>> Okay, so we're going to continue this chapter talking about what is a calorie. So we're going to – Obviously, this is a nutrition class. We're going to be talking about calories. Calories is basically the amount of energy that's contained in the food that you eat. I've been mentioning that when we eat carbs, fats and proteins, they break down into energy for our body and we call that energy ATP. But another term for the energy that we get is calories, when it comes to the amount of energy that's in our food. So a calorie technically the definition is the amount of heat energy it takes to raise the temperature of one gram of water one degree Celsius. You're not going to be tested on that, but for some of you, you might want to know what exactly a calorie is. And your textbook goes through a little bit more detail. Scientists measure how many calories are in a food by using a machine called a bomb calorimeter and I'll show your picture of that. But basically, the food is placed in this machine. It's surrounded by water. It's heated, the machine is heated and then the food is basically broken down. To make this simple, the heat breaks the food down and in the process releases heat or energy. And the amount of heat that is produced, it starts raising the temperature of the water that's surrounding the food and that change in temperature is the amount of energy contained in that food. Let me just show you a picture. It might make it simpler. So you can see that here is the food here and it's surrounded by water. And again, they heat this up and the more calories a food has, it means it took more energy, more effort to break that food down. Okay? So if you're interested in more about that, you can look, you can read about more of that in your textbook but I'm not going to really test you on that. But what you do need to know is how many calories are in carbs, fats and proteins. So both carbs and proteins, for every gram of carb and protein you eat, it gives you four calories. So for every gram, you get four calories for both carbs and protein. So for instance, you eat something and the food label says it has ten grams of carbs, ten grams of carbs, ten times four, since it's four calories for every gram, ten times four is 40. That food contains 40 calories from the carbs. And the protein, same thing for calories if that food item contained let's say five grams of protein, five grams, five times four is 20. It's got 20 grams of protein. And then lipids is nine calories for every gram. So you can see there is more calories for every gram of fat that we eat. So if that product contains another ten grams of lipids, ten times nine is 90. You add all that up and that's the total calorie count in that food. Okay? Just FYI, alcohol also has calories, seven calories for every gram. Okay? So please know for the quiz, you should know these and I might give an example that some food contains let's say ten grams of carbs, how many calories are in it, know how to do that. And if you need help with it, you can get more information in the book or, of course either see me in my office or email me. Here is an example – Here's an example. You eat a large hamburger. It's got 39 grams of carbs. You multiply that times four. That's 156 calories in that hamburger from the carbs. That's probably the bread, the buns. Fat, 32 grams, 32 times nine. And then in the protein again 30 grams times four. That's a total of 564 calories in that hamburger. Where did most of the calories come from? Of course, the fat and the second highest was the carbs or the bread. Okay? So that's just an example, you eat

a hamburger, where the calories come from and what exactly is in it. Okay? So like more than half the calories are from fat. Now please know this as well. How much of carbs, fats and protein should we be getting in a day? Out of your total day's calories, you can see there, there's a range. For protein, you should be getting about 10 to 35% of your calories from protein. And there's a range because everyone is different in their activity level. If you're working out at the gym for several hours every day trying to build muscle, you're probably going to want the higher end of that range for protein, maybe 25, 30, or even 35%. For carbs, anywhere from 45 to 65% of your calories, so about half. Again, if you're very active, you're going to need more carbs, the higher ends because remember carbs break down to sugars for energy. But if you're a couch potato and you're eating the high end of carbs, that extra carb is going to be stored as fat. So you want to keep that in mind. Most Americans are getting way too many carbs and its created a lot of problems with obesity and diabetes. So really most of us only need about 40%, 45%. But again, know these ranges from the textbook. Fat, 20 to 30%. And it's not so much how much fat but the type of fat that you took in. Is it the saturated or the monounsaturated and so forth and we'll get into that in the fat chapter. But please know these ranges. Okay, so how healthy is the American diet? Well, as most of you probably know, we have an obesity problem in this country and it's just been getting worse over the years. Back in 2001, about 61% of Americans are overweight or obese. In 2010, it went up 68%. And now, it's of course almost 2017 and it's going to be a whole lot higher. Obesity plays a major role in all the chronic illness like I talked about earlier. Your risk goes up for pretty much everything, heart disease, cancer, strokes, high blood pressure, diabetes, arthritis, cancers, huge relationship between obesity and cancers, breast cancer, colon cancer and so forth. And it's expensive to be overweight because it's going to cost you a lot of money with healthcare. You're going to be sick, most likely, getting injured but because it increases your risk of chronic diseases if you have diabetes or arthritis and you're seeing the doctor and you need medication, of course this costs a lot of money. So federal agencies have looked at our diet and just FYI, it's kind of interesting. Americans, we get about two-thirds of our protein from animal products, like meat and dairy, whereas we only get about a third of our protein from plant sources, like nuts and seeds, whereas in other parts of the world, most of the protein is made up of plant products. And that of course has its benefits, which we'll go over again in subsequent chapters. In our country, about half of our carbs come from the bad types of carbs and sugars, candy, cookies, crackers, cakes, and the other half comes from starches, you know all the bread, the pasta, the rice. We're getting so many of the bad carbs and not enough of the healthy carbs, meaning fruits and vegetables. Again in our country, about 60% of our fat comes from animal sources, meat and dairy. Only 40% comes from plant sources of fat, such as, again, nuts and seeds. So we're not doing so well. Our rates of obesity, we're one of the fattest nations in the world and we're also one of the most unhealthiest nations in the world. And according to the research, we spend so much, we're at the top of the list as far as industrialized nations for spending money on healthcare and our outcomes

