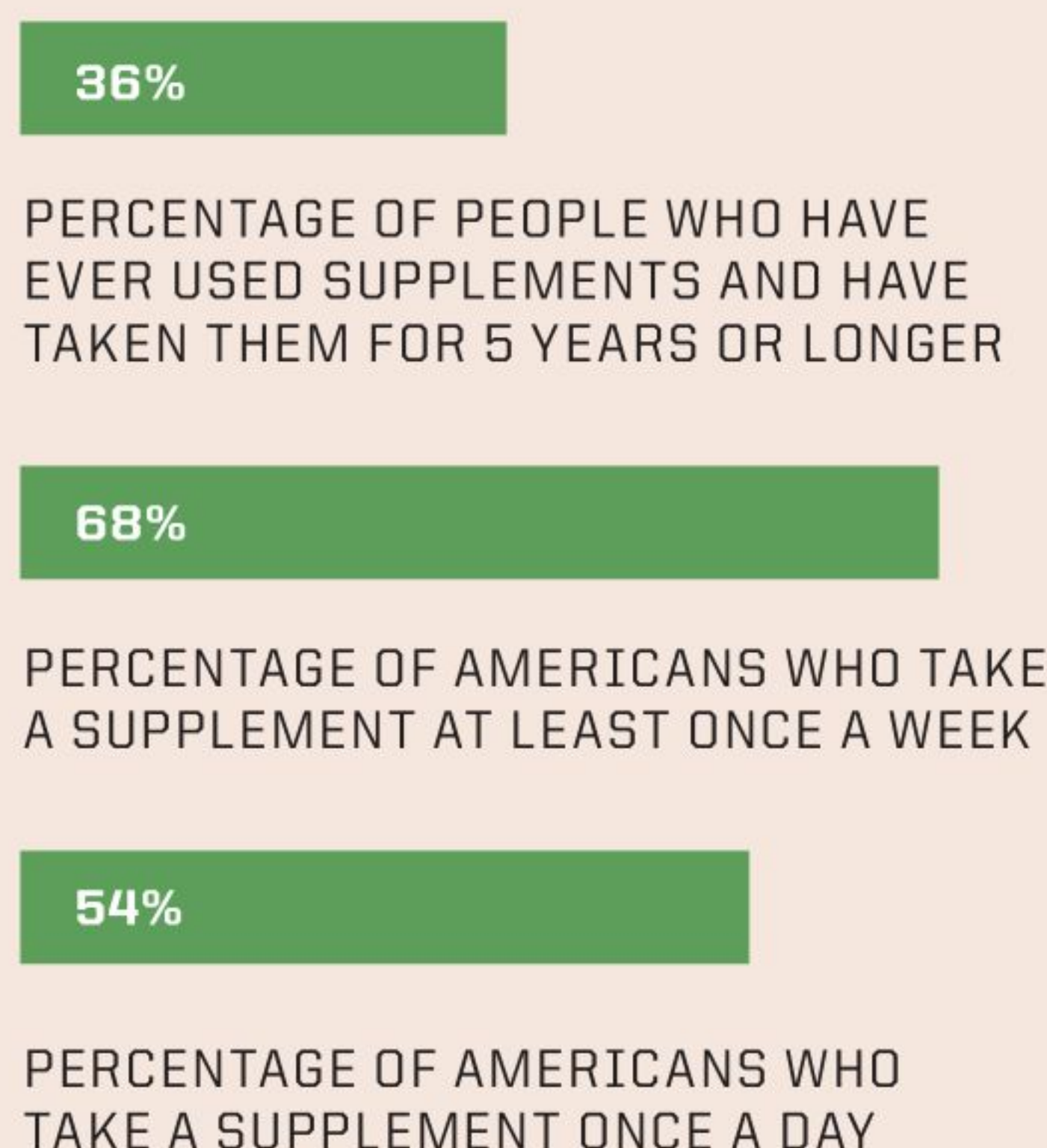
People of all ages take supplements, but older Americans are most likely to take multiple types.*



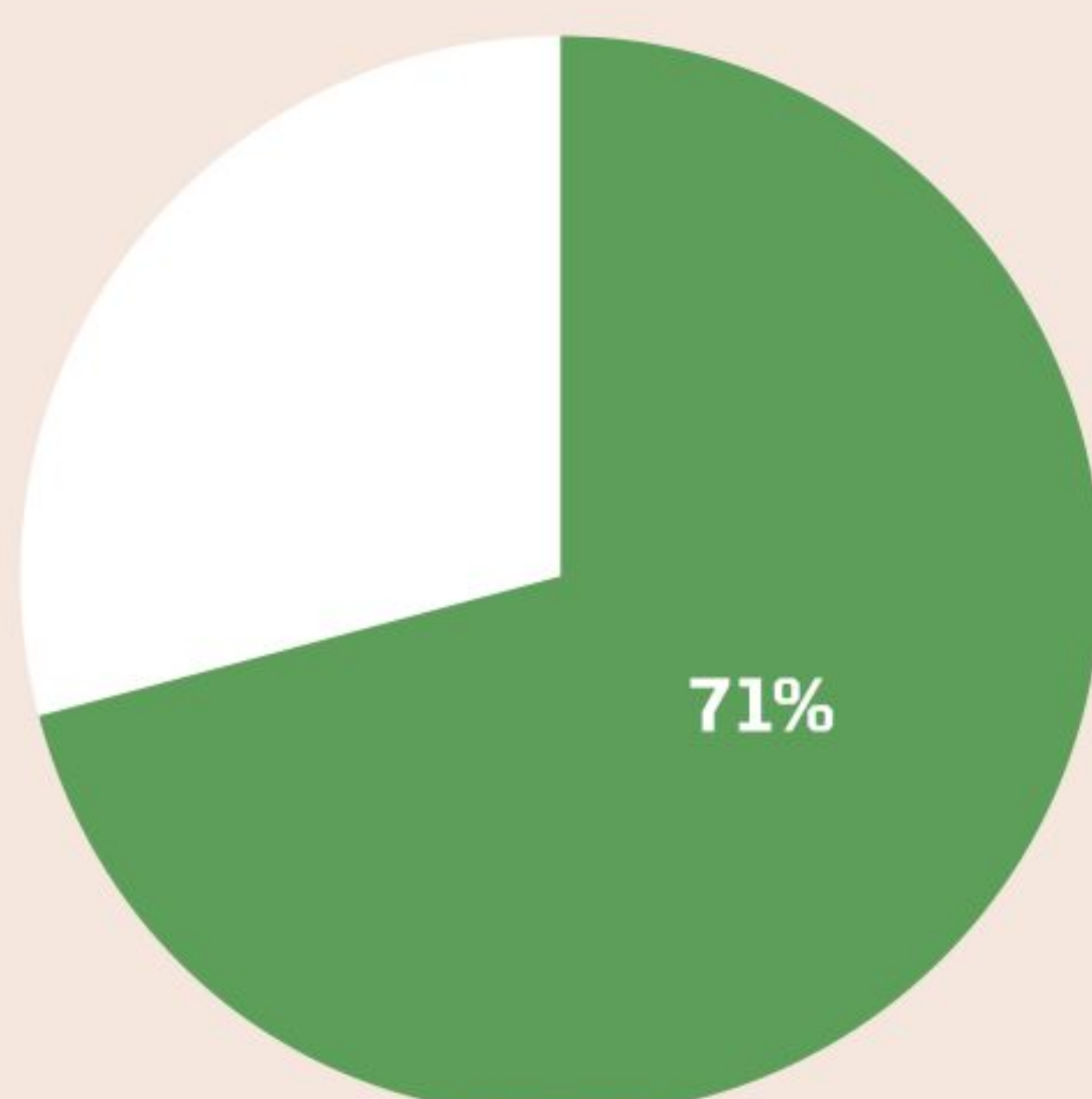
	NONE	ONE	TWO	THREE	FOUR	FIVE	SIX-PLUS
MILLENNIAL BORN BETWEEN 1981 AND 1996	8%	22%	25%	25%	7%	5%	8%
GENERATION X BORN BETWEEN 1965 AND 1980	9%	16%	24%	22%	11%	5%	14%
BABY BOOMER BORN BETWEEN 1946 AND 1964	6%	18%	21%	17%	12%	9%	17%
SILENT GENERATION BORN BETWEEN 1928 AND 1945	7%	13%	15%	15%	17%	7%	26%

*Number of different supplements taken in the past year among people who have ever taken supplements.

