

The Dorito Effect — The Surprising Truth About Food and Flavor

Story at-a-glance

- Animals instinctively select the foods they need to correct nutrient deficiencies based on flavor feedback; humans are equipped with similar chemical-sensing ability, which is being hijacked by artificially flavored foods
- Flavor experience takes up more gray matter than any other sensory experience, and the largest portion of the human genome involves the creation of your nose. So, from an evolutionary perspective, this chemical-sensing ability appears particularly important
- Flavor is a marker for the nutritional density of the food. Artificial flavor technology has allowed for the radical deterioration of food quality, as you can easily mask the flavor of inferior quality ingredients with chemicals
- Using flavored chemicals, you can now produce food that have virtually no nutritional value, yet the great taste and aroma fool consumers into thinking they're eating something wholesome
- Artificial flavors encourage obesity as they entice you to eat food you normally would not want to eat, and eat more than you normally would

By Dr. Mercola

In his book "[The Dorito Effect: The Surprising New Truth About Food and Flavor](#)," award-winning journalist and author, Mark Schatzker, investigates the introduction of flavor into the industrialized food supply. An investigative journalist by profession, Schatzker's curiosity about flavor led him to eventually write two books addressing this issue. The first, "[Steak: One Man's Search for the World's Tastiest Piece of Beef](#)" was, as the title implies, about steak.

"I got deep into the science of flavor [and] the science of how we perceive flavor. But I also [asked a] question that we rarely ask, which is 'Why does food have flavor?' We think it's all very simple. We take for granted of the fact that apples taste like apples and steak tastes like steak. But then when you start to get inside it, it becomes very interesting," he says.

"I would visit a ranch and there would be a field of pregnant cows and a field of steers. The rancher would say, 'Oh, the pregnant cows are in a field of clover because they need a lot of protein [when] they're pregnant.' Cows don't even know what protein is, so how does a cow know what to eat?

The answer is flavor feedback. They seek out the flavors that bring their bodies what they need. It's something we are certainly very alienated from ... We tend to think there's an inverse relationship between health and deliciousness. I set out to do that steak book thinking, 'It might be that the best steak I find is awful for the cow [and] horrible for the planet; it's like a heart attack on a plate.'

What I found, oddly, was that the most delicious steak was the best for the planet, nicest for the cow and the best for me. I thought, 'This is not what I expected. This is not what we were taught to expect. Is there something going on here?' ... [I]n nature ... delicious flavors guide animals to the foods they need. So, I asked what is a simple question with a very complex answer, which is, 'Does it work that way for humans?'"

The History of the Dorito

The story of the Dorito starts with the late Archibald Clark West, a marketing executive who, in the 1950s, worked on the Jell-O Pudding account. In 1960, the Frito company offered him the position of

vice president of sales and marketing. (Shortly thereafter, Frito merged with the Lay's chip company to become Frito-Lay.) A chance stop at a Mexican food shack on the way back home from a visit with Lawrence Frank, the inventor of Lawry's seasoned salt, exposed West to the tortilla chip.

"He thought, 'This is going to be the next big thing for Frito-Lay' ... He presented his idea to his fellow executives. They just sort of looked at him like he's a little funny because they thought, 'Why would we want to make tortilla chips when we already make Fritos, which are kind of the same thing? ... But West was so confident in his idea that he actually funneled discretionary funds to an off-site facility to develop this concept.

He gave them a name, which, in a very bastardized Spanish, means 'little pieces of gold.' He brought it back to his fellow executives. He passed out samples of tortilla chips and said, 'Gentlemen, I give you Doritos.' I know what you're thinking. You're thinking, 'OK. This is when the world changed. This is where junk food was forever junkier and more addictive.'

But in fact, that's not what happened, because the Doritos that first went to market ... were just ... salted tortilla chips. People in the Southwest ... where there was a Hispanic cultural influence, knew that you could dip them in salsa and so forth. But the rest of the country didn't really get it. The main complaint was that the snack sounds Mexican, [but] it doesn't taste Mexican."

The Dorito Effect

Undeterred, West had another epiphany: "Let's make them taste like taco." Up until that time, foods had their own intrinsic flavors and that was that. If you wanted the taste of [raspberry](#) or [pineapple](#), you had to use real raspberries and real pineapple. But some speculate that West's friendship with Lawrence Frank (the inventor of Lawry's seasoned salt) gave him the insight that you could alter flavors through the use of chemicals.

"You could make whatever you wanted taste like whatever you wanted it to taste like. You could literally buy flavored chemicals and put a dusting on a triangular piece of fried cornmeal and, voila! It wouldn't taste exactly like a taco, but it would have that depth, that tang, that zest. Frito-Lay then brought out taco-flavored Doritos, and that changed everything.

Let's think about that for a second. We're talking about a high-fat, high-carb, high-salt snack that America basically wasn't interested in. With the addition of flavored chemicals, it turned into a snack people could not stop eating. Let's also think about this: Prior to taco-flavored Doritos, when people ate tortilla chips, they would dip them in things that are good for you, things like a bean dip or salsa made with tomatoes, made with hot peppers.

