

>> Okay, hi, everyone. We're going to start Chapter 8. Kind of a long chapter, but this chapter on vitamins, and Chapter 9 on minerals, is pretty easy. Most students do pretty well on this next test covering these two chapters. Keep in mind there's a lot of information, a lot of slides, but I'll be pretty specific in this podcast on what you need to know for the quiz. I just, I like to give out all of the information, but I don't expect to hold you responsible to learn it all. So anyway, so what are vitamins? I know a lot of people take some vitamin supplements. We don't hear a lot about vitamins. And please keep in mind that they don't teach doctors in medical school much about vitamins and minerals. I have spoken to many doctors, I've read a lot of MD newsletters, and they admit to getting very little nutrition knowledge and education in medical school because remember that medical schools are, in a large part, mostly funded by the pharmaceutical industry. They make money off of medications. You cannot patent vitamins and minerals. They can't prescribe them or make money on them. So, I mean, they can suggest you take them, but they don't learn about them. So hopefully you'll learn a lot in this lecture. But vitamins, they're essential for our health. It's not something a lot of people think of. I'm just going to take a vitamin and it will help. They're needed for every cell in your body to function. And the problem is, most of us are not getting even the minimal levels. The minimal levels are the RDAs. We're not getting the minimal levels even from our foods, because our foods are so processed nowadays. Also, they've done—scientists have done research on our fruits and vegetables where we get so many of our vitamins. And our fruits and vegetables, due to the farming methods nowadays, have only a small fraction, a small percentage of the vitamins and minerals that they used to have many years ago. So we're just not getting it. But keep in mind that vitamins do help you get energy, help you get ATP from your carbs, fats and proteins, because they are needed in the processes to extract the energy from your foods. So if you're lacking in some of these vitamins, you're going to have less energy, okay? So please, again, remember that fat-soluble vitamins are A, D, E and K. Basically, this means that you must take these vitamins with a meal that contains fat for them to be absorbed. So you, let's say, eat a banana for breakfast and take a multivitamin, not only will that possibly make you nauseous, but you may not—you won't absorb these four vitamins. So maybe you have a banana and peanut butter. The water-soluble vitamins are the B vitamins and Vitamin C. B vitamins, we're going to go over this, but they all function as coenzymes, which means that they help enzymes work in your body, another very important function of these vitamins. So to be classified as a vitamin, basically, two things have to be met. Body is unable to make enough of it to maintain your health. That is, by definition, a vitamin. And also if you don't have it, if you're lacking any of these vitamins, over a period of time, you will get some type of deficiency symptom. And we'll go over these. And you get vitamins from both plants and animal products. Do we store vitamins in our body? Not for the most part, no. We do tend to store some of the fat-soluble vitamins in our fat cells, with the exception of Vitamin K is not very well stored. And so some of the fat-soluble vitamins, so basically A, D and E can get stored a little bit. But the water-soluble vitamins are just that they leave your body

and our urine if you take in more than you need. So we don't really store them, which means we really need to be conscious of getting enough, either from our food, or from a multivitamin, mineral supplement. And, you know, one day of not getting enough Vitamin C or iron or some vitamin or mineral, you're not going to suddenly become anemic from missing iron for a day. It's over time, weeks and months of being deficient is when you develop some type of symptom. As far as toxicity, you know, if you Google this, or do all the research on this, you know, it's very, very rare that you'll hear that someone got sick or died from taking too many vitamins. Toxicity is very, very rare with vitamins. Of course, if, you know, your child gets a bottle of Flintstones vitamins, yes, with all that iron in there, they're going to—it can be toxic. But if you take them as prescribed, they shouldn't pose a problem. If it's going to pose a problem, the one we're seeing is Vitamin A. Vitamin A does tend to get stored in our liver and fat tissues. And again, it's not, it's not going to be too harmful to your body, but I think there was a test question on that, that Vitamin A would be the most common we see in toxicity. But again, how often do you hear about this? It doesn't occur very often. A couple things about the vitamin content in our food. You know, you've got to think that—let's talk about apples. Let's say an apple was harvested in New York State. By the time, you know, it got harvested, until the time you actually eat the apple, so much of the vitamins and minerals have been destroyed or lost, and the antioxidants, because most vitamins and antioxidants that's going to be present in any fruit or vegetable is the second it's harvested, you know? And that's why if you've ever been apple picking, you know that they taste so crunchy and delicious. But let's say an apple is picked at the farm back in New York, and then they are put in boxes and they stay in the warehouse for a couple days, and then they are finally loaded on a truck, it stays there for a day, and then it's either driven across the country or they're put on an airplane, several more days pass, it gets to the supermarket, the supermarket keeps it in the back room for a couple of days, then they put it out on display, it sits there for a couple of days, and then you take it home and you leave it on your countertop for a couple of days. So you can see that many weeks can go by. And that's how a lot of nutrients get lost. Also, if you don't store your fruits and vegetables properly, like in a crisper, in the refrigerator, it also—another way that the vitamins can get destroyed. And if you cook, overcook your vegetables, particularly, and we'll talk more about this, but leaving your fruit out, or vegetables, you know, exposed to heat, light or air, all destroys the cooking. You should keep your—especially with, let's say, a banana, you should keep your fruit and vegetables in the crisper drawers in your refrigerator. Cooking, you know, the longer you cook your vegetables, the more you destroy its nutrients. Freezing, like when you buy frozen fruit and vegetables, those tend to have more nutrients, because they cook them for like a minute, and then they flash freeze them. They basically dip them right away in an ice bucket to stop the cooking process. So you can tell the difference in let's say a green bean that's canned versus a frozen green bean. The frozen ones look a lot more fresh than a canned. Canned, they're just useless. Don't waste your money on canned fruit and vegetables. We'll talk more about that in a minute.