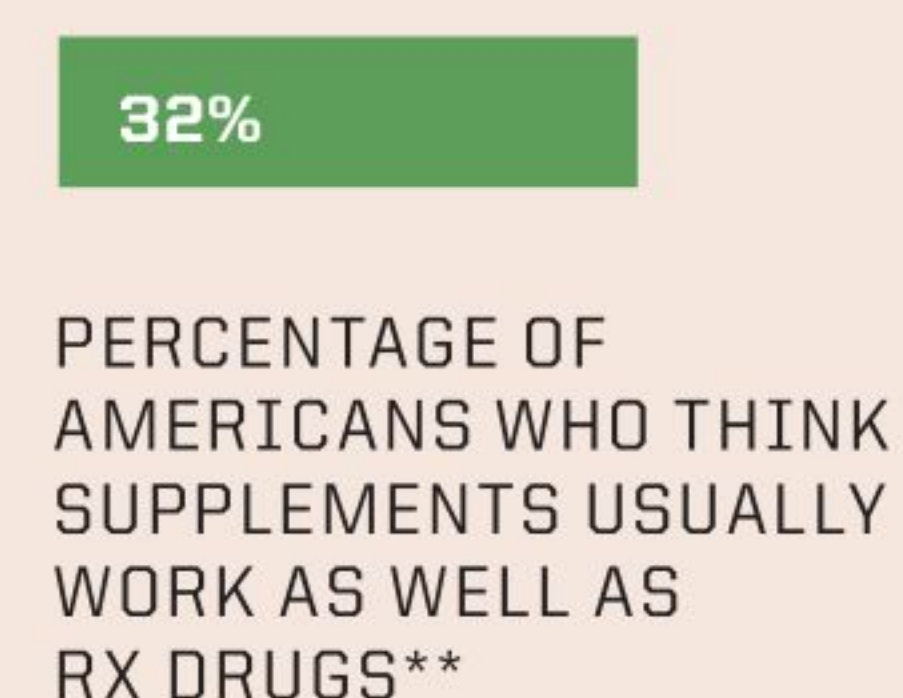
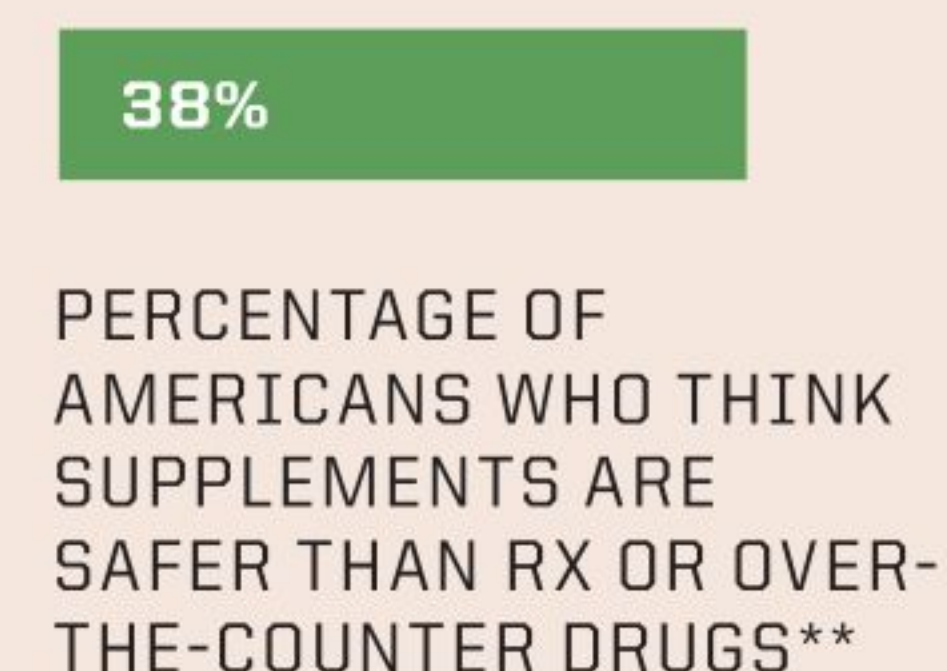
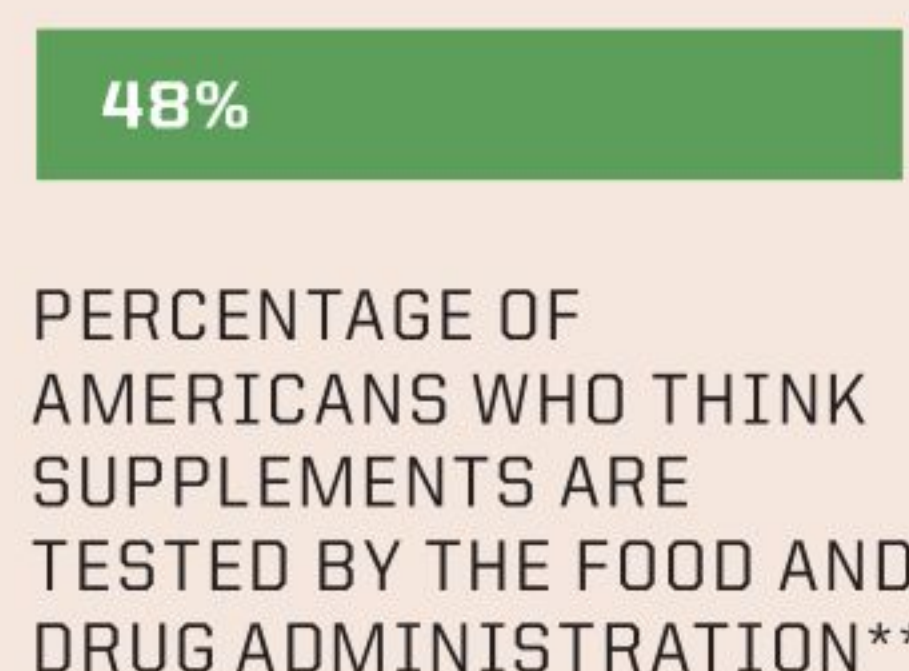
How often, and for how long, have Americans taken supplements?



Americans place a lot of trust in the safety of supplements even though they are largely unregulated.



PERCENTAGE OF AMERICANS WHO SAY SUPPLEMENTS ARE SAFE**



**Percentage of people who said the statements were true or mostly true.
Source: Consumer Reports nationally representative survey of 2,006 adults.

M.D., an internist at Harvard Medical School who has studied supplements extensively. One 2015 study by government researchers found that supplement use led to more than 23,000 emergency room visits a year, most often because of heart problems triggered by supplements taken for weight loss and energy.

“There’s a lack of oversight, a lack of safety, and a lack of rigorous science,” says Daniel Lasoff, M.D., a medical toxicologist at the University of California, San Diego’s department of emergency medicine.

CR tested turmeric and echinacea, and our findings revealed problems with potency and purity even among some of the most widely used brands.

And yet “dietary supplements have benefits to offer,” says Richard van Breemen, Ph.D., a professor of

pharmaceutical sciences and the director of the Linus Pauling Institute at Oregon State University, which focuses on vitamin, mineral, and plant-derived chemical research. He cites black cohosh (see “A Guide to 10 Popular Botanicals,” on page 64) as one example where some women say it eases their menopausal symptoms, even though scientists don’t understand how it works.

But before supplements can be used effectively to address specific ailments, “we need more research on botanicals to figure out the optimum preparations and dosages,” he says, adding that more information is also needed on their long-term safety.

The Potency of Plants

The top reasons for taking botanicals, aside from turmeric and echinacea

(see “Lifestyle Changes That Work—Without the Risks,” on page 67), were “to improve or maintain overall health” and “to strengthen general immunity,” according to our survey.

Plants have, in fact, been used for medicinal purposes for thousands of years. Today, approximately half of prescription medicines in use are derived from plants, microbes, and fungi found in the natural world, according to van Breemen at Oregon State. But the key difference is that prescription drugs used to treat cancer and other diseases are standardized, with each dose containing the exact same quantity of active ingredients.

Such standardization is not mandatory for supplements in the U.S. This is partly why figuring out which botanicals are safe and effective—and which may be useless or risky—can be particularly challenging. Botanicals include turmeric, St. John’s wort, green tea extract, and valerian. (CBD, or cannabidiol, is botanical in origin, which is why many people think of it as a botanical supplement. But the FDA currently considers it illegal to sell the trendy compound from the cannabis plant as a supplement because it’s approved as a drug to treat rare forms of epilepsy. (For more, see “Can CBD Help You Feel Better?” on page 68.)

Part of the challenge is that plant-derived pills can be extremely potent—and that potency can be dangerous. According to Harvard’s Cohen, some botanicals—red yeast rice, used for heart problems, and the now-banned ephedra, once found in weight-loss supplements—can deliver the same amount of a “natural” chemical as a prescription drug. That means that they can have side effects that are similar to (though less predictable than) those of drugs, according to Cynthia

[CONT. ON PAGE 68]

WHAT THE FDA DOES—AND DOESN’T—DO

Even though some supplements

are as potent as certain prescription drugs, different regulations apply. The Food and Drug Administration doesn’t need to approve supplements as effective or safe before they are sold, as it does with drugs.

According to the Dietary Supplement Health and Education Act of 1994—the primary law that governs these products—supplement ingredients that were on the market before 1994 are presumed safe. Companies can assert that a product is safe for use as long as they can provide some evidence that its ingredients were used before 1994 or are currently present in the food supply.

While manufacturers are supposed to notify the FDA when they start selling a supplement that contains a new ingredient, they often don’t, according to Chuck Bell, in the advocacy division of CR.

The FDA technically requires that supplements contain what they say they do and aren’t contaminated with harmful substances. But supplements have exploded in popularity since 1994. Current regulations can’t keep consumers safe, Bell says. “We’re dealing with a much larger industry, and the number of people that are employed by the FDA to oversee that industry has not kept pace,” he says.

How to Choose Products Wisely

If you're shopping for supplements in a store, don't expect much help from the pharmacist or other staffers. That's the conclusion we drew after sending 10 secret shoppers to ask about echinacea and turmeric in 34 stores (branches of Costco, CVS, GNC, Kroger, Target, The Vitamin Shoppe, Walgreens, and Walmart) in seven states. In most cases, pharmacists weren't familiar with potential risks for the supplements on their shelves and rarely warned customers about problems such as interactions with prescription medications. A notable few did; when one saw the list of Rx medications our shopper was taking, he wisely advised her not to take any supplements without consulting her physician.

Because the Food and Drug Administration doesn't verify that supplements contain what they say they do or whether they are contaminated with heavy metals, bacteria, or pesticides before they are sold, some third-party groups have taken on the role.

These groups (see chart at right) include ConsumerLab.com, NSF International, and U.S. Pharmacopeia (USP). USP is a nonprofit organization that sets what CR experts say are the most widely accepted standards for supplements. (It also sets mandatory standards for pharmaceuticals.) The not-for-profit NSF offers two types of certification: NSF Contents Certified and NSF Certified for Sport. ConsumerLab.com, a for-profit company, regularly tests and certifies supplements. A more recent addition is UL, a for-profit company known for testing electronics. Some

of these organizations, such as USP (quality-supplements.org) and NSF (info.nsf.org/certified/dietary), list verified or certified products on their websites.

Even if a supplement has been certified to show that it contains what's on its label, it could still cause serious side effects, according to Pieter

Cohen, M.D., an internist at Harvard Medical School who has worked closely with NSF.

Last May, CVS announced that it had completed an initiative to make sure every supplement it sells has been through third-party testing. Seven percent of products didn't pass the screening, a

CVS spokesperson says, mostly because of failures to meet label claims. (The CVS products in CR's tests were sold before CVS had fully implemented the initiative.) Many other stamps you'll see on bottles ("verified" or "approved") are meaningless, Cohen says.

	CONSUMER LAB.COM 	NSF INTERNATIONAL 	UL 	U.S. PHARMACOPEIA 
How does it acquire test samples?	Purchased when a manufacturer requests testing.	Provided by the manufacturer.	Manufacturer-provided or selected by UL at manufacturing location.	Provided by the manufacturer.
How often does it retest or spot-check?	Once every 12 to 24 months, using samples from stores.	Once per year, using samples provided by manufacturer (occasionally purchased in stores).	At least once per year.	One to six times per year, using samples purchased in stores.
How much does it charge to have products certified or ingredients verified?	\$3,000 to \$5,000 per product.	\$3,000 to \$5,000 per product, plus an audit fee of about \$13,000.	\$300 to \$3,500 for active-ingredient testing.	Varies. Depending on ingredients, can be \$3,000 to \$15,000 per product, plus an initial audit fee of \$15,000 and a label fee of 1 cent per bottle.
Are there products it won't test?	Products containing ingredients known to be unsafe.	Sex enhancement or weight loss products and those with ingredients known to be illegal or unsafe, not recognized by the FDA, or that there's no test for.	Products containing ingredients known to be unsafe, illegal, or not recognized as dietary ingredients by the FDA.	Products that contain ingredients known to be unsafe, that aren't recognized as dietary ingredients by the FDA, or that there's no validated test for.

A GUIDE TO 10 POPULAR BOTANICALS

All these supplement ingredients are derived from plants. But they vary in efficacy and safety. For a partial list of supplement ingredients to outright avoid, see CR.org/ingredientstoavoid.



CLOCKWISE
FROM TOP

GREEN TEA

BLACK COHOSH

CRANBERRY

GINGER

BEETROOT

Beetroot

Reasons for Use

Generally sold as a powder that can be mixed into a juice, to improve athletic performance.

How Well It Works

Though research has yielded conflicting results, studies suggest it might improve performance in endurance sports, such as running, swimming, rowing, and cycling.

