



The Secret to **LOVING FOOD** *&* **LIVING WELL**



BY LORENE SAURO, RHN

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We appreciate the contributions of CAHN-Pro, Heather Hart, RHN, Jackie Pau, DDV Culinary Website, and Gourmet Sleuth.

Please use this information to learn about the human body and nutrition. Take the suggestions that suit you to help make changes in your daily life to achieve optimal health.

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About the Author:

Lorene has been a holistic nutritionist for 13 years and a pastry chef and food professional for 25 years. She teaches at the Canadian School of Natural Nutrition and is a director for The Canadian Association of Holistic Nutritional Professionals (CAHN-Pro). Her food credentials include a Cordon Bleu certificate and many years in the food industry. She also recently published the book *A Pastry Queen Goes Green*, a complete guide to baking with whole grains and whole sweeteners. Lorene does not believe in low-fat or low-carb and

she does not ascribe to any health or diet fads. She has been counseling individuals to help them find the food that works best for them and their health issues for 12 years.

Lorene believes we should focus on consuming whole foods, including whole grains and whole sweeteners, and on cooking with delicious herbs and spices, so flavor, taste and texture are the rule, not the exception. She believes that we are all individuals and that our diets and lifestyles should reflect this fact. It is best that we all eat foods rich in nutrients and learn to respond to our natural food cues.

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Preface

Are you tired of the constant blather about what you should eat? Do you wish you knew a bit more about how and what your body needs so you could make up your mind for yourself? If you answered yes to either of these questions, then this book is for you. I wrote this book to give you basic information so that you can come to your own conclusions regarding your nutrition. I have had my own health issues, so I know the frustration of looking for answers and getting information that did not help or make sense. For many years, I suffered from endometriosis and I have cartilage missing in my left hip. I was frustrated with the information that was available to me about my conditions and, in 1999, I decided to go to the Canadian School of Natural Nutrition to become a holistic nutritionist and begin my own journey to solve my problems. Today, I am pain free and do not have any recurring issues from these conditions. Do I still have missing cartilage – yes, I do, but it does not cause any problems or pain, just a little loss of range of motion. Considering that I used to walk with a cane, this is a huge accomplishment.

As a holistic nutritionist, I have continued to learn and challenge the many food and health theories and I have counselled clients and hundreds of nutrition students who consistently tell me that my perspective makes sense.

I have learned a lot. While dealing with my conditions, I became increasingly frustrated with what I saw was a lack of common sense when it came to connecting my conditions to my diet and lifestyle. I was told so many different things by numerous practitioners on either side of the health spectrum. Medical doctors told me it was my weight. I did not think I was particularly overweight. Other doctors told me it was saturated fat, wheat, or dairy, but it wasn't. I was also told it was a "mystery". If I had not learned what I did, I am sure I would be miserable right now, either still having not solved my issues or, if I had listened to the food police, having no fun at all eating my food.

I have written this book to give you a start on your own journey to understanding your body. By addressing several important concepts, I hope I will make you less afraid of foods, understand the importance of enjoying your life *and* the food you eat, and I hope to empower you to make decisions for yourself. So, please enjoy the journey.

If I was going to sum up my philosophy it is that we should all adopt to keep things simple:

- Understanding that fat is good for you and you cannot be healthy without it. This includes saturated fat, as long as it is natural fat and not hydrogenated.
- Eating whole foods, like whole grains and whole sweeteners, and learning to create the textures and taste you like with these foods.
- Consuming fermented foods to maintain the good bacteria in the body.
- Keeping the body moving – all forms of activity are valuable.
- Consuming sufficient carbohydrates, fats, protein, vitamins, minerals and plant phytonutrients every day, to make sure your body has all the parts it needs.
- Making sure your food is full of flavour and that you enjoy every bite.
- Having a reason to get up every day and be happy!

This is a basic recipe for health and longevity and if you want to know why, keep reading!

Introduction

If we all understood the basics of how our bodies work, it would be easier to understand why we need the nutrients that nature put in our food. We are complex but amazing beings. As much as scientists have learned about how we function, it is just the beginning. This information is for those who want to know more, but are not sure where to begin to look for it. Most people just want to enjoy their food and know that their food is giving them something in return. This book will give you the basics, as well as guide you to make the best, tastiest choices for you.

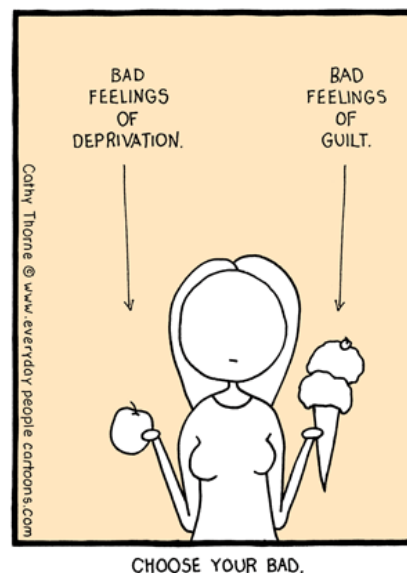
Just like the raspberry, we are a product of the natural world and there is only so much usable information we can gain by scientists dissecting our food. Sooner or later, we must go back to the natural model. Nature has a simple plan - only the strong survive - and it has created a system where the healthiest plants and animals are the ones that live and procreate to perpetuate the species. This may sound a little harsh, but for the purpose of understanding what we need, it is helpful to remember. How does nature do this? It has a simple formula. It gives all healthy members of a species the ability to defend themselves from all types of foes. Anything less than being completely healthy, and individuals become vulnerable.



From this perspective, it makes our jobs as people quite simple - be healthy. If nature gave us all that we need to defend ourselves from disease, then our focus should be on what resources we have been given. And while there may be things we have done to ourselves, impacting the planet in negative ways and creating food that makes this more difficult than it should be, we can at least focus on the food that nature gave us as a good place to start. Is it such a stretch of logic that maybe we should have left nature's food alone? And, if we can agree about that, then we know where we need to go – back to the foods we were supposed to eat.

Our ancestors had it right. They knew how to grow and prepare food, as well as mix and match ingredients, for the best results for one's health. In this process, they understood the health and taste value of the flavor that was natural to the food. Many of the foods we love so much today, from pizza to pad thai to red wine, are based on these traditions. So, we have nothing to lose by learning how to make the most of these traditions to keep us healthy.

Before we get into the food that we should be eating, we need to look at where we are today. There are many earnest people, who set upon a course of healthy eating only to find it made no difference or they felt worse. How can this be? If we are getting the nutrients our bodies need, then logic would suggest that it is all we should need to function. Unfortunately, depending on what we have experienced physically and emotionally in our lives, our genetic background and our current lifestyle, it may require more. So, let's first take a look at the body and how it works; then we can discuss the nutrients in the food and how we may access them for use in our bodies.



The expression may be “you are what you eat”, but it should really be “you are what you absorb

and excrete". Digestion is the process that allows nutrients from your food to enter into your body and help you build and maintain all that you need to be healthy. Elimination is the process of ridding the body of the things it does not need.

Many researchers believe disease begins with gastro-intestinal system problems. When our bodies don't digest food properly, we don't absorb the nutrients that are required to maintain our body's health. Our wellbeing is affected if our digestive or intestinal tract is not working optimally - whether it manifests itself as nausea, chronic gas and bloating or something as serious as irritable bowel syndrome - problems should never be ignored.

Food goes through three types of processes in the body: digestion, absorption and elimination. Our intestinal tract is one very long passageway through our body and, as food moves through it, the body breaks it down absorbing nutrients along the way and expelling the rest through the colon, along with any waste products from metabolic processes in the body. It is a simple process, nutrients in, waste material out. In between there are too many chemical activities to count and trying to wrap our heads around it all is really not necessary for our purposes. We should trust in the inherent intelligence of nature, do the best to give our bodies what they need and then relax and enjoy life. There is no need for perfection, just respect for our bodies and what they require.

Digestion

The digestive process begins in the mouth when we chew food. Saliva moistens the food and salivary enzymes start to break down carbohydrates. Food then moves into the stomach where protein is broken down further by hydrochloric acid (HCl), enzymes and gastric acid that starts separating the fat from other macronutrients.

After this, food moves into the duodenum, the first part of the small intestine. Here the food is mixed with bile (created by the liver and stored in the gall bladder) that acts like a detergent to break down fats. Carbohydrates, proteins and fats, are then ready for the final stage of digestion in the small intestines. The pancreas releases enzymes: amylase for carbohydrates, protease for protein and lipase for fats, into the duodenum and, with help from good bacteria, these enzymes break each of these macro-nutrients down into their smallest components. The stomach material (chyme), mixed with HCl, is then neutralized by bicarbonate also released by the pancreas. The intestines need an alkaline pH for intestinal enzymes to work and good bacteria to thrive.



Breaking down carbohydrates, proteins, and fats:

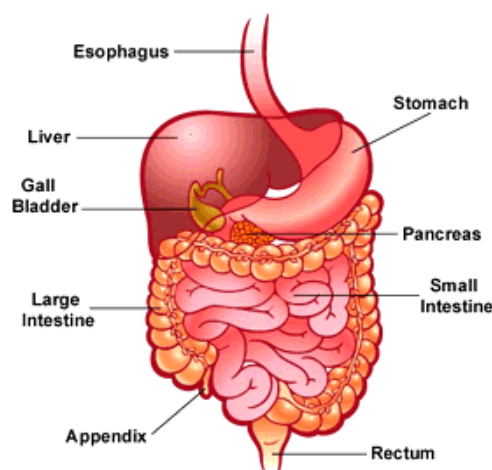
- * Carbohydrates are broken down into single molecules of carbohydrates such as glucose or other simple sugars like fructose
- * Proteins are broken down into single amino acids
- * Fats are broken down into single fatty acids

Once food is digested, the single components of carbohydrates, proteins and fats, along with vitamins, minerals and phytonutrients, are ready to be absorbed into the bloodstream and sent

to the liver. Then, the liver decides, based on signals from the brain and other parts of the body, what to do with the nutrients.

Optimal Digestion Time

Complex carbohydrates such as grains or legumes:	Up to 2 hours
Protein such as beef, chicken or fish:	Up to 2 hours
Fats including foods that are a combination such as nuts or seeds:	Up to 2 hours
Fruits and Vegetables:	15-30 minutes



[Courtesy of vitaminsdiary.com](http://vitaminsdiary.com)

Inside the Body or Out?

The gastro-intestinal tract starts in the mouth and ends in the rectum. It is simply a long tube. Technically though, this tract is still the outside of the body and it is more like the hole in a donut. As far as the body is concerned, until something like a nutrient or pathogen enters the bloodstream, it is not inside the body. There are blood vessels all along the tract and absorption of some liquids can enter at any point. However, the biggest point of entry into the blood stream is from the small intestines. 60% of the antibodies in the body sit just inside the bloodstream attached to this section of the tract, waiting for a pathogen to enter in order to attack it, since the body tries to prevent all pathogens from entering the bloodstream. Strong

Stomach acid and sufficient good bacteria are usually enough to stop most pathogens before they enter the bloodstream and both should be considered an important part of the body's defense system.

Good Intestinal Flora

There are at least 400 different types of good bacteria in the gastro-intestinal track and recent research indicates there may be many more. These good bacteria perform a variety of functions and exist in the mouth, small intestines, large intestines and vagina. There is speculation that they could also exist elsewhere, perhaps on the skin or in the urinary tract. We now know that these beneficial organisms play a substantial role in helping us fight disease and are an important part of our immune system.

In the small intestines, the good bacteria produce enzymes that can aid digestion, make decisions about absorption of nutrients and kill bad bacteria. In the large intestines, good bacteria help form the stool, aid in elimination and also kill bad bacteria. The good bacteria protect the intestinal wall lining from becoming damaged and facilitate repair. They also produce nutrients such as vitamins K and B12 and specialty enzymes like lactase and cellulase. In addition to performing all of these functions, good bacteria de-activate harmful chemicals

naturally occurring in food like solanine and apsegerillus niger and keep the gut lining healthy. A lack of good bacteria is now considered a leading factor in the development of all allergies.

When we study our ancestors' traditional diets, we learn that they took great care to maintain good bacteria levels by eating fermented foods that contained good bacteria. Examples of these types of foods are yogurt, kefir, miso, tempeh, red wine and sauerkraut. This is something we don't do sufficiently today. Other beneficial traditionally fermented foods are buttermilk, kimchi, true apple cider, vinegar and beer. These types of foods need to be consumed daily, as they support the good bacteria in our gut. In addition, the fermentation process also makes vitamins, minerals and phytonutrients in these foods more active and available for absorption in our bodies.

When suffering from a food allergy or sensitivity, most likely a lack of good bacteria is the original cause, not the food itself. Working to restore the intestinal flora, which is not an easy task, is the best solution for long-term health. If the issue with the food is resolved, then the intestinal flora has been successfully restored. Blame the gut, not the food!

There can be a variety of reasons for digestive problems and just as many different theories to explain them. If you suffer from gas and bloating, reflux, heartburn or any type of digestive problem, often it is not what you may be eating that's causing trouble, but how you may be eating. Combining certain types of foods can lead to poor digestion and discomfort. Therefore, if you're dealing with these types of problems, there are several approaches to try, known as The Steps to Good Digestion.

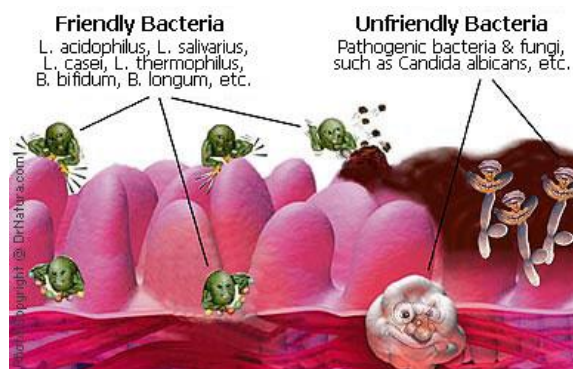
Benefits of Good Bacteria, Beyond the Intestinal Tract...

Fatty Liver: Interesting research on rats showed that rats that were fed a high-fat diet (71% fat) and probiotics had significantly lower levels of inflammatory indicators, such as liver TNF α , as well as MMP-2 and MMP-9 activities and evidence of iNOS and COX-2 all indicators for fatty liver disease, compared to rats not fed probiotics. Human studies are set to begin soon.

Hypertension, Cholesterol and Diabetes have recently been added to the list of conditions that also can benefit from probiotic therapy.

Cancer: Lactic Acid Bacteria (LAB) present in traditional fermented foods and probiotic supplements favor biological functions in our bodies, including an increase in immune system cell activity, which may play a role in the prevention of cancer. In cancer patients, probiotics prevent or delay the development of tumours through the binding of lactobacilli to mutagenic compounds in the intestine. This suppressed the growth of bad bacteria that convert procarcinogens (substances that can become carcinogens) into carcinogens.

AIDS: Probiotics have antibacterial effects and also play a role in the prevention and transmission of AIDS and STIs.



Are you lactose intolerant?

Good bacteria in the gut make the lactase enzyme, which breaks down lactose, the sugar found in milk products. Lactose intolerance indicates an insufficient amount of good quality bacteria in the gut to make lactase. This deficiency can be remedied, so it is worthwhile to take the time to learn what can be done to replenish it. You can stop consuming dairy products that will stop the symptoms, but this will not help you replenish the good bacteria you are missing, meaning an important member of your immune system is missing.

