

# Health Beatv

Issue 5

The Death of the  
Microbiome

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Long Term  
Impacts of Sugar

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Western Diet Link  
to Chronic Pain

Weight  
and  
Blood Sugar  
Management

A smiling woman with long dark hair, wearing a light green halter-neck top, is shown from the chest up. She is holding a white bowl in her left hand and a silver spoon with a strawberry and a small white cube on it in her right hand. The background is a bright, slightly blurred kitchen setting.

# Active Green Tea

Longevity enhancing antioxidant



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# Dirty Diets and the Death of the Microbiome

By Dr. Nirat Nibber, ND

## What is a Healthy Microbiome?

Our gut microbiome describes the unique and complex array of the microorganisms that inhabit our gut. Imagine in your large intestine there is a fertile landscape ready to welcome a vast array of microbes including billions of bacteria and yeast. These microbes colonize the lining of the gut and are known as “commensal microbes” meaning we have developed a “symbiotic” or mutually beneficial relationship with them. In return for hosting these bacteria, they help us digest food, strengthen or calm our immune system, and even send signals to our nervous system impacting mood and mental health, affecting almost every system in our body. <sup>1</sup>

Every person has a different makeup of this “ecosystem” that is developed right at birth and continuously changes throughout our lives based on activity, diet, medications, environment and more. <sup>2</sup> We know that the earliest major introduction of microbes to the human gut is when newborns pass through the vaginal canal and are introduced to the mother’s vaginal and fecal microbiome. <sup>2</sup> Non-vaginal births, maternal imbalance, or complications during delivery can all impact the initial colonization of the gut. However, this can be restored and replenished with breastfeeding – where bacteria from the mother’s breast milk and on the skin of the nipples is transferred over to the feeding infant, and the eventual introduction of solid foods. <sup>2</sup>

Three pillars of a healthy microbiome are: metabolically active strains, diversity in strains and species, and a stable colonic environment to ensure that the gut bacteria stay in the large intestine. <sup>3</sup> Depending on the species of bacteria they will use and breakdown different fuel sources giving off by-products that can help absorb nutrients, signal the brain, feed the cells of the gut and so much more. <sup>4</sup> For example, a certain bacteria called *Clostridium butyricum* can produce a short chain fatty acid called butyrate which can then be used by the cells lining the large intestine (called colonocytes) as fuel, leading to better nutrient absorption and reduced inflammation in the gut. <sup>5</sup> Strains such as *Bifidobacterium* and *Lactobacillus*, have been shown to help us break down proteins and produce amino acids which are key building blocks to important neurotransmitters such as serotonin, GABA, dopamine and epinephrine. <sup>4</sup> While the strains themselves are important it is equally important to ensure the diversity of the microbiome, through having multiple different strains of varying bacteria species. Microbial diversity indicates a healthy and robust ecosystem. <sup>6</sup> It’s a well calibrated and sometimes delicate ecosystem whereby some strains work together producing by-products and food for others while others keep each other in check by competing for these resources. This ensures that no strain becomes pathological, in fact some “bad” bacteria can live in our digestive tract for years without doing any harm but after an illness or a change in environment, these opportunistic strains grow unchecked and can cause illness. <sup>6</sup> Finally, it is important to optimize the conditions of the colon to ensure that the two factors above can exist. Specifically, the pH balance throughout the gut, managing infection and inflammation induced damage, and limited use of medications such as broad-spectrum antibiotics. <sup>4</sup>

## Microbiome and Disease

A disruption in the microbiome is referred to as “dysbiosis,” which can have a profound impact on your overall health. Dysbiosis can cause local and systemic symptoms (see below) and when left untreated can influence disease progression. While we don’t know the exact relationship in each disease, the more we learn about the microbiome these correlations are becoming stronger and clearer. In fact, researchers have identified that characteristic changes to the microbiome can be seen in diseases such as IBS and IBD, cancer, multiple sclerosis, asthma, arthritis, depression, anxiety, obesity and more. <sup>1,2,3,6,7,8</sup> For example, researchers found that patients with IBS had reduced levels of the beneficial *Lactobacillus*, *Bifidobacterium* and *Faecalibacterium prausnitzii* species as compared with healthy individuals. <sup>2</sup>

Signs and Symptoms of Dysbiosis <sup>8</sup>	Risks for Dysbiosis <sup>8</sup>
Digestive: <ul style="list-style-type: none"> <li>• Gas</li> <li>• Bloating</li> <li>• Constipation</li> <li>• Diarrhea</li> <li>• Abdominal cramping or pain</li> <li>• Undigested food in stools</li> <li>• Foul smelling stools</li> <li>• Iron deficiency</li> <li>• Vitamin B12 deficiency</li> <li>• Food allergies/ intolerance</li> </ul> Systemic: <ul style="list-style-type: none"> <li>• Acne</li> <li>• More infection</li> <li>• Anxiety</li> <li>• Depression</li> <li>• Fatigue</li> <li>• Weight gain</li> </ul>	<ul style="list-style-type: none"> <li>• Unclean drinking water and food</li> <li>• Gastroenteritis infection</li> <li>• History of an eating disorder</li> <li>• Frequent antibiotic use</li> <li>• Abdominal trauma</li> <li>• Cancer</li> <li>• History of irritable bowel syndrome (ie; chronic constipation or diarrhea)</li> <li>• Malnutrition</li> </ul>

## Diets and the Microbiome

While genetics, physical environment, comorbidities, medication use, toxin exposure and infection are all important considerations, our diet is arguably the most easily modified factor. It is important to note that while the diet impacts the makeup of the microbiome the relationship really goes both ways as a healthy microbiome ensures proper nutrient absorption. <sup>1,3</sup>

Let’s examine how diets – what, when and how we eat will impact the three pillars of the microbiome.

