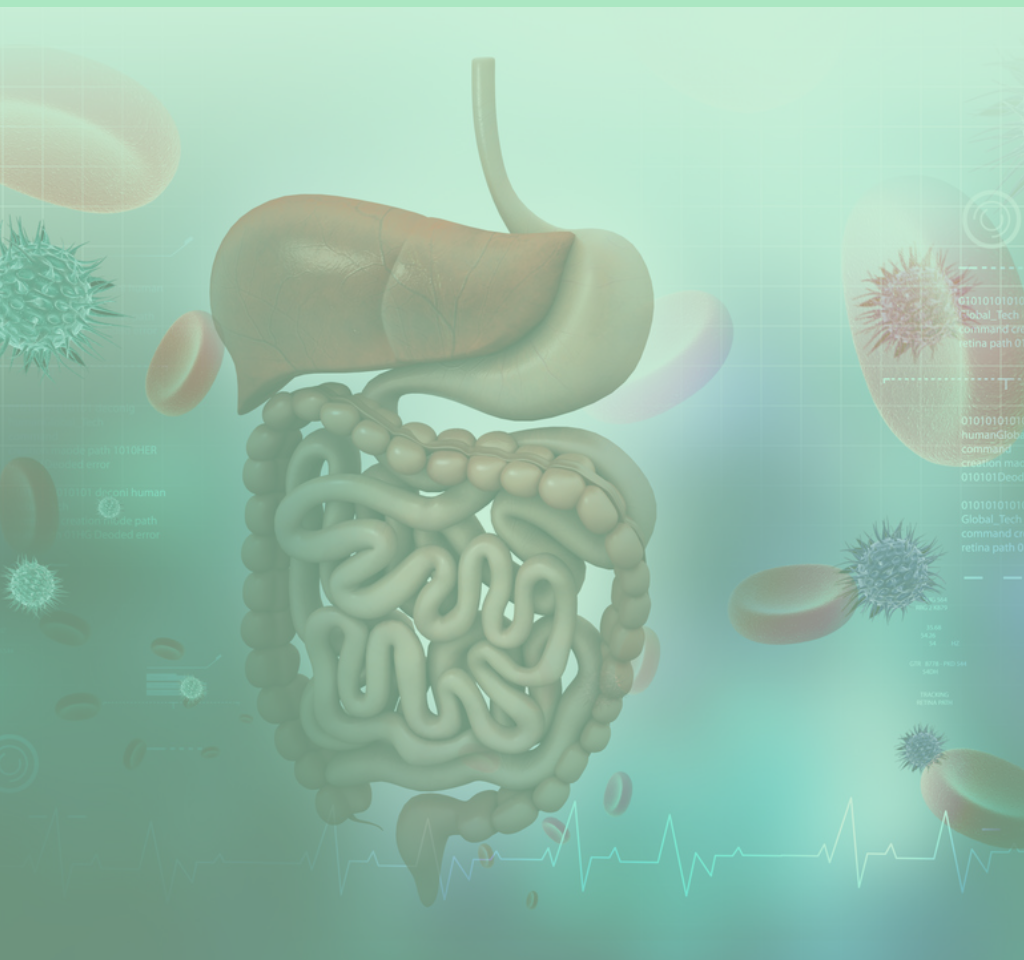


# DIGESTION

THE FOUNDATION OF FOUNDATIONS



Amber Wentworth, NTP



## ABOUT ME

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I'm a nutritional therapy practitioner and life coach specializing in food addiction, carnivore, keto, & IF coach, podcast host, and a huge keto and carnivore enthusiast.

I have battled with weight issues for over 40 years, trying just about every diet out there only to gain it back time and time again. And every time I failed, I blamed it on my weak will when I knew that was so far from the truth. Along the way, I have also dealt with multiple eating/exercise disorders and major health issues. But even worse than the physical issues were the emotional and psychological pain I endured.

All that changed when I stumbled across keto, then carnivore. For me, it was a life-changer. Finding a nutrition lifestyle that worked for my bio-individual needs was key to my long term success. I now apply the same philosophy to my clients. There isn't a one-size-fits-all approach.

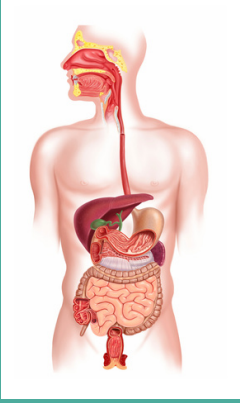
Just a short time ago, the final piece of the puzzle fell into place for me. The reason I had "failed" all those other diets wasn't because of willpower.

I'm a pathological sugar addict.