Steps to Good Digestion

Picture the average person with digestive issues. They have spent the day stressed and probably eating too little. They arrive home extremely hungry and, for the first time in the day, they can sit and eat. They are so tired and hungry that they start stuffing as much food as they can into their body. A big dinner is usually consumed in about 20 minutes, before the brain has a chance to signal that enough food has already been consumed. So now we have a stomach that is too full of food, most of it up at the top of the stomach and, as the peristaltic action to move the food through the tract begins, the muscles of the stomach contract trying to force the food down. But, because of the amount and the location of the food, some of it is forced up, causing reflux. The result is heartburn. The rest of the evening for this person is now spent feeling bloated and uncomfortable, continuing until the digestive system can catch up and finish digesting all the food ingested.

What would be a better scenario? A day spent consuming small amounts of food as needed, providing the body with a steady amount of fuel all day long. At the end of the day, a reasonable-sized dinner should be consumed in a slow, relaxed fashion, with each bite being savored and appreciated. The rest of the evening is spent feeling satisfied, comfortable and focused on other things.

Here are few key tips to maximizing your ability to digest:

1. **Chew thoroughly.** The enzymes in the saliva help start the digestive process for carbohydrates. The more you chew, the more saliva and enzymes are produced. For fat and protein, this chewing process exposes more surfaces to help enzymes that come into play later on as the food moves through the gastro intestinal tract.
2. **Drink no more than 1 to 2 oz. of fluids with meals.** Any extra volume in the stomach, whether from excess food or too much liquid, can cause reflux and heartburn.
3. **Avoid eating when stressed.** During times of stress, energy needed for digestion is co-opted for giving the body extra energy to deal with the stress. The process is called fight or flight and is a protective mechanism we have for dealing with danger.
4. **Eat small meals more often.** The less eaten in one sitting, the easier it is for stomach and intestinal enzymes to digest.

5. **Eat slowly.** Take time to allow the brain to register when enough food has been consumed. It takes at least 20 minutes before the message reaches the brain that food is in the stomach. If the meal is consumed in less than 20 minutes, it is too late for the brain to indicate overeating has happened. A full meal is best consumed over at least a 40-minute period or longer. So relax, slow down and enjoy.
6. **Try Food Combining or Food Sequencing.** Re-arranging how and when you eat certain foods can be helpful while correcting digestion.
7. **Try a Digestive Enzyme Supplement or Probiotic Supplement, or Both:** Taking either, or both of these, can help restore function when the other steps do not help enough. Digestive enzymes can contain HCL to help digest protein and ox bile to digest fat. These always contain amylase, protease and lipase. They may also contain specialty enzymes like lactase for milk or invertase for sugar. Probiotics (good bacteria) can be found in supplements, but can also be in fermented foods, like yogurt, kefir and sauerkraut. It is hard to know what you need specifically, so try different products.

What is Fight or Flight?

Fight or flight is the natural process we have to help us defend ourselves when we are under a physical threat. Energy is diverted from non-essential processes, like digestion, so that heart rate, blood sugar and muscle strength can all be increased, getting people ready to either fight to defend themselves or run away. The problem is, our bodies and brains do not distinguish between a physical threat, like being chased by a bear, from the boss yelling because an important deadline has been missed. This type of stress, which is quite chronic amongst many of us, has been linked to many common health conditions.



Two Theories That May Help Digestion

Food Combining:

Since proteins are digested primarily in the stomach and carbohydrates are digested primarily in the small intestines, when eaten together, carbohydrates must wait in the stomach's acidic environment for proteins to be digested. This causes carbohydrates to ferment, often producing gas and bloating, especially when consuming a large meal. Again, this is a theory and is based on the assumption that the stomach is an empty cavity and the churning of the stomach, as part of the digestion process, causes food to be mixed together. Food combining rules essentially state:

- 1) Eat concentrated proteins (meat and fish) and carbohydrates (especially grains) separately.
- 2) Vegetables can be eaten with either a carbohydrate or a protein.
- 3) Fat can be eaten with either carbohydrates or protein.
- 4) Fruits should be eaten alone a half-hour before or two hours after a meal.

Food Sequencing:

It is actually true that food moves through the digestive system in the order it is consumed. So, if you eat your food one bite at a time, chewing properly, the food will move through the stomach and into the duodenum one bite at a time. If vegetables are consumed first, they digest and move into the duodenum very quickly. Consuming the bigger carbohydrates like grain next allows them to move through the stomach to the duodenum without waiting for the protein. By eating the concentrated protein last, it has plenty of time by itself to allow the stomach acids to do their job before moving into the duodenum. (www.drbaass.com) It is explained as follows:

- 1) Vegetables first
- 2) Carbohydrates second
- 3) Complex proteins last
- 4) Fruit alone

These are just theories, but they take pressure off the digestive system because, if for no other reason than they both allow for thoughtful eating. If experiencing some digestive issues, try one of them—it is free and simple and could be a first step worth trying. One last tip: A digestive enzyme supplement can also be helpful if these tips do not help or if you find yourself in circumstances where you cannot control the food, timing or amount of food you are eating.



Looking Deeper Into Theory Of Eating Fruit Alone: There are two potential reasons to eat fruit alone. One is the belief that in a sluggish digestive system, fruit mixed with grains and other foods will cause further fermentation and gas. While this belief may have some merit, following the steps above will probably prevent the problem, should it occur.

The other reason often quoted is incorrect. Many food-combining books and websites discuss the enzymes found in raw fruit that help digest. Statements are made that stomach acid kills these enzymes and by eating fruit alone, it can pass through the stomach without the stomach acid interfering with the enzymes. This is simply not true. Stomach acid cannot kill enzymes. Enzymes cannot operate in an acid environment, as they require an alkaline PH to be active; they just go dormant as they pass through the stomach and become active again once they arrive in the alkaline environment of the small intestines.

All cultures consume fruit after a meal. There are theories as to why, but the best one is that it helps digestion and cleanses the palette after eating. If a meal is eaten in a calm fashion and proper timeframe, this is a helpful habit to develop. As for fruit with meals, individuals should do what is best for them and, if fruit is digested well with a meal, there is no reason to stop the practice.

Absorption & Elimination

The upper part of the digestive system, which consists of the mouth, stomach and small intestines, is for absorption. After all nutrients are absorbed into the bloodstream, the remainder passes from the small intestines to the large intestines or the colon. This semi-liquid mass contains mainly fiber and water material. It continues to breakdown to be formed into feces. Bile also contributes to the quality and color of the stool.

Proper elimination is critical to good health. Think of it as living in your house and not taking out the garbage. What would your house be like to live in with trash everywhere? The same holds true for your body. In order to have energy, maintain a healthful appearance and function properly, you need to eliminate waste from your body by, ideally, having two to three bowel movements daily. When elimination occurs less than once a day, it is an indication of constipation. The overall result of chronic, poor digestion and elimination is ill health that can lead to disease.

Any type of intestinal condition can cause a great deal of discomfort and unpleasantness. It must be understood that all of these conditions are preventable, but that once you have one of them, it may be difficult, though not impossible, to get rid of. A diet high in refined foods, lack of adequate water and fiber and insufficient good bacteria all play a role in the development of all bowel conditions. Many experts look for specific foods to blame for the cause of the intestinal disturbances, should a food cause discomfort such as diarrhea, constipation, gas bloating, or pain when consumed. However, the food is not the cause; it is a symptom. Removing the food may take away the symptom, but it does not solve the problem. As with lactose intolerance, the real problem remains a lack of good bacteria or other issues that indicate digestion problems. If not corrected, this will lead to further problems over time even though a food that highlighted an issue has been removed.

Stress is another issue that can affect how we absorb and eliminate. Potent neurotransmitters found in our brains are also found in our gut lining in much higher amounts. Materials move through our intestines using a process called peristalsis, which is a series of muscle contractions, and the neurotransmitters help regulate this function. The neurotransmitters involved are also the same ones we use when we are stressed and therefore our intestinal function can be affected as a result of stress.

Fermenting Grains and Legumes For Better Digestibility

Our ancestors fermented grains and legumes and so can we. There is so much talk about removing wheat or gluten from the diet, but is this really necessary? The answer is no. The process of fermenting grains, as used in making sourdough, actually breaks down starches and proteins, making the foods digest easily. The same goes for sprouting grain. A simple technique, for cakes and muffins, is to add one cup of flour, one cup of water (or whatever liquid the recipe requires) and 1-2 tbsp real apple cider vinegar. Let the mixture sit overnight, uncovered, then add the rest of the ingredients. Making sourdough bread is a topic in itself so check out these sites for more information:

[*Chicken in the Road*](#) [*Pinch My Salt*](#)

The process to prevent gas from legumes is to cook the legumes or buy a can of legumes (without salt), rinse and drain and then soak overnight in water with 1 tsp of sea salt and 1 tbsp apple cider vinegar. Drain, rinse and use as desired.

Making Homemade Kefir

Purchase kefir grains (look for them on the internet) or find someone who has them to donate. Using a clean glass jar, add 1-2 tablespoons kefir grains for every 2 cups (500ml) whole milk and place in a clean glass jar. Cover with a cloth so the carbon dioxide can escape and leave at room temperature for at least 24 hours. Stir and strain out the kefir grain through a sieve (metal ones should be avoided) or slotted wooden spoon. Store them in the fridge in a small glass jar with a lid or use them to start a new batch. The kefir can also be stored in a glass jar with a lid in the fridge. It can be consumed after 12 hours and will still have a sweet taste or it can ferment longer, for up to 48 hours. Once refrigerated it can continue to ferment but at a slower pace and may develop a fizzy taste. The longer it ferments the more the lactose and casein breaks down. Consume within two weeks. Goat's milk and coconut milk can also be used with kefir grains.



Prebiotics versus Probiotics

Prebiotics are dietary fiber substances such as fructo-oligosaccharides (FOS), gluco-oligosaccharides and inulin. They remain undigested in the upper portion of the gastrointestinal tract and feed the good bacteria. They essentially stimulate metabolic activity. Good food sources include bananas, onions, Jerusalem artichokes, yacon, chicory root, garlic, asparagus, barley, wheat, jícama, tomatoes and leeks. They are also heat stable so they can be used in baking and cooking. A 2007 study found that adding Jerusalem artichokes (pictured here) or chicory to baked goods increased the intestinal levels of good bacteria in the study participants over a 21 day period. There are short chain and long chain prebiotics. Short chain ferment faster and help feed the good bacteria in the upper part of the intestines and the long chain take longer to ferment and therefore are more available to feed the bacteria in the lower part of the intestines. Adding these foods to baked goods, other cooked dishes, or consuming them raw can help restore good bacteria in the gut and further help with digestion and elimination.



Probiotics are live microorganisms, also known as the good bacteria or good flora, found in certain foods we eat. Some are also available in the form of supplements and can have varying levels of effectiveness based on strains used, manufacturing and storage practices. A healthier way is to consume them in the food. Naturally fermented foods like kimchi, sauerkraut, kefir, yogurt and apple cider vinegar provide the body with enzymes, good bacteria, and lactic acid, which aids the maintenance of the intestinal flora. They also contain wild yeasts that feed the good bacteria. In order for the body to receive these benefits, the food must not be heated in order to prevent the bacteria, yeast and enzymes from being killed. Russian style kefir is particularly beneficial. If it is made with kefir grains, it contains 32 synergistic strains of good bacteria and yeasts and is the most comprehensive assortment of strains. Consuming this on a regular basis can improve intestinal health.

Three Key Steps to Getting More Nutrients Daily

Here are the basic principles summarized for easy implementation:

1. Follow all the steps to good digestion, especially chewing well and avoiding big meals.
2. Become a conscious eater – don't eat when stressed, pick foods that deliver flavor and taste satisfaction and savor the enjoyment of eating.
3. Consume a cross-section of cooked, raw and fermented food and make sure to include prebiotic and probiotic foods.

What Counts as Constipation?

Ideally, we would have 3-4 bowel movements a day, as they should correspond with the numbers of meals we eat. However, most experts are happy if someone has at least one good, quality bowel movement a day. Since we eat every day, waste material should be leaving every day. It is just logical. So, having less than one bowel movement a day is constipation. But we must also consider some other factors. If we poop little dark brown bullets, a sign of too little fiber and/or water, it is also considered constipation. If we need to strain to have movement, then that is constipation too. Ideally, we get the urge to go, we go, we're done and there is an ease to it that makes this particular body function no big deal.

Shape and Color

Here are the basics: A good bowel movement is either banana-shaped or S-shaped. It should be a dark, golden brown color and will be darker and harder the longer it stays in the colon. When food material enters the duodenum, it is mixed with bile that is a green color. As the material moves through the small intestines and digestion finishes, the remnants, which consist of fiber, water, bile and waste material (some waste comes from the liver with the bile), change color from green to yellow. Next, it moves through the large intestine, gradually darkening to the dark golden brown it should be by the time it leaves. Too yellowy means the material travelled too fast through the intestinal tract, which is the case with diarrhea. The stool should neither float nor sink like a stone. It should hit the surface of the water, gently submerge and then break up easily when flushed. Too much undigested fat in the stool will cause it to float and too little fiber and water will make it sink quickly like a stone.

What is a Good Transit Time?

The time frame for food to pass from the mouth to the exit point of the colon is 18 –24 hours. To test your transit time, eat some corn, which will show in the stool or eat beets to color the stool.

A bowel movement in a perfect world would occur within a half-hour to an hour of eating. The intestinal tract is just one long tunnel so when we eat and swallow, we have to remove something at end of the tunnel to make room for the new waste material coming into the colon. Muscle contractions move food along the tunnel, eventually resulting in a bowel movement at the other end.

What happens if this does not occur? The large intestine is like an accordion and it just expands to accommodate the new material until the bowels are ready to let it go. It is not hard to imagine what this may mean should there not be a bowel movement at least every day. Also, the longer the remnants of food stay in the colon, the darker and more fermented the stool gets allowing more gas and bloating to occur.

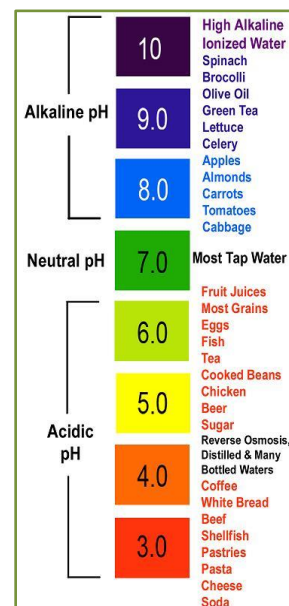
7 Steps to Good Absorption and Elimination

1. The number one step for good absorption and, subsequently, good elimination is following the steps to good digestion.
2. Eat foods that contain lots of nutrients worth absorbing—you can't absorb what you don't consume.
3. Supporting the good bacteria in the intestines keeps the intestinal wall lining healthy so that nutrients can be absorbed properly.
4. Consume plenty of fiber, soluble and insoluble, as it helps with the formation of the stool and works synergistically with the good bacteria to promote intestinal health and elimination.
5. Drink lots of water or eat juice-filled fruits like watermelon or oranges and water vegetables, like cucumbers, celery and lettuce. Water helps lubricate the intestinal tract and allows for easier elimination
6. Exercise, especially Pilates and yoga, keeps the muscles of the intestinal tract strong and help peristalsis. Gentle aerobic exercise like walking can also aid elimination.
7. Avoid stress. When we are stressed, we can tighten up muscles; this means all muscles, including those in the intestinal tract.