Diet	Description	Impact on Microbiome
SAD – Standard American Diet	This diet is high-fat, high-sugar, high levels of red and processed meat, high levels of refined grains and a lower level of fiber.	This diet is related to high inflammation, diabetes, poor cardiovascular function, obesity and metabolic syndrome. One of the most important impacts is on the microbial diversity with an overabundance of the potentially harmful and immune stimulating Enterobacteria, while the <i>Bifidobacteria</i> and <i>Lactobacilli</i> are very low. There is also a higher likelihood of having intestinal barrier issues such as leaky gut with this diet. <sup>2</sup>
Ketogenic Diet – High fat	This high fat (animal and plant) protein and fibre diet requires restrictions in daily carbohydrate intake.	The impact on the microbiome of the high fat diet of the ketogenic diet depends on the types of fats ingested. High saturated fats increased <i>Faecalibacterium prausnitzii</i> and subsequently decreased bacterial diversity. While increased intake of polyunsaturated fats was correlated with more diversity and increases in the beneficial <i>Lachnospiraceae</i> family. <sup>2,3</sup>
Mediterranean Diet	This diet was popularised for its heart health benefits and is characterised by lots of polyunsaturated fatty acids from olive oil, avocado and fatty fish, richly pigmented fruits and vegetables with complete vitamin profiles and dietary fibers.	The most significant impact of the Mediterranean diet on the microbiome seems to be the benefits which improve the colonic landscape – ensuring bacteria can colonize and thrive. Researchers have suggested that this diet reduces inflammation and improves lipid profiles. This diet also shows increased levels of short chain fatty acids (SCFA), and an increase in heart healthy species such as <i>Lactobacillus</i> , <i>Bifidobacterium</i> and <i>Prevotella</i> , while decreasing harmful pathogenic <i>Clostridium</i> levels. This diet also includes plants with high antimicrobial activity such as garlic which helps keep the balance. <sup>2,3</sup>
Paleolithic – High protein diet	This diet emphasizes animal proteins, low sugar and carbohydrate intake with moderate to low fat intake.	Overall a high in protein diet is related to an increase in microbial diversity, though much like the fats the type matters. Plant proteins have been shown to increase <i>Bifidobacterium</i> and <i>Lactobacillus</i> , while also decreasing pathogenic species such as <i>Bacteroides fragilis</i> and <i>Clostridium perfringens</i> . Once again the overall impact is more SCFA production. <sup>2,3</sup> Animal protein is broken down into red and white meats. The red game meats were associated with species that increase intestinal inflammation such as <i>Bacteroides</i> , <i>Alistipes</i> , <i>Bilophila</i> . These species put out more toxic metabolites (amines and sulfides) which can alter barrier function. However, with the proper balance of protein sources this diet pattern can be beneficial to overall microbial diversity. <sup>1,2</sup>

Ultimately, no matter what diet you follow you are also feeding and populating the bacteria in your gut. With that in mind scientists seem to recommend a high fibre, low processed, diverse and fresh diet. With a variety of fruits, vegetables and proteins. Interestingly the overall macronutrient composition did not seem to be most impactful – rather the quality and type of food (ie. What type of fat or protein are you consuming?)

It is worth noting that other factors such as the food preparation and timing of the meals can also impact the microbiome. Cooking, blanching or steaming depending on the type of food can improve the microbial diversity by releasing the nutrients that would otherwise be tied up in the fibrous matrix.<sup>1,5</sup> Chrononutrition is the study of the relationship between the circadian rhythm, nutrition and the microbiome. While the role of the microbiome in establishing feed/wake cycles is unclear there is a synchronicity that is seen between bacterial and host activity that resembles a circadian rhythm. Meaning concepts such as alternate day fasting or fasting mimicked diets (like intermittent fasting) may in turn influence the makeup of the microbiome.<sup>9</sup>

## The Long-Term Effects of Yo-Yo Diets and Disordered Eating

The obsession “magic bullet solutions” to weight loss has unfortunately led individuals down the path of extreme, restrictive diets all in the name of losing weight fast. Unfortunately, this route ignores an individual's unique needs, in particular the balance of their microbiome, resulting in rebound weight gain, digestive disturbance and sometimes long-term digestive complications.<sup>10</sup> Researchers found that yo-yo dieting decreased diversity in the microbiome and the metabolic activity of the strains.

