



TrainSmarter

No Juice Before Age 1 Says New Advice from Pediatricians

There's new advice from the American Academy of Pediatrics (AAP). **The group revised its stance from no juice before 6 months old to no juice before one year old.** The AAP's new policy statement in Pediatrics also advises that **daily intake of juice be limited for kids one year and older, as follows:**

- 4 ounces (½ cup) for ages 1–3**
- 4 to 6 ounces (½ to ¾ cup) for ages 4–6**
- 8 ounces (1 cup) for ages 7–18**

The AAP also advises only buying 100% juice (not fruit drinks with added sugar). And, avoid offering juice in a bottle or sippy cup. Why the tough stance? Juice could interfere with infants consuming the milk or formula they need. **Juice also lacks the fiber of whole fruit, is easily overconsumed, can contribute to weight concerns and increases risk of tooth decay, particularly if sipped throughout the**

Parents Focus on Smartphones, Kids' Misbehaving Can Rise

Young children **whose parents interrupt family time by pulling out their smartphones or tablets appear more prone to misbehaviors, such as whining, sulking and tantrums.** Study author Brandon McDaniel coined the term "technoference" about five years ago when researching technology's intrusion into face-to-face interactions and relationships. "Do you like it when you feel snubbed by someone, when that person isn't validating or listening to you?" asked McDaniel. He's an assistant professor of human development and family science at Illinois State University. "It's the same thing with kids, but since they're not adults, the way they show it is probably by acting out a little more. **Most parents really love their children, but it's hard for a child to feel that if you're staring at your phone.**" Kids between ages 8 and 18 spend about 7.5 hours per day using a screen -- whether TV, computer, cellphone or another device -- for entertainment. The researchers asked parents about their use of smartphones, tablets, laptops and other technology, and how the devices disrupted family time. Technoference could include checking phone messages during meals, playtime or routine activities with their children. Parents were also asked to rate how problematic their device use was, based on how difficult they felt it was to resist checking messages and worrying about calls and texts. The study participants also reported how often their devices diverted their attention when otherwise engaged with their kids. About half of the parents said technology typically interrupted their parent-child time three or more times a day, with 24% reporting twice a day and 17% reporting once a day. Mothers perceived their phone use as more problematic than dads did. Regarding their children's behavior, parents answered questions about how often their children sulked, whined, became easily frustrated, threw tantrums or showed signs of restlessness and hyperactivity over the prior two months. The findings showed that **even low or seemingly "normal" amounts of technoference were associated with more behavioral problems in participants' children.** "It makes sense that if [technology] is interfering with parenting quality, children are going to react to worse parenting," McDaniel explained. He said **it's possible that parents may also "escape" into technology use when children misbehave.** "Children need parent-child interaction -- they are social animals."

Have You Tried This Healthy Swap For Rice?

Cauliflower is hot. The cruciferous vegetable that seemed to always take a back seat to broccoli is trending. One reason: the white veggie is a perfect stand-in for white rice, potatoes, and other carbs that many people overdo. **Instead of the 120-or-so calories in half a cup of cooked rice, you get just 20 calories. And, since we're talking vegetables, they come with 2 grams of fiber, 70% of a day's vitamin C, 15% of a day's vitamin K, 10% of a day's folate, and 7% of a day's potassium.** The trick is to chop (or grate) your head of cauliflower so finely that the pieces look almost as small as rice. Or you can lean on a company like Green Giant to do the work for you. Just open the freezer, pull out one of the Giant's four varieties of Riced Veggies, and sauté for five minutes. Talk about simple. The name—Cauliflower, Cauliflower & Sweet Potato, or Cauliflower & Broccoli—is also the ingredient list. And the Cauliflower Medley is just cauliflower plus green peas, onions, carrots, and green onions.