What Is All This Talk About Acid /Alkaline?

There has been a lot of talk about a person "being acidic" and that this is a potential cause for disease. In this context, the term "acidic" is a euphemism as the body cannot be truly acidic as nothing can live in acid – not bacteria, yeast and certainly not people. So what do people mean when they use this term to describe a person's body? Most of us took chemistry in high school and did experiments with PH strips. When we tested substances with the strips, they turned a certain color that we matched to a color range to indicate a ph number; 7 is neutral, below 7 is considered acidic and above 7 is considered alkaline. The blood in our body must stay in a range of 7.35 - 7.45 ph, so it is slightly alkaline. This is a major priority for the body and it uses alkalizing minerals, especially calcium, to stay in this range. If we do not have enough alkalizing minerals in our diet, the body will use minerals from other places in the body, like bones, teeth or hair, to keep our blood at the right ph level.

Acids are produced as part of the metabolic breakdown of protein tissue - you replace all parts of your body by breaking it down and building new parts - that is why true healing takes so long - some parts are replaced quickly and some take years. You do not have a single cell in your body today that was present 7 years ago. Every tissue in your body that has a protein component (including food) produces an acid, like uric acid, as part of the breakdown. And, these acids must be neutralized by alkalizing minerals, mainly calcium, magnesium, sodium and potassium. Acids are produced on a cellular level are best neutralized by sodium and potassium before the acid reaches the blood. If the acid makes it to the bloodstream, then it is calcium's job and, if there is



Nothing that is an acid outside the body is an acid inside the body once it moves into the duodenum.

not enough calcium, magnesium can do it too. All these minerals can neutralize acids in the intestinal tract produced from digesting protein in food. It really is that simple. If you look at alkalizing tablets or powder that ND's use, it is nothing more than sodium bicarbonate, potassium bicarbonate, calcium carbonate and magnesium carbonate - that tells you all you need to know.

An acidic diet really refers to a diet devoid of minerals to support the body's abilities to keep the blood in the right pH, thereby forcing the body to use minerals from other areas of the body or co-opt the few minerals that are in the diet for neutralizing the blood. Thus, not having enough to support all the functions that require those minerals. No food is actually an acid in the body as all foods, along with stomach acid, are neutralized in the duodenum by bicarbonate from the pancreas as explained in the digestion section.

Ignore all acid/alkaline food lists and remember that it is really quite simple. A food without minerals and a large amount of protein is considered "acidic" euphemistically, like meat or white flour. A food that has a small amount of protein and also contains minerals like grains, legumes, nuts, seeds and dairy products **are neutral**. Fruits and vegetables are considered alkalizing, as they do not contain large protein molecules that need to be broken down and they do contain minerals. Balance is the key.

Detoxification

Just as we need to eliminate what remains of the food we consume daily, we also need to eliminate the toxic waste substances created by various metabolic functions of the body. Simply put, "nutrients in; accumulated waste out". We also need to detox out any chemicals, drugs or substances the body deems harmful.

The bloodstream transports nutrients to various areas of our body and carries waste materials accumulated in our cells, from both external sources (e.g. pollutants, chemicals) and internal sources (e.g. from metabolic processes such as tissue repair), to the liver. Once there, waste materials are prepared for detoxification by the liver and carried by the bile into the intestinal tract and out of the body. We may be exposed to many different chemicals, medicines and pollutants on a daily basis, many of which have been linked to cancer and other diseases. It is critical to understand the body's built-in protective mechanisms and what they require in order to do their job properly to protect us from disease. The liver wants vitamins, minerals, bioflavonoids, antioxidants, other types of phytochemicals, properly digested proteins, fats (especially EFAs) and carbohydrates for energy, in order to detox. In other words, it wants the nutrients from properly digested, whole foods.

While the liver is not the only organ that helps us to detox, it is the most important. The liver performs more than 400 different functions and acts as a filter, trapping toxins by filtering blood, producing bile and breaking down toxins and waste. The kindest of body parts, the liver does everything possible to protect us and all it asks for, in return, is adequate nutrients to do its job. Because the typical North American diet is abundant in chemical-laden foods devoid of nutrients and since many people have lifestyles that often include alcohol and/or tobacco, medicines and stress, it's understandable why our bodies contain many toxins, which are stored in our fat cells. As long as we consume nutrient-dense foods, avoid chemicals and drugs as much as possible, our liver will do its job and prevent these toxins from being stored.

Stress And The Role It Plays In Our Health

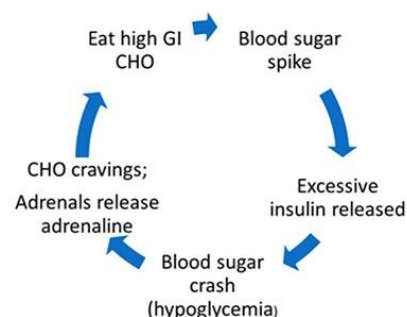
Today, the biggest threat to our health is the unrelenting stress we incur each day. Every common ailment, including heart disease, Type II diabetes and obesity, has stress as a contributing factor. Our bodies have been uniquely designed by nature to handle some stress. Our adrenal glands produce the hormones adrenaline and cortisol to provide boosted heart rate, energy and muscular strength, as we require it. This requirement was designed for situations of "fight or flight" - when we are confronted by sudden physical danger and the need to save ourselves. However, our bodies cannot differentiate between fleeing from a predator or other stressful situations, such as workplace, family or other emotional conflict. So when we experience stress our body's natural defense mechanism pumps adrenaline and excess cortisol that, in turn, uses up many nutrients and over time could cause damage to the body.

Stress, and the sudden release of adrenaline or the steady stream of elevated cortisol can also cause our blood sugar levels to fluctuate wildly as we burn sugar, not fat, when we are stressed. We are supposed to be fat burners, not sugar burners, but our lifestyles have changed. Instead of doing the steady daily physical work that burns fat like our ancestors did, we run with much higher stress levels causing our systems to produce excess cortisol, which causes us to burn much more glucose (simple sugar). This requires the body to need far more carbohydrates in a steady, even fashion. Without a steady source, blood sugar will drop and cravings result, as our body tries to make us consume something to bring up blood sugar.

The best way to mitigate the effects of stress on our bodies, from a nutritional perspective, is to keep the body fed with a steady supply of carbohydrate energy from whole grains, legumes, fruits and vegetables that are packed with vitamins, minerals, phytonutrients and fiber. There are different types of supplements that can help our adrenals function more effectively by supporting their function. However, in the end, the stress itself must be addressed. Nutrition can go a long way to help the body not suffer the ill effects of stress, but it cannot relieve the stress itself. So it is imperative that we take responsibility for the quality of our lives as best we can and make choices that limit stress as much as possible.

Understanding Cravings:

When our body wants to tell us to eat for a specific reason, it sends us a craving. In order to speak to us, our body signals us to consume foods and beverages it knows we will eat as that is the only way it can communicate with us to get us to do what it wants. A sugar craving, for example, occurs when the blood sugar drops and we need quick energy. If a cookie is our choice for sugar, we will crave a cookie. A beer or coffee at four o'clock in the afternoon is a habit we develop because we "feel" like we need one. If we paid attention, we would notice we are feeling down or tired, which are symptoms of low blood sugar. Cravings are designed to force us to take action and we will respond by consuming whatever we typically eat or drink. If the only source of vegetables a person eats is found on a pizza, then the body will send the craving signal for pizza as a means of getting the valuable nutrients found in vegetables. When we eat too many empty foods that do not have enough nutrients to meet the body's needs, we will crave more food until our body gets enough nutrients from whatever we do eat. Consuming nutrient-rich food makes it easier to satisfy the body's needs and stop the cravings and the urge to eat too much.



It takes time for the body to stop sending us the craving message once we have switched to eating good foods. The body will need to receive enough nutrients to make up for any deficiencies it may have. Once the body has built up the reservoir, the cravings will stop. This means we can enjoy all the nutrient-rich recipes no matter how “rich” they are. Smaller portions will be consumed because the body's needs are satisfied with less food than would have been consumed previously when eating processed and refined counterparts.

Carbohydrates

Carbohydrates are the body's main source of energy. They provide most of the energy needed in our daily lives, for normal body functions like heartbeat, breathing, digestion and exercise. There are three types of carbohydrates: starches, sugars and fiber. They are chemical compounds made up of carbon, hydrogen and oxygen, joined together to form molecules. Simple carbohydrates are one molecule or two molecules joined together. Complex carbohydrates consist as a chain of many simple molecules. This is where it gets confusing. The term “sugars” does not mean sugar. It refers to the simple carbohydrates, of which there are good simple sugars found naturally occurring in whole foods, such as fruits, and then there are the refined simple carbohydrates, like white sugar or corn syrup. The same is true for complex carbohydrates. Whole-wheat flour and white flour are both complex carbohydrates as they both consist of a chain of many simple carbohydrate molecules. But the body benefits far more from the whole wheat. The vitamins, minerals, fiber and phytonutrients in whole-wheat flour all provide far more of a nutritional punch than its white counterpart.



Fruits, vegetables, grains and legumes all contain carbohydrates. When we consume these foods, our digestive system breaks them down into a blood sugar called glucose that is released into the bloodstream and helps fuel our bodies. The amount of sugar released depends on the type of carbohydrates consumed, the amount and the absorption rate. For example, fruit contains fructose, a simple sugar that is quickly and easily digested. However, a piece of fruit is not high in calories so the actual amount of sugar it supplies is not high.

Once the digestive system breaks carbohydrates down into simple sugars they are absorbed by the body through the bloodstream. The pancreas releases insulin to move glucose from the blood into cells where it can be used by our body for its normal functioning.

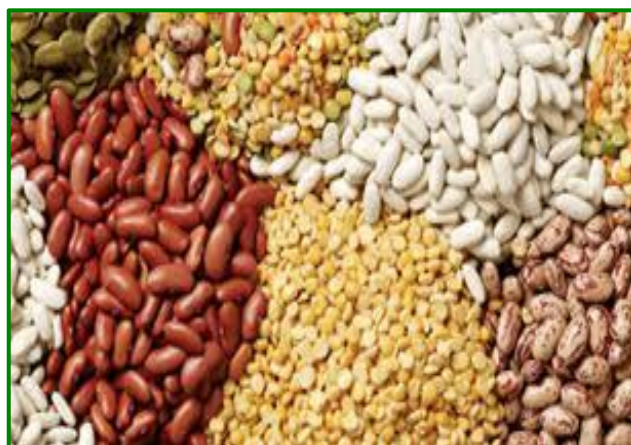
Any glucose not immediately used by the body is converted and stored as glycogen either in the liver or in muscle for quick conversion to energy when needed. If all the glycogen stores are filled, then excess glucose is turned to fat. We have 400 calories of glycogen in the liver and 1200 calories in our muscle. Active people burn a lot of carbohydrates by using their muscles, so their excess carbohydrates will be used to replenish glycogen and are far less likely to be converted to fat.

So what is the issue with carbohydrates? Nothing - as long as they are consumed as nature intended. The problem arises when we consume food that has been stripped of its nutrients, especially fiber, as is the case with white flour, white sugar and white rice. The result is that we metabolize these foods too quickly, sending high levels of glucose into the bloodstream at once. One of the purposes of fiber in food is to control the delivery of carbohydrates and nutrients into the body so that it is steady and consistent. The good bacteria also slow the rate of

carbohydrates into the bloodstream. Since our bodies most likely don't require all of this glucose, from refined carbohydrates for immediate energy, it will be stored as either glycogen or converted and stored. When we are stressed, our body burns glucose rapidly and, instead of converting stored fat for more energy, we generally crave and eat more carbohydrates and the process repeats. If the body has a steady source of carbohydrates coming into the bloodstream, it will burn the carbohydrates steadily and have enough to prevent blood sugar drops but not so much that it will convert into excess fat.

Did you know that legumes are mainly carbohydrates?

Legumes, on average, are about 65% carbohydrate. Studies have found that consuming legumes during a meal not only sustains blood sugar for several hours after the meal, but also helps sustain blood sugar from the next meal. Adding legumes and lentils to soups, stews or salads and consuming them for lunch is the best way to benefit from their extra blood sugar stabilizing power. See Appendix (pg 43) for cooking instructions or look for organic brands of canned legumes prepared without salt.



1. We often lose the ability to easily convert glucose that is stored as fat back to glucose when we need it. This may be due to a sluggish metabolism, poor digestion and poor absorption of nutrients needed to function efficiently and, of course, stress, which causes us to burn sugar instead of fat. When the body burns sugar instead of fat it is because it wants quick energy and does not want to wait for the process of converting stored fat.
2. The high amount of insulin released time after time can make the cells resistant to insulin (known as insulin resistance), which leads to an increased risk of Type II Diabetes.
3. High insulin levels promote inflammation, which is now considered a major factor in many serious diseases including diabetes, heart disease, arthritis, osteoporosis, autoimmune conditions, Alzheimer's and even cancer.

The solution is simple: Consume fiber, vitamins, minerals and phytonutrients through whole food carbohydrate-containing foods that naturally contain all of these nutrients and maintain good bacteria levels. Dietary fiber and good bacteria slows the absorption and metabolic processing of the carbohydrates (sugars) being consumed. This allows for steady delivery of small amounts of glucose into the bloodstream that can easily be utilized for our immediate energy and body function needs. Insulin release is lower because a lower blood sugar level is maintained. Nature put fiber in all carbohydrates so it is important for us to consume them in their natural state as much as possible. Whole sugars such as sucanat, honey, maple syrup, evaporated cane juice, coconut sweetener and agave syrup do not affect blood sugar the way their refined counterparts, like white sugar, corn syrup or dextrose, do. Although whole sugars do not contain fiber, they are a 'whole' food with vitamins, minerals and phytonutrients (which help stabilize blood sugar). Whole foods, even those without fiber, score low on the Glycemic Index, a measure of how much a particular food can impact one's blood sugar.



Raw Organic Sugar vs. White Refined Sugar: Which do you think has more nutrients?

Good Carbohydrates to Consume:

Whole wheat, spelt, kamut, barley, rye, oats, brown rice, quinoa, teff, amaranth, millet, chia, salba, potatoes, lentils, chickpeas, beans, peas, corn, sweet potatoes, all fruits and vegetables, nuts, seeds and whole sugars as listed above.

Carbohydrates to Avoid:

White flour, white rice, cornstarch, tapioca starch, potato starch, white sugar, corn syrup, processed refined fructose powder and table syrups. Remember: "If it is pristine white, it's not right." The "whiteness" also affects the taste. At best, white is bland. If the palette is working optimally, most will find that "white" actually has an unpleasant chemical aftertaste. Remember, for true taste satisfaction it is not the first taste we notice when we put food in our mouth that counts, it is the last taste, after we swallow, that allows us to savor the flavor and be satisfied we ate something really tasty, long after we've finished eating.

What are Glycemic Index and Glycemic Load?

The glycemic index (GI) is a numerical ranking for determining the potential of carbohydrate-containing foods to raise blood sugar levels. If the GI of carbohydrates are high then they will be absorbed into the bloodstream quickly and a substantial rise in blood sugar and insulin levels will follow. Foods that are absorbed slowly into the bloodstream, producing a steady level or small rise in blood sugar and insulin levels, are considered low GI foods.