Known Risks

More research is needed, but there have not been major safety concerns identified with moderate consumption (2 cups a day) for several weeks, as is commonly recommended.

Black Cohosh

Reasons for Use

To treat menopausal symptoms and sometimes menstrual cramps, or to induce labor.

How Well It Works

Knowledge is limited, with insufficient evidence to support use.

Known Risks

While black cohosh itself has been shown to be generally safe when taken for as long as a year, many black cohosh products have been found to contain unlisted herbs mixed in. Cases of liver damage have also been linked to black cohosh, potentially because of the other herbs.

Chamomile

Reasons for Use

For sleeplessness, anxiety, and gastrointestinal conditions.

How Well It Works

It's not well-studied, though preliminary research indicates that it may be helpful for anxiety and may ease an upset stomach if taken in combination with other herbs, including milk thistle and peppermint.

Known Risks

As a tea, it's generally considered safe. Some people allergic to plants such as ragweed may have a reaction to chamomile. It can also interact with drugs used after organ transplants as well as with some blood thinners.

Cranberry

Reasons for Use

Mostly used to treat urinary tract infections (UTIs).

How Well It Works

Evidence is mixed. Some studies indicate that cranberry may reduce UTI risk for certain people, but research hasn't shown that it works as a UTI treatment.

Known Risks

Drinking cranberry juice is generally safe, though it's usually high in sugar. Large quantities can lead to upset stomach, and drinking a lot of cranberry juice on a regular basis can increase the risk of kidney stones. Cranberry supplements may interact with blood-thinning drugs.

Ginger

Reasons for Use

Commonly used to treat nausea and vomiting and sometimes for other conditions, including arthritis and motion sickness.

How Well It Works

Ginger may help with nausea related to pregnancy and chemotherapy, studies have shown. Evidence is less certain on whether it can ease other types of nausea or conditions.

Known Risks

Usually considered safe when used as a spice. Some users may experience gas and heartburn; it may also be problematic for people with gallstones. And it can interact with blood-thinning meds.

Green Tea Extract

Reasons for Use

Mainly to improve alertness, relieve digestive symptoms, and promote weight loss.

How Well It Works

Green tea seems to make people more alert, probably because of the caffeine. There's not good evidence that it helps people lose weight.

Known Risks

Drinking green tea in moderate amounts is believed to be safe. But green tea extract has been linked to serious problems, including liver damage, elevated blood pressure, increased heart rate, and even death. CR recommends avoiding green tea extract supplements.

Milk Thistle

Reasons for Use

Mostly used for liver problems related to conditions such as hepatitis and cirrhosis.

How Well It Works

Results have been uneven. Some research shows certain patients who take milk thistle have milder symptoms from liver disease; other studies have found it's no better than a placebo.

Known Risks

Well-tolerated in recommended doses, though some report gastrointestinal problems. Can trigger allergic reactions, especially for people also allergic to ragweed. Diabetics should also use caution with milk thistle because it may lower blood sugar levels.

Saw Palmetto

Reasons for Use

To treat the symptoms of an enlarged prostate—an age-related condition in men that can make urination difficult.

How Well It Works

Small studies suggested a possible benefit, but the best well-designed large studies have concluded that it's no more effective than a placebo.

Known Risks

There are few known side effects, though some people experience mild ones, such as headaches.

St. John's Wort

Reasons for Use

Primarily for depression; sometimes to treat menopause symptoms, attention deficit hyperactivity disorder, and obsessive-compulsive disorder.

How Well It Works

It seemed to ease depression in a few studies, but results are mixed. Evidence indicates it is not helpful for ADHD or other conditions.

Known Risks

It can interact in life-threatening ways with certain drugs and has been shown to weaken antidepressants, birth control pills, some cancer drugs, and warfarin. It has also been linked to side effects such as anxiety, fatigue, and sexual dysfunction.

Valerian

Reasons for Use

Mainly used to treat insomnia, though some also use it to treat anxiety, depression, or menopause symptoms.

How Well It Works

It's unclear how much valerian helps with sleep because there's not much rigorous research on the topic and results of existing studies have varied. There's too little evidence to know whether it can help with other conditions.

Known Risks

Some people experience mild side effects, such as headaches and itching. There are no major safety concerns with short-term use in adults; the effects of long-term use are unknown.

Rider, Ph.D., a toxicologist at the National Toxicology Program at the National Institute of Environmental Health Sciences (NIEHS).

Take, for example, vinpocetine, a synthetic substance derived from a chemical found in the *Vinca minor* plant. In some countries it's sold as a prescription drug to treat stroke or cognitive impairment. However, in the U.S. it isn't an FDA-approved prescription drug but is sold as a botanical ingredient in some memory supplements. Vinpocetine can cause dangerously low blood pressure, and birth defects or miscarriage if taken by a pregnant woman.

The form and source of raw ingredients also vary: Research indicates that some overseas suppliers of turmeric spice, for example, have sometimes intentionally added lead to it to brighten its distinctive color, making it especially risky when consumed regularly. The same plant grown in California and India can have different levels of active compounds. Additionally, many plants can suck up heavy metals from the soil as they grow, turning a safe plant dangerous. And botanical supplements are sometimes manufactured under unsanitary conditions, allowing bacteria to be introduced into the products.

One particularly harmful side effect linked to supplements is liver damage. In 2004, the percentage of all liver damage cases in the U.S. involving herbal or dietary supplements was estimated at 7 percent; by 2014, that number was estimated to have climbed to 20 percent, mostly because of green tea extract in weight loss supplements, and steroids illegally added to bodybuilding supplements.

Active compounds in supplements can also amplify the effects of prescription drugs or render other

medications ineffective. Ginkgo biloba, for example, can thin the blood, increasing the effect of a prescription blood thinner, such as warfarin.

"I have totally seen this perception of 'natural' equals safe," says Rider at the NIEHS. "I think it is not a fair assumption."

The results of CR's own tests of echinacea and turmeric conform with the kinds of problems also seen by Tod Cooperman, M.D., the president and founder of ConsumerLab.com, an organization that regularly tests supplements and certifies products that pass its quality control tests.

Representatives of the supplement industry point to products with major problems or inconsistencies as outliers. "There are some supplements in the marketplace that either don't contain what their label says they are supposed to contain or they contain things that are not supposed to be there, but that is a very small minority of the industry," says Steve Mister, president and CEO of the Council for Responsible Nutrition, a dietary supplements trade organization.

Yet according to Cooperman, more than 25 percent of the botanical supplements that ConsumerLab.com examines fail the organization's testing, either because of bacterial or heavy metal contamination or because they don't contain what's listed on the label. Botanical supplements are much more likely to fail these tests than mineral or vitamin supplements because, he says, plants often have different levels of active compounds and can pick up contamination from the environment where they were grown or packaged.

Protections on the Way?

The FDA doesn't test supplements for safety or screen them for contaminants

before they are sold, but it does require that supplements contain the ingredients listed on their labels. However, the agency doesn't perform comprehensive tests to verify compliance. And although complying with U.S. Pharmacopeia (USP) quality standards—including tests for identity, potency, and purity—is mandatory for prescription and over-the-counter drugs, doing so is voluntary for supplements. Most manufacturers do not opt in—especially when it comes to botanicals, where standardization can be a challenge, proprietary blends are common, and there is less agreement about appropriate dosage.

The FDA generally recalls a supplement if it receives a large number of reports (from consumers, doctors, manufacturers, and others) indicating that it might be causing serious illnesses—because of contamination with salmonella or prescription-drug ingredients, for example. The agency has issued 34 recalls for dietary supplements over the past two years, according to an FDA database. But a product that simply doesn't contain what it should could potentially fly under the radar indefinitely, Harvard's Cohen says.

Last year, the FDA indicated that it would be taking steps to more strictly regulate the supplement marketplace, and launched a new online list to warn consumers about certain supplement ingredients. An FDA spokesperson also told CR that the agency has continued to step up enforcement against bad actors. It cited, among other examples, the recent seizure of 300,000 containers of dietary supplements manufactured in substandard conditions, and recalls of drugs illegally sold as supplements.

Even though these increased efforts to enforce the law are a positive step, consumers have a right to expect the

Lifestyle Changes That Work—Without the Risks

FDA to have been doing this all along, says Chuck Bell, who has led CR's advocacy work on supplements for 20 years. Nor does it change the fact that—over several decades—the agency has been slow to push for changes to regulations that experts say continue to leave too many unsafe products on the market. “Progress has been glacial,” Bell says.

What Consumers Can Do

When it comes to safety, the onus still largely falls on consumers to be advocates for themselves. Indeed, industry representatives say consumers should do their own research to find safe products. “You have some responsibility to become informed about the supplements you use,” says Michael McGuffin, president of the American Herbal Products Association, an industry group. “We recommend consumers consult with their healthcare practitioner.”

Before you try any supplement, Bell says, you should discuss it with your primary care provider and seek out trustworthy information from sources such as MedlinePlus.gov, the NIH's health portal for consumers.

A frank assessment of your own habits is probably in order, too. As much as supplement-takers might believe that supplements are safe and effective, many mainstream healthcare practitioners say the products are a waste of money. For those committed to continuing supplement use, see “How to Choose Products Wisely,” on page 63, to help you spot labels that can identify more the trustworthy products on the market.

“One day I envision that this industry will have products that are shown to be both safe and effective,” says van Breemen at Oregon State. “But we're not there yet.”

People often take echinacea to bolster immunity and ward off colds or other viruses. They turn to turmeric to alleviate pain or to reduce inflammation due to psoriasis or rheumatoid arthritis. In our survey, turmeric was the most popular supplement for chronic health problems.

Some studies suggest that taking echinacea might make you slightly less susceptible to colds, and preliminary research indicates that curcumin could potentially help with knee pain from osteoarthritis. But conclusive evidence that these products work is lacking, according to experts who have studied them and the National Center for Complementary and Integrative Health at the National Institutes of Health.

There are, however, other, proven nonpharmacological ways you can get these desired health benefits.

STRENGTHEN YOUR IMMUNE SYSTEM

■ Get between 7 and 9 hours of sleep nightly.

This will improve your ability to fight off viral infections such as the common cold, says Robert McLean, M.D., a rheumatologist at Yale New Haven Hospital and president of the American College of Physicians.

■ Increase your intake of nutrient-dense foods.

These include fatty fish (sardines and salmon),

which provide vitamin D, key for immune-system function, says Julie Stefanski, a registered dietitian nutritionist and spokesperson for the Academy of Nutrition and Dietetics.

■ **Rehab your diet with superfoods.** These include dark leafy greens, raspberries and blackberries, and citrus and broccoli, all good sources of vitamin C, which supports the immune system and healing. Pumpkin and sweet potatoes provide vitamin A for a strong immune system. And foods such as olive oil, chia seeds, and avocado provide vital nutrients that help to fight infection.

REDUCE INFLAMMATION

If you're dealing with inflammation from an injury, ice can reduce pain and swelling. For minor pains, an over-the-counter nonsteroidal anti-inflammatory drug, such as ibuprofen, can also provide short-term relief, McLean says.