When Sports Injuries Lead to Arthritis in Joints

When a physically active person injures a joint, especially one as crucial as a knee or ankle, one of the first thoughts, if not the first thought, is likely to be “How fast can I get back to my usual activities?” That kind of thinking, however, could set the stage for a painful chronic problem years later: **post-traumatic osteoarthritis**. In the rush to get back in the game, whether as part of a team sport or simply a recreational activity like jogging or tennis, it is tempting to short-circuit the rehabilitation needed to allow the joint to heal fully. But **adequate recovery, including rehab measures aimed at strengthening structures that support the injured joint, is critical to maximize its stability, reduce the risk of reinjury and head off irreparable joint damage. And you don’t have to be a senior citizen to pay the price of failing to build up the tissues that help protect that joint. Studies have shown that when an adolescent or young adult sustains a knee injury, X-ray evidence of arthritis is often apparent within a decade. As a team of orthopedists and rehabilitation specialists from the University of Iowa explained, “Recent research suggests that acute joint damage that occurs at the time of an injury initiates a sequence of events that can lead to progressive articular surface damage.” That means deterioration of the surface of the bone itself and the connecting tissues that cushion and stabilize bones of a joint like the knee, which is what arthritis is all about.** Osteoarthritis afflicts some 27 million Americans, and that number will certainly grow with the increase in obesity, the current emphasis on lifelong physical activity and the aging of the population. It is a degenerative joint disease that occurs when the protective cartilage on the ends of bones and often the surface of the bones themselves wear down, causing pain, stiffness, instability and disability that can interfere with work and mobility and diminish quality of life. The Iowa team noted that **arthritis will eventually develop in more than 40% of people who seriously injure the ligaments (the stabilizing bands that connect bones to one another); the meniscus (the crescent-shaped cartilage that cushions the knee and certain other joints), or the articular surface of a joint. People with a history of trauma to the knee, for example, are three to six times more likely to develop arthritis in that knee. Even without an acute injury, highly repetitive impact on a joint can damage the articular cartilage.** This may help to explain why I ended up with bone-on-bone arthritis and had to replace both knees at age 63. I’d sustained three ligament injuries (while skiing) and after years of running and singles tennis, the meniscus in both knees had shredded. Although I did the recommended physical therapy after each injury, I now know that I was not sufficiently diligent about maintaining the strength and flexibility of the supporting muscles and other tissues that might have better protected my knees for years longer. Recognizing how common a scenario this is, a prestigious group of athletic trainers has issued a call for a more aggressive approach to both preventing and managing post-traumatic arthritis among physically active people. Although athletic trainers most often treat team players and elite athletes, they also work at physical therapy and rehab clinics where they often see joint damage among recreational athletes. They pointed out in a statement in the *Journal of Athletic Training* that **arthritis should no longer be considered a disease that affects only the elderly. “Increasing evidence demonstrates that young and middle-aged adults are suffering from osteoarthritis More than half of adults with symptomatic knee osteoarthritis are younger than 65.”** Joseph M. Hart, an athletic trainer who conducts clinical research at the University of Virginia, and his colleagues wrote, **“A 17-year-old athlete who tears her anterior cruciate ligament could develop osteoarthritis before she turns 30.”** Damage to this ligament, in the center of the knee, is the most common injury among young athletes, especially girls. Jeffrey B. Driban, an athletic trainer at Tufts Medical Center, said that one person in three who injures the anterior cruciate ligament “will have X-ray evidence of osteoarthritis within 10 years” whether or not the injury is repaired surgically. A person’s risk of injury can be reduced by having deficits in muscle strength, balance and stability evaluated and treated. However, he added, “not all injuries can be prevented, and **unless the initial injury is properly treated, it can lead to additional injuries to the same joint or other joints,**” increasing the chance that arthritis will develop early in life. Dr. Driban said that **sports participants who sustain a knee injury can minimize the risk of reinjury and arthritis by “not rushing back into activity or trying to play through pain. They must strengthen the muscles that support the joint – the quads, hamstrings and hip muscles. It’s important to think about the entire lower extremity, not just the knee.”** Following an injury, an athletic trainer, rehabilitation specialist or physical therapist who specializes in orthopedics can evaluate a person’s muscle strength, endurance, balance and movement quality, then guide recovery with a **structured rehab program that is maintained for six to nine months.** It is also important to continue to pursue an active lifestyle, said Abby C. Thomas of the University of North Carolina at Charlotte. **“You may have to modify the activities you do, but you have to stay active to maintain strength and cardiovascular fitness without putting repetitive stress on a joint that’s already injured. If your knee hurts and you can’t run, maybe get on a bike or swim,”** activities that place less stress on the knees. **“Don’t sit around on the couch because running hurts,”** Dr. Thomas said. **“Try walking, or something different, but don’t give up on physical activity.”** *Jane Brody NYT*



Knee Arthritis Has Doubled... And It's Not Because of Running

One of my pet topics on this blog has been the persistent myth that running will ruin your knees. In truth, as numerous studies over the years have suggested, **runners are no more likely, and perhaps even less likely, than comparable non-runners to develop osteoarthritis, the wear-and-tear form of arthritis, in their knees.**

Still, there's a widespread sense that osteoarthritis is getting more common, which is often blamed on the fact that people these days are heavier and live longer than they used to. Is that really true? That's what a new study from Dan Lieberman's group at Harvard University, published in the Proceedings of the National Academy of Sciences, sought to determine.

The methodology of the study was fascinating. One of the researchers traveled around the country to examine collections of old and new skeletons, looking for signs of "eburnation," which is a polished surface on the bones of the knee joint that occurs when the bones rub against each other because of the loss of cartilage associated with osteoarthritis.

In total, **he examined almost 2,500 skeletons from three distinct time periods:**

1 "Prehistoric" skeletons from archeological digs in Alaska, California, New Mexico, Kentucky, and Ohio, from hunter-gatherers and early farmers between 300 and 6,000 years ago. All of the people were at least 50 years old when they died.

2 Early industrial skeletons from Cleveland and St. Louis, from people who died between 1905 and 1940 and whose bodies were used for medical education and research.

3 Postindustrial skeletons from Albuquerque and Knoxville, from people who died between 1976 and 2015 and donated their bodies to medical research.

The results showed that knee osteoarthritis occurred with roughly similar frequency in the prehistoric and early industrial skeletons, but was much more common in the postindustrial skeletons.