High blood sugar and insulin have been linked to Type II diabetes, obesity, heart disease, all inflammatory conditions and many other conditions prevalent today. How a carbohydrate affects blood sugar depends on the degree of processing, the length of time the food is cooked and what types of sugar, starch and nutrients it contains. When carbohydrates are stripped of fiber, vitamins, minerals and phytonutrients, they have a higher glycemic value. In order to compare all the foods on the GI list, all calculations are made with 50 grams of usable carbohydrates for each food or about 200 calories. Watermelon, for example, has a GI calculation based on about 664 g or about 1 1/2 pounds of watermelon. The average portion size that a person would eat is about 100 g or 3 1/2 ounces which contains 5 g usable carbohydrate. The rest of its weight is water.

Fructose Should Stay in Fruit

There is a difference between the fructose found and consumed in fruit and powdered fructose found in candy and beverages. Fruits contain fiber, phytonutrients and, for the most part, are relatively low in calories. These all help modulate how the fructose is utilized by the body to our benefit. White powdered fructose or high fructose corn syrup is an entirely different matter. Highly refined, they do not work the same way and are empty calories, generally delivered with a higher calorie count.

The glycemic load is a new calculation that takes into consideration the amount consumed. To calculate the GL, multiply the GI of the food by the number of grams consumed. Divide that number by 100. So watermelon has a GI of 72, but it only contains 5 grams of available

carbohydrates: $72 \times 5 / 100 = 3.6$ g, which is a very low glycemic load. Any GL value 25 or below is considered low. When looking at whole foods such as carrots, mangoes, or watermelon that are labeled as high GI, remember it is based on an extremely large amount and not a normal serving size.

Whole sugars contain many vitamins, minerals and phytonutrients and have a low GI and glycemic load. Both white sugar and sucanat come from sugar cane but white sugar has a GI of 80 and sucanat has one of 47. The difference is that sucanat has all the nutrients found in sugar cane while white sugar has been stripped of these nutrients. Phytonutrients found in all whole sweeteners and whole grains can help stabilize blood sugar and this gives sucanat and other whole sweeteners their advantage.

Low GI is 55 or lower. Here are how GI values for the following natural sweeteners: maple syrup, 54, evaporated cane juice, 54, honey, 35, coconut sweetener, 35, agave, 15, and brown rice syrup, 15. There are other whole sugars like jaggery or date sugar but they are not as well known, so a definitive GI is not available. There are studies on dates that show they can help stabilize blood sugar.

When Is Honey Not Honey?

Honey and maple syrup are often mixed with glucose and they will have a much higher GI than their "pure" counterparts. Some products called honey or maple syrup are artificial and contain only glucose and artificial flavors. The values listed above in the glycemic index/glycemic load section refer to pure honey and maple syrup. There is a lot of misleading information about natural sweeteners as the food industry frequently tampers with our food and most nutrition professionals would not be aware of this. Remember, the honey that's healthy is the honey made by the bees and only the bees. Unpasteurized or raw honey is best as it contains enzymes as well as vitamins and minerals. Honey made from summer bees contains 10 strains of good bacteria.

Maple Syrup is healthy if it comes from the sugar maple tree and only the tree. The medium syrup has more nutrients than the amber and a richer flavor, so less is needed.



Protein

Protein is a primary component of muscles, skin, nails, eyes and internal organs such as the heart, lungs and brain. It makes up 20% of the body and is composed of carbon, hydrogen, oxygen and nitrogen. We need carbohydrates as the fuel to build our bodies but protein is the building material; think of the bricks of a house that put it together. Each protein molecule is a series of amino acid chains and when we consume protein each must be broken down into a single amino acid to facilitate absorption. Once absorbed, the single amino acids make their way to the liver, which reassembles them into new amino acid chains that will eventually be used to generate and maintain the integral parts of the body mentioned above.

Since protein digestion begins in the stomach, the process requires sufficient hydrochloric acid.

Hydrochloric acid, along with the enzyme pepsinogen, starts the break down process of proteins to their individual amino acids. Once the material moves from the stomach into the duodenum, the pancreas releases protease enzymes to complete the process of breaking down proteins to single amino acids. Deficient hydrochloric acid secretion makes proper protein digestion more difficult, forcing the pancreas to do more work, and may result in bloating, belching, flatulence, nausea, indigestion, diarrhea, constipation and other problems. When we eat too much in one meal, we seldom have enough acid to digest properly. The same is true when we drink too much liquid with a meal, diluting the stomach acid and interfering with digestion. These are common habits, yet we can suffer significant health consequences through their practice.

Some amino acids are essential and can only be obtained from our diet, while the body can produce others. Essential amino acids are isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine. Each of these must be consumed daily as they enable the body to synthesize other amino acids. Foods such as grains, legumes, nuts, seeds, meat, fish and dairy all contain protein, as well as some essential amino acids and some non-essential ones. For a long time, it was assumed that only protein found in animal products was complete because they contained all eight essential amino acids. But now it has been determined that soybeans, hemp seeds and the grains quinoa and kamut are complete. We may discover others as we learn more about foods from other parts of the world. Generally, in order to form complete proteins, plant proteins must be combined to be complete.

These combinations form complete proteins:

⇒ Grains AND legumes

⇒ Nuts OR seeds AND legumes

Protein Powders

Protein powders are quite popular today, especially to help vegetarians meet their protein needs. Unfortunately, it does matter whether it is rice, hemp, soy, whey or egg protein, only 17 percent of these proteins are utilized by the body. Meat, fish and poultry protein is better, utilized at 32 percent, while consuming egg whites with the egg yolk allows for 55 percent utilization of the protein. Does the fat in foods play a role in protein utilization? One of the things we know most about whole foods is that they are more than the sum of their parts.

The convenience of protein powder is obvious, especially for vegetarians. The problem with the above information is it does not indicate which type of protein powders since they come in the form of concentrates, isolates and hydrolysates. It also does not indicate if this utilization amount changes for protein powders mixed with other ingredients, especially fats as that would be the key difference between an egg white by itself and a whole egg or animal-sourced protein and a protein powder. For now, until we know more, let's err on the side of caution and build a better model with our protein powder. Add fats like coconut oil and ground chia that both contain many other benefits for health, making this a win-win situation.

Are Eggs a Good Source of Protein?

On average, men need 70 g of protein a day and women need about 50 g which is about 10-15 percent of their total calorie count based on a 2000 a day calorie diet.

An egg contains 6 g of protein, and while this is a complete protein, it not a significant amount. However, it can be part of a healthy diet with other protein-rich foods. It may not be the best food for vegetarians to consider as their main protein source.

However, if you separate and remove the egg yolk, only 17% of the protein will be used by the body. Consuming the whole egg allows for 55% utilization of the protein in the egg.



As for protein powders, concentrates are the closest to whole food still containing fat and carbohydrates. Isolates are just the protein. Both still require digestion and create an acid ash that must be neutralized with minerals. But concentrates are preferable. Hydrolysates are broken down into peptides, making them more digestible, and they are often the form used in baby formula to prevent the development of allergies.

Fats

No building block of our body has received more bad press than fat. If everyone truly understood the importance of this macronutrient they wouldn't think of cutting its consumption to the low levels that have been, at times, foolishly recommended. Fat provides insulation and is a secondary source of energy or "back-up" system. It helps regulate body temperature and is a critical component of every cell membrane. Like carbohydrates and protein, fat is essential for maintaining a healthy nervous system, brain and heart function, hair and skin. Fats are composed of carbon, hydrogen and oxygen (some fats may also contain phosphorus and nitrogen).

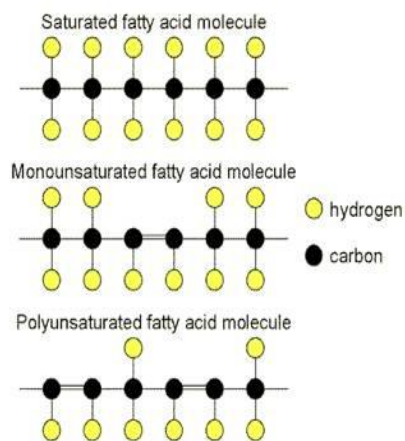


There are three basic types of fat that are taken from food: triglycerides, cholesterol/sterols and phospholipids. Triglycerides come in three forms as well: saturated fat, monounsaturated fat and polyunsaturated essential fatty acids. The polyunsaturated essential fatty acids are used by the body to rebuild. The essential fatty acids, known as Omega 3 and 6, are what are typically called 'good fats' and are necessary for life. The truth is, all fats are 'good' as long as they are natural and have not been tampered with. An example of an unhealthy fat is the hydrogenated fat found in many margarines, shortening, most refined baked goods and snack items. The end result of the hydrogenation process is the creation of synthetic trans fats that clog arteries and contribute to obesity because our bodies cannot utilize synthetic fats.

There are naturally occurring trans fats found in meats and dairy and these trans fats are actually healthy. One example is CLA (conjugated linoleic acid). CLA can actually help reduce body fat and has both antioxidant and anti-tumor properties. Consuming CLA accelerates the body's metabolism while slowing the body's conversion of dietary fats into body fat. Again, this demonstrates the difference between nature's compound vs. a synthetic or 'lab manufactured' compound like hydrogenated fat. To increase CLA intake, consume healthy oils such as extra virgin olive oil, flax seed oil, evening primrose oil, peanut oil, macadamia nut oil and extra virgin coconut oil. It is also found occurring naturally in meat and dairy.

The logic used in the development of hydrogenated margarine was that if natural and manufactured fats had the same molecular structure, then they must be the same. The perceived value was that it was exactly like saturated fat except without the cholesterol. This is the logic that allowed hydrogenated fat to be promoted as being healthy for 40 years. This was not studied scientifically, just assumed. Now, we know such assumptions were wrong.

What is hydrogenation?



Hydrogenation is the process of adding hydrogen to polyunsaturated fats so that they will be solid at room temperature and more stable, like saturated fat. A saturated molecule, as seen in the diagram, has hydrogen in all spaces. This makes it more stable and less prone to rancidity. A polyunsaturated fat is missing several hydrogen atoms and is much more unstable. By forcing hydrogenated atoms into a polyunsaturated fat, it becomes "Saturated" with hydrogen and more stable. The logic used in the development of hydrogenated margarine was that if natural and manufactured fats had the same molecular structure, then they must be the same. The perceived value was that it was exactly like saturated fat, except without the cholesterol. This is faulty logic allowed hydrogenated fat to be promoted as being healthy for 40 years. Unfortunately, studies have found that a 1-2% increase in the diet of synthetic trans fats significantly increases the risk of many conditions such as heart disease, diabetes and depression.

To remain healthy, we need to consume a combination of saturated, monounsaturated and polyunsaturated fats with less emphasis on what the "correct" ratio of each is. There is no agreement about this among health professionals today and attempts to justify a specific combination have fallen short by failing to consider some viewpoint or another.

Omega 3 and Omega 6 essential fatty acids (EFAs) are those fats that are essential to life - building and maintaining a healthy heart, brain, nerves, immune system, healthy joints and skin and many other important functions. Our bodies cannot make or store EFAs, so it is necessary to consume sufficient levels of them in our diet.

Most North American diets contain sufficient levels of Omega 6 fats but deficient levels of Omega 3s. While Omega 6 fats are more plentiful, found in vegetable oils, nuts, seeds AND hydrogenated fats, Omega 3 fats can be obtained by consuming some types of fish, like salmon tuna, and anchovies, flaxseed, chia and hemp, and in lower levels, animal fat. Both Omega 3 and 6 fats are polyunsaturated and easily damaged through exposure to heat, light or air. Therefore, the refined oils that have been extracted or processed using heat, and then used in commercially prepared food products, are damaged and more prone to rancidity. The best choice for plant-based, polyunsaturated fats is oils made with cold-pressing techniques and that are preferably certified organic. Animal-based essential fatty acids (EFAs), including fish and butter, are less prone to rancidity because the saturated fat found in the animal protects these fatty acids. The EFAs found in animal fats are the same ones we need. Plant-based EFAs have to be converted from plant form to animal form to make them useful for humans. They also require sufficient vitamins and minerals for conversion.



One more fact to consider about fat: Toxins, hormones and drugs we consume, or produce in our bodies, are stored in our fat cells if our liver cannot successfully detoxify them. The same is true for plants and animals. So fat from organic food sources is going to have far less toxic substances.

Although there are different theories as to the amounts of carbohydrates, protein and fats we need daily, most recommendations fall into a range as follows: carbohydrates: 50-65%; proteins: 10-20%; fats: 20-30%. Instead of worrying about the breakdown of each type of food in our diet, it is better to consume nutrient-dense foods that support our body's effective utilization of all three macronutrients. Factors such as gender, genetics, lifestyle choices and stress levels make each of us unique.

The "bottom line on fats" is to avoid consuming excessive amounts of any fat. A gram of fat has nine calories. A gram of either carbohydrate or protein contains four calories. Therefore, it is easy to see that caloric intake increases much quicker when consuming fat than when consuming carbohydrates or protein. It is important to avoid excess carbohydrates and excess proteins as an excess of calories from any source can cause weight gain. Moderation is the key.

Medium Chain Triglycerides (MCT)

All fats, from olive oil to butter, are made of fatty acid chains and are categorized as short, medium or long. Each fatty acid chain has a specific function and plays a role in helping us to function. MCTs are fatty acid chains with 8-12 carbon atoms. Anti-fungal caprylic acid and anti-bacterial lauric acid are two examples, found in many food sources, that contain saturated fat, but they are most abundant in coconut oil. Compared to butter, which has 10% MCTs, coconut oil has 56%. However, butter has more mono-unsaturated fat at 25%, whereas coconut oil is only 6%. This is why a food has to be assessed in its entirety and we cannot cherry-pick one aspect over another for review.

Research shows that MCTs convert better into energy than other types of fatty acids and also burn easier. Some studies show that they also aid in weight loss and thermogenesis. This does not make long chain fatty acids less beneficial. They are utilized more slowly, nature's way of allowing us to store fat to help maintain energy, in case we are unable to eat for an extended period of time.

What is DRI?

Dietary Reference Intakes (DRI) refers to nutrient recommendations based on the most recently available scientific information, including the Recommended Dietary Allowance (RDA), the Estimated Average Requirement (EAR), the Adequate Intake (AI) and the Tolerable Upper Intake Level (UL).

The amount of energy required in individuals is labeled the Estimated Energy Requirement (EER). The difference between these values lies in the amount of evidence available to support the daily-required recommendation for that nutrient. In any case, the RDA, EAR, and AI are the recommended daily amounts for individuals. The UL sets the maximum level that can be consumed on a daily basis safely. Most of these standards are measured in grams (g), milligrams (mg) or micrograms (mcg). Vitamins are commonly measure in International Units (IU).



Vitamins

In order to remain healthy and function properly, the body needs vitamins daily. Vitamins are organic compounds required to regulate the proper functioning of cells. Either deficient or excessive intake of vitamins can lead to disease.

There are two types of vitamins: water-soluble and fat-soluble. Water-soluble vitamins are not stored by the body, and travel through the bloodstream to where they are needed; excess is excreted. These include vitamins include beta-carotene (plant version of Vitamin A), Vitamin C and the entire B family of vitamins. Because they are not stored, these vitamins must be replenished often.

Fat-soluble vitamins A, D, E and K are stored in our body until we require them - sometimes for a few days and sometimes for a few months.