Now you didn't need that. Now you could just dust on the flavorings and they tasted good on their own. This, to me, is a very important moment in the history of our food culture, because it's when we mastered flavor. Up until that point, roughly speaking, flavor had been the domain of Mother Nature. Now, it was up to, literally, the folks who worked in marketing."

Artificial Flavor Technology Allowed for Massive Deterioration of Natural Food Quality

This [flavor technology](#) is ultimately what allowed for the radical deterioration of food quality, as you not only can easily mask the flavor of inferior quality ingredients, but impose a flavor that has no business being there — making foods taste like something that they are not, and literally imbue nutritionally empty foods with the "sheen" of nutrition.

This is important for [processed foods](#) manufacturers because, as modern agricultural methods have taken a toll on soil health, food has gotten increasingly bland, as the natural flavor and aroma of food is actually tied to its nutrient content. In other words, flavor is a marker for the nutritional density of the food.

Using flavored chemicals, you can now produce food that has virtually no nutritional value, or even negative nutritional value, yet the great taste and aroma fool consumers into thinking they're eating something wholesome. As noted by Schatzker:

"There's been a change in quality. When old-timers complain that food doesn't taste like it used to, it's not because they're [remembering] the past through rose-tinted lenses, it's because food really doesn't taste the way it used to. We have this ongoing debate in our culture about the importance of eating right. We tell people you need to eat more fruits and vegetables, you need to eat more whole foods, but what have we done?"

We've made those whole foods blander, less delicious than ever, and we've made the processed foods more delicious than ever. This book is an attempt to understand what's gone wrong with food through the lens of flavor. We think we understand carbs and protein and vitamins, but what we all seek in every meal is flavor, and there's been a huge change in the way food tastes."

The Evolutionary Imperative of Taste and Smell

We think we experience the aroma of food when we smell it, but it's actually a bit more complex than that. When you bite into the food, the aroma goes into the back of your throat and through a small hole up into your nose. This is called retronasal olfaction, and is actually a more powerful form of smelling than normal smelling. This is what allows you to experience the richness and nuance of food.

Brain scans reveal the experience of flavor takes up more gray matter than any other sensory experience. Additionally, the largest portion of the human genome involves the creation of your nose. So, from an evolutionary perspective, this chemical-sensing ability appears to be particularly important.

Experiments by Utah State University scientist Fred Provenza proved that animals use flavors to obtain required nutrients, and it appears the same applies to humans, and that this is why this incredible chemical-sensing apparatus exists.

"For millions of years, it worked perfectly. It helped us balance our nutrition so that we could find the foods we need, get what we needed and not eat to excess," Schatzker says. "That all changed in the mid-1950s. The first gas chromatograph went on sale. What's important to remember is that before that, scientists had absolutely no idea where flavor came from. They knew a lot at this point about things like the macronutrients, protein, carbs and fat."

They knew a lot about vitamins. But flavor was a mystery, [in large part because] flavors exist in such minute amounts — we're talking parts per million, parts per billion ... With the gas chromatograph, you could take a piece of food and literally turn it into a gas. You volatilize it and send the gas through this big coil. The coil separates every compound out.

Out the other end comes each flavor chemical, and then they would analyze it. It didn't take long for them to analyze the flavors in things like fried chicken, tacos, tomatoes or cherries. Then they started making [the flavors] in flavor factories. They started putting them in foods ... Junk food is high-calorie, nutritionally empty food, that is true. But here's the thing; we wouldn't eat that stuff if not for the flavor. That's what was added to make it irresistible."

The 'Natural Flavors' Scam

As the Center for Public Integrity points out, industries can basically decide for themselves what is safe for you to eat. Of the 10,000 [food additives](#) on the market, 95 to 99 percent have never been tested for safety when consumed in isolation, let alone been tested for synergistic toxicity that can occur when you combine several of them together. People have gotten savvier about this in recent years, and many are now trying to avoid artificial flavors and colors. Yet the food industry is still tricking most of us.

If you read food labels, you've likely seen the inclusion of "natural flavors." If this has led you to believe they were different from and healthier than artificial flavors, you've been soundly deceived. Originally, "natural flavors" referred to things like spices and spice extracts — flavors obtained through natural means. This changed when consumers began rejecting foods containing "artificial flavors." Schatzker explains:

"When consumers started getting frightened by the word 'artificial,' the flavor companies began to make the very same flavored chemicals using natural means ... It's the same flavored chemicals, made through fermentation or evaporation, for example, and not through more chemically complex ways. The bottom line is, it's the same stuff ... There is nothing more wholesome or more natural about these so-called 'natural' flavorings.

In fact, you could argue the artificial ones are better because they're purer. When they make these natural flavorings, they don't have full control over what they're getting in. They take these chemical extracts and they don't know exactly what's in there. The problem is you have mothers looking at things like yogurt tubes and granola bars; they see this word 'natural flavoring' or they see 'no artificial coloring or flavoring,' and they're being totally hoodwinked."