Of course, that's exactly what you'd expect if you subscribe to the old-age-and-obesity theory. Fortunately, in many of the early industrial and postindustrial skeletons, age and body mass index (BMI) at death were recorded, which allowed the researchers include those factors in their analysis. The surprising result: **Even accounting for age and BMI, knee osteoarthritis was still roughly twice as common for people born after World War II than it was for people born before it.**

So if it's not obesity or age, what explains the apparent rise in osteoarthritis rates? This study can't answer that, but the researchers do float a few hypotheses in their discussion.

One possibility is that walking around on hard, paved surfaces all the time isn't good for our knees. In support of that possibility, they cite a 1982 paper in which sheep spent 2.5 years living either on concrete and tarmac or on wood chips and pastures. The sheep in the concrete jungle had noticeable changes in the cartilage and bone of their knee joints, and maybe we do too.

Another possibility is shoes—and they're not talking about trainers. They cite a 1998 study showing that **high-heeled shoes generate abnormally high forces on the knee joint, and note that, in their analysis, women were about 50% more likely to have knee osteoarthritis than men.**

But the biggest factor, they suspect, may be physical inactivity. Joints, like muscles, have a use-it-or-lose-it aspect. If you sit at a desk all day, you end up with thinner, lower-quality cartilage in your joints, and weakness in the muscles that would otherwise take some of the load off your joints. The problem, in other words, isn't too much running; it's not enough running.

In real life, of course, things are never that neat and tidy. As the authors are careful to point out, there's lots of work remaining to explore some of these hypotheses. And even if the theories are confirmed, the fact remains that some runners, despite doing everything "right," will still get osteoarthritis.

Still, the results are significant because they join a **growing body of evidence that argues against osteoarthritis as a wear-and-tear disease, in which your knee are delicate instruments that will wear out if you use them too much. Your knees were made to be used, and are healthiest when used regularly.** So use them! *Runner's World*

Getting It Straight— Improve Your Posture for Better Health

Sit up straight! This common request may have been how you first heard about posture, the way you hold your body.

Posture isn't just about how you look. How you position yourself can help or hurt your health over your lifetime. "Posture is not only about how well you sit, but how well you move and go about your daily life," says Dr. George Salem, an NIH-funded researcher at the University of Southern California who studies how movement affects health and quality of life. How you hold yourself when you're not moving—such as when you're sitting, standing, or sleeping—is called static posture. Dynamic posture is how you position your body while you're moving, like walking or bending over to pick something up. "It's important to consider both static and dynamic components of posture," Salem says. Posture can be affected by many things: your age, the situations you find yourself in, and your daily choices. For instance, children may have to adjust to carry heavy backpacks to school. Pregnant women move differently to accommodate growing babies. Your posture involves your musculoskeletal system. This includes your bones, muscles, joints, and other tissues that connect the parts of your body together. It's what provides form, support, stability, and movement to your body. How you hold yourself can either align or misalign your musculoskeletal system. Throughout life, this system must adapt to the type of work you do, the hobbies you enjoy, how you use electronic devices, injuries, and even the kind of shoes you wear. You may think that sitting with slumped shoulders or bending at your back instead of your knees sometimes won't hurt you. But small changes in how you hold yourself and move can add up over a lifetime. Years of slouching wears away at your spine to make it more fragile and prone to injury. Holding your body and moving in unhealthy ways often leads to neck, shoulder, and back pain.



In any 3-month period, about 1 in 4 adults in the U.S. has at least 1 day of back pain. Poor posture can also decrease your flexibility, how well your joints move, and your balance. It can impact your ability to do things for yourself and increase your risk for falls. Slumped posture can even make it more difficult to digest the food you eat and breathe comfortably. Some research suggests a link between posture and mental health as well. "Someone with depression may appear more closed in, curved, and tend to look down," says NIH physical therapist Dr. Cris Zampieri. "When people feel anxious, they may raise their shoulders." Scientists are now exploring the connections between posture and how we think and process information in the brain. Our bodies change as we age. These natural changes make it especially important for older adults to maintain good posture, strength, flexibility, and balance. "Older adults tend to adopt a progressively hunched posture," says Salem. "When shoulders continue to round forward over time, it creates excessive loading on the shoulder joint. This can create injury and limit the independence of older adults." An extremely hunched posture, or hyperkyphosis, affects up to two-thirds of senior women and half of senior men. This posture has been associated with back pain, weakness, and trouble breathing. It can also limit everyday activities, like brushing your hair and dressing yourself. "One way to improve your posture is to be aware of it in the first place," Zampieri says. "It's important to take a look at your posture before it becomes a problem. Yoga, tai chi, and other types of classes that focus on body awareness and mindfulness can help you learn to feel what's wrong in your own posture. They also help you connect your physical posture with your emotional state, offering benefits in both areas." Classes aren't the only way to improve your posture. "Be mindful of your posture and how you're moving. Think about lifting your head, pulling your shoulders back, and tightening your abdominal muscles in everyday situations." Be aware of repetitive postures, like regularly lifting heavy objects, and holding positions for a long time, like sitting at a computer all day at work. "If you spend a lot of time in front of a computer, make sure you have a good setup," says NIH physical therapist Dr. Jesse Matsubara. "It's important that your workstation fits you the best it can. You should also switch sitting positions often, take brief walks around the office, and gently stretch your muscles every so often to help relieve muscle tension." The foundation of good posture is having a body that can support it. This means having strong abdominal and back muscles, flexibility, and a balanced body over your life. Another way to improve posture is to lose weight, especially around your gut. More than 2 out of 3 Americans are either overweight or obese. Extra weight weakens your abdominal muscles, causes problems for your pelvis and spine, and contributes to low back pain. **NIH**



