Dr. Kessler, how has the average American’s weight changed in the U.S. over the last 20 or 30 years?

In the past, our weight remained relatively stable over our adult life. We gained a few pounds between ages 20 and 40. It leveled off by age 50 or 60, and then maybe we lost a few pounds in our elder years, but it did not vary that much. Over the last decade, we are entering our adulthood significantly bigger; often obesity is occurring in childhood and adolescence. Also, adult weight continues to rise, and doesn’t plateau until much later. So there are significant changes in our weight over the last 20 to 30 years. A new study recently showed an obesity increase in every one of our states.

Isn’t this also happening in the other nations in the world that adopt our modern American diet?

That’s correct. We set the example in the U.S., in many instances. We were a leader in the decrease in smoking. For that we were ahead of the curve, but we’re also, regrettably, showing the world how to gain weight.

In your new book, The End of Overeating, you talk about how sugar, fat, and salt stimulate appetite and prompt us to eat more. Can you explain how food has changed in recent years, especially in restaurants and fast food chains?

Fat, sugar, and salt are increasingly being loaded and layered into our food. The business plan for modern American food companies is for them to take fat, sugar, and salt, put it on every corner, and make it available 24/7. So it’s virtually acceptable to eat any time. We’ve made food into entertainment.

What do you mean by “loading and layering?”

Sugar, fat and salt are either loaded into a core ingredient (such as meat, vegetable, potato, or bread), layered on top of it, or both. Deep-fried tortilla chips are an example of loading; the fat is contained in the chip itself. When a potato is smothered in cheese, sour cream, and sauce, that’s layering. Take Buffalo wings: you start with the fatty part of the chicken, which gets deep-fried. Usually they are fried at the production plant, and then fried again at the restaurant, which essentially doubles the fat. Then they’re covered in sauce and served with a creamy dip that’s often heavily salted. That gives us sugar on salt on fat on fat. With potato skins, the potato is hollowed out and the skin is fried, which provides a substantial surface area for fat pickup. Then some combination of bacon bits, sour cream, and cheese is added. The result is fat on fat on fat, much of it loaded with salt.

Sometimes you can look at food and you can tell it’s full of fat and salt. The joke in the food industry is “When in doubt, add bacon and cheese to it.” But sometimes you can’t see it. Grilled chicken is often bathed in this sugar/fat syrup that you can’t see. It’s mixed in deep; the meat is sometimes injected with fluids that contain fats and sugars, so that our foods are increasingly being loaded.

You’ve written that chain restaurants, not just fast food places, are not doing as much real cooking anymore, but are more like construction sites.

Exactly. In many cases, the preparation of the dish begins in the factory, where the meat is processed, battered, fried and
frozen. Like many processed meats, chicken can contain as much as 19% of a water/sugar based solution, and salt is added as well. More salt and other spices are added before the battered chicken is prebrowned in oil and frozen. At the restaurants, the meat is deep-fried in oil again before it's served.

Many people feel that they’re at fault when they’re overweight, thinking it’s just poor willpower. But you make it clear in your book that it’s actually due to the food industry stacking the deck against us.

We now have the science to show that a person who has a hard time controlling their eating—who’s thinking about food all the time and who has a hard time stopping eating—their brain is being excessively activated. When we study people who have certain symptoms—loss of control in the face of high-calorie foods, lack of feeling full, this preoccupation with food—we call this **conditioned hyper-eating**.

The first phase is anticipation. You’re not even given the food yet, but just the thought, the smell, the sight of it—you see excessive activation in the reward pathways of the brain in the amygdala area. Then when they eat the food, that activation continues. The brain pathways stay activated until all the food is gone. So we now know it’s not a question of willpower. In fact, the brains of millions of Americans are literally being hijacked by fat, sugar, and salt!

Don’t they actually use exhaust fans to pump the food smells out into the air at the fast food places?

David Kessler, MD served as commissioner of the US Food and Drug Administration (FDA) under George Bush Sr. and Bill Clinton. He is a pediatrician and has been dean of the medical schools at Yale and the University of California, San Francisco. He lives in Northern California with his family.

Yes, because scent is a cue; it certainly stimulates you. I landed in San Francisco airport, and I started thinking about Chinese dumplings, even as the plane landed on the taxiway. Why? Because there was a place I had been at the food court that had these dumplings that I love. We’re very effective learners. So we need to understand how the cycle of consumption works: we get cued; our brains get activated; we get aroused; our attention gets focused; our attention gets locked in; we consume. It’s a momentary pleasure, but it’s ephemeral. We get cued again every time we reach for and eat foods. It’s going straight into the neural circuits. We’ll do it again and again.

*One phrase in your book really made an impression: you refer to certain foods as “fat bombs.”*

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Fat bomb was an expression used by someone in the food industry who designs foods. Chicken tenders are so loaded with batter and fat that my source in the food industry jokes that they’re UFOs—unidentified fried objects. But I’m not the food curate. You want to eat a hamburger, I’m not going to object. It’s when that 500 calories turns into a whole day’s worth of calories, that’s where the problem is. One of the signature hamburgers at Hardee’s is called the Monster Thickburger, which famously contains 1,420 calories and 108 grams of fat. It’s little more than fat on fat on salt on fat on salt on fat, all on a refined carbohydrate bun.