But keeping, like I said, your fruits and vegetables in the refrigerator, keeping them chilled will retain nutrients. If you do cook your vegetables, having them in a—I'll show you a special bin that you can put them in. So you don't want to have your vegetables in direct contact with the water that you're cooking it in because that's how more nutrients are lost, the water-soluble vitamins. Try not to reheat and reheat several times because the more you heat it, the more of the nutrients you lose. The canned foods, there's a couple problems with canned foods. Probably most of you have heard that canned anything, the cans have BPA that is in the lining of the can, which is toxic. BPA, that's why they have BPA-free bottles, water bottles. It's also in a lot of water bottles. BPA has been shown to be harmful to our health in many ways, reproductive problems, cancer, and other things. But the cans, vegetables and food are cooked immensely, and then they stay in that can with the BPA sitting in this liquid, and all the nutrients are all but lost, and then you go home and you reheat it. So I would not waste any of your precious money on buying canned vegetables. You have very little nutrients left. Plus you're exposed to the BPA. So get the frozen or get the fresh and cook it. This is what I was talking about, a steam basket. You put the water in the pot. So you put this in the pot, you put the water up to here, this line here, and so the water doesn't actually touch your vegetables. When the water touches your vegetables, that's how you lose the water-soluble vitamins. And you just want to steam them briefly so there's still a crunch. You know, if they lose their color and they're just mush, you've lost the nutrients. Again, the longer you cook the vegetables, the more nutrients you lose. Okay, so like I mentioned earlier, we do absorb fat-soluble vitamins with dietary fats. So be sure to have some type of fat when you take these vitamins. We don't store every—we don't absorb everything we eat, and we'll talk more about that. Again, we do store some of it in the liver and our fat tissues. Now, keep in mind, too, that if you are taking any type of medication that may interfere with your absorption of fat, you also are not going to absorb any fat-soluble vitamins. And this can be certain medications. But also the weight loss drugs, like over-the-counter weight loss drugs, a lot of them work, help you lose weight, because they block your absorption of fat. And Alli, if you remember, Alli is an over-the-counter weight loss drug. Because they absorb, they interfere with your absorption of fat, you don't absorb the calories, but then you also don't absorb the fat-soluble vitamins. And any unabsorbed fat and the vitamins will then travel to your large intestine and you won't excrete them without getting absorbed. Okay, so let's start with the first vitamin. There are two forms of Vitamin A, retinoids and carotinoids, and you should know the difference between the two. The retinoids are found only in animal products, like fish and organ meats, like liver. The carotinoids are found in the plant products. So when you're eating these different colored fruits and vegetables, these different colored ones will have the carotinoids. The animal products will have the retinoids. The way I remembered that is carotinoids sounds like carrots, okay? So we do need those. They both have different functions. Vitamin A, basically we need it for vision. It does play a role with your ability to see in the dark. And if you're deficient, it can cause night-blindness, which means you

have difficulty seeing in the dark, driving in the dark. Most of the time, that is due to a Vitamin A deficiency. Vitamin A is also important to just regular vision. And actually, this is a test question. Vitamin A deficiency is the second leading cause of blindness in the world. Vitamin A deficiency. Second leading cause of blindness in the world. It can also help decrease your risk of cataracts, which tends to form as you get older. Cataracts also can lead to blindness. So you don't want to wait until you're 60 or 70 years old with cataracts. You want to make sure you have enough Vitamin A intake throughout your lifetime to help prevent that. So, you know, cataracts, it's not something old people get. Old people can get it if they didn't have enough fruits and vegetables that have Vitamin A throughout their lifetime. I don't know if you can see the difference here, but here is the pupil nice and dark. And this is cataracts, clouding of the lens of your eye. And it can interfere with your vision. A lot of people have cataract surgery. Even dogs get it. Again, dogs that have been on a poor diet throughout their life. Macular degeneration, there's no test question on it, but you should be familiar. It is the leading cause of blindness in the United States in older adults. And one cause is a lack of carotinoids. There's two different types; Lutein and Zeaxanthin. So if through your life you have enough of these carotinoids from eating a lot of vegetables and fruit, you can hopefully reduce your risk of getting this macular degeneration, which basically means that you can lose part or all of your vision. Other causes of macular degeneration is, you know, as you get older, you are at risk, smoking, and just genetics, smoking in the big factor. Vitamin A is also important for all cells in your body. So if you're deficient, any cell can be affected. Your immune system as well needs Vitamin A. Protein synthesis, we need it for cardiovascular disease prevention because they are antioxidants. So as you can see, there's a lot of benefits of having enough Vitamin A. It helps prevent cancer. There are major antioxidant effects that can help prevent many kinds of cancer; breast cancers, bladder, skin, lung cancer.