You'll also want to avoid soda, processed meat, and too much alcohol (more than one drink a day for women or two drinks a day for men). Regular exercise and adequate sleep have also been shown to help with chronic inflammation. If you think you might have a medical condition, such as celiac disease, where certain foods trigger inflammation, talk to your doctor.



CAN CBD HELP YOU FEEL BETTER?

Cannabidiol is being used to treat anxiety, joint pain, epilepsy, and opioid addiction. But does it really work? And can you trust products on the market? Read this before you try CBD.

A mother uses CBD to treat her son's seizures.

A veteran hopes it will help her wean off opioids.

A dietitian says it helps her sleep through the night. Even a pet owner uses it to calm his anxious Saint Bernard.

These are just some of the estimated 64 million Americans who had tried CBD, or cannabidiol, in the previous 24 months, according to a 2019 nationally representative Consumer Reports survey of more than 4,000 Americans.

The survey found that more than a quarter of people in the U.S. say they've tried CBD—a compound in marijuana and hemp that doesn't get you “high”—for a slew of mental and physical reasons. One out of 7 of those people reported daily use.

Americans of all ages are using it, too. It's most popular among people in their 20s, with 40 percent of them saying they have tried CBD. But so have 15 percent of people 60 and older. And our survey respondents also said it helped. Most of those who tried CBD reported that it was effective, especially among those who used it for anxiety. In some cases, they said CBD allowed them to eliminate over-the-counter or prescription drugs, including opioids.

Sold in pill form, oils, tinctures, topical lotions, and even in bottled water, coffee, beer, and cosmetics, CBD is already in hundreds of products on the market. And that could soon rise sharply, in part because of recent changes in federal law that allow U.S. farmers to legally grow hemp, according to the Brightfield Group, a market research firm specializing in cannabis. The company expects the CBD market from hemp alone to grow to \$22 billion by 2022, up from \$327 million in 2017.

■ **What Is CBD—and Could it Help You?**

CBD is a nonpsychoactive compound found in cannabis plants, which include hemp and

marijuana—and until recently, it was underappreciated. Growers actually tried to breed it out of plants, seeking strains with higher THC levels, according to Martin Lee, a cannabis historian. It wasn't until 2009, he says, that growers came across plants containing large amounts of CBD.

Some research suggests that CBD may affect the “endocannabinoid system,” a series of receptors found in the body that seem to interact with various compounds in cannabis, including CBD, and some of which are related to feelings of anxiety and pain, or that help regulate the body's sleep-wake cycles.

CBD's most far-reaching health effect may be its anti-inflammatory properties. And not just in a knee

or hip joint, but throughout the body, including the central nervous system and the brain, says Joseph Maroon, M.D., a clinical professor of neurological surgery at the University of Pittsburgh Medical Center, who has investigated the link. In a 2018 review, he and colleagues said such effects could possibly reduce anxiety, depression, seizures, and post-traumatic stress disorder (PTSD), and even benefit people who have had a concussion.

The best studies of CBD so far have been in the area of seizures, and the results were strong enough that in 2018 the Food and Drug Administration approved a prescription version of CBD, called Epidiolex.

CR's 2019 survey also provided some support for CBD's possible health benefits. Almost three-quarters of people who took CBD said it was at least moderately effective for the main reason they took it, with 48 percent of them saying it was very or extremely effective.

And CBD seemed to work well for some of the most common problems, including easing stress and joint pain, and improving sleep. Our survey also suggests that side effects are uncommon; almost three-quarters said they experienced no side effects.

Also promising: 22 percent of people who took CBD for one of the health problems we asked

**Edibles,
oils, drops,
vape pens,
and rubs were
the most
popular forms
of CBD in
CR's survey.**

about said it helped them replace prescription or OTC drugs, with more than a third of them saying they used it to replace opioids. And some researchers across the U.S. are now studying whether CBD (alone or in combination with THC) could be a tool in the fight against the ongoing opioid crisis.

Where and How CBD Is Sold

You might find CBD online or in health-food stores or CBD-specific retailers. In CR's survey, edibles including gummies and other infused foods and drinks were the most popular form, along with oils or drops, vape pens, and rubs.

Look for products that show how much CBD is in each dose, not just the whole product, says Mitch Earleywine, Ph.D., a professor of psychology at the University at Albany, State University of New York, who has studied the medicinal use of CBD.

Dosages, which are expressed in milligrams, or mg, vary depending on the form of the product, and experts often suggest starting with

products that have relatively low doses. For example, with tinctures, Earleywine suggests generally starting with a product that has just 10 mg per dose.

Avoid products that make sweeping health claims, because they're often inaccurate and illegal.

To date, few states require testing of CBD products sold online or in retail stores. The best way to find out whether a product has what is claimed is to ask for its COA, or certificate of analysis.

That document shows how a product performed on tests, typically commissioned by the manufacturer, checking for CBD and THC levels, and whether it contains contaminants like heavy metals or pesticides. If a manufacturer or a retail store doesn't have the information or refuses to share it, look for another product.

Think Twice About Vaping CBD

Vaping CBD was linked to 26 hospitalizations for lung illness last year. The CDC traced many of the hospitalizations back to vitamin E acetate, used to dilute oils used in vaping. In addition, many doctors, scientists, government officials, and even industry representatives remain concerned about vaping, especially CBD, for several reasons.

For one thing, beyond the dangers of vitamin E acetate, little is



CBD's Legal Status

The legal status of CBD is still somewhat murky. Nearly all states have passed laws legalizing it to one extent or another. (If it comes from hemp, THC levels must stay very low—0.3 percent or below compared with the 20 percent or higher concentrations typical in marijuana.) And the 2018 Farm Bill allows farmers to grow hemp and legalizes hemp derivatives like CBD. The bill also removes CBD extracted from hemp from the Drug Enforcement Administration's list of Schedule I drugs such as heroin, which the DEA deems to lack any medical use and to pose a high risk of abuse. (Marijuana and THC remain Schedule I drugs.)

But on the federal level, the FDA still has reservations. That's partly because

now that the agency has approved a CBD-based prescription drug—Epidiolex—it says any product that markets the compound for health purposes should go through the FDA's rigorous official drug approval process.

In addition, the FDA notes that when CBD is put into food—say, a cookie, honey, coffee, or water—it is considered a "food additive." And the agency has not yet approved CBD for that purpose.

As a result, some local health officials have cracked down on CBD in food. Michael Lanza, a spokesman for New York City's Department of Health and Mental Hygiene, says the city prohibited CBD in food after being advised by the FDA that



it was "unlawful to add [CBD] to food and drink." Regulators in Maine, Ohio, and elsewhere have taken similar steps.

The FDA says it is now considering how it will regulate CBD, which could clarify confusion over CBD's legal and regulatory status.

known about the long-term effect of inhaling several other chemicals often found in vaping oils, says Michelle Peace, Ph.D., a toxicologist and associate professor in the department of forensic science at Virginia Commonwealth University in Richmond, who has studied and tested vaping oils.

For another, the devices themselves, when heated, can cause a chemical reaction in the vapor, posing further risk to the lungs—one reason the American Lung Association cautions people away from all vaping devices, says Erika Sward, national assistant vice president for advocacy at the

association, which has long urged people to not vape at all.

Finally, there is little regulatory oversight of CBD in general and vaping it in particular. The FDA—which oversees tobacco products, including vaping ones—has not yet determined how it should regulate CBD vaping products.



The ABCs of CBD

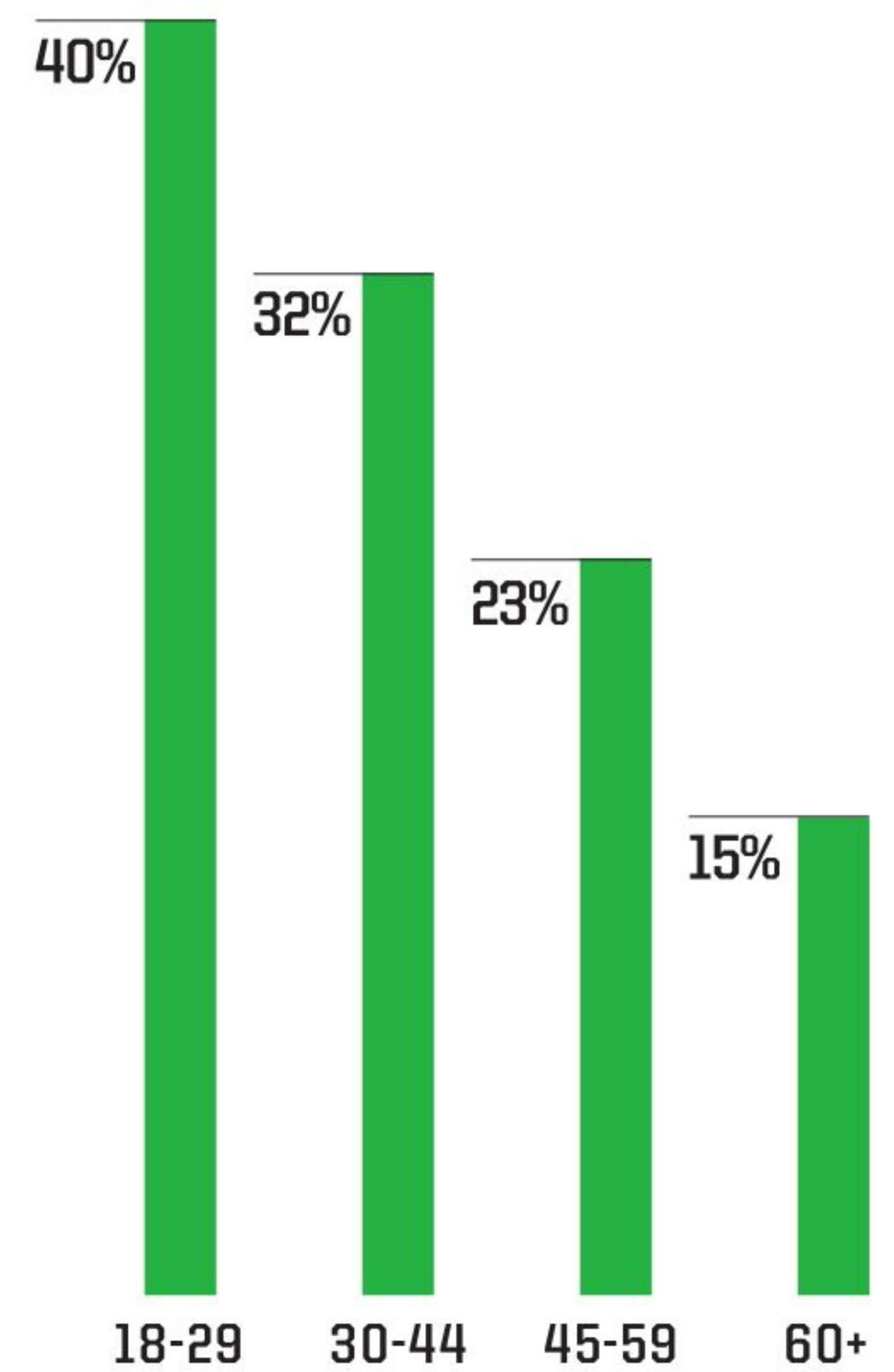
More than a quarter of U.S. adults have now tried CBD, a compound extracted from hemp and marijuana plants, according to a 2019 nationally representative Consumer Reports survey. Here are some insights into who's using CBD, why they use it, and how effective they say it is.