Vitamin B6 and B12 Supplements Associated With Cancer in Men

Energy. If you're not taking vitamin B12, forget about having energy. As The Dr. Oz Show has recommended, "End your energy crisis with Vitamin B12." The nice thing about sublingual pills is "you don't need a doctor, you don't need a prescription." And don't get me started on metabolism. If you want to "supercharge your metabolism and energy levels," Amazon can deliver you a tall bottle of B12 supplements by the end of the day. Your metabolic processes will be the envy of the neighborhood. ("Is Janice ... on something?" "Yes—B12!") These are the sort of vague marketing claims that have propelled the cobalt-based compounds sold as B12 into American hearts and minds and blood in ever-growing quantities. They are extrapolations from the fact that B12 deficiency causes anemia, and correcting that deficiency will alleviate symptoms of fatigue and weakness. But as the National Institutes of Health notes, "Vitamin B12 supplementation appears to have no beneficial effect on performance in the absence of a nutritional deficit." Nonetheless around 50% of people in the US take some form of "dietary supplement" product, and among the most common are B vitamins. Worse than just a harmless waste of money, this usage could be actively dangerous. In an issue of the Journal of Clinical Oncology, researchers reported that taking vitamin B6 and B12 supplements in high doses (like those sold in many stores) appears to triple or almost quadruple some people's risk of lung cancer. This is a heavy claim about a very common substance, so it's worth spending a minute on the methodology. Concerns about B-vitamin supplements and cancer have been percolating for years. They came up quietly in a large trial in Norway that concluded ten years ago. Starting in 1998, researchers assigned 6,837 people with heart disease to take either B vitamins or a placebo. The researchers then watched as people died and contracted diseases in ensuing years, and the vitamin group raised concerns. In 2009, the researchers reported in the Journal of the American Medical Association that taking high doses of vitamin B12 along with folic acid (vitamin B9) was associated with greater risk of cancer and all-cause mortality. The largest increase in cancer risk was in the lung. Still, the number of cases of lung cancer among these 6,837 Norwegians was relatively small so the actual risk was difficult to quantify. But it was big enough to catch the attention of Theodore Brasky and Emily White, researchers at the Fred Hutchinson Cancer Research Center in Seattle. White had been overseeing a cohort study that involved more than ten times as many people as the Norwegian trial, some 77,000 people across the state of Washington. The cohort is tracking their supplement intake as we speak, and it is also being followed for cancers by the National Cancer Registry. The Washington study was specifically designed to examine the roles of "dietary supplements"—compounds known as vitamins, minerals, and non-vitamin non-mineral compounds like ginseng—in cancer risk. This was an ideal setup to look at the relationship between B vitamins and cancer, and see if it was indeed worthy of concern. So Brasky and White, along with Chi-Ling Chen at National Taiwan University, broke down this population by B-vitamin use and looked at cancers. Unfortunately their findings were even more significant than the Norwegian trial. Lung-cancer risk among men who took 20 milligrams of B6 daily for years was twice that of men who didn't. Among people who smoke, the effect appeared to be synergistic, with B6 usage increasing risk threefold. The risk was even worse among smokers taking B12. Using more than 55 micrograms daily appeared to almost quadruple lung-cancer risk. There was no apparent risk among women—which is not to say it doesn't exist, only that it wasn't apparent. Why or how would B vitamins increase a person's risk of cancer? I asked Brasky what he thought was going on. B vitamins all contribute enzymes and coenzymes to a metabolic pathway that breaks down folate in order to make the bases that comprise DNA. The pathway also regulates the expression of genes. When we have too little of these B vitamins, this pathway can go wrong, leading to problems like incorporation of the wrong types of bases into DNA, which can cause breaks in the strands, and, in theory, lead to cancer. Deficiency can also mean genes that should be inhibited are no longer inhibited, also potentially meaning cancer. Sufficiency of certain vitamins is important in cancer prevention, but avoiding excess appears to be similarly important. Among smokers, who

are already exposed to carcinogens, the effect of taking anything that impairs these cellular processes could be even more likely to lead to cancer. The research team is quick to note that the doses of B vitamins in question are enormous. The U.S. Recommended Dietary Allowance for B6 is 1.7 milligrams per day, and for B12 it's 2.4 micrograms. The high-risk group in the study was taking around 20 times these amounts. That could seem nonsensical, except that these are the doses for sale at healthy-seeming places like Whole Foods and GNC. Many sellers offer daily 100-milligram B6 pills. B12 is available in doses of 5,000 micrograms.