 Isn’t one of the biggest problems that we’re just eating too much at once?

Certainly. Researchers compared serving sizes at restaurants in Paris and Philadelphia and found that American portions averaged 25% larger. That held true both in chain restaurants, bistros, Chinese restaurants, and ice cream parlors. When I was trying to lose weight, I went to a food coach. She asked me what I ate. I told her I thought I had a relatively healthy diet. I told her what I ate, and she said, “Did you know you ate the equivalent of two meals in that one dinner?” Here I was, a physician, and I regulated foods at the Food and Drug Administration. She said, “You ate 12 ounces of protein in that meal.” I didn’t even really know what 12 ounces of protein looked like. I now eat half as much as I used to eat.

 So even though you’re a medical professional, you still got caught off guard.

Exactly! The business plan of the modern American food company is to put their product on every corner, make it emotionally irresistible, make it entertaining, and make it socially acceptable to eat at any time. In fact, it’s a food carnival. Who wouldn’t want to get on the ride? We published this article called “Deconstructing the Vanilla Milkshake.” What do you think it is in the vanilla milkshake that drives consumption? Sugar is the main driver, but when you study it closely, it’s not any one ingredient. If I give you a package of sugar and say, “Go have a good time,” you’re going to look at me like I’m crazy. But add fat to that sugar, add texture, add temperature, add color, add mouth appeal. Then add the emotional gloss of advertising. Then add the social factor—you can do it with your friends, blow off steam, reduce stress. The food industry will say, “We’re just giving the consumers what they want.” But what do we end up with? A great public health epidemic.

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So we’re becoming conditioned to overeat?
Yes. We now know that the food industry is excessively activating the brains of millions of Americans. Because food involves not only the learning circuits of the brain, but the motivational, habit, and memory circuits of the brain, food has become multisensory—and it’s the multisensory nature of the stimulus that is driving intake.

About the time Americans started gaining lots of weight, in the 1980’s, is also the time when high fructose corn syrup became prevalent. Several nutritional experts that we’ve interviewed have pointed to this one ingredient as a big source of problems.

I think there’s no doubt, whether it’s sugar or high fructose corn syrup—both will stimulate intake, and both contribute significantly to overeating. I think the major culprits are fat, sugar, and salt—and especially highly processed foods. It’s as if our food is predigested for us. In many instances, we’re just eating adult baby food!

Now that the economy is hurting, and people are more stressed than ever, it seems like eating can be a cheap form of indulgence, and allow people to feel rewarded.

That’s true. We now understand that it’s a form of self-medication. We need to understand the cycle. Eating for reward is eating for stimulation. It involves this arousal and release. We’re constantly chasing something that doesn’t exist. There’s no doubt that consumption can give you momentary satisfaction, but in return for that, you’re in this constant cycle that you can’t escape from. So it’s a figment of your imagination that the food you’re eating is really comfort food. It’s not! You’re engaged in a cycle that you’ll never, ever escape. Until you decide that you want to eat something else—by which I mean eat foods that are not loaded and layered with fat, sugar, and salt.

Sounds like we need to watch out for our children.
Yes. The greatest gift you can give somebody, especially a child, is to prevent the neurocircuitry in the brain that is excessively responsive to fat, sugar, and salt from ever being laid down. It’s much easier to prevent it, because once that neurocircuitry is laid down it’s there for a lifetime.

I was raised on bologna sandwiches, but I retrained my taste buds for brown rice and tofu.

How to do that is the thing millions of Americans want to know. They need to know that it can happen, because it can. But it involves new learning and new habits, which involves finding new things that you want more than food. People need to change the way they perceive food. Instead of looking at food and saying, “Boy, that cookie is my friend,” now you look at it and say, “No, that’s not what I want.” People need to know they can add new learning—but it’s not the stuff of fad diets or of miracle fixes.

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In your book you talk about how many chain restaurants are making food that’s designed to go down very fast and easy.

Yes, it’s almost as if it’s predigested. It goes down in a whoosh, because the food is so highly processed. We used to chew about 20 chews per bite. Today, it’s two or three. Food is now designed for a quick disappearance; the food industry understands that rollercoaster in the mouth. When that food goes down easy, you reach for the repeat.

We recently saw the new film Food, Inc which brings to light the negative consequences of the industrialization of our food supply. We feed cattle and chickens corn to make them fatter than is natural. Then we pump them up with growth hormones and antibiotics. It changes the nutritional profile of the meat we’re eating. How much do you think this is a factor in America’s poor nutrition and obesity problem?

I think it’s increasingly a problem, and we’re going to see a movement back to real food. None of us wants to be fat. None of us wants the inevitable health consequences.

You mention in your book that food companies have figured out how to fool consumers by being sneaky with the ingredient list. Sometimes instead of one type of sugar, they’ll use several, so that they’re not as high on the ingredient list.