WHO USES CBD?

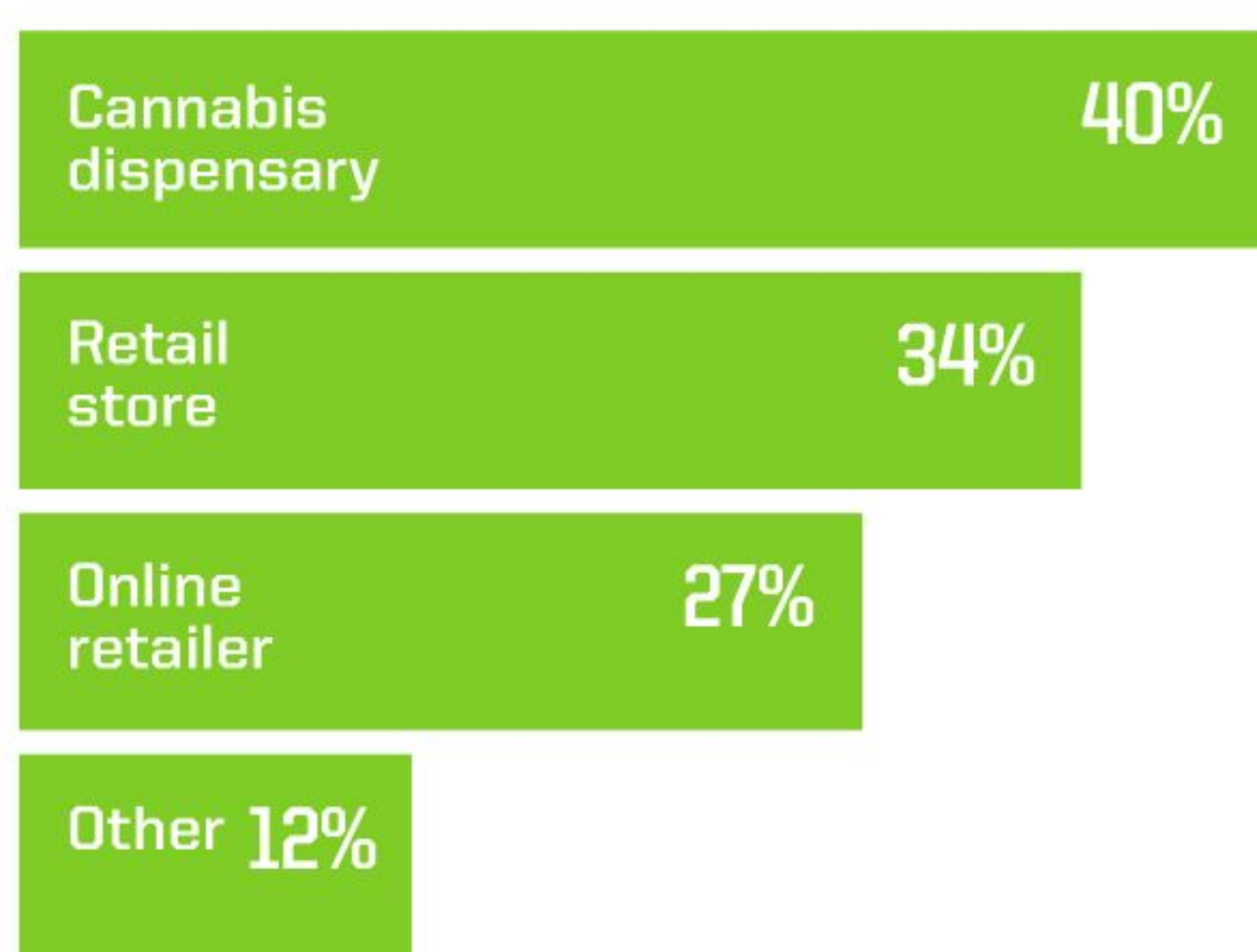
26% of all Americans have tried CBD at least once in the past two years.



How old they are



WHERE DO YOU USUALLY BUY CBD?

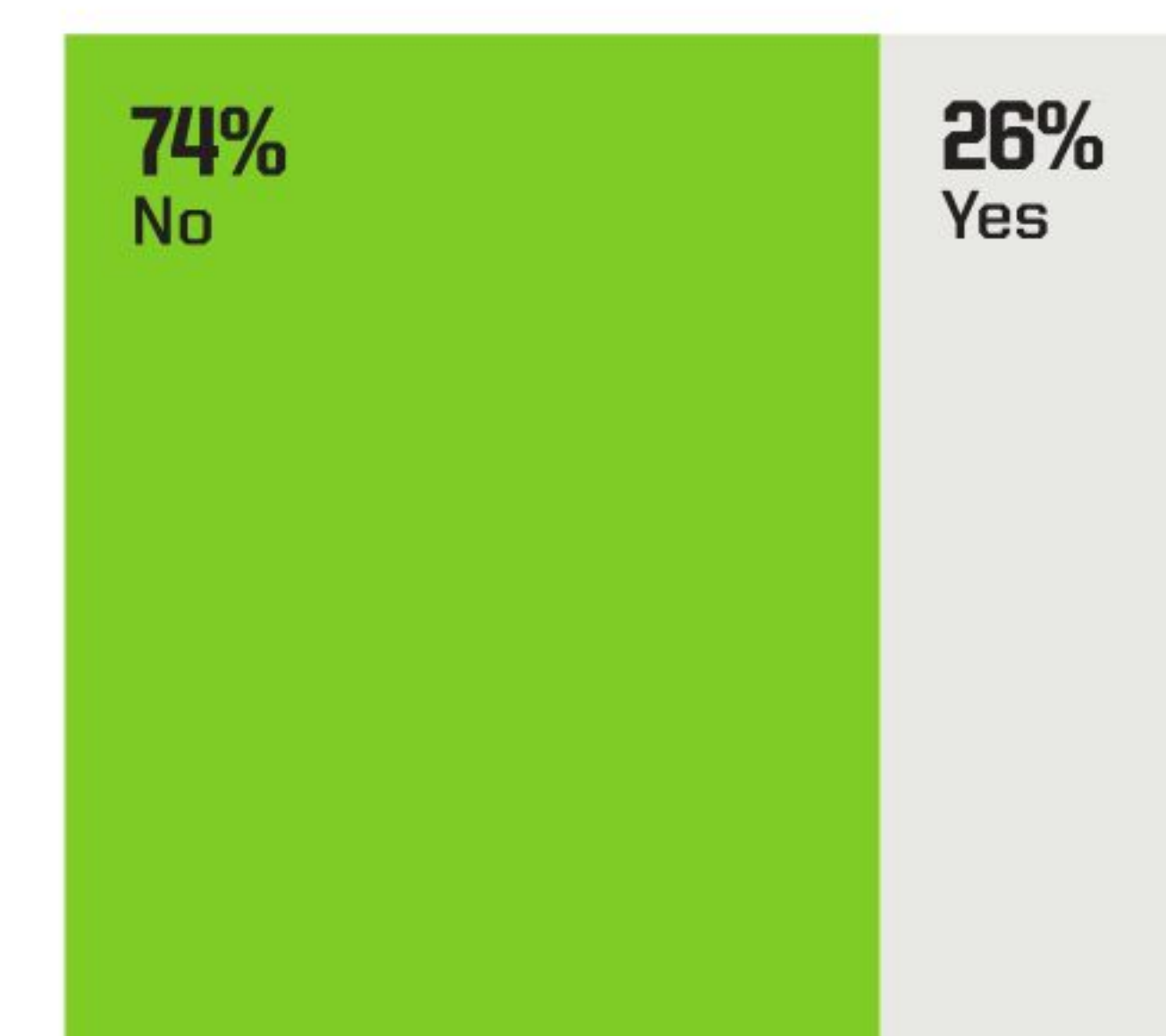


HOW OFTEN DO YOU USE CBD?

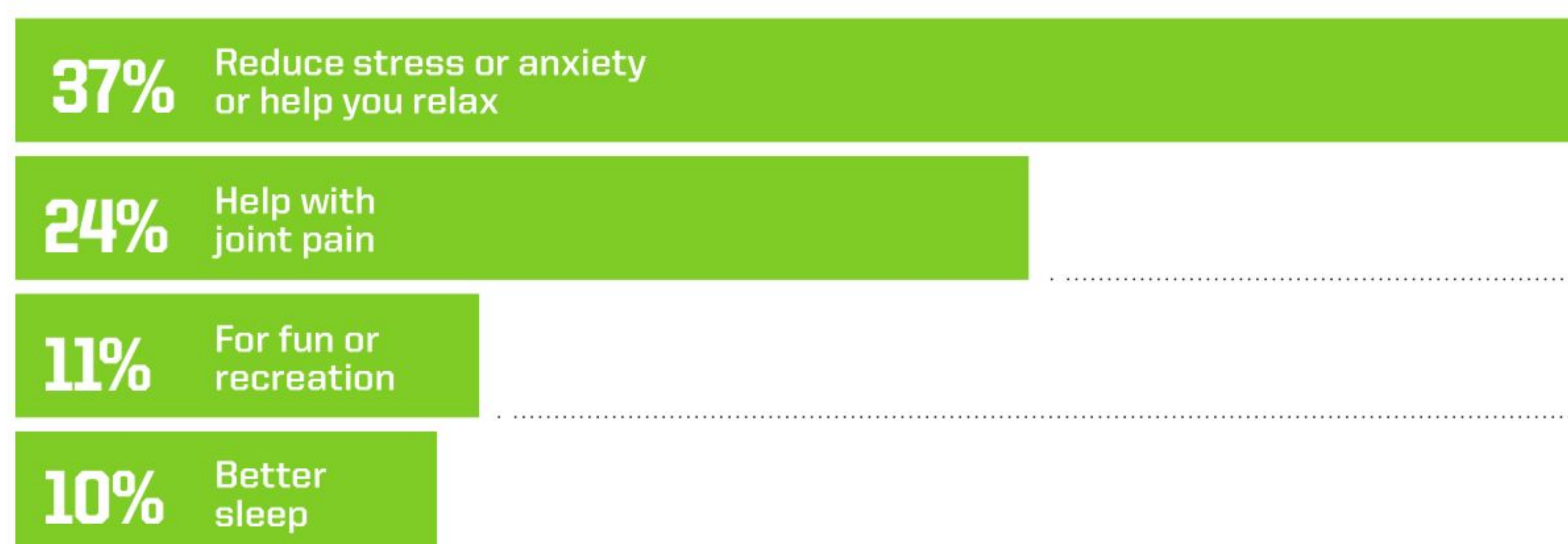
21%

of people who tried CBD more than once use it every day.