Vitamins in food, in particular the water-soluble type, can be depleted in cooking. The longer and more severe the cooking process, the more vitamin content is lost. Fruits are one of the best sources of vitamins, especially the water-soluble ones, and when we eat them raw we achieve the vitamins' full beneficial value. When we bake with fruit, the vitamins are more isolated from direct heat and the vitamin content is not lost as easily as it would be through stovetop cooking.

While there's nothing wrong with taking a vitamin supplement, our body naturally prefers food as its source of vitamins. Although there are now whole food vitamins, most vitamin supplements are partial versions of the molecules found in food. The easiest way to increase our vitamin intake is to consume a nutrient-rich diet. Taking a supplement as an insurance policy is not a bad idea, but do not be fooled into thinking that a supplement is enough by itself. And, if we could get our food grown and consumed as nature meant it to be, a supplement would not need to even be considered.



How do vitamins get into our foods? Vitamins are produced through photosynthesis. The longer the food ripens on tree or vine, the greater that food's vitamin content. Flavor and taste also increase during the natural ripening process. Today's food distribution system does not allow for foods to ripen naturally. Crops are picked green to be less prone to damage and spoilage during transportation from grower to distributor and, before being sent to the grocer, they are treated with ethylene gas to accelerate the ripening process. This is the same ethylene gas that fruit and vegetables naturally give off when we place them in a paper bag at home to ripen. However, there is a big difference between ripening slightly unripe fruit at home and picking fruit when it is still green and using gas to completely and rapidly ripen it. This ripening process is the reason why much of the produce at grocery stores looks good but lacks flavor and texture. Thomas F. Pawlick, in his book, "The End of Food", quotes a study conducted by speaking with scientists, food processors and industry spokespeople about the tomato. Asking them what qualities the ideal tomato should possess, responses referred to yield, uniformity of color and shape, disease resistance and firmness. Not one person mentioned the two things that we, as consumers of food, typically care most about: taste and nutrition content.

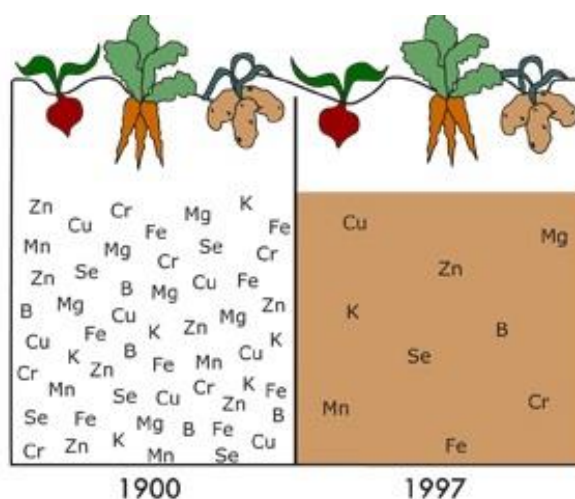
Minerals

Minerals present in food are inorganic compounds that are vital to human health. Like vitamins, they assist the body by producing energy and other life-supporting chemical reactions such as

helping enzymes function and maintaining normal body fluids. However, unlike vitamins they are not destroyed during cooking. Sources of minerals include grains, nuts and legumes, fruits and vegetables, dairy, meats and fish. Minerals are more easily obtained from cooked foods because they bind closely with fiber and, unless raw foods are chewed well, the minerals are often excreted with the fiber. The heating process during cooking breaks down fiber, making the minerals more readily available.

Minerals that are found in our food come from the soil. Plants chelate minerals through their roots. Plants need minerals for their health as much as animals and humans do. It is part of the synergy of nature. All nutrients that a plant develops are beneficial for its health and for us. Animal products we may eat also contain minerals since they eat plants. So essentially, all minerals do is move around. As tiny rock particles, they move from the soil into the plant to the animal and eventually they make their way back to the soil as part of animal matter and decomposition.

Microorganisms in the soil help make rock particles in the soil ready for the plants and help the plant make decisions. If there are insufficient microorganisms in the soil, there are fewer minerals available for plants. Chemicals used in commercial agriculture deplete minerals in the soil. How many minerals we have in our food depends on the farmer and the techniques he uses. This is a complicated subject but nature had a plan that made sure that minerals were abundant in our soil. Traditional farming techniques, such as composting, crop rotation, companion planting and leaving fields fallow once every seven years, help maintain a healthy mineral content and prevent erosion. Organic farming techniques also maintain the soil by abstaining from the use of synthetic chemicals that harm the organisms in the soil.



We have macro-minerals and trace minerals. Calcium, potassium, magnesium and sodium are required by the body in the largest amounts and are found quite substantially in various foods. However, trace minerals are important too; even though we only need very small amounts of them, a deficiency can cause health issues. If soil is deficient in minerals, it is more likely to be deficient in the trace minerals. Most manufacturers of supplements will tell you that we have far less minerals in our food than we did 100 years ago. This is a bit of a blanket statement and too many factors can affect the amount. Still, many modern agricultural techniques deplete minerals from the soil and it is up to individual farmers to be good stewards of the soil. Food manufacturing techniques can also deplete nutrients.

How Do You Know If You Have Healthy Soil?

Look for the earthworms. Healthy soil is teeming with billions of bacteria, fungi and other microorganisms, but they are microscopic and not visible to the naked eye. However, a cubic meter (slightly larger than a cubic yard) should have 100 earthworms.

Is Organic Food Better Than Conventional Food?

What does it mean to say that a food is organic? It means a more environmental approach has been used in growing and manufacturing. In the case of growing produce and raising animals, this means using the farming techniques of the past and creating a more sustainable way of using the land. For manufacturing of food products, the concern is to use organic ingredients and avoid using toxic chemicals in the food or in the facility.

Organic Agriculture:

- Look for the certification sticker
- Third party verification of standards to allow certification
- There's a three day assessment process every year
- Plants: organic seed, organic compost, clean water sources, natural fence posts
- Animals: organic feed, no vaccinations of hormones or drugs, animals are not confined to small spaces

Nutrient content in foods is determined by many factors but phytonutrients are part of the plants' defence systems, and only the plant having to defend itself from pests will create foods with the high levels nature intended us to have to stay healthy.

A £12m EU-funded, 4-year investigation, into the difference between side by side organic and conventional farming, found that the organic foods had up to 40% more antioxidants and phytonutrients than the conventional. The cows produced organic milk with 60% more antioxidants and desirable fatty acids. In another study from Washington State University, 13 conventional and 13 organic strawberry plants side by side were compared. The organic strawberries had increased antioxidants, Vitamin C, total phytonutrients and fewer instances of post-harvest fungal rots than conventional strawberries.

Phytonutrients - The Big Game Changers

There are currently two big areas of research. One area involves the good bacteria and the other involves the phytonutrients or phytochemicals. These potent plant chemicals, that not only help us prevent many diseases such as heart disease, Diabetes and cancer, also regulate how we utilize the carbohydrates, fats, protein, vitamins and minerals from our food. The most interesting information is the relationship the phytonutrients have with the good bacteria and the fiber. Good bacteria, whether in our gut, or as part of fermenting a food, potentiate the phytonutrients making them more potent and beneficial to us. Most phytonutrients are found attached to the fiber wall and must be released by the good bacteria. The fiber's role is to decide what we absorb and what we excrete and, again, it works with the good bacteria and the phytonutrients to make decisions.

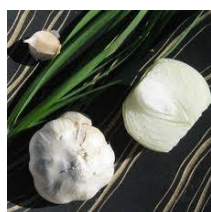
The study of the phytonutrients varies on a food by food basis. What is emerging is that the unique flavor a plant food has represents the phytonutrients, as does the color. The polyphenol family are foods that are dark in color, especially reds, purples and blues. The carotenoid family is represented by yellows and oranges. All foods can have some of each. On the following page are a few phytonutrient examples to demonstrate how truly remarkable whole foods can be.

Chocolate: The chemicals in cocoa solids that give chocolate its rich dark color and flavor are potent phytonutrients, known as phenols and bioflavonoids, from the same family of healthy chemicals found in blueberries, red wine and other foods with rich dark colors. The foods containing this family of chemicals have been shown to



help prevent heart disease, Diabetes, cancer and many other prevalent diseases today. These chemicals have been deemed so desirable that supplement companies are pulling them out of foods and putting them into capsules, leaving behind all the other elements that may be found in the food. So what else is in chocolate?

Cacao butter is a naturally saturated plant fat that contains significant amounts of antibacterial lauric acid, anti-fungal caprylic acid and stearic acid, which studies have found does not raise LDL. It also contains a significant amount of oleic acid, the healthy fatty acid found in olive oil that helps raise HDL. More importantly, cocoa butter contains important plant sterols including the most popular ones, beta sitosterol, stigmasterol and campesterol, now being added to margarines and other polyunsaturated fats to help prevent rancidity. Studies have found plant sterols lower cholesterol levels and may help prevent cancer and heart disease. Many studies referring to the benefits of dark chocolate frequently mention the plant sterols as one of its benefits. It is important to know that these benefits are due to the fat content and not the "dark" content, a factor of the flavonoids, which are also very beneficial. So, leave the fat in the chocolate and enjoy. Dark chocolate is better than milk chocolate for higher phenols and bioflavonoids and European-style couverture chocolate has the highest cocoa butter content.



Garlic is a member of the Allium family which also includes onions and leeks. It is extremely rich in a variety of powerful sulfur-containing compounds, including thiosulfates (of which the best known compound is allicin), sulfoxides (among which the best known compound is alliin) and dithiols (in which the most researched compound is ajoene).

While these compounds are responsible for garlic's characteristically pungent odor, they are also the source of many of its health-promoting effects. Garlic has anti-fungal (phytoncide) anti-bacterial (allicin) and anti-cancer (a phytoalexin - allixin) properties. It also has other chemicals which have been shown to fight inflammation, lower blood sugar and lower blood pressure. To get these benefits, the whole garlic must be consumed since garlic supplements only contain allicin. The good news is that studies show both cooked and raw garlic benefits our health. However, it needs to be crushed or chopped to release more of the potent chemicals. Letting it sit at room temperature for 20 minutes, chopped or crushed, before consuming or using in cooking, potentiates the chemicals. A lot of garlic needs to be consumed so it should not be surprising to find most traditional cooking has garlic in everything. If garlic is not a favorite, then use plenty of onions and leeks. Garlic and onions together in recipes is also a common cooking technique.

Raw vs. Roasted:

Which has the higher antioxidant content?

(from most to the least)

- *Organic Raw, dried, unroasted & unsweetened cocoa powder*
- *High content cocoa chocolate (dark chocolate)*
- *Baking Chocolate, unsweetened*
- *Dutched Cocoa Powder*

But is that the end of the story? No, because roasting at a higher temperature can increase the antioxidant levels and, if it is high enough, can exceed the raw dried cocoa powder, showing that, once again, nature is more complicated than we thought. This is not the first time antioxidants have increased as a food is heated. Other studies have found a similar action in tomatoes and honey.

Grilling and HCA Compounds: Everyone loves a summer barbecue and the ease of preparing some food on the grill. While most people do not know this, the black strips produced from grilling contain chemicals known as HCA compounds, which studies have found to be carcinogenic. However, a literature review of a number of studies found that yogurt, beer, wine, honey, herbs, garlic, fruits and even olive oil, lowered HCA compounds when used in marinades before grilling. In other words, the marinades that make the grilled food so yummy also protect us. Now that is information we want to hear!

Phytonutrients and Good Bacteria: The most amazing relationship that is emerging from research into both phytochemicals and good bacteria is how the bacteria works with the fiber and how these chemicals, attach to the fiber wall, to regulate their potential to help us. The good bacteria releases them and, together with the fiber, determines, for example, how quickly glucose is absorbed into the blood stream. The phytonutrients also play a role regulating glucose function once in the blood stream. Cholesterol regulation is another activity that involves the good bacteria. Bile salts, that help us digest and emulsify fats, are made from cholesterol in the liver and excrete them through the intestines as part of our stool. Good bacteria is needed to ensure these bile salts stay intact and leave the body as part of the process of removing excess cholesterol. Failure to convert cholesterol into bile salts can contribute to the accumulation of it in the bloodstream.

Cooking with Garlic and Red Wine

Garlic and red wine work together to be cancer-cell killers. In countries where red wine is consumed with a meal, garlic is almost always found in the dish. Cooking with garlic and red wine together is even better and so delicious.

Remember every food consist of many chemicals along with the fats, carbohydrates, proteins, fiber, vitamins and minerals. Researchers are studying them food by food and a picture is emerging. These chemicals not only play various roles for the health of the plant, they also affect how we benefit from the foods as well.

For more information about phytonutrients and whole foods, go to whfoods.com, a great site with all the evidence-based research per food that has been discovered, especially pertaining to the phytonutrients

Maximizing the Nutrient Content in Your Diet

- Raising foods organically, so the plant and animals can build beneficial chemicals to defend themselves, makes the food more beneficial to us.
- The richer the colors, blues, greens, yellows and reds, the more phytonutrients the food contains.
- The phytonutrient content is highest in the skin of the food.
- Fermenting foods potentiates the phytonutrient content and makes phytonutrients more available.
- Grains contain a lot of phytonutrients, but 99% are attached to the fiber wall, so whole grains are best and cooking or fermenting the grain releases the phytonutrients.
- There are phytonutrients that are lost in cooking and phytonutrients that are quite stable and the amount goes up when cooked.

- Studies now show the good bacteria in our gut, fiber and the phytonutrients, work synergistically to protect us and help us absorb all the nutrients we need in our bodies and excrete those we don't need.

Exercise: Is it necessary?

Yes, Yes, Yes! We all know what it is like to be tired - so tired you cannot move off the couch. If you have this problem, maybe your issue is that your muscles are weak and it takes too much energy and strength to move when you go exercise. It does not matter. Until you get up off the couch and actually develop some stamina, muscles and strength, you will never appreciate how much better you'll feel. The important part is to keep it simple and easy for you to accomplish. Maybe there is a DVD you can buy and use in the comfort of your home, or a structured class at a gym, or perhaps you can just go for a walk; it does not matter as long as you move.

Traditionally, we would have been on our feet for 8-14 hours a day. In fact, our bodies are designed for that level of constant, consistent activity. We need low intensity aerobic exercise, muscle building exercise and strength training. We should also stretch to maintain flexibility. If you don't use it - you lose it.

What qualifies as low intensity aerobics? It depends on what kind of shape you are in. For most of us, it means walking. But, depending on your fitness level, it could include rebounding (mini-trampoline), gentle cycling, low intensity aerobic dancing and light jogging. Pilates and yoga can help with both flexibility and muscle tone. Yoga breathing techniques, or other deep breathing techniques, help aerobic function. There are many different types of equipment that can help make the task easier and faster.

Finding a way to burn 100 calories extra every day would allow you to lose 10 pounds over the course of a year. Exercise is not just about weight though. It is unfortunate that all the health gurus equate health with thinness. There are many thin people who are not healthy. So this is not about weight; this is about how you feel, and exercise improves clarity of thought, your moods, helps you fight stress and depression and makes you feel better overall. By exercising, you can work longer with less fatigue and enjoy leisure activities more.

What are endorphins?

Endorphins are powerful brain chemicals that make us feel good and can help us control pain and stress. Too many of these chemicals create a "morphine-like" high. The right amount makes us feel happy and ready to rock the world. Exercise increases endorphin levels in the brain.

Simple Tips for Moving

Always look for ways to move in your everyday life:

- Take the stairs instead of the elevator whenever possible.
- Park the car a reasonable distance from your destination.
- Move while you are standing in the kitchen cooking. Put on some music - it helps you move.