Disordered eating, such as the patterns in anorexia nervosa or binge eating, can also slow down the migrating motor complex (MMC) a network of signals that propels food through the digestive tract using smooth muscle contractions.<sup>11</sup> The sensors for the MMC can become hypersensitive or inactive, movement through the digestive tract becomes sluggish and can lead to a slow transit time. When this happens, food is sitting in the gut longer and there is an opportunity for bacteria to colonise parts of the small intestine, known as small intestinal bacterial overgrowth (SIBO<sup>12</sup>) The migration of the bacteria up into the small intestine can cause some very unpleasant symptoms such as bloating after meals, abdominal pain and malabsorption.

## Improving your Microbiome

To help get your microbiome back to balance we can follow a simple “weed” then “seed” protocol.<sup>13</sup>

**Step one:** Identify and correct any overgrowth of harmful or pathogenic bacteria.

**Step two:** Replenish and restore. Knowing what we now know about the microbiome, it's no wonder every culture has a fermented food dish. Sauerkraut, kimchi, kefir, yogurt, kombucha, to name a few, are all fermented meaning there is a little microbial ecosystem waiting to meet your gut. The research is still out on how effectively these fermented foods colonize your gut but combined with high fibre prebiotics we can begin to cultivate the good bacteria to grow. In cases with severe dysbiosis, or post antibiotic use you may consider taking supplements that combine some of these common strains. The main considerations you need to have when selecting your probiotic are the strains, the delivery and the stability. Take a less is more approach to probiotics as each strain should be synergistic and complementary with the others in the capsule. And the strains should have clinical evidence of use proving that they will arrive at the large intestine unscathed as many formulas don't account for the harsh environment of the stomach acid and are clearly designed in a lab without consideration of the complexities of the human digestive tract.

After correcting any dysbiosis a well-balanced fibre and protein rich diet will foster a healthy microbiome because those bugs are working hard for us, and it really is the least we can do.



### References:

- Hills RD Jr, Pontefract BA, Mishcon HR, Black CA, Sutton SC, Theberge CR. Gut Microbiome: Profound Implications for Diet and Disease. *Nutrients*. 2019 Jul 16;11(7):1613. doi: 10.3390/nu11071613. PMID: 31315227; PMCID: PMC6682904.
- Dong TS, Gupta A. Influence of Early Life, Diet, and the Environment on the Microbiome. *Clin Gastroenterol Hepatol*. 2019 Jan;17(2):231-242. doi: 10.1016/j.cgh.2018.08.067. Epub 2018 Sep 7. PMID: 30196160; PMCID: PMC6422042.
- Zmora N, Suez J, Elinav E. You are what you eat: diet, health and the gut microbiota. *Nat Rev Gastroenterol Hepatol*. 2019 Jan;15(1):35-56. doi: 10.1038/s41575-018-0061-2. PMID: 30262901.
- Salazar N, González S, Nogačka AM, Ríos-Covián D, Arbolea S, Gueimonde M, Reyes-Gavilán CGL. Microbiome: Effects of Ageing and Diet. *Curr Issues Mol Biol*. 2020;36:33-62. doi: 10.21775/cimb.036.033. Epub 2019 Sep 27. PMID: 31568686.
- Isono, A., Katsuno, T., Sato, T. et al. Clostridium butyricum T0-A Culture Supernatant Downregulates TLR4 in Human Colon Epithelial Cells. *Dig Dis Sci* 52, 2963-2971 (2007). <https://doi.org/10.1007/s10620-006-9593-3>
- Daniel H. Diet and the gut microbiome: from hype to hypothesis. *Br J Nutr*. 2020 Sep 28;124(6):521-530. doi: 10.1017/S0007114520001142. Epub 2020 Apr 2. PMID: 32238220.
- Ezra-Nevo G, Henriques SF, Ribeiro C. The diet-microbiome tango: how nutrients lead the gut brain axis. *Curr Opin Neurobiol*. 2020 Jun;62:122-132. doi: 10.1016/j.conb.2020.02.005. Epub 2020 Mar 19. PMID: 32199342.
- Belzario JE, Faintuch J. Microbiome and Gut Dysbiosis. *Exp Suppl*. 2018;109:459-476. doi: 10.1007/978-3-319-74932-7\_13. PMID: 30535609.
- Zheng D, Ratiner K, Elinav E. Circadian Influences of Diet on the Microbiome and Immunity. *Trends Immunol*. 2020 Jun;4(6):512-530. doi: 10.1016/j.it.2020.04.005. Epub 2020 Apr 28. PMID: 32359722.
- Chilloux J, Dumas ME. Are Gut Microbes Responsible for Post-dieting Weight Rebound? *Cell Metab*. 2017 Jan 10;25(1):6-7. doi: 10.1016/j.cmet.2016.12.016. PMID: 28078768.
- Monteleone AM, Troisi J, Fasano A, Dalle Grave R, Marciello F, Serena G, Calugi S, Scala G, Corrivetti G, Cascino G, Monteleone P, Maj M. Multi-omics data integration in anorexia nervosa patients before and after weight regain: A microbiome-metabolomics investigation. *Clin Nutr*. 2021 Mar;40(3):1137-1146. doi: 10.1016/j.clnu.2020.07.021. Epub 2020 Jul 31. PMID: 32782162.
- Bures J, Cyran J, Kohoutova D, Förstl M, Rejchrt S, Kvetina J, Vorisek V, Kopacova M. Small intestinal bacterial overgrowth syndrome. *World J Gastroenterol*. 2010 Jun 28;16(24):2978-80. doi: 10.3748/wjg.v16.i24.2978. PMID: 20572300; PMCID: PMC2890937.
- Peron G, Gargari G, Meroño T, Miñarro A, Lozano EV, Escuder PC, González-Dominguez R, Hidalgo-Liberona N, Del Bo' C, Bernardi S, Kroon PA, Carrién B, Cherubini A, Riso P, Guglielmetti S, Andrés-Lacueva C. Crosstalk among intestinal barrier, gut microbiota and serum metabolome after a polyphenol-rich diet in older subjects with “leaky gut”: The MaPLE trial. *Clin Nutr*. 2021 Oct;40(10):5288-5297. doi: 10.1016/j.clnu.2021.08.027. Epub 2021 Sep 9. PMID: 34534897.