I had been treating the wrong issue! And with keto and eventually carnivore, the main "drug" of choice was removed which allowed my addictive brain to rewire. Now, I want others to be free from food addiction and lead a happy and healthy life through proper bio-individual nutrition, behavior changes, and support.

*Amber Westworth*  
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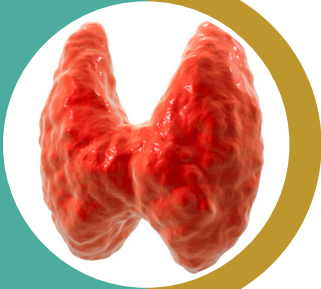
## DIGESTION:



Digestion is one of the most important processes our bodies perform and affects every single cell in the body. The body needs nutrients from the food eaten and the liquids consumed in order to stay healthy and function effectively. The digestive system breaks down the foods we eat into their simplest forms, like glucose (carbs), amino acids (protein) or fatty acids (fat). The food that is broken-down is absorbed into the bloodstream from the small intestine and the nutrients are carried to each cell in the body to use for important things like energy, growth, and repairing cells.

Gut health is of paramount importance to all systems in the body. The focus of this article will be on how digestion supports the healthy function of the endocrine system, Immune system, cardiovascular health, detoxification, and mental health.

## DIGESTION & THE ENDOCRINE SYSTEM



- The liver helps to deactivate hormones that are in excess or no longer functional, so proper liver function is essential
- Proper protein digestion is necessary to make available the amino acids that are needed to make thyroid, amine, & peptide and protein hormone
- Adequate stomach pH is needed in order to break-down protein.
- Proper liver/gallbladder function is essential to make available the fatty acids that are needed to make steroid & eicosanoid hormones

The endocrine system is made up of glands that create and secrete hormones which are chemicals that coordinate different functions by sending messages through the blood to tell your body what to do and when to do it. Although the endocrine system is charged with the production of hormones and the digestive system deals with the processing of food, the two systems are closely linked.

The body cannot make steroid (adrenal gland, ovaries/testes) or eicosanoid hormones without fats and cholesterol which means fat must be properly digested into fatty acids, so they can be used to produce hormones. The liver and gallbladder need to be functioning correctly in order for bile to be

produced, stored, and secreted, so fats can be emulsified into a form that can be used to make the hormones. The pancreas secretes lipase which helps breakdown fats, so it needs to be working properly as well. The production of thyroid, amine, peptide, and protein hormones rely on the proper digestion and absorption of amino acids derived from protein. Stomach acid (HCL) and the enzyme protease (pancreas) need to be at adequate levels in order to break-down the protein into amino acids. Every endocrine gland is dependent on a specific mineral. For example, the thyroid relies on iodine. If digestion is not working properly, the needed minerals can't be absorbed and used.

The interesting thing about the digestive and endocrine system is that they rely on each other. The production of hormones requires amino acids and fatty acids, but without the needed HCL production and enzymes, they can't be properly broken down and absorbed in order to be available for hormone production. But in order for the stomach acid, bile, and enzymes to be at the right level at the right time, the endocrine system has to send hormone messages to tell the digestive system what to do. The stomach environment is controlled by hormones. The two systems may have different jobs, but they must work together to provide what the other needs. If there is a dysfunction in one system, the other suffers.

## DIGESTION & THE HEART

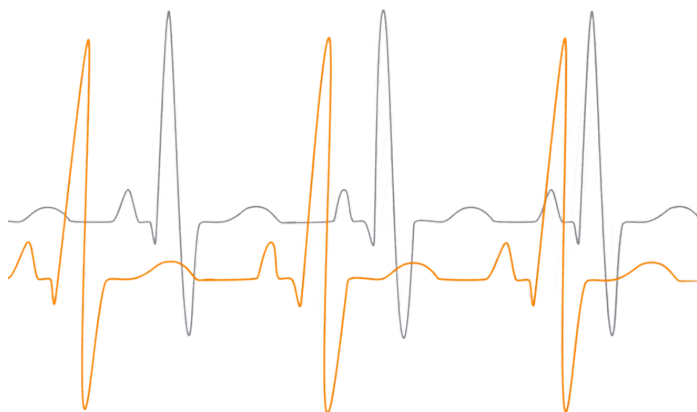


- **Proper protein digestion is essential to make available the amino acids like taurine & carnitine that are needed by the heart.**
- **Adequate stomach pH is needed in order to absorb calcium and digest the B vitamins.**
- **Proper liver/gallbladder function enables the digestion of healthy fats & the fat-soluble vitamins.**
- **Proper bowel flora is needed to produce vitamins B1, B2, B12, & K2.**