"You need more activity. Start with some light dusting of your exercise equipment."

- Practice movement in your chair – lift your legs, do gentle stretching movements, move your arms.
- If you are too tired to exercise in front of the TV, then just stand and watch TV. When you begin to feel silly, start walking in place and swinging your arms. Try this for 30 minutes a day and see how you feel.
- If you have a lot of paperwork to do, set up a standing work station on a counter for an hour. You might be surprised how much better you work.
- Do deep-breathing exercises while you sit on the couch or are driving in the car.
- Pick leisure activities that require movement like dancing, hiking, biking, shopping, walks in the park or after-dinner strolls, or just go to the mall and walk around (you do not have to buy anything).
- Keep it simple – do not overthink what you are doing and do not worry about how you look. Just move. There are more formal ways to exercise like joining a gym, playing sports, buying a treadmill, stationary bike or mini-trampoline, or following a DVD from an expert. Remember though that it doesn't need to be structured, but it does need to be something you like and enjoy and can fit into your schedule.

Do You Have A Sluggish Thyroid and Metabolism?

[The Maffetone Method](#), by Dr. Phillip Maffetone, describes how to build an aerobic method base to help a sluggish metabolism. Many of us are simply overweight or out of shape due to bad eating habits. In addition, years of inactivity, poor nutrition or years of dieting can leave your metabolism sluggish. This means the thyroid is not functioning optimally. If this is the case, then read [The Maffetone Method](#). Most fitness experts will suggest that in order to burn fat instead of carbohydrates, someone must exercise at their target heart rate, calculated by subtracting a person's age from 220. Dr. Maffetone suggests that people with a sluggish thyroid should instead calculate their fat-burning target heart rate as 180 minus their age. He suggests that these individuals need to build up their aerobic muscle base in order to become efficient fat burners instead of sugar burners (carbohydrates).

Stress causes you to burn sugar as well. Once you consistently burn sugar instead of fat, you store fat instead of burning it, making it difficult to stay thin and have a healthy metabolism. It is important to note that a person can have a sluggish metabolism and be thin. This is a complicated issue involving many different factors. In our case though, the bottom line is that if you are having trouble losing weight, you might want to consider Dr. Maffetone's suggestions.

This is all very important because if you have a sluggish thyroid and don't address this issue, you will not have a high-functioning metabolism and maintaining a healthy weight will be difficult. Ideally, be aware of what you eat and how many calories you need and are consuming. Also, don't forget that exercise can help the thyroid no matter what your age.

Symptoms of a Sluggish Thyroid:

Note: There are causes for these symptoms other than the thyroid, but having two or more of them may indicate a sluggish thyroid.

- Low appetite
- Eating very little
- Exercising a lot and still unable to lose any weight
- Cold hands and feet
- Depression and/or anxiety and/or mood swings
- Dry skin and hair or other changes in the texture of your skin or hair

- Muscle and joint aches and pains
- Menstrual irregularities and fertility problems
- Changes in weight and an inability to lose weight
- Bowel problems, especially constipation
- Headaches
- Cholesterol issues
- General weakness and fatigue

Steps to help the thyroid: Eat a whole food diet including fish, flax and chia and fermented, fiber-rich probiotic foods. Make sure you get plenty of EFA's (essential fatty acids) and B vitamins. You may want to take a 50 B-complex supplement and fish oil. Cod liver oil is best as it gives you EFAs and is a great source of vitamins A and D. Sea vegetables like kelp, nori or dulse (also available in capsules can help) are a great source of iodine, selenium and zinc. The thyroid depends on iodine for proper function and zinc and selenium help with the uptake of iodine. Coconut oil, especially consumed as 1 tablespoon melted in warm water before a meal, helps stimulate thermogenesis, a process to burn calories for heat production. The thyroid regulates body temperature. Consuming 1 tablespoon of coconut oil three times a day can be very helpful but you must adjust the calorie count for the day accordingly. One tablespoon is 100 calories.

To Help the Thyroid and Your Metabolism: Support the liver with whole foods! The liver is also involved in metabolism and converts T4 to T3, which is the active thyroid hormone you need for optimal function. Exercise with light aerobics and gentle movement. Get plenty of sleep to help your metabolism function. Eat plenty of iodine, zinc and selenium rich foods like sea vegetables. Medium chain triglycerides (found in foods like coconut oil and animal fats) help stimulate thermogenesis, essential for a health metabolism. Read [Boost Your Metabolism Naturally.](#)

Products That May Be Helpful

These are just some products ideas that I, or clients of mine, have found effective that you can use to help you get thinking. Amazon sells all types of equipment and is the best place to go to get other ideas.

Walking: We were designed to walk and it is my favorite form of exercise. It allows me to relax, think and enjoy being outside. Walking in a forest or green area has been shown to be more beneficial than walking on a treadmill though any walk is worthwhile. The only issue with walking is that sufficient walking takes time. Thirty minutes every day is good but an hour is even better. A combination of different activities may be best so that you can enjoy walking outdoors when you can fit it in and enjoy it.

A **pedometer** can be useful as it helps you know how far you have walked. A rule of thumb is that a 180-lb person can burn 100 calories per mile whereas a 120-lb person burns 65 calories per mile.

Bodyblade is a product I have used for many years. Following the exercises that are recommended can tighten the abs, arms, thighs and hips. The reverberating motion doubles the benefit and save times. There are so many pieces of equipment like this – try them. Find the ones that work for you.

Rebounder: I have been using a rebounder and have tried many brands. The springs will break on any of them and eventually the material will rip. The springs on the Needak or the Rebound

Air last much longer. However, these are more expensive than other brands. I cannot say enough about rebounding as a form of exercise. It is easy, so much more effective than jogging and walking for burning calories and you can do it in front of the TV – what more can you ask? There are cheaper rebounders and you might purchase one until you know this is a type of exercise you want to do on a regular basis. Still, make sure it comes with extra springs as they break and the cheaper rebounders have cheaper springs that do not last as long.

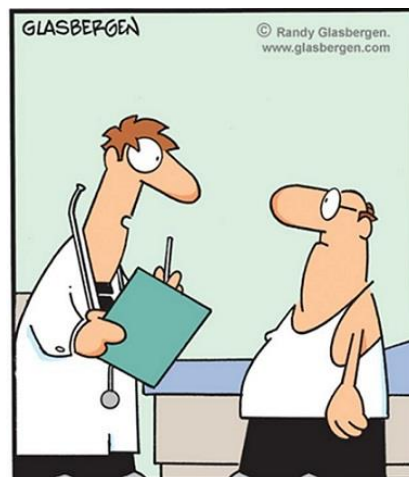
If DVD's are your thing: There are many dvds for pilates, yoga, light aerobics and dance programs. Pick what you like and do it in the comfort of your own home. This is a simple way to get more exercise and enjoy the activity at the same time.

A **Stability Ball** is great for sitting on and using while you are in front of the TV. You can also use it to sit at a desk. It stabilizes your core muscles and posture. Doing specific exercises and bouncing on it can build both muscle and aerobic capacity.

Pilates DVD with Pilates Ball is another option – the instructions are there and it is not as heavy a ball as some of the more expensive ones, but when combined with the proven Pilates techniques, it will help build long, lean muscles and improve core stability.

Fitness Treadmill These are very economical and are known as a starter treadmill. Before you pay a lot of money for a treadmill, you may want to start with a Merit which can be purchased for \$500. If you are really tall, you may find these awkward, as though you don't have enough room to walk since they have thinner belts than more expensive treadmills. Also, to change the incline, you must get off the treadmill and do it manually. One positive is that the company has a good customer service record and they are very popular machines. Until you know if you can use a treadmill consistently, there is no reason to buy an expensive one.

A **Walking Work Station** is the ultimate luxury. Sitting for long hours is bad for our health so standing more while working is helpful. Even better is buying a work station that includes a treadmill. The work station has a seat for sitting that can be moved out of the way in order to use the treadmill. This means you can work and exercise at the same time. It's perfect for those who work at home or for those who have their own office.



What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?

Getting Started: Tips for Making Changes

Do not overthink this and be overwhelmed by the challenge. Some of you may read this information and not know where to start. In some cases, you may realize just how much you do that inhibits your well-being and optimal health. But remember that you do not have to be perfect. Think progress, not perfection.

The first step is to analyze your current habits. You may be able to do this in your head or you may enjoy the experience of writing a food journal for 5 days.

Once you know what areas you would like to focus on, you can make simple changes and start slow. It is important that you start slow so you can observe the changes and learn what your body likes.

1. If you do not eat enough vegetables or fruits – just add one a day.
2. If you eat too many refined white grains, go find one whole grain product you like. Maybe it is a whole grain loaf of bread or perhaps a whole grain cookie or cracker. The sensible thing to do, if you are a bread eater, is to go find a whole bread you like as opposed to start to cook quinoa or amaranth and making dishes you may not like.
3. If you wish to buy organic foods, but cannot afford them, buy whole grains and legumes and do more of your own cooking. Go to local farmers markets, especially in-season for the freshest and cheapest options. Avoid heavily sprayed foods (see page 37 for *The Clean 15 and the Dirty Dozen*). For cheaper organic meats or fish, eat smaller portions so the dollar goes further.
4. To add whole sweeteners into your daily diet, start by replacing the white sugar with honey or agave. If sugar is not essential to how the recipes work, as it is in baking, then always use these whole sweeteners in a sauce or on cereal.
5. Find a fermented food you like to support the good bacteria levels in your gut and follow the steps to good digestion. Until you try these, you will never know if this is contributing to issues you may be having. They are cheap and easy and will teach you more about how your body works,
6. Learn to take existing recipes you like and substitute healthier ingredients. Macaroni and cheese with whole grain noodles is just as delicious as its white counterpart, which we all know is a recipe for eating yummy cheese. Improve the quality of the cheese by buying raw milk, cheddar cheese or use organic milk. The same is true for spaghetti and meatballs. Use whole grain pasta and improve the quality of ingredients you use for the sauce and the meatballs.
7. If you are trying to eat your 5-10 servings of fruits and vegetables that most experts recommend but you are just not a fan of vegetables, never eat them plain. Add vegetables to recipes so the sauce of the recipe flavors them or flavor vegetables with butter or olive oil and your favorite seasoning.
8. As for fruit, it doesn't matter what fruit you eat and there must be one or two you like. They make great snacks and do not require any preparation. It is also acceptable to use fruit in recipes as a means of consuming them.
9. Learn to read ingredient labels and nutrition panels.
10. Don't forget to reduce your stress levels and move. Take some time to relax and go places with your friends and family or by yourself. It doesn't matter. A contemplative walk by yourself is just as healthy as a fun physical sport (even just horsing around for no particular reason) with other people.



Food Shopping Guide

Shopping at the grocery store can be intimidating, especially when establishing a new routine or buying new foods. Here are some quick tips:

- Most of the best quality foods are found in the outside aisles of the stores – fruits, vegetables, cheese, meats, dairy products, bakery items, fresh herbs and spices, and store-prepared items (which may or may not be whole foods).
- In the center aisle are the most processed and refined foods. However, specialty items can also be found there, like bottled herbs and spice, condiments, grains, legumes and specialty flours.
- Go to the store with a list and identify all the areas in the store where products you are looking for may be found.
- Look for a health section and/or an organic section in the store – most big grocery stores have them. If not, ask the store or department manager how they have organized the store for these items.
- Get to know your local health food store – many of the new items you might like to try can be found there.
- Read the label. Every time you pick up a packaged product, the first thing you do is flip to the ingredient listing and read it. Make your decision based on what you read – not the price or the convenience or the picture on the package. The [How to Read a Food Label](#) on page 45 has a list of additives to help you make your decision.
- You should also be looking for whole foods and avoiding white refined flours, grains and sugar. Also avoid high-fructose corn syrup, dextrose, malt dextrin, glucose, corn syrup, aspartame, mannitol, maltitol, erythritol, sorbitol, sorghum and xylitol.
- Avoid corn starch, potato starch and other starches.
- Avoid hydrogenated fat and foods with words like “modified” or “partially hydrogenated” on labels.
- Look for the word “pure” on the label as a sign you are getting the real deal, especially for maple syrup, honey and jam. Opt for fruit-sweetened jams over sugar-sweetened.
- When buying organic look for the certification sticker. It can be found on produce as a sticker and as part of the label on packaged products.
- Organic products are produced without chemicals or preservatives and in an environmentally safe manner. Produce is grown without synthetic pesticides and fertilizers



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and in an environmentally sustainable manner. Animals are raised humanely and without drugs or vaccinations and they eat organic feed or their naturally wild diet.

- Avoid GMO foods – organic food is non-GMO but so are many Conventional, non-organic items and many companies are now getting certified as non-GMO and will be labeled as such.



GMO foods are produced from GMO seed which has had alterations to the DNA of the seed with the insertion of something foreign to the species, like a pesticide. There are indications that they do pose health risks for us. They are also too new to the market for anyone to say they are safe. It often takes years for health issues to be discovered, like what we saw happen with hydrogenated fat.

- What is Fair Trade? It's a certification process indicating a product was produced under fair labour conditions. Products like sugar, tea, chocolate, vanilla and coffee can be from countries where labor abuses are known to occur.



The Clean 15 and The Dirty Dozen

By Jackie Pou

A new report issued by the President's Cancer Panel recommends eating produce without pesticides to reduce your risk of getting cancer and other diseases. And according to the Environmental Working Group (an organization of scientists, researchers and policymakers), certain types of organic produce can reduce the amount of toxins you consume on a daily basis by as much as 80%.

The group put together two lists, "The Dirty Dozen" and "The Clean 15," to help consumers know when they should buy organic and when it is unnecessary. These lists were compiled using data from the United States Department of Agriculture on the amount of pesticide residue found in non-organic fruits and vegetables after they had been washed.

The fruits and vegetables on "The Dirty Dozen" list, when conventionally grown, tested positive for at least 47 different chemicals, with some testing positive for as many as 67. For produce on the "dirty" list, you should definitely go organic — unless you relish the idea of consuming a chemical cocktail. "The Dirty Dozen" list includes:

- celery
- peaches
- strawberries
- apples
- domestic blueberries
- nectarines
- sweet bell peppers
- spinach, kale and collard greens
- cherries
- potatoes
- imported grapes
- lettuce



All the produce on "The Clean 15" list bore little to no traces

of

pesticides, and are safe to consume in non-organic form. This list includes:

- onions
- avocados
- sweet corn
- pineapples
- mango
- sweet peas
- asparagus
- kiwi fruit
- cabbage
- eggplant
- cantaloupe
- watermelon
- grapefruit
- sweet potatoes
- sweet onions



Why are some types of produce more prone to sucking up pesticides than others? Richard Wiles, senior vice president of policy for the Environmental Working Group says, "If you eat something like a pineapple or sweet corn, they have a protection defence because of the outer layer of skin. Not the same for strawberries and berries."

The President's Cancer Panel recommends washing conventionally grown produce to remove residues. Wiles adds, "You should do what you can do, but the idea you are going to wash pesticides off is a fantasy. But you should still wash it because you will reduce pesticide exposure."

Remember, the lists of dirty and clean produce were compiled after the USDA washed the produce using high-power pressure water systems that many of us could only dream of having in our kitchens.

The full list contains 49 types of produce, rated on a scale of least to most pesticide residue. You can check out the full list from on the Environmental Working Group's website at www.foodnews.org.

Remember this is not to make you paranoid about your food. The goal is to give you the knowledge and power to make the choices that are best for you.