Vitamin B6 and B12 Supplements Associated With Cancer in Men (cont'd)

I asked Brasky if his finding means that products like these should be more closely regulated—at least to require selling more reasonable doses, or to disclose risks, as is required for pharmaceuticals. Currently, supplements are absolved from this sort of requirement, or even to prove safety or efficacy before going to market. This is dictated by a 1994 law called the Dietary Supplement Health and Education Act (DSHEA). “The law was created by industry lobbying to keep the FDA away from regulation, so the industry self-regulates,” said Brasky. But he deferred and said he hoped this article wouldn’t be about regulation. “I don’t want to pick a fight with the vitamin industry for any reason.” So that falls to me. **There are legitimate and important uses for B-vitamin supplements, but the emerging evidence suggests we’re best to treat them more like pharmaceuticals than like panaceas to be shoveled into us in pursuit of energy, metabolic fortitude, “cardioprotection,” “bone wellness,” or whatever way in which we’d like to be better. The enduring theme in health is that more doesn’t mean better. What’s healthy for one person may be unhealthy for another. The fact of a product being sold without a prescription does not mean it is exempt, or that it’s good or even harmless. Any ingested bioactive substance will come with risks and benefits. The current law gives consumers no reason to expect that risks will be listed on the labels of these products, or that health claims are accurate. A product like a high-dose B6 and B12 supplement hits shelves, and only decades later do researchers begin to understand the long-term health effects, who might benefit from taking it, and who might be harmed.** *The Atlantic*

The Sleep-Weight Connection

We’re not sleeping as much as we used to. More than a third of adults report sleeping less than 7 hours a night. **We’re sleeping significantly less than we were 20 or 30 years ago. “It’s due to light, our gadgets, noise in the neighborhood, stress, people working two jobs,”** says Erin Hanlon, assistant professor in the department of medicine at the University of Chicago. “The list of reasons goes on and on.” New research is showing how too little sleep can affect our health, starting with our waistlines. **“Studies have consistently associated insufficient sleep with an increased risk of obesity,”** notes Hanlon. Researchers tracked more than 68,000 women in the Nurses’ Health Study from 1986 to 2002. **“We found that women who reported less sleep—5 or 6 hours—gained more weight than those who reported getting 7 or 8 hours of sleep,”** explained Sanjay Patel. Patel is the director of the Center for Sleep and Cardiovascular Outcomes Research at the University of Pittsburgh. **And women who slept no more than 5 hours a night were 28% more likely to gain at least 30 pounds over those 16 years than women who slept 7 hours a night. Women who slept 6 hours were 12% more likely to gain that much. “One explanation is that they’re eating more,”** Michael Grandner, director of the Sleep and Health Research Program at the University of Arizona College of Medicine. In the largest study done so far, “about 200 people were sleep deprived in a laboratory for 5 nights, to simulate a sleep-restricted workweek,” said Grandner. They were allowed only 4 hours in bed each night, “and they had unlimited access to food in the lab kitchen.” **After the 5 days, “the sleep restricted subjects [had] gained about 2 pounds,”** while the control group, which was allowed to sleep for up to 10 hours a night, gained virtually no weight. And it wasn’t because they ate more than the control group at breakfast or lunch. They ate more only at night, when the control group was asleep. **“It’s been shown over and over again that when you keep people up for extended periods of time, they start eating between 300 to 550 [extra] calories per day. What seems to be clear across studies is that people start craving energy-dense food.”** There’s a slight bump in calorie burning when you’re up at night **“but the amount of calories you start craving is much greater than energy needs.”** What’s driving that increased appetite? Hanlon randomly assigned 14 people to spend either 4½ or 8½ hours in bed for four nights each. On the fifth day, the people weren’t allowed to eat until 3 p.m. No matter how long they had slept, **“they ate about 2,000 calories—90% of their calorie needs—at that meal.”** But that didn’t stop them from eating more when they were given snacks in their rooms right after that meal. **“When they had normal sleep, they ate another 600 calories of snacks, but when they were experiencing short sleep, they ate another 1,000 calories,”** says Hanlon. Why? **Their levels of ghrelin (which boosts appetite) were higher, while their leptin (which curbs appetite) was blunted after short sleep. What’s more, endocannabinoid peaks were higher when people got less sleep. The endocannabinoid system helps regulate appetite. If the name sounds familiar, it’s because the cannabinoids in marijuana and the endocannabinoids our bodies make bind to the same receptors in the brain, fat cells, muscles, and elsewhere. “We know that marijuana causes people to eat when they’re not hungry, It engages the same feeding pathways that our endocannabinoids do.”** That could explain the 400 extra calories’ worth of snacks. **“Despite saying that they felt full, the short-sleepers had a stronger desire to eat, and they ate more,”** says Hanlon.



Can We Get All of Our Nutrients From Food?