are actually quite poor. Now there is a report put out every so many years called Healthy People and the latest one is Healthy People 2020 and it's put out by the government. And it's trying to put out guidelines to help us get healthier. As we talked about earlier, a healthy diet and exercise will definitely reduce our risk for diseases, which will take a big burden off of our society, off of our healthcare costs. So that's what this report is about is how to get us healthier. These recommendations are for everybody ages two and up. You can read in more detail in your book, but the obvious is increasing intake of fruits and vegetables, which have lots of vitamins and minerals and antioxidants and fiber, whole grains, reducing solid fats like from meat, reducing sugars. Sugar increases your risk of heart disease and cancer, diabetes. Reducing sodium, reducing calories, of course, and getting enough exercise. We, as a nation, most of us are not getting the minimal amount. The minimal amount, and you should know this for the quiz, is 30 minutes a day of activity. We'll talk more about that again in another chapter. But at least 30 minutes a day. Also, minimizing how much alcohol we drank, keeping it to one drink or less for women and two drinks or less a day for men because more than that now increases your risk for, again, heart disease, cancer, diabetes and a whole other bunch of chronic illnesses. And of course, not smoking cigarettes or cigars if you do so since we know smoking is the number one cause of preventable death. Okay, let's talk about scientific research. Like I mentioned, nutrition is a science. And because it's a science, there's research going on all the time to try to relate ways of eating certain foods and disease. The thing is when you hear the news that something has been shown to help reduce the risk of something or something's been shown to increase risk, you have to try to find out who did that experiment. You know, was it done by somebody that would be bias, like by a drug company or was it done by a hospital or college or university, who did the actual research and was it done by the dairy industry which shows something positive about dairy. You know, you see the point here. So you need to be critical and ask questions about what you're hearing on the news because a lot of it is not exactly accurate or you don't hear the whole story. Just because you heard it on the news doesn't mean it's completely accurate. Again, they leave out a lot of information and we'll get more into that later. But please know there's two different types of studies, case-controlled and double-blind. Case controlled is you have two groups of – Sorry about that. Case controlled, for instance, you have two groups of people. One group had gotten lung cancer. The other group didn't. And they basically compare the two groups to see what in their lifestyle was different that may have caused the lung cancer in the one group, you know, did that group smoke or live in a smoggy area. Double blind is definitely more reliable, more accurate. And so let's go to that. Double blind, you've probably heard commercials on the radio asking for volunteers for a research study. Basically, double-blind means the researchers and the people in the study are blinded or not known to them if they got what they were studying. In other words, let's say they're studying migraine medication. And there's a group of people, two groups of people. One group gets the migraine medication. The other group gets what we call placebo; basically it's an empty capsule, you know, a sugar pill or what not. They're

blinded. You don't tell the people that they got the actual medication because we know that the mind is very powerful. If they know that they got the actual medication, it might influence how they feel. You know, you might think, oh, I got the medication. It's going to help me. I'm going to feel better and they actually do feel better. And maybe the people that got the sugar pill, they think they got the real medication and they feel better. They actually got results, but they didn't get and that's called the placebo effect. It's the power of the mind to affect how your body feels. So they do this research. They don't tell who got what. So it's more accurate. So again, when you hear information that something is helpful or it increases risk of something, just question it, you know, where did you read it or where did you hear it. Was it a scientific publication? You know, how big was the study participants, you know, how many people? Was it ten people or 3000 people? Obviously, the more people involved, the more accurate. And who funded the research is really important because, like I said, there's a lot of bias. Who paid for that research because a lot of times they put, you know, they slant the results in their favor. Lastly, there's something called the Dietary Supplement Health and Education Act and basically it just states that the FDA does not regulate vitamin supplements. So when you buy a supplement at the store, you really need to know is it a good company because not everything you buy is a good material. You can get vitamin C that says 500 milligrams and maybe there's 200 mg in it because there's no regulation on vitamin supplements. There's definitely wonderful brands out there, but you need to know which ones they are, you know, buy from companies. And I'd be more than happy to help you with that if you're not sure. Okay, so that's the end of chapter one. Let me know if you have any questions.