

>> Okay, so to continue with digestion, again, this is so important to understanding nutrition. When you eat food obviously we start chewing in the mouth the food. When you start chewing your mouth starts secreting enzymes. We call it digestive enzymes. The enzymes start preparing the rest of your digestive tract that foods coming and to get ready. And please know that in your mouth you have, of course, saliva and the saliva we have salivary amylase; salivary amylase. Amylase is the digestive enzyme for starches. Okay, so we begin digesting starches or basically carbs in the mouth. What are enzymes? Enzymes speed up any chemical reaction and, in this case, the chemical reaction is digestion, which like I said, is the chemical part is the digestive enzymes that are going to breakdown your foods into small pieces that your cells can then use for making energy. So, your esophagus connects your mouth to your stomach, so you chew your food and then food starts going down your throat we call it, but the esophagus and then it, there's a sphincter called the lower esophageal sphincter that is at the end of the esophagus right where the stomach is and it's usually closed and it will open up to allow the food to enter into the stomach. Some people have GERD or reflux disease or heartburn basically. And what has happened in that situation is the sphincter or the valve stays open or it opens easier than it should and a lot of times what happens is the acid and other contents of the stomach start refluxing up into the esophagus and it caused heartburn. Okay, so heartburn is when the acid and other enzymes get up past that sphincter into the esophagus. As a nutritionist and alternative doctors, you know, we treat heartburn differently than medical doctors, you know, will give you antacid which neutralize those enzymes and acid, but why do you have the heartburn. We're not born with heartburn. We don't have it as little kids. It usually develops later in life and, like I said, alternative doctors and nutritionists we try to find the why and fix it and usually it's because of poor digestion. Either you didn't chew the food well, you were in a rush, you were angry while you were eating, or as you get older at about the age of 30, your body starts secreting less and less enzymes and without enough enzymes the food kind of just sits around in the stomach more likely to reflux up. You can easily go to a health food store and buy digestive enzymes and that usually helps greatly with that condition. Again, see me or email me if you would like more information on that. This is a great picture and it shows you where most of the digestion is occurring. So, you can see there's here's your esophagus, here's your stomach, and this is the small intestine. The upper part of the small intestine you can see that's where we've got a lot of these dots that signifies the digestion. So, most digestion and absorption occurs in the upper part of the small intestine and you got the lower part of the small intestine and then you can see down the colon, we don't digest anything there. Okay, so your stomach holds food, about four cups of food for anywhere from one to four hours. Why that variation there? It depends on what you ate for one thing. If you ate a lot of fat, a fatty meal or a meal high in protein it will usually take longer to digest, carbs take the shortest amount of time to digest. It also depends on are you relaxed when you were eating; when you relax your enzymes secrete more readily and the enzymes will help digest your food. Again, as you get older at

the age of about 30, we have less and less enzymes so we digest a lot slower and you probably notice that when you're a kid you're hungry every two minutes and as you get older it just takes longer for you to get hungry again. In the stomach, please know this, you have stomach acid of course, you've probably heard of that. Stomach acid is very important for digestion particularly for protein digestion. It's crucial for breaking down protein. It is also crucial for absorbing your minerals; calcium, iron, magnesium, and so forth. So, again, as you get older we secrete less acid. We don't digest our food well. We don't digest proteins as well. We don't absorb our minerals as well and you can end up with lots of problems, so again, you can go to the health food store and buy a digestive enzyme formula and it usually includes stomach acid. It goes against what conventional medical doctors, you know, giving you an antacid, but again, if you read the physiology books and it shows that as you, after the age of 30 as we get older we secrete less and less stomach acid. Why do we get indigestion and heartburn as we get older? Because we're secreting less acid and less enzymes. We're not digesting our food well. It sits in our stomach longer and starts to, you know, we if it sits there it creates gas, it creates burping, digestion and it can start to reflux up. So, you want to fix the cause not just put a band aid on it. But back to the stomach, the stomach will kind of churn and mix together the food with the acid and other enzymes and we call that mixture chime and the chime leaves your stomach about a teaspoon at a time and goes into the small intestine. Now, your stomach lining has what we call a mucosal lining. The mucosal lining helps protect your stomach from the acid and enzymes. If your enzymes wears; if your lining wears down or you get an ulcer, you're going to have that sharp pain. Some of you might have experienced this at some point. But we don't really absorb nutrients from the stomach. We really just, you know, digest it and mix it up, churn it up, try to break the pieces of food into smaller pieces. Water or not water, alcohol is the only liquid that's absorbed through the stomach wall. And that's why if you go out drinking and you can take literally two sips of a drink and feel it right away because it gets absorbed right away. Okay, how do you slowdown the absorption of alcohol? Is make sure you have food in your stomach, most importantly, food that will stay there the longest which will proteins and fats. Okay, the next stop is the small intestine which is about ten feet. Again, foods stay there anywhere from three to ten hours depending on, again, how many digestive enzymes you have there, the health of your digestive tract, what you ate, again, protein and fats take the longest, meat takes a very longtime of course, but please know this; the small intestine is where most food is digested and absorbed. This is where we're doing most digestion and absorption. We have digestive enzymes there for all carbs, fats, and proteins. Please know this a word "villi." Villi are the absorbed cells. They line the small intestine. So, think of a hose, a garden hose, on the inner lining we have these villi, these absorbed cells and when the food is done being broken down it's going to absorb through those villi and get into the bloodstream, the blood is then going to bring it to the cells, because remember the whole point of eating is to nourish and feed your cells. That's a picture of your villi. Here's a better picture from your book. So, these they're