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# Long-Term Impact of Sugar Consumption

By Jen Marion, ND



Hippocrates said, “let food be thy medicine and medicine be thy food.” Unfortunately, in the Western world most people do not view food this way, especially sugar.

The breakdown of carbohydrates into glucose (a sugar) is an important way the body gets fuel to carry out various chemical processes. However, the source of the sugar and how much one consumes is also very important.

In a typical Western diet, people consume approximately 17 tsp of added sugar each day. In 2015, the WHO suggested that people on a 2,000 calorie a day diet only get 5% of their calories from added sugar (6 tsp or 100 calories). Added sugar consumption can result in many short- and long-term effects.

High sugar intake has been associated with an increased prevalence of acne and poor skin appearance. In a 2018 study of university students who consumed sweetened drinks seven times per week, it was found that they were more likely to develop moderate to severe acne. When one consumes sugar, insulin levels spike to move that sugar out of the bloodstream and into the cells. This insulin spike leads to inflammation throughout the body and an increase in the production of skin oils that clog follicles and can produce acne. Further, when this inflammatory process occurs, there is increased glycation of collagen in skin. Glycation of collagen will impact one's complexion, as well as reduce the function of internal organs. Glycation is one of the main culprits for the numerous complications associated with diabetes.

Interestingly, there is still controversy as to whether added sugar directly causes obesity and weight gain. At this time, there are epidemiological studies showing that sugar consumption is associated with weight gain, as well as intervention studies where it is shown that high sugar diets increased weight gain compared to low sugar. However, there are no blinded studies where subjects are on either a high or low sugar diet, where each diet contains equal fibre and macronutrients and weight gain is compared. Unfortunately, the challenge in completing these studies, which would then be able to provide support for policy changes, is obtaining funding. It is known that over time high sugar diets can lead to leptin resistance, which is the hormone that tells your brain you are full. Therefore, those who consume high sugar diets will be more prone to over-eating and ultimately weight-gain.

As previously mentioned, intake of sugar leads to insulin secretion and a diet that is consistently high in sugar can lead to insulin resistance and type 2 diabetes. Type 2 diabetes leads to a significant increase in the risk of cardiovascular disease. A 2014 study found that those who consume 17-21% of their calories from sugar had a 38% increased risk of dying from cardiovascular disease compared to those who only consumed 8%. For those that had greater than 21% of their calories coming from added sugar, the risk of cardiovascular disease doubled.

Further, it has been suggested that excess sugar can potentially lead to an increased risk of cancer. As previously mentioned, sugar causes inflammation and oxidative stress throughout the body, which are both linked to an increased risk of cancer. There is a 23-200% increased risk of cancer with sugary drink consumption and a 59% increased risk in those who consume sugary drinks and have abdominal obesity.

Long-term sugar consumption has also been shown to lead to cognitive issues. The purpose of food is to maintain homeostasis and energy balance in the body. In a recent animal study, they found that high sugar consumption led to the same firing in the brain as one would see in a drug addict. In a sense, this type of desire for sugar can be compared to an addiction. The craving for unhealthy sugar laden foods is reward-driven, and consumption leads to dopamine release. The drive for these foods overrides the purpose of food, to maintain homeostasis and ultimately, the pleasure of consumption can lead one to eat much more than would be necessary for energy balance. In one study, drug-sensitized rats were more willing to endure foot shock punishment for palatable food than for methamphetamine. Aside, from having an addictive quality, long-term sugar intake has been shown to lead to other cognitive deficits.

In Western populations where children and adolescents consume four times the recommended added sugar amounts, there is a higher prevalence of attention deficit hyperactivity disorder (ADHD). High sugar is correlated with inattention and hyperactivity in children and inattention and impulsivity in adults. Animal models have shown that long-term high sugar consumption (adolescence into adulthood) led to significant weight gain, persistent hyperactivity and learning impairments. The learning impairments were correlated with reduced hippocampal neurogenesis in adult mice. The hippocampus is the part of the brain that plays a major role in emotions, learning and memory.