You've probably come across this argument from nutrition gurus: Modern diets just don't have enough of the nutrients we need. But does the evidence support that? Are we doomed to be undernourished unless we pony up for nutritional supplements? There are two sides to this story, so let's first explore the evidence that modern diets are missing crucial nutrients. The Centers for Disease Control and Prevention collect vitamin- and mineral-deficiency data every few years, in rigorous detail. **Although several vitamin and mineral deficiencies are somewhat common, four stood out in the last CDC report: vitamin D, iodine, iron and polyunsaturated fatty acids. Public awareness of these nutrients varies, as vitamin D and omega-3 fatty acids have received substantial attention in the past few years.** One reason among many for the attention on vitamin D deficiency is that it's more common in darker-skinned people. However, recent research suggests that while African-Americans may average lower levels of measured vitamin D compared with Caucasians, both groups have similar levels of bioavailable vitamin D. Much research must be done to find out what actually constitutes deficiency in different people. Iron deficiency, a well-known issue for women with anemia, is also increasingly a problem in children, especially from lower-income groups. Iodine deficiency often comes up in the context of pregnant women, as iodine is crucial for fetal development. Polyunsaturated fats are more controversial. Foods are increasingly fortified with omega-3 fatty acids, and fish oil is among the most popular dietary supplements. We're also seeing innovative research on subclinical deficiencies that cause problems as we age. Much of this research, known as the "triage theory of aging," falls under the work of Bruce Ames at the University of California, Berkeley. His research shows some of the first examples of the body prioritizing nutrients for survival over longevity. **When the body isn't getting optimal nutrient levels, it may prioritize/triage functions essential to life (like keeping the brain and heart working) and deprioritize others that aren't. Seniors are especially prone to nutrient deficiencies. Seniors absorb vitamin B12 less efficiently and produce less vitamin D with sun exposure than younger adults. As you may have figured out, the most important deficiencies in the U.S. aren't a single list. They vary depending on who you are.** If you compare today's diets with those of a hundred years ago, three things stand out.

First, **the food categories we eat are much more homogenous. Wheat, corn and vegetable oils make up a huge portion of our diet**—the average American consumes over 130 pounds of wheat per year. These three foods (or food products, when it comes to high-fructose corn syrup, cottonseed oil, etc.) are rather low in vitamins and minerals, and lack potentially beneficial phytochemicals found in other plants.

Second, **we eat a lot more processed foods these days. The simple act of processing a food is not harmful, so pressing olive oil out of whole olives doesn't make it unhealthy. But when we grind certain foods down to a powder (like wheat flour) and make that a large portion of our diet, we take in a lot of "acellular carbohydrates".** (Basically, plants and animals have cells, which contain water, but when we eat dried, powdered grains, a lot of acellular carbohydrate enters the gut all at once, which may predispose some people to health issues.)

Finally, **the plants we eat (and the ones animals eat, which become our meat) grow in soil that's less mineral-rich than it used to be. And levels of selenium and magnesium can vary widely depending on modern farming practices and natural concentrations. Moreover, roughly half of Americans may be drinking tap water that is low in magnesium and/or calcium.** This may be important, given the potential for high-mineral water to help protect against cardiovascular disease.

So, Should We All Take Multivitamins?

Sometimes, when a pill is widely used and occasionally helpful, people joke around about "putting it in the water supply"—think statins, antidepressants and the like. Joking aside, those drugs can have clear side effects. Multivitamins, by contrast, are marketed as being safe, with few if any side effects widely publicized, so why aren't they used more often?

Well, it turns out **they have little to no effect on cancer or cardiovascular-disease mortality, according to the best evidence.** The reasons for this are complex, but a few are intuitive. For instance, just because a pill has 100% of the Recommended Dietary Allowance of vitamins and minerals doesn't mean the pill will help an individual, since RDAs are population-based estimates. And **when you add up the vitamins you get in those pills, plus what you get in your diet, bad things can happen.** For example, research has increasingly pointed to cancer risks from folic acid supplementation. So eating nutritious foods, rather than swallowing nutrient-filled pills, may be the safer way to avoid deficiency. This reasoning extends to fish oil supplements. While fish oil has mixed evidence for health benefits, fish tends to perform better than separated fish oil in a direct comparison. People generally focus on getting more and more omega-3 fatty acids, without knowing the biochemistry of why this issue came up in the first place.



Can We Get All of Our Nutrients From Food? (cont'd)

Omega-3s in the body often directly compete with omega-6s, with the latter typically being more inflammatory. **The ratio of the two is more important than the absolute level of omega-3s in the diet.** When you eat that salad doused in dressing, the dressing is likely to contain large amounts of omega-6s (such as from soybean or cottonseed oil) as well as a smaller amount of omega-3s. We already get a large amount of omega-6 from a variety of foods, including vegetable oils and meats, which can skew our body toward inflammation. **And attempting to balance out the ratio by consuming fish oil supplements is probably a bad idea, as fish oil has surprisingly little evidence for efficacy in disease prevention, plus supplemental fish oil can be prone to potentially harmful oxidation.**