The fact is our food is so bloated with fat, sugar, and salt it’s hard to decipher how much has been added. We made food so chemically processed that it has none of the substance that helps slow down our eating. We need greater disclosure, there’s no question—not only for processed food, but for foods we’re eating in restaurants and fast food outlets. And it’s very hard to find out. I went dumpster diving. That was the only way I could find out what was in the restaurant food. The food industry designs food for the bliss point. They construct foods these days for optimal stimulation and pleasure, and that is literally changing the brains of millions of Americans.

You talk about awareness being the first step in breaking conditioned hyper-eating. Isn’t that the first thing they tell alcoholics also: become aware of what you’re doing?

Well, there’s no question that awareness is the first step. But once you understand that your brain is being activated, how do you cool off the stimulus? That’s the great challenge. The second step is to develop private rules for yourself. I know if I start eating french fries, I’m going to finish all of them.
I just know that. So it's easier for me to just have a rule not to eat them. But the rule has to be unambiguous. It can't be “I'd really like those, but I'll deny myself today.” That kind of rule won't work, because that only increases anxiety. A rule needs to be a rule you can believe in, and you want to follow. Another important thing is to create a plan: know what you're going to eat, when you're going to eat it, and eat with a certain structure, so you're not grabbing food constantly throughout the day. Structure is probably one of the greatest ways to create boundaries around your eating.

You've written that when the brain knows that the reward will not be forthcoming, it shifts its attention elsewhere. So does that mean if you have a clear rule that you don't eat any fast food, then you'll be less tempted when you drive by?

Yes. If you tell a smoker “You can't smoke on the plane,” they cue their brains and they have less cravings. They resign themselves. So if you've set certain rules that you always follow, that helps cool down the stimulus. If you want to lose weight, it's going to require a commitment to change your eating patterns and habits for the duration. That's not news that people want, because it's not the quick fix, it's not the miracle, but that's the only sustainable way to lose weight.

You talk about the problem of snacking contributing to weight gain. But many nutrition experts have said that small meals more frequently are better than three big ones.

Structure is the best solution. And that could be three times a day, five times a day, whatever works for you. But eat in a planned way, not in a chaotic way. Snacking constantly is just responding to the cues in your environment. Every time you get a cue, your brain gets activated, and you reach for the food. That kind of eating needs to be replaced with structure. And it's very important not to feel deprived or hungry. So whatever you need to sustain you, do it. If you need to eat every three hours, that's fine. If you need to eat every five hours, that's fine. What's important is you anticipate when you're going to get hungry, and not allow yourself to feel excessively deprived. Because that's only going to increase the reward value of food and make it harder to stop.

Some people have trouble recognizing that they are full, and so they eat too much. What causes this?

What's going on is the brain is being stimulated and the reward pathways are being activated. So the peripheral mechanisms that allow you to sense fullness don't even get through to your brain.

So are you saying the combination of sugar on fat on salt suppresses the feeling of satiety?

Yes, because your brain is being so highly activated, that's preoccupying your working memory, and you're not sensing

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When we interviewed Jack Lalanne years ago, he said, “Food is queen, but exercise is king.” But it looks as though you see it the other way around.

Exercise is certainly key in maintaining weight loss. But if I gave you a candy bar, that’s 300 to 400 calories, and you could eat that in two minutes. How long would it take you to work that off? Several multiples of that, so it’s an unfair equation. Food has become so energy dense, you’re fighting an uphill battle. If you expect to be able to keep on eating energy dense foods, you’re never going to be able to work off the calories, because it’s just so much harder and more time consuming to work off the calories than to eat the food.

**What do you mean when you talk about food being designed for hedonic value?**

The food industry understands how to construct and develop food for optimal sensory stimulation and pleasure. Hedonics involves five factors: anticipation, visual appeal, aroma, taste and flavor, and texture and mouthfeel. We now know that this involves activating certain parts of the brain.

**This is done so restaurants can get what you call a “larger share of stomach?”**

Yes, the food industry certainly understands that fat, sugar, and salt stimulate intake. They understand that people will come back for more. Maybe they don’t understand the neuroscience, but I think there is no doubt that they construct foods for the maximal hedonic experience.

At a recent trade show we heard a lecture where they said that 25% of the American population cares about healthy eating, 25% doesn’t care at all, and that 50% are somewhere in the middle.

I think we’ve made nutrition increasingly confusing. It’s very hard to see what is real food. And I think we need to move back to a simpler time, where we’re focused on eating real foods—fruits and vegetables and whole grains. It sounds so simple, but it’s hard to do, because our behavior has become so conditioned and driven by fat, sugar, and salt that’s loaded and layered into our foods, and our brains are constantly being bombarded with food cues.

**In the future, do you think the food industry will be held accountable for caring more about profits than the health of the American public?**

I think there’s no question that the food industry needs to change. I think the government needs to do more disclosure and education. But I think in the end, just because our brains are being hijacked by all the food cues, doesn’t mean we can’t take steps to protect ourselves.

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