Long-term added sugar consumption is clearly correlated with many negative health outcomes and is linked to the obesity epidemic in Western society. Though advertising for these high sugar foods is powerful and grocery store aisles are full of these products masked as a “healthy snack,” there are ways to avoid added sugars. One must become knowledgeable about how to read a label to find the hidden sugars (see below for a list of examples). Currently, sugar is still big business, and it is up to the consumer to become educated on how to make smart choices and truly make “food thy medicine” and not a contributor to disease.

## Some other common names for added sugar to be aware of:

- Dextrose
- Fructose
- Glucose
- Galactose
- Lactose
- Maltose
- Sucrose
- Corn Sweetener
- High fructose corn syrup
- Invert sugar
- Maple syrup
- Rice syrup
- Molasses
- Honey
- Agave
- Cane Juice
- Fruit juice concentrates
- ANYTHING with sugar in the name



# Emotions and Weight Management

By Krista Powell

Every year, many people recommit themselves to living a healthier lifestyle, exercising regularly and eating a balanced diet. And yet, weight management continues to be a lifelong struggle. Even for those who initially lose weight, it usually returns. Studies show that nearly two out of three people who lose up to 5% of their total weight will gain it back and the more weight lost, the less likely it is to keep it off.

In a survey of more than 1,000 people it was found that 31% thought a lack of exercise is the biggest barrier to weight loss, followed by 26% who said it's all about diet, then 17% who thought the cost of a healthy lifestyle was the main factor. Another 12% thought the necessary time commitment was the biggest barrier to weight loss.

**Only 1% of people thought emotional well-being was a factor. The key to losing weight and keeping it off long term, may be less about what we eat and more about why we're eating.**

While this strategy may sound simple it's more complex than it seems at face value. Our emotional attachment to food begins at an early age. Treats are often given as a reward for good behaviour or to console an upset child. We learn very early that food, especially treats can make us feel better, even if it's only temporary. Cookie = Happy.

This continues into adulthood as most celebrations like Halloween, Thanksgiving and Valentine's Day, birthdays are spent sharing large meals and sweet treats. Even the smells of foods from our childhood can evoke powerful emotional connections, like dad's blueberry pancakes or grandma's snickerdoodles.

We have been conditioned to use food not only for nourishment, but for comfort whether we're aware of it or not. If we are able to acknowledge it and deal with it appropriately then this isn't necessarily a problem. But when food consistently becomes our reward, it can have negative consequences.

Whenever the brain experiences pleasure for any reason it produces the same reaction. A delicious slice of cake or satisfying meal can cause the release of dopamine in the brain, the same "happy hormone" that is released by caffeine, cocaine or even a romantic encounter. We experience the same good feelings regardless of whether the thing that triggered the response is good for us or not.

Research has uncovered a link between emotional issues like stress, anxiety and depression, and weight management struggles. Many of us can relate to the idea of overindulging at

happy hour after a hard day at work or eating a pint of ice cream or a bag of chips to cope with bad news or a stressful event.

It's easy to develop a habit of coming home from work and going immediately to the fridge or treat cupboard for comfort or consolation. This is an easy way to calm down and relax. Food can numb the mind and provide a temporary escape.

So how do we break this cycle? Are we doomed to a life of craving food rewards or is it possible to reprogram the brain's reward centre? Change is difficult but definitely possible. It's important to first recognize the emotional connection we have with food and then find ways to alter those patterns.

Here are a few ways to start this process:

- Keep a food journal. Don't just make note of what you ate, but also how you were feeling when you ate. Look for patterns that might help you develop better habits.
- Identify which foods make you feel happy and why. Do you have a sentimental attachment to that food? Does it bring you comfort? Does stress make you crave it?
- Ask yourself: Am I eating this because I'm hungry? If the answer is no, look for your true motive. Am I stressed? Scared? Lonely? Bored?
- Practice mindful eating. Try to really experience the food you eat. The different textures, the colours, the flavours. Chew your food thoroughly and avoid eating in front of the television where it's easier to zone out.
- Try to listen to your body's hunger cues. Eat when you're hungry. Depriving yourself of nourishment will only make cravings worse.
- If you have the urge to eat when you're not hungry or to keep eating past the point of fullness, find a distraction. Go for a quick walk, pick up a craft project, turn on some music and dance, take a bath - anything that brings you joy and fulfillment.
- Look for other ways of rewarding yourself that don't involve food. Buy yourself some special coffee or tea that you enjoy, sign up for a pottery class, treat yourself to a facial or massage, visit an art gallery or museum. These are just a few ideas; the key is to find something that feels special to you.




Weight management is nuanced and complex and there are no easy, one size fits all answers. Learning to see food as nourishment, not as a reward is one way to introduce real change. It's normal to struggle and there's no shame in asking for help. If you were looking to learn a new exercise, you'd ask a fitness expert for guidance so why not talk to a mental health professional for the emotional aspect? You might find that taking a new approach makes all the difference.