DID YOU EXPERIENCE A SIDE EFFECT?



WHAT DO PEOPLE USE CBD FOR?

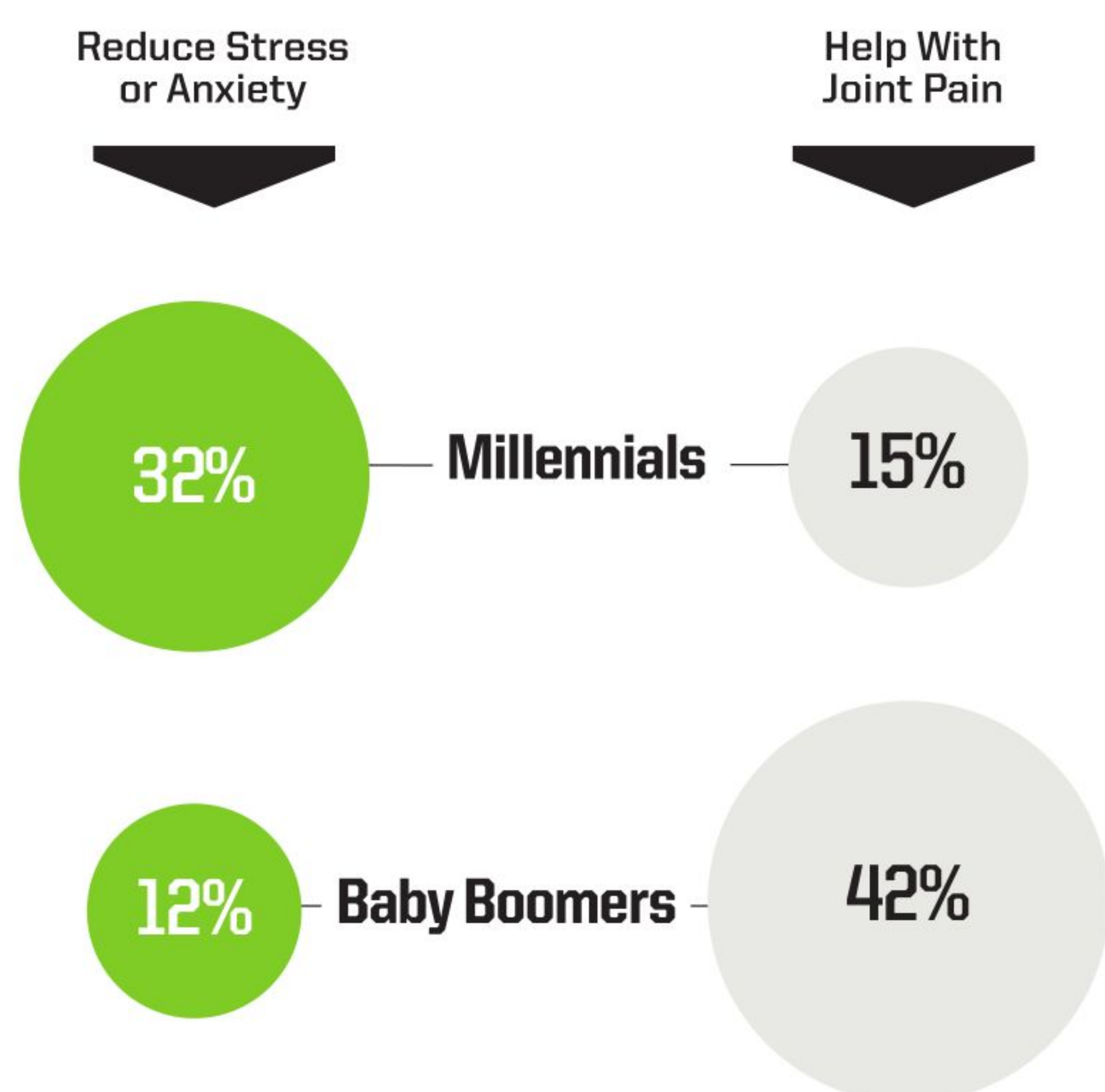


HOW EFFECTIVE IS IT?*

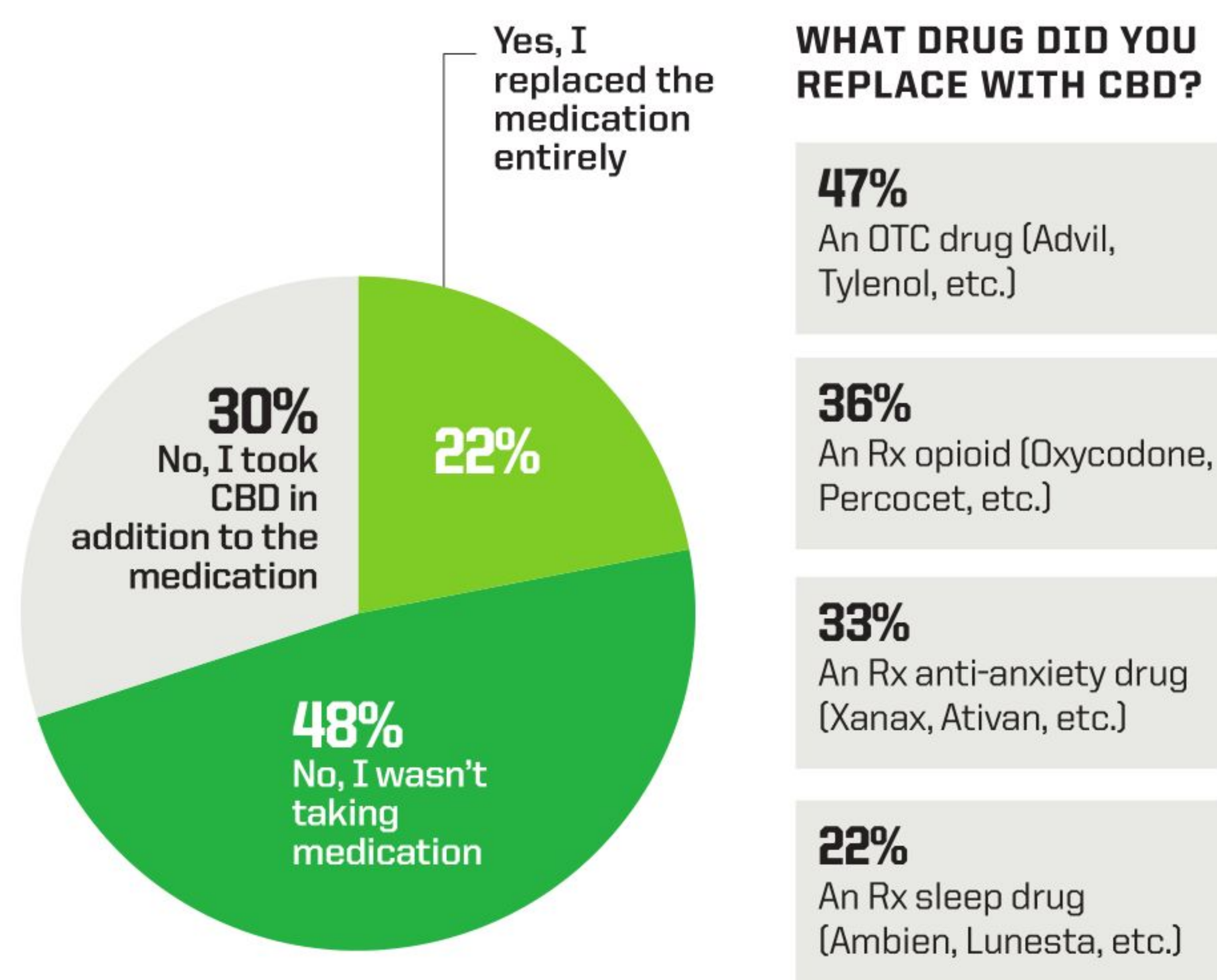
	Extremely or very effective	Moderately effective	Slightly or not at all effective
Reduce stress or anxiety or help you relax	63%	17%	16%
Help with joint pain	38%	30%	27%
For fun or recreation	24%	44%	22%
Better sleep	52%	28%	16%

*Numbers don't total 100 percent because people who are unsure are not included.

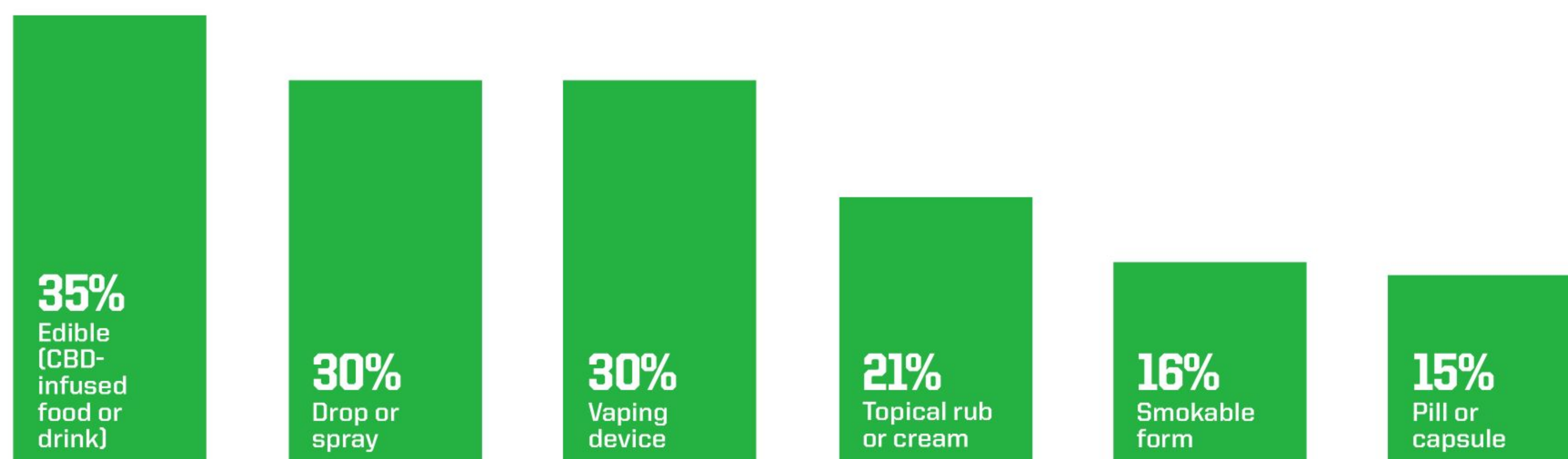
HOW CBD USE DIFFERS BY AGE



DID YOU USE CBD TO REPLACE A DRUG?



WHAT FORM OF CBD DO YOU USUALLY USE?





THE ADVANTAGES OF

RUNNING

VS.

WHICH IS BEST FOR YOUR HEALTH AND FITNESS? IT ALL DEPENDS ON YOUR GOALS. HERE'S HOW TO DO EITHER ONE WELL, INDOORS OR OUT.

WALKING

WHICH IS BETTER?