fingerlike projections and they stick out into the middle of your small intestine. So, when you're done digesting, the absorption takes place where these nutrients now go into through these villi; this is all in the small intestine and then it gets into the arteries, here you can see the circulation are the arteries and veins and they bring it to your cells. Okay, so that's how that happens. Again, as we get older, these villi break down and by the way we need good amounts of protein and other nutrients to make sure that these villi stay healthy as if you don't eat enough nutrients these villi can't rebuild. They do die every three days and end up in your stool. This is another really great diagram here and you see your stomach here. Here's a small intestine. Remember, from right here to here, remember this is where most digestion and absorption occurs and you can see here just like I said, most digestion and absorption. These are all your vitamins and minerals. You have iron, and magnesium, zinc, calcium, all the B vitamins, A, fat, carbs, proteins, everything is being, the owl is showing, being absorbed into the circulation into the bloodstream. Everything then goes to the liver. The liver helps filter everything and then it goes into the circulation, into the heart, into the blood, everywhere all throughout your body to every cell. Now, you look down here in the colon nothing much is really getting absorbed. You remember, anything that ends up in the colon is leaving your body. It means it did not get digested and absorbed. We do secrete a little bit of sodium and potassium, a little vitamin K, but that's about it. Anything that you basically poop out your body didn't want or need. Or it didn't digest well. You know, we're not supposed to see food. Okay, if you do, you didn't chew it well. You didn't digest it well. And, by the way, we'll talk about bile in the gallbladder here, secretes bile into the small intestine to help digest fat. Here's your pancreas secreting all the enzymes to digest carbs, fats, and proteins, okay. So, basically what this is saying is that the carbs and the proteins go through what's called the "portal vein", please know that word, the portal vein; anything portal means liver. The portal vein then brings those nutrients to the liver to be filtered. Fats, however, are little bit too big for the portal vein and they go through your lymph system to get filtered and into the blood. Okay, so again, the liver helps process and filter the nutrients before in enters the circulation. It takes out chemicals, any chemicals and things that your cells just don't need, food colorings, things like that. Now, like I said, anything that enters the large intestine did not get digested and absorbed. Hopefully, that's very little because otherwise what good is it if everything you eat goes right through you? So, in the large intestine we don't digest. We have no enzymes there, no villi. We don't absorb. However, there is some absorption of a little bit of water, like I said, a couple of vitamins, some potassium and sodium, but that's about it. And there, again, here is your stomach, the small intestine is in the middle, large intestine all that. That's just for waste products anything leaving your body that did not get digested. Now, in the large intestine we do have bacteria. It's good, healthy, well we have good and bad bacteria. You probably have heard of probiotics. You can buy probiotics. A lot of people buy yogurt thinking you're getting a lot of probiotics or acidophilus. Probiotics are basically bacteria. We have so much probiotics and bacteria in your gut.

It's in the colon mostly. There's about 500 different species and it's like I said good and bad. If you have undigested food in your colon, the bacteria there will eat it and cause gas, okay so that part is bad, but it does tell you you didn't digest well. If you have an excess amount of gas or some other issues going on, bloating, that's a sign there's food in the colon and the bacteria there is having a field day on it. But we have good and bad bacteria. If you get food poisoning you got a little bit too much bad bacteria. You travel to a foreign country and you tend to maybe eat some bad bacteria and it will make you sick. Eating probiotics or taking it as a supplement on a regular basis is a good way to keep the good bacteria higher in your gut than the amount of bad bacteria. Okay, but what's, remains in the colon that goes out in your stool is anything you didn't digest like fiber, some fiber, animal tissues like connective tissue, the dead intestinal or villi and bacteria, okay. And let me stop the tape here and we will finish this part in, last part in part 3.