Other ideas for buying organic and saving money:

- Buy in season at local farmers markets – it is often the same price.
- Legumes and grains are cheap – even organic, so learn to cook them. (See charts on pages 41 and 42.)
- Most toxins store in the fat cells, so buying organic meat, egg and dairy is best. This is always more expensive in the store so eat less. The other option is to try and buy directly from the farmer. While milk is not available this way, cheese, butter, meat and eggs often are and it will cost you less.
- Just be observant about what you are buying. If you are not buying organic, try to at least buy local as much as possible.

Eating Healthy *On-the-Go*

Adapted for CAHN-Pro Diabetes Protocol

Always be prepared:

Never leave the house starving whether going to eat in a restaurant or going to a friend's house for dinner. The temptation to overeat is too great. You are more likely to eat too fast when food is available because the signals from your brain say eat, eat, eat. It is fine to have an empty stomach, but there is a difference between having an empty stomach and feeling so hungry you could eat the dinner napkin. Should you find yourself starving, be sure to chew slowly and take your time with the meal in order to give your brain a chance to play catch-up with your stomach. The brain needs to know that sufficient food has been consumed in order to shut off the signal to eat. Should you get carried away and order too much food, remember that you do not have to eat it. Just ask for a doggy bag. Even if you are eating at a friend's house, most hosts are happy to send food home with you and are even flattered when you want to take food home. If you are not sure whether you will have access to the type of food you wish to eat, then taking snacks with you is an option that can help prevent over indulging in food with no nutritional value. Some good snacks to consider are:

- Fresh fruit – easy
- Raw nuts: almonds, walnuts
- Vegetable sticks like carrots and red peppers, with dips like hummus, guacamole and salsa
- Whole food nutrition bars
- Organic whole grain crackers from the health food store or grocery store
- Corn chips or other natural snacks
- Muffins, cookies, snacks (refer to snack list and recipes) you make yourself to your taste
- Nuts and seeds with dried fruit
- Drinks-to-go: bottled water, fresh fruit or veggie juice, smoothies, protein drinks
- Whole grain cookies and muffins made in local bakeries or health food stores; learn to read labels



When Dining Out:

1. **Salads.** Garden, Spinach, Greek. Ask for dressing on the side, or bring your own natural dressing (dip your fork in the dressing instead of pouring it over the entire salad... surprise yourself with the taste only a touch of dressing adds. Add grilled chicken, fish, chickpeas, or lentils; the more veggies the better! Remember, darker lettuce and veggies are more nutritious.

2. **Soups.** Vegetable, chicken, split pea, lentil. Avoid salty soups. Many soups contain MSG. Ask your server about the ingredients!
3. **Sandwiches, subs & wraps.** Vegetarian, chicken, turkey, tuna, salmon or eggs are the best options. Ask for whole grain bread. **Add extra vegetables** into your sandwich, sub, or wrap. Use cooked meats instead of cold cuts to avoid nitrates and chemical preservatives.
4. **Grilled or baked chicken, fish, tofu or vegetables.** Avoid fried/breaded. Add salad and grilled, steamed, or baked veggies. Baked potato with a bit of butter and salsa is fine or yogurt with some green onions.
5. **Stir-fry.** A veggie stir-fry is easy to digest (try it with tofu or grilled chicken). Ask for brown rice instead of white whenever possible. Be aware that restaurant stir-fries are notoriously over salted;



increase potassium intake (500 to 1,000 mg) following such a meal. Potassium and sodium work in balance. Excess sodium causes water retention and balancing it properly with potassium will cause the body to excrete water properly.

6. **Pizza.** Vegetarian/Mediterranean is your healthiest choice. Ask for wholegrain thin crust.
7. **Pasta.** Tomato, pesto or olive oil sauces are best. Avoid cream sauce. Go for pasta with veggies, grilled chicken, or shrimp. To help control sugar absorption, order protein (fish, fowl, meat) with your pasta. No need to add bread to this meal. Most restaurants will allow you to substitute white pasta with whole grain pasta, so be sure to ask.
8. **Breakfast.** Fresh fruit with plain organic yogurt, granola, protein smoothies, eggs and toast (whole-grain). Avoid fried foods and limit fatty meats.
9. **Beverages.** Ask about herbal tea/mineral water varieties even if they're not on the menu; lots of restaurants carry things not listed. Hot chocolate and speciality coffees and cappuccinos should be avoided.
10. **Remember:** Look for places that work with real ingredients and choose to eat there. Ethnic restaurants, especially if they are not a fast food chain, are your best options.

Fast Food & Restaurant Quick tips...

- Don't go to the restaurant starving. Also, drink a good amount of water before the meal so that you don't mistake thirst for hunger. Both of these suggestions will help prevent overeating.
- Drinking warm water with the juice of a lemon slice added before your meal will improve digestion; certain herbal teas will have the same effect: mint, ginger and chamomile. Green tea has caffeine (if you want a mild 'pick-me-up').
- Ask for a take home bag before your meal arrives to take half of the meal home... out of sight out of mind! Plates and portions of food are often much bigger than you realize.

- Don't be afraid to ask the server about ingredients, what something comes with and/or what can be substituted. Most servers know a lot about the food and, overall, just want customers to enjoy their meals.
- Meals can be 'created' out of a few side dishes if desired (e.g. a small garden salad with grilled chicken or salmon with a side of steamed rice and side steamed vegetables makes a complete meal).

- Nearly all dressings and sauces can be put on the side as well as substituted... so it's always a good idea to ask which allows for better portion control (e.g. ask for tomato instead of cream sauce).



- Don't forget to ask to add extra vegetables (preferably steamed) – they can be added to most dishes.
- Vegetarian options are often healthier than meat options (particularly red meat options).
- Always ask for a whole grain/whole wheat variety of bread and pasta. Some restaurants now have gluten-free options. Some are happy to substitute rice in place of pasta noodles in dishes.

- **Dessert:** If you're really craving dessert, but don't want to get a whole course, ask if they can provide a "kids dessert... they're often just one small scoop of ice cream/pudding and cost less too! Donuts, pies, cinnamon buns and most muffins should be avoided since they



contain hydrogenated oils and refined sugar and flour.

- A second way to avoid wanting to order dessert is to carry some quality chocolate or a naturally sweetened nutrition bar with you and eat it instead. (The restaurant doesn't mind.)
- Ask if a dish that is normally fried can be grilled or baked. Calamari and some fish entrees, spring rolls, the breads that come with spinach dips, and many other foods, can often be baked instead of fried. Fried, deep-fried, breaded and greasy food are high-fat, upsetting to the stomach and could make you very, very tired. Fries and onion rings can contain rancid, poor quality fats.

Final thoughts...

- If you have a choice as to the type of restaurant, avoid those known for offering big portions. It is better to go to a more expensive restaurant with better food quality and eat less than it is to go to a cheap restaurant and eat a lot of food that is not very good for you. Your budget can often help control portion size.
- Buffet restaurants can be your friend or your enemy. If you have self-control and you are not starving, you can really

control the portion size, suit your taste desires and still not overeat. Remember that the food at a buffet may not be of the highest quality, so make sure to avoid the lure of the "look" of the food. Neither you nor your body will be happy if you succumb to overeating.

- Share a dish with a friend whether it is a dessert or an appetizer or an entrée. This way you can have something really want while limiting the calorie count and the cost.
- It is perfectly acceptable to indulge on the occasional meal, so do not beat yourself up should you over-indulge.
- Weight gain from eating out happens because of frequency, not a one-time occurrence. Understanding your options for eating out so they can be available to you is ideal, so think about them and pick the ones that makes the most sense to you and your needs and lifestyle.
- Make your choices and relax. Don't stress about your choices. Stressing about what you eat is worse for your overall health than eating unhealthy food. Once you decide what you are going to do, relax. Enjoy your dining out experience and focus more on spending quality time with friends and family; enjoy taking a break from work or a hectic day

Cooking Grains

For Each Cup Grain	Cups Liquid	Cooking Method	Cooking Time	Yield (cups)
Amaranth	3	Absorption or Boiling	15 min	2-2/3
Barley grits	2/3	Cereal	3 min + 5 min standing time	2/3
Barley groats	4	Absorption or Boiling	1 hour 45 min	2-1/2
Barley, pearl	3	Absorption or Boiling	45-55 min	4
Barley, quick	2	Absorption or Boiling	10-12 min	3
Buckwheat groats, unroasted	2	Absorption or Boiling	15 min	3-1/2
Buckwheat groats, roasted (kasha)	2	Absorption or Boiling	15 min	3
Bulgur wheat	2	Absorption	15 min	3
Cornmeal	4	Cereal	10 min	3-1/2
Couscous	1-1/2	Steep	5-10 min	3
Cracked Wheat	2	Absorption or Boiling	15 min	2
Farro, semi-pearled	2	Absorption or Boiling	25-30 min	2
Hominy, dried	5	Absorption or Boiling	5-6 hours	3
Kamut	2	Absorption or Boiling	40-45 minutes	2
Millet	3	Absorption or Boiling	25-30 min, 10 min standing time	5
Oats, quick	2	Cereal or steep	1 min + 3-5 min standing time	2
Oats, old-fashioned	2	Cereal	5 min	2
Oats, steel-cut	4	Cereal	20 min	2
Quinoa	2	Absorption or Boiling	15 min	4
Rye berries	3	Absorption or Boiling	1 hour 55 min	3
Rye flakes	3	Cereal	1 hour 5 min	2-1/2
Triticale berries	3	Absorption or Boiling	1 hour 45 min	2-1/2
Teff		Absorption or Boiling		
Wheat berries	3	Absorption or Boiling	1 hour 10 min	2-1/2
Wheat flakes	4	Cereal	50-55 min	2

Adapted from [Gourmet Sleuth](#)

Cooking Methods

Absorption: Bring liquid to a boil. Stir in the grain. Cover and reduce the heat to low. Cook until liquid is absorbed and grain is tender to the bite. Fluff with a fork before serving. Soak harder grains in the liquid overnight to reduce the cooking time.

Steep: Pour boiling liquid over the grain. Cover and let stand until grain is tender to the bite.

Boiling: Bring water to a boil. Add grain, simmer until done. Transfer to a colander and drain well.

Cereal: [Cereal grains](#) are typically added to boiling water and stirred periodically (or constantly depending on the cereal) until cooked and thickened.

Cooking Legumes and Lentils

Bean or Legume (1 cup)	Time	Yield
Adzuki (Aduki)	45-60 minutes	3 cups
Anasazi	45-60 minutes	2 1/4 cups
Black (turtle) Beans	1 – 1 1/2 hours	2 1/4 cups
Black-Eyed Peas	45 minutes – 1 hour	2 cups
Cannellini (White Kidney Beans)	45 minutes – 1 hour	2 1/2 cups
Cranberry Bean	40-45 minutes	3 cups
Chickpeas- see Garbonzo		
Fava Beans	45-60 minutes	1 2/3 cups
Ful Nabe	45-60 minutes	1 2/3 cups
Garbanzo Beans (Chickpeas)	1 1/2 – 2 1/2 hours	2 cups
Great Northern Beans	1 – 1 1/2 hours	2 2/3 cups
Green Split Peas	45 minutes	2 cups
Yellow Split Peas	1 – 1 1/2 hours	2 cups
Green Peas, whole	1 – 2 hours	2 cups
Kidney Beans, Red	1 hour	2 1/4 cups
Lentils, Brown	45-60 minutes	2 1/4 cups
Lentils, Green	30-45 minutes	2 cups
Lentils, Red	20-30 minutes	2 1/2 cups
Lima Beans	45-60 minutes	2-3 cups
Mung Beans	45-60 minutes	2 cups
Navy Beans	45-60 minutes	2 2/3 cups
Pigeon Peas	30 minutes	
Pink Beans	50-60 minutes	2 3/4 cups
Pinto Beans	1 – 1 1/2 hours	2 2/3 cups
Soybeans	3 – 3 1/2 hours	3 cups

Adapted from: [DDV Culinary Website](#)

General Directions

1. Wash beans or legumes and discard any discolored or badly formed ones. Also remove any debris or pebbles.
2. Cover beans with about 3 inches of water and soak for 8 hours or overnight.
3. Discard the soaking water.
4. Place beans in about 3 times their volume of fresh water in a cooking pot.
5. Bring to boil, then lower the heat to low and simmer for the specified time.
6. Add a 1/2 - 1 tsp salt during the last few minutes of cooking.

Note: Lentils, Black-Eyed Peas, Split Peas, or Whole Peas do not need soaking.

Reading Food Labels

Black-Eyed Peas

Nutrition Facts	
Serving Size 172 g	
Amount Per Serving	
Calories 200	Calories from Fat 8
% Daily Value*	
Total Fat 1g	1%
Saturated Fat 0g	1%
Trans Fat	
Cholesterol 0mg	0%
Sodium 7mg	0%
Total Carbohydrate 36g	12%
Dietary Fiber 11g	45%
Sugars 6g	
Protein 13g	
Vitamin A 1%	Vitamin C 1%
Calcium 4%	Iron 24%
*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.	
NutritionData.com	

Calories: The number of calories in the predetermined serving size.

Serving Size: This is not a “recommended” amount since it is not accounting for an individual's caloric needs. Also, manufacturers sometimes manipulate the portion size to create a better label read so a portion has a low calorie number. Compare the weight of the serving size to the total weight listed on the package to get an idea of how much you can eat for that calorie count.

% Daily Value: A percentage of a nutrient amount based on a 2,000cal/day diet.

Fat: Think quality not quantity! Avoid products containing any trans fats. Saturated, polyunsaturated and monounsaturated fats should each be 1/3 of the total fat content

Sodium: Aim to consume 1,500-2,000mg/day.

Carbohydrates:
Total carbohydrates

are comprised of starch, sugar and fiber.

Sugars: Does not mean sugar – it refers to small or simple molecules of carbohydrates called monosaccharides or disaccharides (like glucose or fructose) as opposed to polysaccharides, which are many molecules of carbohydrates (known as starch). For the black-eyed peas that the label above is for there are 36 g total carbohydrates, we do not ingest fiber so they do not count as calories. The label tells us that the black-eyed peas have 6 grams of simple carbohydrates, listed as sugars, probably glucose. This means there will be $36 - (11 + 6) = 19$ g left and these would be the polysaccharides or starch molecules, also known as complex carbohydrates.

Try to consume at least 40 g of fiber a day and remember that fiber works best with good bacteria, so consume traditionally fermented foods.

Spotting Unhealthy Fats on the Label:

- Hydrogenated oils & fats
- Partially-hydrogenated oils & fats
- Fractionated palm kernel oil
- Margarine, shortening
- Vegetable oil (commercial yellow oil)
- Commercial canola oil, sunflower/safflower oil, soybean oil, palm oil

Avoid These Additives At All Costs:

- MSG
- Nitrates
- BHT, BHA
- Tartrazine (Yellow#5)
- Sodium Benzoate
- Potassium Sorbate

General Rules:

1. The fewer ingredients, the better.
2. Learn the official names of vitamins like “niacin” or “riboflavin” so that you don’t mistake them for artificial chemicals.
3. Look up words you do not recognize; use the chart below for chemical additives to avoid.

Spotting Sugars on the Label:

Low Glycemic Natural Sugars

Normally a carbohydrate that does not spike blood sugar can be easily identified by looking for the fiber content. However, these whole sweeteners do not contain fiber but are still low glycemic. The reason is powerful phytonutrients found in these sweeteners.