It's hard to think of digestion affecting the heart, but a diet of nutrient-dense foods that have been digested and absorbed properly is fundamental for a healthy heart. If there are issues along the way that interfere with the breakdown and absorption of nutrients, it can have a cascade effect on the heart. For example, the heart needs amino acids like carnitine and taurine that are broken down from the protein eaten. If the stomach acid level isn't optimal, the protein may not break down well enough to be used by the heart. Another issue with low stomach acid is that it will have a hard time absorbing calcium and digesting the B vitamins which are required for heart health and function. Calcium is crucial to the heart because it

triggers the contraction of the heart muscle. The liver and gallbladder also play a big part in a healthy heart because the liver produces bile that emulsifies fat. Fat is the predominant source of energy for the heart and it is also needed to dissolve the fat-soluble vitamins so they can be absorbed. The right ratio of fatty acids (omega-6:omega-3) is important when it comes to inflammation which is a major factor contributing to heart disease. When the intestinal barrier is not working the way it should, it won't be able to protect the rest of the body from dangerous bacteria or toxins. If the bacteria or toxins enter the blood stream ("leaky gut"), it can contribute to heart conditions like chronic heart failure.

The microbiome is important to heart health because it produces vitamins like B1, B2, B12, and K2. If the microbiome is compromised, it will affect the production of these necessary vitamins.



## DIGESTION & DETOXIFICATION



- **Scans food for invaders**
- **Detoxifies poorly digested, fermented toxins**
- **Filters food & intestinal bacteria**
- **Eliminates toxins & other unusable substances from the body**

The detoxification system of the body relies on the digestive system to be both a physical barrier as well as housing an adaptive immune response. The digestive system looks out for dangerous substances within our food. It also detoxifies food that has been poorly digested as well as fermented toxins. The stomach acid (HCL) along with pepsin help to neutralize pathogens before they enter the small intestines. The pathogens that survive digestion enter the intestines which provide a physical barrier to stop foreign molecules and chemicals from entering the rest of the body. They also contain probiotic bacteria that helps to further detoxify substances. The liver filters and neutralizes the toxins from the blood in order to prepare for elimination. The neutralized toxins then get passed to the gallbladder in



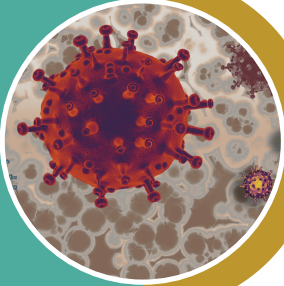
the form of bile and eventually excreted out of the body via feces. If the elimination process is obstructed due to constipation or other issues, the toxins may end up getting reabsorbed before the stool can be eliminated. It's important that the digestive system is working properly in order to aid the detoxification process.



**Detoxification**

## DIGESTION & THE IMMUNE SYSTEM

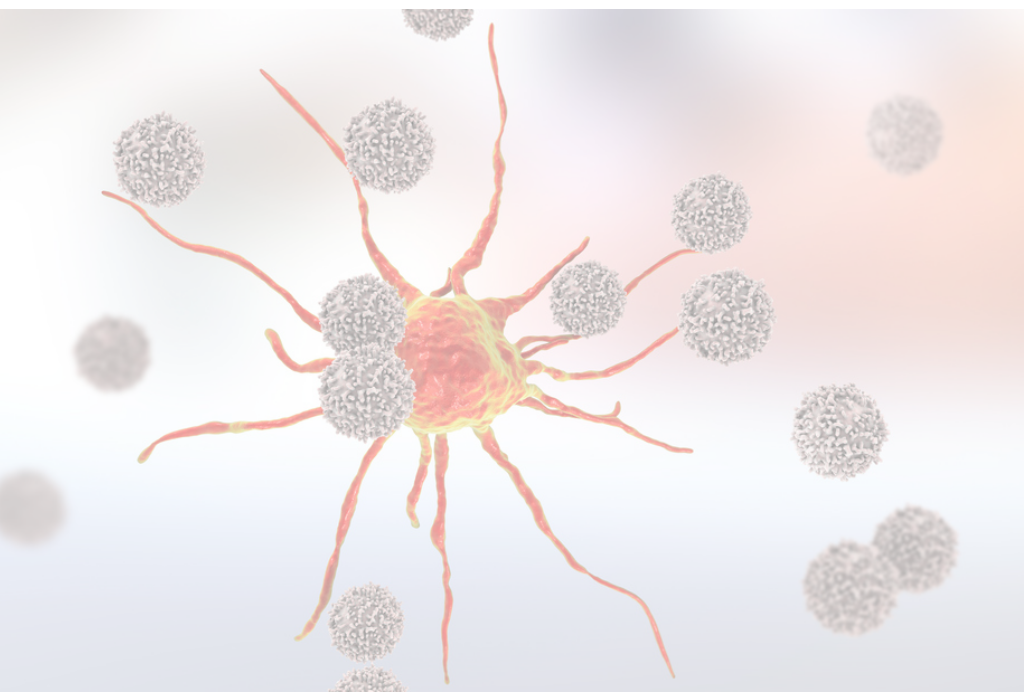
- **The stomach is a barrier defense that neutralizes many pathogens before entering the intestines**
- **Maintain an effective physical barrier against colonization or invasion by pathogens**
- **Facilitate nutrient digestion and assimilation**
- **Provide immunological surveillance signals at the gut mucosa-lumen interface.**