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# Obesity and Liver Health

We're all looking for ways to optimize our health and maintain balance with weight management and movement. Keeping our livers healthy and functioning properly is paramount, as this powerhouse organ, our body's second largest, is one that works 24 hours a day. Our livers are responsible for over 500 biological functions such as detoxification, energy storage and creation, nutrient processing, fighting infections, cleansing our blood and converting carbohydrates, proteins and fats into the energy we need on a daily basis.

There are ways the liver can become fatty through an excess of fat in the liver's cells. The most common cause of a fatty liver is obesity according to the Canadian Liver Foundation, where they estimate more than 50% of Canadians are overweight, with an estimated 75% of obese individuals at risk of developing a fatty liver.

If you have one or more of the following risk factors, you may want to speak with your healthcare provider about monitoring your liver function:

- Waist measuring >35 inches for women and >39 inches for men
- Existing type II diabetes
- High blood pressure over 130/85
- Insubstantial diet with lots of processed foods and sugar
- Smoking

Be sure to talk to your healthcare provider right away if you're experiencing any of these symptoms:

- Chronic fatigue
- Yellow pallor on skin
- Yellowed whites of the eyes
- Tenderness in the upper right abdomen

Our livers metabolize everything that goes into our bodies and there are many ways in which we can keep our livers healthy and thriving. The best way to thwart fatty livers is from our diet and making lifestyle changes – getting some activity and exercise in our lives (at least 30 minutes a few days a week), maintaining a healthy weight and if necessary, medications. The traditional western diet is high in meat, dairy and refined grain products, making our livers work that much harder and this plays a part when our livers become fatty and unhealthy.

While we do need the right amounts of “healthy fats” in our diets, we also need to be cognizant of steering clear of saturated and trans fats, fried foods, excess amounts of sugar and drinking too much alcohol. Overloading our livers can force them to work extremely hard and increases the potential for a fatty liver. Foods such as avocados, dark chocolate, nuts, chia seeds, flax seeds, hemp hearts and virgin olive oil are good sources of healthy fats to incorporate into your diet and they also provide other nutritional benefits.

It's also important to have a strong and diverse representation of fibre in your diet. As we age, a common phrase people will say to one another is “fibre is your friend” and they're right. It is a key source in helping eliminate waste and toxins, helping sweep the colon. There are two types of fibre: soluble and insoluble. Insoluble fibre helps promote regularity and a healthy digestive system, while soluble fibre helps in lowering blood cholesterol levels as well as controlling our blood sugar levels.

A diet rich and high in fibre will keep you feeling full for longer, an ally against overeating. When increasing your fibre intake, drink plenty of liquids like herbal teas and water to help fibre work better and aid in the digestion process. From whole grains (quinoa – though technically a seed, rice) to vegetables (Brussels sprouts, sweet potato) to fruits (pears, berries, dates) and legumes (beans, lentils, chickpeas), there are many healthy and delicious ways to increase our fibre intake and we should aim for 30-35 grams per day.

A question you may ask yourself when researching all the foods high in fibre and ones that promote a healthy liver is, “Do I need to take a supplement?” There are several nutrients that can support the optimal function of your liver. Some of these include:

- **Milk Thistle Extract** – with the active herbal ingredient silymarin, milk thistle has been extensively researched for its role in detoxification via several methods. Its liver protecting properties include antioxidant activity of free radical scavenging, increasing the intracellular concentration of glutathione (the body's premiere antioxidant), regulating cellular membrane permeability to stabilize against toxic injury, as well as helping to protect DNA inside the cell.
- **N-acetyl cysteine (NAC)** – this sulfur containing amino acid is a precursor to glutathione and also displays free radical scavenging properties, reducing oxidative stress from issues like heavy metal load and acetaminophen toxicity to name a few.
- **Phyllanthus amarus** – an Ayurvedic herb, Phyllanthus has shown impressive results as an anti-inflammatory for the liver, as well as an antiviral to infections like Hepatitis B. With active liver disease of any kind, detoxification processes will be impaired, therefore Phyllanthus can be very synergistic to assist in supporting the liver from both an infective and detoxification perspective.
- **Sulfurophane** – a naturally occurring ingredient from the brassica vegetable family (e.g. broccoli), this compound exerts antioxidant properties and is a potent inducer of Phase 2 detoxification enzymes and also demonstrates anticancer properties.

Consult with your healthcare provider about any questions, comments or concerns you may have about weight management, your liver health and the possibility of supplementation so that you can come up with a plan that works for you.



#### Sources:

1. Yoxal V, Kentish P, Coldham N, Kuhnert N, Sauer M, Ioannides C. Modulation of hepatic cytochromes P450 and phase II enzymes by dietary doses of sulforaphane in rats: Implications for its chemopreventive activity. *Int J Cancer*. 2005; 117(3): 356-362.
2. Bagalkotkar G, Sagineedu SR, Saad MS, Stanslas J. “Phytochemicals from Phyllanthus niruri Linn. And their pharmacological properties: a review.” *Journal of Pharmacy and Pharmacology* 2006; 58: 1559-70.
3. Manov I, Hirsh M, Iancu TC. Acetaminophen hepatotoxicity and mechanisms of its protection by N-acetylcysteine: a study of Hep3B cells. *Exp Toxicol Pathol*. 2002 Feb;53(6):489-500.