What nutrients should we worry about the most? **Minerals do tend to be rather low in modern diets—not only because we don't drink hard water and we have lower-mineral soil than before, but also because minerals are pretty bulky.** To get 100% of the RDA for magnesium, you'd have to swallow a large pill, whereas you can get 100% of each of your B vitamins combined in a small pill. Because supplement companies want to make money, they will typically not market multi formulas that have a lot of minerals in them. And when minerals are included, they are often in forms that aren't well-absorbed, like magnesium oxide. **Speaking of B vitamins, they are, quite simply, overrated. Not that they don't play important protective roles against some diseases, but people tend to think B-vitamin pills and injections will magically solve "low energy" and other common complaints. This is generally not true, and simple measures such as getting more sleep and destressing will pay much higher dividends. That being said, it's important to get enough B vitamins if you're an athlete, and as such, you may have higher-than-average requirements. Fat-soluble vitamins (A, D, E and K), on the other hand, get very little attention but are enormously important and often deficient. Many people take these on an empty stomach, even though taking them with fat increases absorption levels from negligible to quite high. And while a variety of foods contain other vitamins and minerals, not many contain fat-soluble vitamins. While medical professionals tend to mention vitamins D and A quite often, many of them aren't even aware of the most underrated fat-soluble vitamin: K2. Completely different from the better-known K1, this vitamin is essential to preventing heart disease by reducing calcification of arteries (Shea & Holden 2012). And K2 is very low in diets because it occurs mainly in pastured dairy products and in natto, the Japanese fermented soybean that most Americans don't eat.**

Do We Really Need to Supplement?

The short answer is no. **People who have low levels of micronutrients almost always lack whole foods in their diets or have low-variety diets. And consuming single nutrients, such as individual antioxidants, is less likely to improve health than taking in a variety of phytochemicals through—you guessed it—real food (Liu 2004; Hart et al. 2012). Antioxidant supplements have even shown potential to harm health in many studies (Bjelakovic, Nikolova & Gluud 2014), which makes sense given that high levels of certain individual nutrients could throw a wrench in normal biochemical pathways. What's more, supplements sometimes harm people because of simple manufacturing errors, as happened when selenium supplements contained 200 times the amount listed on the labels. That being said, can you get enough micronutrients through diet alone, and if so, how? First of all, remember there are no superfoods, but there are staple foods high in nutrients. Many fruits and vegetables are high in vitamins, and animal products (plus nuts and legumes) are often rich in certain minerals. Moreover, some foods are especially high in certain nutrients, making them useful if you find you are low in a nutrient. For example, shellfish is often quite high in minerals, eggs are rich in fat-soluble vitamins, leafy greens are rich in vitamin K and other nutrients, and liver is an overall nutritional powerhouse (that happens to be considered unpalatable to younger people, but doesn't have to be if cooked properly). Even though thousands of studies have explored the health impact of nutrients, we're unsure about the exact effects because randomized trials typically last only a few months or a couple of years. But we can draw insight from one last example: indigenous cultures around the world. People in many of these cultures enjoy fairly long lifespans (even without health care and with occasional food shortages), and nutrient measures tend to be mostly adequate even though the people literally never take supplements.**

The bottom line: Getting meganutrition through pills is probably less important than avoiding processed and unhealthy foods. You don't have to jam-pack your diet with exotic berries high in antioxidants and eat nothing but power smoothies. Focus on getting a variety of foods, as your omnivorous ancestors did, and keep intake of junk foods low. Though modern foods and diets may not be quite as nutritious as in centuries past, we are much more likely to get enough food each day, and we have the luxury of choosing what we eat. Take advantage of that. *IDEAFit*

Here's Why a Soda With That Burger Is Especially Fattening

Combining a sugary soda with your burger or fried chicken can really prime your body to pack on more pounds. **Folks who had a sweetened drink with a high-protein meal stored more unused fat, compared to others who ate the same food with a sugar-free beverage. Their bodies did not burn about a third of the additional calories provided by the sugary drink. The participants also burned less fat from their food, and it took less energy overall to digest the meal.** "If we are adding extra carbohydrates on top of what's already in a meal, that will definitely have an effect on the body being able to use fat as an energy source, and it will more than likely go into energy storage," said lead researcher Shanon Casperson. She's a research biologist with the U.S. Department of Agriculture. **Sodas, sweetened coffee and iced tea drinks, fruit drinks, energy beverages and the like are leading sources of added sugar in the American diet,** according to the U.S. Centers for Disease Control and Prevention. Six in 10 kids and half of adults drink at least one sugary beverage each day. Food contains three major types of nutrients -- carbohydrates, fats and protein. Casperson and her team wanted to see how extra carbs in the form of a sugary drink would affect metabolism of fats and proteins. For the study, 27 healthy-weight adults were placed in a sealed "metabolic room" that carefully tracked how much oxygen was inhaled and carbon dioxide was exhaled, Casperson said. Urine samples were also collected. "With those three variables, we are able to calculate the amount of nutrients they use" as well as the calories they burn every minute, Casperson said. Participants spent two full days in the sealed room. On one day they ate two meals containing 15% protein, and on the other they ate two meals with 30% protein. The meals consisted of bread, ham, cheese, potatoes and butter, and each provided 17 grams of fat and 500 calories. Each day, the participants had a sugary cherry-flavored drink with one meal and a sugar-free cherry drink with the other meal. **The sugar-sweetened drink decreased fat oxidation -- the process that kick-starts the breakdown of fat molecules -- by 8%. Also, the sweetened drink consumed with a 15% protein meal decreased fat oxidation by an average 7.2 grams, while the same sugary drink with a 30% protein meal decreased fat oxidation by 12.6 grams. The researchers think the extra load of carbohydrates in a soda might reduce the body's need to process dietary fat for energy, since fat is more difficult to burn than sugar.** "It's easier for the body to use carbohydrates as an energy source," Casperson said. "When you provide the body with carbohydrates, it's going to use that first." Unburned fat then winds up deposited somewhere in a person's body, such as the belly or hips.