Running and walking are excellent forms of exercise. Those who regularly do either typically have healthier hearts, stronger bones, and lower body weights than their sedentary counterparts. The current Physical Activity Guidelines, issued by the Department of Health and Human Services, call for a minimum of 150 to 300 minutes per week of moderate activity or 75 to 150 minutes of vigorous activity. So does it matter whether you get those minutes walking or running? Arguments can be made for both—and which is right for you depends on your personal goals (and preferences) and your current fitness level.

● IF YOU WANT TO MAXIMIZE CALORIE-BURNING

“The key difference between running and walking is how many calories you are burning—not per mile but per minute of exercise,” says Paul D. Thompson, M.D., chief of cardiology at Hartford Hospital and a professor of medicine and preventive cardiology at the University of Connecticut.

For a 160-pound person, walking at a brisk, 3.5-mph pace for 30 minutes will burn about 156 calories. But running at a 6-mph pace for that same 30 minutes will burn more than double the calories (about 356).

“Running is a less efficient movement, and it’s more demanding on the body, so it burns more calories per minute,” Thompson says. “But if you’ve got the time to walk long enough to burn the equivalent calories, then walking is fine.”

That said, if your ultimate goal is to lose weight, chances are neither running nor walking alone is going to do the trick. “Exercise on its own is not the best way to lose weight,” Thompson says. “Research has shown that it needs to be done along with calorie restriction.”

● IF YOU WANT TO IMPROVE HEART HEALTH

Running makes the heart work harder than walking, so it stands to reason that it would also make it healthier. But the answer again may come down to how much time you have.

In a 2013 study that analyzed data from the almost 50,000 people involved in the National Runners’ Health Study II and National Walkers’ Health Study, researchers found that runners’ risk of cardiovascular disease was 4.5 percent lower than that of those who were inactive.

But walkers who expended the same amount of energy as runners daily—burned the same amount of calories—had a risk level that was 9 percent lower than those who were inactive.



● IF YOU WANT TO REDUCE BELLY FAT

You can help decrease fat stored in your middle if you pick up the pace by interspersing some stretches of all-out sprinting with your jog or walk. High-intensity interval training (HIIT)—a workout in which you alternate short bursts of activity at close to your peak heart rate with easier bouts—can help eat away at belly fat. A 2018 analysis of 39 studies, published in the journal *Sports Medicine*, concluded that HIIT reduced what’s called visceral fat by 1.8 percent.

This is important because visceral fat is located deep in the abdominal cavity, surrounding organs such as the liver and pancreas. That means the fat can trigger a variety of metabolic changes, including increased insulin resistance and higher triglyceride levels. “Reducing visceral fat, even without

losing weight, can improve overall health,” says Carol Ewing Garber, Ph.D., a professor of biobehavioral studies at Columbia University Teachers College in New York City. (Garber was not involved in the 2018 analysis.)

HIIT is also a great way to ease yourself into a running regimen, Garber says. “Running is often a big step up in intensity from walking, so it’s best to add it into your routine gradually,” she says. “By alternating higher-intensity intervals of running with lower-intensity walking intervals, you’ll reap the benefits without putting excessive stress on your body.”

● IF YOU’RE WORRIED ABOUT YOUR JOINTS

Runners pound the pavement, but running doesn’t necessarily lead to more arthritis than walking, according to recent research.

How to Start a Treadmill Routine

In a study published in 2017 in the journal *Arthritis Care & Research*, almost 59 percent of nonrunners had osteoarthritis in their knees, compared with 53 percent of the runners; for the group that reported running the most, the rate dropped to about 51 percent.

Another study, published in 2013, that analyzed data from the National Runners' Health Study found that those who ran more than 1.2 miles per day had a 15 percent lower risk of osteoarthritis and a 35 percent lower risk of hip replacement than the less active.

The researchers theorize that one reason for fewer joint problems among runners is that, as a whole, the runners had lower body mass indexes (BMIs) than the walkers. A lower weight puts less stress on the joints—even during a high-impact activity such as running.

“Running gets the reputation for causing injuries because many people who are just starting to run try to do too much too quickly,” Garber says. “And they often get injured as a result.”

If you want to progress from walking to running, do it slowly, gradually increasing speed, distance, and frequency of your runs.

SO SHOULD YOU WALK OR RUN?

Running may be more high-intensity and may burn more calories than walking does, but walking is a great way to ease into exercise and make sure you're staying physically active every day. The bottom line is that getting exercise of any kind is beneficial.

“The best exercise is the one you are going to do,” Thompson says. “There are additional benefits to be gained from running, but what's most important from a public health point of view is that everyone gets out and does some kind of exercise.”

It's important to keep up your exercise routine all year—even in cold weather. That can mean bundling up for outdoor walks or jogs, working the gym into your schedule, or setting up a mini-gym at home.

PLAN FOR THE LONG TERM

Before you first step onto a treadmill, consider your fitness goals, says Peter Anzalone, senior test project leader for fitness equipment at CR.

If you are trying to prepare for a marathon, you may want to follow a specific training plan, such as one of those offered by the New York Road Runners (nyrr.org), and get in some outdoor runs as well.

If your goal is just to move more, training programs built into your treadmill can help keep you interested, with simple programs such as hill training or workouts focused on

different objectives, such as improving heart health.

Set a goal for how long you want to run each time you work out, and try to make your workouts more challenging over time by increasing the duration, speed, or incline.

BE SAFE

If you're not familiar with treadmill running, start slow, says Chris Gagliardi, a personal trainer certified by the American Council on Exercise as a medical exercise specialist and health coach. Start at a walking pace, around 2 or 3 mph, until you're used to the feel of the belt moving underneath your

feet. Then increase the speed to a comfortable jogging or running pace, about 4 to 8 mph, depending on your level of experience.

THE SAME GOES FOR THE INCLINE

Increase it gradually and see how it feels when the machine gets progressively steeper—don't immediately put the setting on the maximum incline.

Certain machines also let you enter your age to calculate appropriate maximum and target heart rates.

And remember to use the safety key, which clips onto your clothing and is designed to stop the machine if you fall.

Top-Rated Treadmills



✓ **Peloton Tread**
\$4,300

90
OVERALL SCORE

HIGH-END INNOVATION

Designed to work with a \$39 monthly membership, the Peloton has a 32-inch touch screen that displays a range of workouts and on-demand live classes.



✓ **Sole F80**
\$1,500

86
OVERALL SCORE

LESS EXPENSIVE OPTION

This folding model has a large LCD display and can connect via Bluetooth to the Sole Fitness App on a mobile device. Controls are well-laid-out and easy to use.

Ratings > Treadmills

Brand + Model	Overall Score	Price	Test Results					Features										
			Ergonomics	Construction	Ease of use	Exercise range	User safety	Motor (hp)	Belt (LxW, in.)	Maximum incline (%)	Maximum speed (mph)	Weight capacity (lb.)	Quick speed controls	Quick incline controls	Chest strap included	Heart rate control programs	Reading shelf	Cup holders

NONFOLDING TREADMILLS

✓ Peloton Tread	90	\$4,300	↑	↑	↑	↑	↑	2.00	60x20	14.3	12.5	300			●		●	2	392
✓ Sole TT8	84	\$2,500	↑	↑	↑	↑	↑	4.00	60x22	13.5	12.0	400	●	●		●	●	4	355
✓ Precor TRM 243	84	\$3,200	↑	↑	↑	↑	↑	3.00	57x20	14.9	12.0	500				●	●	2	238 ⁽¹⁾
✓ SportsArt T615	81	\$3,200	↑	↑	↑	↑	↑	3.00	57x20	13.6	12.0	400	●			●	●	2	267
✓ True M30	81	\$1,700	↑	↑	↑	↑	↑	3.00	57x20	14.4	12.0	300	●	●	●	●	●	2	275
Star Trac 4 Series	79	\$3,200	↑	↑	↓	↑	↑	3.00	59x22	15.5	12.5	450	●	●		●	●	2	409 ⁽¹⁾
Bodyguard T-30	77	\$3,000	↑	↑	↑	↑	↑	3.00	55x22	13.5	12.0	400				●	●	2	324
Precor TRM 211	76	\$2,000	↑	↑	↓	↑	↑	3.00	57x20	16.3	12.0	350					●	2	227 ⁽¹⁾
LifeFitness T3 Go	72	\$2,600	↑	↓	↓	↑	↑	3.00	61x20	14.3	12.0	350	●	●	●	●	●	2	271
Endurance T3	62	\$1,275	↓	↑	↓	↑	↑	2.20	49x18	10.0	10.0	275						1	185

FOLDING TREADMILLS

Ⓢ Sole F80	86	\$1,500	↑	↑	↑	↑	↑	3.50	60x22	12.8	12.0	375	●	●	●	●	●	2	298
✓ Bowflex BXT116	86	\$1,600	↑	↑	↑	↑	↑	3.75	61x20	12.9	12.0	375	●	●	●	●	●	4	309
✓ NordicTrack Commercial 2450	84	\$2,000	↑	↑	↑	↑	↑	4.25	60x22	14.2	12.0	300	●	●	●		●	2	260 ⁽¹⁾
✓ Bowflex BXT216	84	\$1,800	↑	↑	↑	↑	↑	4.00	61x22	13.7	12.0	400	●	●	●	●	●	4	341
Ⓢ NordicTrack C1650	83	\$1,350	↑	↑	↑	↑	↑	3.60	60x19	14.6	12.0	350	●	●	●	●	●	2	300 ⁽¹⁾
Ⓢ ProForm Smart Pro 2000	83	\$1,400	↑	↑	↑	↑	↓	3.60	61x22	14.1	12.0	300	●	●			●	2	302
✓ Spirit Fitness XT485	82	\$2,000	↑	↑	↑	↑	↑	3.50	60x20	12.2	12.0	425	●	●	●	●	●	2	306
✓ 3G Cardio 80i	77	\$1,600	↑	↑	↑	↑	↑	3.00	56x19	9.0	11.0	350	●	●				1	222
Ⓢ LifeSpan TR2000e	76	\$1,200	↑	↑	↑	↑	↑	2.50	54x20	14.9	11.0	300	●	●		●	●	2	231
LifeFitness F3 Go	75	\$2,600	↑	↑	↓	↑	↑	3.00	55x20	11.5	10.0	350	●	●	●	●	●	2	291
BH S1Ti	74	\$1,200	↑	↑	↑	↑	↓	3.00	55x19	12.3	10.0	350	●	●		●	●	2	216
Spirit XT185	66	\$1,400	↑	↓	↑	↑	↓	2.75	55x20	13.1	10.0	295	●	●			●	2	257

BUDGET FOLDING TREADMILLS

✓ Nautilus T616	84	\$1,000	↑	↑	↑	↑	↑	3.00	61x19	15.3	12.0	300	●	●	●	●	●	2	241
✓ Sole F63	81	\$900	↑	↑	↑	↑	↑	3.00	60x20	14.1	12.0	325	●	●	●	●	●	4	280
✓ Schwinn 830	79	\$900	↑	↑	↑	↑	↑	2.75	56x19	13.1	12.0	300	●	●		●	●	2	218
✓ NordicTrack C990	77	\$1,000	↑	↑	↑	↑	↑	3.00	58x20	11.8	12.0	325	●	●		●	●	2	NS ⁽²⁾
✓ Xterra TRX4500	77	\$1,000	↑	↑	↑	↑	↑	3.25	60x20	10.1	12.0	300	●	●	●	●	●	2	236