# Western Diet and Chronic Pain

By Dr. Chantal Ann Dumas, ND

The famous quote “Let thy food be thy medicine and thy medicine be thy food” may not have been stated by Hippocrates after all but the Greek physician’s philosophy still holds true. We are currently witnessing a reappraisal of nutrition as recent studies not only underline the therapeutic potential of lifestyle interventions but are also generating valuable insights in the complex and dynamic transition from health to disease. <sup>i</sup>

## Chronic Pain

Of all well-known old and new lifestyle factors, dietary choices might influence the most the occurrence, maintenance and perception of chronic pain. <sup>ii</sup> The Global Burden of Disease Study 2016 concluded that due to their high prevalence, pain and pain-related diseases are the leading causes of disability worldwide. <sup>iii</sup> Chronic pain exerts an enormous personal and economic burden, affecting roughly 20% of the population <sup>iv</sup> and more than 30% of people worldwide based on some studies. <sup>v</sup> According to the World Health Organization (WHO), it is an important co-morbidity associated with depression, coronary heart disease, cerebrovascular disease, and road traffic accidents which are predicted to become the four leading contributors of global burden of disease by 2030. <sup>vi</sup> Unfortunately, conventional management of chronic pain is generally unsatisfactory. In fact, two-thirds of patients report dissatisfaction with current treatment and consequently, most chronic pain persists for many years. <sup>vii</sup>



## The Western Diet and Chronic Pain Connection

However, researchers are confirming what clinicians have been witnessing in the field for many years; the risk of chronic pain associated with conditions such as diabetes, obesity and arthritis may be increased by eating a high-fat Western diet. <sup>viii</sup> The Western diet is based on processed meat, sugary foods, refined grains, and low intake of fruits and vegetables. Although the composition of a western-style diet may not necessarily increase inflammation directly, it induces a reduction in anti-inflammatory defense and the persistent proinflammatory state can result in chronic pain. <sup>ix</sup> Western diet causes an excessive production of proinflammatory mediators that sensitize the peripheral afferent neurons including interleukins, histamine, TNF- $\alpha$ , 5-hydroxytryptamine, bradykinin, free radicals and eicosanoids (prostaglandins, leukotrienes and thromboxane). <sup>x</sup> To make matters worst, western-style diet imbalance also yields fewer anti-inflammatory mediators, including antioxidants and antioxidant defense. <sup>xi</sup>

## Omega-6 and Omega-3

A study published in the European Journal of Pharmacology found that typical Western diets, high in omega-6 polyunsaturated fatty acids (PUFA) constitute a significant risk factor for both neuropathic and inflammatory pain. Moreover, lowering omega-6 consumption while increasing omega-3 fatty acids was shown to ‘significantly reduce or even reverse pain’. Compared with the diet on which human beings evolved and our genetic patterns were established, Western diets are typically deficient in omega-3 fatty acids and have excessive amounts of omega-6 fatty acids. <sup>xii</sup> Various sources of information suggest that we have evolved on a diet with a ratio of omega-6 to omega-3 essential fatty acids (EFA) of approximately one whereas this ratio is typically 15/1-16.7/1 in

Western diets. <sup>xiii</sup> Good sources of omega-6 include nut and seed oils but they are also found in processed and fast foods, cakes and fatty or processed meats. Sources of omega-3 include oily fish, oysters, green mussels, lean beef, lamb, flax seeds, walnuts, tofu, and Brussels sprouts. Although eliminating, or at least reducing processed foods, is always in order, recommendations consist more in increasing our omega-3 intake.

## The Gluten Connection

Another dietary factor to consider when addressing chronic pain is gluten. Gluten sensitivity that does not fulfill the diagnostic criteria for celiac disease (CD) is increasingly recognized as a frequent and treatable condition with a wide spectrum of manifestations. <sup>xiv</sup> Hence the efficacy of a gluten-free diet (GFD) as a treatment modality for pain management has been the object of various study. For example, a study published in *Rheumatology International* supports the hypothesis that non-celiac gluten sensitivity may be an underlying cause of fibromyalgia syndrome. <sup>xv</sup> GFD also seemed to reduce pain sensitivity in women with chronic myofascial pain in masticatory muscles, and the researchers concluded that it may be beneficial as an adjunctive therapy. <sup>xvi</sup>

## Conclusion

Living with the burden of chronic pain is no small hurdle but the good news is that relatively simple modifications to our dietary choices may go a long way in reducing the occurrence, maintenance and perception of chronic pain. Several dietary patterns and interventions can be used to alleviate chronic pain such as improving our omega-3 to omega-6 fatty acids ratio and adopting a GFD. Although reducing processed foods and incorporating more omega-3 rich foods can only be beneficial, adopting a GFD can result in certain vitamins and mineral deficiencies. It is always best to consult with your healthcare provider when going on an elimination diet.