The study provides much-needed nuance to the understanding of fast-food nutrition, said Erika Renick. She's a bariatric dietitian with the Comprehensive Weight Loss Center at Staten Island University Hospital in New York City.

"While this was a small sample size, the study backs up what recent research has been pointing to -- that **adding protein to meals helps to keep us full and that sugary drinks can influence our food cravings,**" Renick said.

"However, this study takes it a step further by suggesting that **pairing sugar-sweetened drinks with protein-rich meals can encourage weight gain more than we originally understood,**" Renick continued.

"This specific combination seems to decrease how well our bodies burn fat," she said. "More research would need to be done, but steering people away from this combination could potentially be another tool when counseling people on weight management."

Casperson isn't sure why adding extra protein to a meal seemed to affect the reduction in fat burning. "That's something we need to look at in future research," she said. *medlineplus.gov*



Asparagus, Quinoa and Goat Cheese Frittata

¼ cup quinoa, rinsed and drained
 7 large eggs
 ¼ cup whole or 2 percent milk
 2 Tbsp. grated Parmesan
 ½ tsp. kosher salt
 ½ tsp. ground black pepper
 1½ Tbsp. olive oil
 ½ pound asparagus, trimmed and cut into ½" pieces
 1 shallot, peeled and sliced into half moons
 6 packed cups (9 ounces) baby spinach
 2 ounces herb-and-garlic goat cheese



Preheat oven to 425°. In a small saucepan, bring ½ cup water to a boil. Stir in quinoa, cover, and cook over low heat until water is absorbed and quinoa is tender, about 10 minutes. Let cool. (You'll have ½ cup cooked quinoa.)

In a large bowl, whisk together eggs, milk, Parmesan, salt, and pepper until combined. Whisk in cooked quinoa and set aside.

In a 10" nonstick, ovenproof skillet, heat olive oil over medium heat. Add asparagus and shallot and cook 5 minutes. Add spinach and cover for 2 minutes. Uncover and stir until spinach has completely wilted, about 2 minutes.

Pour egg mixture over vegetables and stir gently with a wooden spoon for 1 minute. Cover and cook 3 minutes more. Uncover and scatter goat cheese over top.

Place skillet in oven until eggs are cooked through, about 10 minutes. Slide frittata onto a platter and allow to cool for a few minutes. Serve warm or at room temperature.. oprah.com

Use This Cooking Hack to Reduce Arsenic Levels in Your Rice

Worried about arsenic in your rice? According to an experiment on the BBC show *Trust Me, I'm a Doctor*, **soaking rice overnight and cooking it with extra water can reduce levels of the carcinogen by up to 82%**. Experts say this cooking method is a simple way to limit exposure to arsenic, which may be especially dangerous for pregnant women, children, and anyone who eats a lot of rice. **Arsenic is a naturally occurring element that's present in soil and can make its way into drinking water, wine, and food crops. Because of the way it's grown, rice has levels of arsenic 10 times higher than any other dietary staple, says Andy Meharg, PhD, a professor of molecular biosciences at Queens University in Belfast, Northern Ireland. A 2014 Consumer Reports study detected arsenic in every one of the 233 samples of rice and rice-based products tested. It also found that people who ate a serving of rice had 44% higher levels of arsenic in their urine than those who hadn't. One form of the element, inorganic arsenic, has been linked to cancer and other health problems in humans.** *Trust Me, I'm a Doctor* invited Meharg, who's been researching arsenic in food for years, onto the show. Meharg and host Michael Mosley found that **when they cooked one part rice with five parts water, only 43% of the arsenic originally detected in the rice remained. And when they soaked the rice overnight and then used the 1:5 cooking method, only 18% remained.** Soaking rice opens up the grain's structure, and allows arsenic, which is water soluble, to permeate into the liquid. **Arsenic also escapes into water while cooking, but if all of the water evaporates (as it does during the usual methods of cooking rice), the arsenic is absorbed back into the grains. After you soak the rice, it's important to drain and rinse the grains thoroughly with fresh water and to cook them with fresh (and arsenic-free) water. Then, cook until tender—making sure the rice doesn't boil dry—and rinse one last time with hot water before serving. Meharg has found that basmati rice tends to contain less arsenic than other types, and brown rice tends to contain more. And because arsenic occurs naturally, buying organic doesn't generally help. Arsenic can also be found in rice milk, rice cakes, and rice crackers, at even higher levels than cooked rice.** The World Health Organization and the United States Food and Drug Administration have concluded that **people who consume high amounts of rice have reason to be concerned.** "In any case, if you can reduce exposure to a known carcinogen, you should," Meharg told Health.com via email. "This is just common sense."

Exposure is particularly concerning for pregnant women and young kids, he adds, because even small amounts of arsenic have been associated with lower IQ and impaired development in children.