How Artificially Flavored Foods Are Driving the Obesity Epidemic

[Most people eat too much](#) these days, and more than two-thirds of Americans are either overweight or [obese](#) as a result. Processed, artificially flavored foods have a lot to do with this, as these chemicals make you eat food you normally would not want to eat, and eat more than you normally would. Remarkably, even whole foods like chicken and pork are now getting flavor enhancements, as the real thing has gotten so bland.

Again, this loss of flavor is a direct result of the way the animals are being raised. "We raise our livestock so quickly and so cheaply that it tastes like cardboard," Schatzker says. "So, it's not just Doritos and soda. It's everything. We might think we're making a healthy choice but, really, we're being fooled in the same way."

On a side note, there are even flavorings in cigarettes, and the reason they're there is because it would make teenagers like them more. "That's a testament to its effectiveness — getting consumers to do things they wouldn't ordinarily be inclined to do," he says.

Breeding Flavor Back Into Food

Unfortunately, while the junk food industry has top-notch flavor experts working for them, many fruit and vegetable producers fail to give any attention to flavor at all. Not only is this hurting the sales of whole foods, but more importantly, as mentioned earlier, flavor is a marker of nutritional density. While poor soil quality plays a significant role, plant breeding has also contributed to the blandness of many foods.

Take the tomato for example. Many older people will tell you today's tomatoes taste nothing like they used to. Schatzker spent time interviewing Harry Klee, Ph.D., a horticultural science professor at the

University of Florida, who since the early 1990s has been trying to crack the mystery of what happened to tomatoes.

"The truth is we've genetically damaged tomatoes," Schatzker says. "They have literally forgotten how to be flavorful, because for so many years, we've been breeding tomatoes to produce a big crop, to have a long shelf-life, to be disease-resistant. It's amazing how much more productive tomato plants are than they were, say, 100 years ago. They're more than 10 times as productive. But we've paid for it in flavor ... [I]f you don't select flavor, you lose flavor ..."

Knowing what we've done means we can take steps to undo the damage ... [Klee] found is that there are about 26 flavor compounds in tomatoes that really drive the experience of liking them ... So, he thought, 'If I can figure out how the tomato makes each one of those, I can target it and I can breed for it. By ordinary, classic breeding, I can target those flavor pathways.'

What he found is that each of those 26 flavors is synthesized from an essential nutrient. This basically means that the flavor of a tomato is like a big chemical sign telling your brain there's good stuff in here. This is why we have noses. This is why we have this chemical sensing apparatus, because it leads us to the nutrients we need.

When you start to fix the flavor problem in the tomato, you improve the nutrition and you improve the chemical representation of that tomato, so that when you bite into it you go, 'Yes. That's a great tomato' ... Klee has created a modern tomato that has the flavor of an heirloom, but it still has the yield and the disease resistance. It's not GMO. It's just a classically bred tomato. It really is the best of both worlds ...

It works so beautifully in whole foods. But when you create a tomato flavoring in a factory and you put it on a potato chip or you put it in a sugary tomato sauce, you're creating this experience of tomato, but you're not delivering the nutrition. That, I think, is a really elegant illustration of just how things have gone off the rails."

You Can Trust Your Intuition When Eating Real Food

Your body was designed to identify the best foods for you in any given moment. The call of certain foods is really difficult to ignore. However, problems arise when your body is being tricked into craving foods that don't contain the nutrients promised by their smell and taste. The system does work, however, if you eat real food.

"My advice to people is to eat the most delicious food you can, but buy real foods," Schatzker says. "Don't be frightened of calories. Don't be frightened of food ... The other thing I'd like to tell people is be aware of your own eating experience ... I think there are two different kinds of delicious.

There's a delicious where you can't stop eating. This is what happens to me with flavored potato chips or Doritos. You have one and you just can't resist putting your hand back in the bag ... These are experiences to be avoided ...

Then there are other foods — dark chocolate is a great example; a great tomato is a really good example — where the point isn't to stuff as much into your mouth as fast as you can. The point is to sit in a kind of deep contemplation of this incredible flavor experience. That, to me, is a better kind of food experience to have. I don't think it's one that you need to be afraid of. I think it's one that will give back.

Also, be aware of how you feel after a meal. Try to integrate that into your perception of food. I've eaten some pretty low-end fried chicken that had that manic I-can't-stop-eating [sensation], and an

hour later I felt dreadful. If you can remember that feeling, it makes you less inclined to go after that [unhealthy food] again in the future."

As discussed in many other articles, fruits and vegetables grown in healthy soils without toxic chemicals are a flavor sensation that is hard to beat. It certainly cannot be replicated with chemicals. Fortunately, Schatzker assures us horticultural scientists are now working on breeding flavor — and hence nutrients — back into a several foods, including strawberries and sweet corn.

While it may take time, there's certainly hope for the future. We just have to keep our eye on the goal, which is to bring real food back into the lives of everyone. To learn more about the impact food additives have on our food selections and health, be sure to pick up a copy of Schatzker's book, "[The Dorito Effect: The Surprising New Truth About Food and Flavor.](#)"

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