Healthy digestion is one of the most important Foundational factors when it comes to healthy immune function. It's important that macronutrients, especially protein, are adequately digested. This requires an acidic stomach environment with enough hydrochloric acid and pepsin. If food is partially undigested, it can cause eventual food reactions as well as allowing harmful microbes to survive and even multiply all through the digestive tract. If undigested foods make it to the small intestines and the body is under certain stressors, it can inflame causing damage to the mucosal layer of the intestines. Undigested proteins can increase the odds of triggering an adaptive immune response. If the mucosal lining is damaged, it can lead to what is sometimes referred to

as "leaky gut." This is where the cellular junctions are no longer tight and can allow undigested food, bacteria, and other microbes to go through the intestine and into the bloodstream potentially causing an immune response. And if pathogenic microbes make it into the large intestine, they can take over the healthy bowel flora. This can lead to overgrowth of fungus, bacteria, and parasites. Once this happens, an important physical barrier against pathogens is lost.

As you can see, digestion is the foundation of all foundations. Every cell of the body depends on the digestive system to provide the nutrients it needs for structure and function.



## DIGESTION & MENTAL HEALTH

- **Microbes in the large intestine consume undigested substances like fibers, resistant starches, and polyphenols, like fibers, resistant starches, and polyphenols**
- **Some microbes produce vitamins like K2 and B1, B2, B12 vitamins**
- **Some microbes make short-chain fatty acids like butyrate.**
- **Gut microbes produce about 90% of serotonin aka "happiness neurotransmitter"**
- **Some gut bacteria can produce Gamma-aminobutyric Acid (GABA) which calms the nervous system**



The human microbiome refers to the microorganisms and their genetic material that live in many areas of the body. The digestive tract contains over 100 trillion bacteria microbes that can affect the health of your digestive system, immune system, and mental wellbeing. You can't discuss digestion without talking about the microbiome (Prescott, 2017).

Our gut microbiome performs several different functions. One such role is to consume undigested substances like fiber, resistant starches, and polyphenols. Another is to produce vitamins like K2, B1, B2, B12 and butyrate.

The tiny bacteria in your gut biome can have a

profound effect on mental health as well. Intestinal microbes are essential for normal brain function. Gut bacteria are key players in your mood and mental health. They can relieve the symptoms of depression, anxiety, and stress. The gut microbes help produce around 90% of serotonin which is known as the "happiness neurotransmitter," which regulates your mood, as well as levels of anxiety and happiness. Some can even produce Gamma-Aminobutyric Acid (GABA) which regulates and improves mood because it helps to calm the nervous system and switch off stress reactions. It's important that the gut microbiome stay diverse and balanced. If it becomes unbalanced and the bad bacteria take over (dysbiosis), it can result in reduction of serotonin and GABA which can affect mental health (Benakis, Gallausiaux, Trezzi, Melton, Liesz, & Wilmes, 2020).

Diet and ultimately the breakdown of food via digestion can help the bacteria protect mental wellbeing because eating the right foods feeds the happy bacteria. When you have plenty of different and healthy bacteria, the microbiome is more diverse and produces substances which increase mood-lifting chemicals, like serotonin and GABA. Everyone's gut microbiome is unique, but diversity is a proven factor in keeping your body and mind healthy. They are well

connected and can influence each other's activities. The gut and the brain are prime examples of how changes in one can affect the other.



# REFERENCES

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Benakis, C., Martin-Gallausiaux, C., Trezzi, J.P., Melton, P., Liesz, A., & Wilmes, P. (2020). The microbiome-gut-brain axis in acute and chronic brain diseases. *Current opinion in neurobiology*, 61, 1-9.

Prescott, S., Logan, A. (2017). *The Secret Life of Your Microbiome*. British Columbia, Canada: New Society Publishers.