## References:

- <sup>i</sup> Witkamp RF, van Norren K. Let thy food be thy medicine...when possible. *Eur J Pharmacol*. 2018 Oct 5;836:102-114. doi: 10.1016/j.ejphar.2018.06.028. Epub 2018 Jun 21. PMID: 29936236.
- <sup>ii</sup> Casas R, Estruch R, S. Dietary Patterns, Foods, Nutrients and Chronic Inflammatory Disorders. *Immun. Res.* 2016;12:1-10. doi: 10.4172/1745-7580.10000122.
- <sup>iii</sup> Nijs J, Van Houdenhove B, Oostendorp RA. Recognition of central sensitization in patients with musculoskeletal pain: Application of pain neurophysiology in manual therapy practice. *Man Ther.* 2010 Apr;15(2):135-41. doi: 10.1016/j.math.2009.12.001. Epub 2009 Dec 24. PMID: 20036180.
- <sup>iv</sup> van Hecke O, Torrance N, Smith BH. Chronic pain epidemiology and its clinical relevance. *Br J Anaesth.* 2013 Jul;111(1):13-8. doi: 10.1093/bja/aet123. PMID: 23794640.
- <sup>v</sup> Cohen, S, Vase, L, Hooten, W. Chronic pain: an update on burden, best practices, and new advances. *SERIES/CHRONIC PAIN VOLUME 397, ISSUE 10289, P2082-2097, MAY 29, 2021 DOI:https://doi.org/10.1016/S0140-6736(21)00393-7*
- <sup>vi</sup> Mathers C. Fat WHO The global burden of disease: 2004 update. D. 2008 http://www.who.int/healthinfo/global\_burden\_disease/2004\_report\_update/en/
- <sup>vii</sup> Elliott AM, Smith BH, Hannaford PC, Smith WC, Chambers WA. The course of chronic pain in the community: results of a 4-year follow-up study. *Pain.* 2002 Sep;99(1-2):299-307. doi: 10.1016/S0304-3959(02)00138-0. PMID: 12237208.
- <sup>viii</sup> Witkamp RF, van Norren K. Let thy food be thy medicine...when possible. *Eur J Pharmacol*. 2018 Oct 5;836:102-114. doi: 10.1016/j.ejphar.2018.06.028. Epub 2018 Jun 21. PMID: 29936236.
- <sup>ix</sup> Shivappa N, Hébert JR, Rietzschel ER, De Buyzere ML, Langlois M, Debruyne E, Marcous A, Huybrechts I. Associations between dietary inflammatory index and inflammatory markers in the Asklepios Study. *Br J Nutr.* 2015 Feb 28;113(4):665-71. doi: 10.1017/S000711451400395X. Epub 2015 Feb 2. PMID: 25639781; PMCID: PMC4356169.
- <sup>x</sup> Dragan, S., Serban, M. C., Damian, G., Buleu, F., Valcovici, M., & Christodorescu, R. (2020). Dietary Patterns and Interventions to Alleviate Chronic Pain. *Nutrients*, 12(9), 2510. https://doi.org/10.3390/nu12092510
- <sup>xi</sup> Dragan, S., Serban, M. C., Damian, G., Buleu, F., Valcovici, M., & Christodorescu, R. (2020). Dietary Patterns and Interventions to Alleviate Chronic Pain. *Nutrients*, 12(9), 2510. https://doi.org/10.3390/nu12092510
- <sup>xii</sup> Simopoulos AP. The importance of the ratio of omega-6/omega-3 essential fatty acids. *Biomed Pharmacother.* 2002 Oct;58(6):365-79. doi: 10.1016/S0753-3322(02)00253-6. PMID: 12442909.
- <sup>xiii</sup> Simopoulos AP. The importance of the ratio of omega-6/omega-3 essential fatty acids. *Biomed Pharmacother.* 2002 Oct;58(6):365-79. doi: 10.1016/S0753-3322(02)00253-6. PMID: 12442909.
- <sup>xiv</sup> Isasi, C., Colmenero, I., Casco, F., Tejerina, E., Fernandez, N., Serrano-Vela, J. I., Castro, M. J., & Villa, L. F. (2014). Fibromyalgia and non-celiac gluten sensitivity: a description with remission of fibromyalgia. *Rheumatology International*, 34(11), 1607-1612. https://doi.org/10.1007/s00296-014-2990-6
- <sup>xv</sup> Isasi, C., Colmenero, I., Casco, F., Tejerina, E., Fernandez, N., Serrano-Vela, J. I., Castro, M. J., & Villa, L. F. (2014). Fibromyalgia and non-celiac gluten sensitivity: a description with remission of fibromyalgia. *Rheumatology International*, 34(11), 1607-1612. https://doi.org/10.1007/s00296-014-2990-6
- <sup>xvi</sup> Araújo Oliveira Buosi J, Abreu Nogueira SM, Sousa MP, Soraya Costa Maia C, Regis RR, de Freitas Pontes KM, Bon Jardim LR, Sales Pinto Fiamengui LM. Gluten-Free Diet Reduces Pain in Women with Myofascial Pain in Masticatory Muscles: A Preliminary Randomized Controlled Trial. *J Oral Facial Pain Headache.* 2021 Summer;35(3):199-207. doi: 10.11607/orfph.2823. PMID: 34609378.



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