Brand + Model	Overall Score	Price	Test Results					Features									
			Ergonomics	Construction	Ease of use	Exercise range	User safety	Motor (hp)	Belt (LxW, in.)	Maximum incline (%)	Maximum speed (mph)	Weight capacity (lb.)	Quick speed controls	Quick incline controls	Chest strap included	Heart rate control programs	Reading shelf

BUDGET FOLDING TREADMILLS *Continued*

✓ LifeSpan TR1200i	73	\$900	↑	↑	↑	↑	↓	2.50	53x20	9.6	11.0	300	•	•	•	•	2	224
Nautilus T614	71	\$900	↑	↓	↑	↑	↑	2.75	56x19	13.3	12.0	300	•	•	•	•	2	218
Horizon Fitness T101	69	\$600	↑	↑	↓	↑	↑	2.25	55x20	10.2	10.0	300	•	•	•	•	2	192
ProForm Power 995i	68	\$1,000	↑	↓	↑	↑	↓	3.00	60x20	14.7	12.0	350	•	•	•	•	2	NS ²
Xterra TRX2500	65	\$800	↑	↓	↑	↑	↑	2.25	55x20	11.1	10.0	300	•	•	•	•	2	227
Landice M1	50	\$900	↓	↓	↑	↓	↑	1.00	49x19	1.5	5.0	220	•	•	•	•	0	110
Weslo Cadence G 5.9i	47	\$300	↓	↓	↑	↑	↓	2.00	50x16	6.1	10.0	275	•	•	•	•	2	101 ¹

HOW WE TEST: **Overall Score** is based on the performance of the product in all our tests. **Ergonomics** evaluates how well the machine accommodates the needs of users and includes belt size, foot-rail design, and handgrip

design. **Construction** notes aspects that affect quality, such as the motor and related components, the running deck, and the results of our durability tests. **Ease of use** includes the ease of using the controls,

functions, and programs, and reading the display. **Exercise range** considers the aspects that provide an effective workout to users of various fitness levels, from beginners to very fit individuals. **User safety**

assesses operational safety and security, including stop-button size and location, safety-key operation, the possibility of striking the motor housing, and the security of the deck for folding models.

Recommended Fitness Trackers

Our top-rated fitness trackers can help you keep track of your daily steps, your heart rate, and more



85
OVERALL SCORE

Samsung Gear Fit2 Pro, \$150
Our top-rated model was very easy to use, somewhat accurate for counting steps, and excellent at measuring heart rate accuracy.



84
OVERALL SCORE

Garmin Forerunner 35, \$170
Excellent performance and an attractive price made this model a CR Best Buy. It's easy to use, and tracks steps and measures heart rate accurately.



76
OVERALL SCORE

Fitbit Charge 3, \$150
Overall, this model was somewhat easy to use, somewhat accurate for counting steps, and very good at measuring heart rate accuracy.



76
OVERALL SCORE

Samsung Galaxy Fit, \$80
This CR Best Buy boasts very good performance and a lower price. Unlike the Garmin—also a CR Best Buy—it does not have GPS tracking capability.

¹ Indicates net weight, not gross shipping weight. ² Not stated; the model's weight was not provided in any published material.

For a Lower-Impact Workout, Consider an Elliptical

Ellipticals mimic the motion of running but without the impact, and the moving handgrips and adjustable resistance allow you to create a full-body workout.

High-end models cost upward of \$2,000, but you can get a good machine for less than half that price. More expensive machines are often heavier and have a larger footprint. The number of features also tends to increase with the price of the machine.

● CHOOSING THE RIGHT ELLIPTICAL FOR YOU

Of course, cost isn't the only thing to consider before buying. Here's a checklist of important shopping points.

- **Try before you buy.** Even if you plan to buy a model online, we recommend that you try it out in person, if possible. You might notice a problem with the ergonomics that you can't detect by sight or user reviews alone—maybe your knees bump the framework or the machine just doesn't move to your liking.
- **Consider the size.** On average, ellipticals are about 6 feet long by 2.5 feet wide but can range in length from 50 to 84 inches. Keep in mind that during operation, the pedals may extend out beyond the length of the machine. You'll also be more elevated than you would on a treadmill, so make sure you have a space with a sufficiently high ceiling. We've measured step-up heights between 5 and 15 inches with pedals reaching up to 25 inches above the floor at the apex of the elliptical cycle. You'll also need a minimum of 20 inches of free space on at least one side and either the front or back for safety.
- **Attend to ergonomics.** Unlike a treadmill, which allows you to move free-form, an elliptical constrains you to its

movement. Note how comfortable you feel when using an elliptical. You should be able to maintain an upright posture when holding on to the moving handles. Handgrips should be easy to reach and not force your wrists into an awkward position. For most people, pedals should be as close together as possible. And the moving handgrips and fixed frame components should not interfere with your arms, shoulders, or knees.

- **Check the intensity settings.** All ellipticals have variable resistance. Make sure that the lowest resistance setting is easy to pedal and that it becomes challenging to pedal at about 75 percent of the highest setting. This will provide some room to grow. You should

feel a significant but incremental change whenever you increase or decrease the resistance. Some ellipticals come with an adjustable automated or manual incline.

- **Weigh high-tech features.** Ellipticals can have built in wireless connectivity and browsers, or Bluetooth that connects to an app on a mobile device. Some use USB drives to move workout data to a web-based tracking feature accessed via a laptop. Keep in mind that it's not all that easy to use a browser or an app while exercising.
- **Peruse the programs.** Exercise programs can make a workout more varied and less boring, which might get you on the machine more often. But don't pay for frills that you don't care about.
- **Insist on safety features.** Ellipticals are inherently dangerous for children, who could get pinched or trapped in the moving parts. People with children at home or as visitors should make sure the little ones can't access the machines (by locking the room) and employ safety features.



PHOTO: GETTY IMAGES

Brand + Model	Overall Score	Price	Test Results						Features + Specs					
			Ergonomics	Exercise range	Ease of use	Construction	Heart rate features	User safety	Chest strap included	Resistance levels	Incline levels	Magazine rack	Operational footprint (LxW, in.)	Shipping weight (lb.)
NO HEART RATE PROGRAMS														
Octane Fitness Q35X	68	\$2,000								20	1		77x25	232
ProForm Pro 16.9	68	\$1,500								26	41		80x28.75	NS ²
ProForm Pro 12.9	67	\$1,300								24	21		80.25x25	NS ²
NordicTrack SE9i	67	\$1,250								24	11		79x32	190
NordicTrack C12.9	65	\$1,300								24	41		70x28.75	NS ²
Octane Fitness Q37x	65	\$2,600								20	1		77x24	282
ProForm Endurance 720E	64	\$1,200								20	41		69x25.5	228
Horizon Fitness EX 59	63	\$650								10	1		73x22.5	183
NordicTrack C9.5	47	\$1,000								24	21		71x35	NS ²
HAS HEART RATE PROGRAMS														
Vision S7100	77	\$2,600								20	20		63.5x30	240
Sole E95S	76	\$2,200								20	1		84x31	309
Schwinn 470	74	\$900								25	11		70x28	187
Nautilus E616	71	\$1,000								25	11		71.5x27	194
BH S3Xi	71	\$1,800								24	1		63.5x45	270
LifeFitness E5 Go	71	\$4,300								20	1		85.5x34.25	293
Bowflex BXE116	68	\$1,500								25	15		77.5x31.25	263
True M30	64	\$2,050								25	1		70x30	304
Sole E55	61	\$1,500								20	20		74.5x30.5	240
Fitnex E70	60	\$2,000								16	1		87.25x30.25	220
Spirit Fitness XE395	60	\$1,800								20	41		75x24	235 ¹
BH S1Xi	59	\$1,000								23	1		71x27	166
Endurance E400	56	\$2,100								20	1		71x32	276

HOW WE TEST: Overall Score is based on the performance of the product in all our tests. **Ergonomics** evaluates how well the machine accommodates the needs of users and aspects of the pedaling motion. **Exercise range** considers

exercise intensity and measures incline and the effort to pedal the machine through the resistance level settings. **Ease of use** includes the ease of using the controls, functions, and programs, and reading the display. **Construction** notes

indications of good construction methods, design choices, and our perception of quality based on noise, feel, and ride. **Heart rate features** considers features such as heart rate sensor type and heart rate programs but does not

evaluate their performance. **User safety** assesses operational safety and security, including pinch points, nonslip materials, stability, and static loading strength.

¹Indicates net weight, not gross shipping weight. ²Not stated; the model's weight was not provided in any published material.



How to Keep Leftovers Safe

Use these easy steps to help ward off flavor loss and foodborne illness

ATTEND TO THE TEMPERATURE

To keep leftovers—and all the food in your refrigerator—safe, the temperature should be set at 37° F. Bacteria grow rapidly when food is between 40° F and 140° F, so cooked foods should sit out no longer than 2 hours. Bear in mind that it's 2 hours from the time you take it off the stove or out of the oven. So if you let chili or other cooked food cool down for half an hour before dinner, then leave it on the table for an hour while you serve and eat, be sure to get it into the fridge in the next half-hour.

USE THE RIGHT CONTAINERS

Refrigerating cooked food right away is a good idea, but if you just put a big pot of, say, stew in the fridge, the food might not cool all the way through within 2 hours. The better solution: Refrigerate cooked food in several small, shallow dishes. This allows the food to get into the safe zone faster. And keep in mind that even when food is safely in the fridge or freezer, its quality can degrade if it's exposed to moisture or oxygen. Keep it airtight: Think zip-top storage or freezer bags, or sealable containers.

DON'T DEFROST

Food thaws unevenly when it's left on the counter, so the outside of a dish could reach an unsafe temperature while the middle is still frozen. It's generally fine to put frozen leftovers straight into the oven or microwave. Just use a food thermometer to make sure reheated food reaches an internal temp of 165° F, according to the Department of Agriculture's Food Safety and Inspection Service. If you decide to thaw, do so in the refrigerator.

USE WITHIN 3 TO 4 DAYS

Leftovers are not likely to taste all that good after that, but more important, even in the fridge bacteria can grow. If you don't think you'll eat the dish again within four days, you can freeze it anytime during that window (although the sooner you freeze it, the better it will taste when you eat it). According to the USDA, leftovers should stay good in the freezer for three to four months. Be sure to label leftover containers with the date the food was made. You can write on a piece of masking tape.

WHEN IN DOUBT, THROW IT OUT

It's not just a catchy saying; it's good advice. And don't assume that your senses will tell you whether a food is safe to eat. True, if a food has spoiled, it may look or smell bad. But the kinds of bacteria that cause foodborne illness—such as salmonella and E. coli O157—won't change a food's taste, smell, or appearance.

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