- Honey
- Coconut or Palm sugar/sweetener
- Pure maple syrup
- Molasses
- Barley malt syrup
- Brown rice syrup
- Fruit puree/concentrate
- Evaporated cane juice
- Organic cane sugar*, brown sugar*, raw sugar*, turbinado sugar*

**The more refined and processed these sugars are, the less natural with less nutrients and fiber they will be.*

Avoid Artificial/Unnatural Sugars

- White sugar
- Corn syrup
- High-fructose corn syrup
- Fructose, glucose, sucrose, dextrose
- Maltodextrin, mannitol
- Sorbitol, sorghum, xylitol

Artificial sweeteners like aspartame, sucralose and Splenda should also be avoided.

8 Mistakes Commonly Made When Reading Food Labels

1. Watch the portion size. Make sure you understand the weight they are indicating versus the total weight of the package and decide if that represents what you consider a good portion size.
2. No added sugar means that they did not add extra sugar; it doesn't mean it does not contain refined carbohydrates or simple sugars that are easily absorbed into the bloodstream. For example, fruit juice can have added sugar, meaning it is not pure juice, or it can be pure juice, meaning the only carbohydrate source is from the fruit. However, pure fruit juice is still easily absorbed into bloodstream and drinking too much of it will spike blood sugar since the fiber has been removed. So watch the quantity.
3. "Fat Reduced" or "Sodium Reduced" Claims: This does not mean low-sodium or low-fat. It only means they have reduced what was there originally by 25%. If it was very high originally, then lowering by 25% still means it is quite high.
4. Daily Value or DV%: This represents the percentage the portion size has of your total needs for the day. The label example above for black-eyed peas states the fat content has a DV of 1%, so consuming this portion size of black-eyed peas means 99% of the fat needed for the day still

needs to be consumed. This is an estimate and does not take into consideration your size or metabolism and, therefore, is not something you should carve in stone – it is just an average guideline.

5. As mentioned above, sugars listed on a nutritional label do not mean white sugar. Honey as an ingredient, which is extremely healthy and beneficial and helps stabilize blood sugar, on a nutritional panel shows up as the word “sugar”. This word simply means simple carbohydrate.
6. Read the ingredient panel for a true picture of how nutritious a product truly is. This is where you find out if a product is made with whole foods. Look for words like “whole wheat” as opposed to “enriched wheat flour” which means “white flour”.
7. The ingredient label lists the ingredients from the largest amount to the smallest amount. This tells you a lot about the food and what you are paying for.
8. The following are common claims found on packaging. Understanding what they mean can be helpful:
 - A. **Fat Free or No Fat:** Contains less than a 1/2 g of fat per serving
 - B. **Low fat:** Contains less than 3 g of fat per serving
 - C. **No Calories or Calorie Free:** Contains less than 5 calories per serving
 - D. **Sugar free:** Contains less than a 1/2 g per serving
 - E. **Reduced Sugar:** Contains less than 25 percent of the original amount of sugar – this does not mean low sugar
 - F. **No Preservatives** – It does not contain preservatives
 - G. **No Added Preservatives:** It does not have added chemicals to preserve it; it could still contain ingredients that are natural and aid in preservation, like vinegar or lemon juice
 - H. **Low Sodium:** Contains less than 140 mgs of sodium per serving
 - I. **No Salt or Salt Free:** Contains less than 5 g of sodium per serving
 - J. **High Fiber:** Contains 5 g or more per serving. foods must also meet low fat claims to make a high fiber claim and the total amount of fat must appear next to the high fiber claim
 - K. **More Fiber or Added Fiber:** The product must contain at least 2.5 g to 4.9 g more fiber than the food originally had. So, for example, there are breakfast cereals that advertise added psyllium fiber. However, this does not mean the cereal is high in fiber. The cereal can be made from refined carbohydrates and did not have fiber in the first place. Also, natural foods contain different types of fibers with different benefits and a product with added fiber would only have one type.

Are you concerned about additives and preservatives? In most cases, the ingredient list on the package lists all the additives, though sometimes the specific chemicals can be hidden in the listing of “artificial flavors”.

Dangerous Additives to Avoid:

...can be linked to hyperactivity, asthma and cancer – avoid these in your own, everyday diet! Allergic and other types of reactions to food additives can occur hours or even days after being consumed. This makes it difficult for many people to notice the connections

From Traditionaloven.com

Additive Number	Name of Food Additive	Hyper-activity	Asthma	Cancer
102 & E102	Tartrazine (food color)	H	A	C
104 & E104	Quinoline Yellow (food color)	H	A	C
107 & E107	Yellow 2G (food color)	H	A	C
110 & E110	Sunset Yellow (Yellow food color #6)	H	A	C
120 & E120	Carmines, Cochineal (food color)	H	A	-
122 & E122	Azorubine, Carmoisine (food color)	H	A	C
123 & E123	Amaranth (Red food color #2)	H	A	C
124 & E124	Ponceau, Brilliant Scarlet (food color)	H	A	C
127 & E127	Erythrosine (Red food color #2)	H	A	C
E128	Red 2G (Red food color)	H	A	C
129 & E129	Allura Red AC (food color)	H	A	C
E131	Patent Blue (food color)	H	A	C
132 & E132	Indigotine, Indigo Carmine (food color)	H	A	C
133 & E133	Brilliant Blue (food color)	H	A	C
142 & E142	Acid Brilliant Green, Green S, Food Green (food color)	H	A	-
143	Fast Green (food color)	-	A	-
150 & E150	Caramel (food color)	H	-	-
151 & E151	Activated Vegetable Carbons, Brilliant Black (food color)	H	A	C
154	Food Brown, Kipper Brown, Brown FK (food color)	H	A	C
155 & E155	Chocolate Brown HT, Brown HT (food color)	H	A	C
160b & E160b	Bixin, Norbixin, Annatto Extracts (yellow, red to brown natural colors)	H	A	-

E171	Titanium Dioxide, TiO ₂ (to give foods an opaque color) more on Titanium Dioxide in comments below ↴	?	?	?
E173	Aluminium (preservatives)	-	-	C
E180	Latol Rubine, Pigment Rubine (preservatives)	H	A	C
200 & E200-203	Potassium & Calcium Sorbates ,Sorbic Acid (preservatives)	H	A	-
210 & E210	Benzoic Acid (preservatives)	H	A	C
211 & E211	Sodium Benzoate (preservatives)	H	A	-
212 & E212	Potassium Benzoate (preservatives)	-	A	-
213 & E213	Calcium Benzoate (preservatives)	-	A	-
E214	Ethyl Para Hydroxybenzonate (preservatives)	-	A	-
E215	Sodium Ethyl Para Hydroxybenzonate (preservatives)	-	A	-
216 & E216	Propyl P Hydroxybenzonate, Propylparaben (preservatives)	-	A	-
E217	Sodium Propyl P Hydroxybenzonate (preservatives)	-	A	-
220 & E220	Sulphur Dioxide also Sulfur dioxide (preservatives)	H	A	-
221 & E221	Sodium Sulfite or Sodium Sulphite (preservatives)	-	A	-
222	Sodium Bisulfite or Sodium Bisulphite (preservatives)	-	A	-
223 & E223	Sodium Metabisulfite or Sodium Metabisulphite (preservatives)	-	A	-
224 & E224	Potassium Metabisulphite or Potassium Metabisulfite (preservatives)	-	A	-
225 & E225	Potassium Sulfite or Potassium Sulphite (preservatives)	-	A	-
E226	Calcium Sulfite or Calcium Sulphite (preservatives)	-	A	-
E227	Calcium Hydrogen Sulphite or Calcium Hydrogen Sulfite (preservatives)	-	A	-

E228	Potassium Bisulfite, Potassium Hydrogen Sulfite or Potassium Bisulphite, Potassium Hydrogen Sulphite (preservatives)	H	A	-
E230	Diphenyl, Biphenyl (preservatives)	-	-	C
E231	Orthophenyl Phenol (preservatives)	-	-	C
E236	Formic Acid (preservative)	-	-	C
E239	Hexamine, Hexamethylene Tetramine (preservatives)	-	-	C
249 & E249	Potassium Nitrate (preservative)	-	A	C
250 & E250	Sodium Nitrite (preservative)	H	A	C
251 & E251	Sodium Nitrate (preservative)	H	-	C
252 & E252	Potassium Nitrate (preservative)	H	-	C
260 & E260	Acetic Acid, Glacial (preservatives)	-	A	-
280 to 283	Calcium or Potassium or Sodium Propionates, Propionic Acid (preservatives)	H	A	-
310 & E310	Propyl Gallate (Synthetic Antioxidant)	-	A	C
311 & E311	Octyl Gallate (Synthetic Antioxidant)	-	A	-
312 & E312	Dodecyl Gallate (Synthetic Antioxidant)	-	A	-
319 & E319	TBHQ, Tert Butylhydroquinone (Synthetic Antioxidants)	H	A	-
320 & E320	Butylated Hydroxyanisole (BHA) (Synthetic Antioxidants)	H	A	C
321 & E321	Butylated Hydroxytoluene (BHT) or Butylhydroxytoluene (Synthetic Antioxidants)	H	A	C
330 & E330	Citric Acid (NOT DANGEROUS if naturally occurring E330 & 330 citric acid additive – but others can contain sulfites and mold, as explained earlier in the article above this table.)	-	-	-
407 & E407	Carrageenan (Thickening & Stabilizing Agent)	-	A	C
413 & E413	Tragacanth (thickener & Emulsifier)	-	A	-
414 & E414	Acacia Gum (Food Stabilizer)	-	A	-
416	Karaya Gum (Laxative, Food Thickener & Emulsifier)	-	A	-

421 & E421	Mannitol (Artificial Sweetener)	H	-	-
430	Polyxyethylene Stearate (Emulsifier)	-	-	C
431	Polyxyl Stearate (Emulsifier)	-	-	C
E432 – E435	Polyoxyethylene Sorbitan Monostearate (Emulsifiers Gelling Stabilisers Thickeners Agents)	-	-	C
433 – 436	Polysorbate (Emulsifiers)	-	-	C
441 & E441	Gelatine (Food Gelling Agent)	-	A	-
466	Sodium CarboxyMethyl Cellulose	-	-	C
507 & E507	Hydrochloric Acid (Hydrolyzing Enhancer & Gelatin Production)	-	-	C
518 & E518	Magnesium Sulphate (Tofu Coagulant)	-	-	C
536 & E536	Potassium Ferrocyanide (Anti Caking Agent)	-	A	-
553 & E553 & E553b	Talc (Anti Caking, Filling, Softener, Agent)	-	-	C
620 – 625	MSG Monosodium Glutamate, Glutamic Acid, all Glutamates (Flavor Enhancers)	H	A	C
627 & E627	Disodium Guanylate (Flavor Enhancers)	H	A	-
631 & E631	Disodium Inosinate 5 (Flavor Enhancers)	-	A	-
635 & E635	Disodium Ribonucleotides 5 (Flavor Enhancers)	-	A	-
903 & E903	Camauba Wax (used in Chewing Gums, Coating and Glazing Agents)	-	-	C
905 & 905 a,b,c	Paraffin and Vaseline, White Mineral Oil (Solvents, Coating and Glazing, Anti Foaming Agents, Lubricant in Chewing Gums)	-	-	C
924 & E924	Potassium Bromate (Agent used in Bleaching Flour)	-	-	C
925 & E925	Chlorine (Agent used in Bleaching Flour, Bread Enhancer and Stabiliser)	-	-	C
926	Chlorine Dioxide (Bleaching Flour and Preservative Agent)	-	-	C
928 & E928	Benzoyl Peroxide (Bleaching Flour and Bread enhancer Agent)	-	A	-
950 & E950	Potassium Acesulphame (Sweetener)	-	-	C

951	Aspartame (Sweetener)	H	A	-
952 & E952	Cyclamate and Cyclamic Acid (Sweeteners)	-	-	C
954 & E954	Saccharine (Sweetener)	-	-	C
1202 & E1202	Insoluble Polyvinylpyrrolidone Insoluble (Stabilizer and Clarifying Agent added to Wine, Beer, Pharmaceuticals)	-	-	C
1403	Bleached Starch (Thickener and Stabilizer)	-	A	-

Appendix

Vitamins

Fat-Soluble Vitamins: We can store these in fat cells in our bodies so it is not necessary to get them in our diet every day. However, eating a whole food diet would give fat-soluble vitamins to us daily. This would not be an issue since it would be very difficult to get an excess of fat-soluble vitamins from food alone.

Vitamin A (retinol and beta-carotene): RDA: 700 to 900 mcg/day or 2,300 to 3,000 IU/day

Functions/Benefits: Assists the body's epithelial tissues (the cells that make up your skin and line your eyes, mouth, nose, throat, lungs, digestive tract and urinary track) in growing and repairing themselves, helps heal infections, is essential for healthy eyes, vision and reproductive health. Also, it helps lay down new cells and moisturize mucous membranes to promote secretion.

Natural Food Source: Beef Liver (9,000 IU/oz) as well as other animal livers, milk, butter (840 IU/oz), spinach, broccoli, carrots (8100 IU/oz), medium apricot (1,000 IU), collard greens (7,410 IU/4 oz), green leafy vegetables, squash, yams.

Deficiency symptoms: Marginal deficiency: red eyes, loss of facial color, sores around mouth, sore throat, raw, red lips, skin issues, rash on face and/or genital areas, insomnia. Severe deficiency: anemia and nerve disease and night blindness.

NOTES: Absorption is reduced with alcohol use, with vitamin E deficiency, with cortisone medication, with excessive iron intake or the use of mineral oil, as well as with exercise.

Vitamin D (Calciferol): AI: 200 to 600 IU

Functions/Benefits: Regulates calcium and phosphorous metabolism. It is required for bone growth and development. The body makes Vitamin D when it is exposed to sunshine (so the use of sunscreen minimizes its absorption).

Natural Food Source: Exposure to sunlight, fortified milk (96 IU/8oz), sardines (450 IU/3oz), fresh salmon (350 IU/3oz), shrimp (1.29 IU/3oz), cod liver oil (460 IU/1tsp), fortified cereals.

Deficiency symptoms: Rickets in children, weak muscles, and late tooth development; in adults: osteomalacia (softening of bone), hypocalcemia (calcium deficiency), osteoporosis and muscle spasm.

NOTE: Taking calcium, magnesium and Vitamin D all together is probably ideal for the best bone health. It acts more like a hormone than a vitamin as it is produced in the body (skin) and released into the body to affect the other tissues in bones.

Vitamin E (Tocopherols): RDA: 60 to 80 mg/day

Functions/Benefits: Anti-oxidant that may result in preventing premature aging, tissue degeneration and skin changes brought about by free radicals. It may help in preventing heart disease. It may boost immunity.

Natural Food Sources: Sunflower seeds (9.3 IU/oz), almonds (10 IU/oz), medium sweet potato (8.9 IU), wheat germ (6IU/2 oz), medium apple (1.2 IU), olive oil (2.5 IU/1tbsp).

Deficiency symptoms: (Rare) anemia, edema (excessive accumulation of fluid in tissues), nerve damage, and retina damage.

NOTES: Discovered in 1922. Experiments with rats indicated that when fed on a diet devoid of Vitamin E they became infertile and that their fertility returned when the supply was restored in their diet. It is not stored as readily as other fat-soluble vitamins.

Vitamin K: RDA: 60 to 80 mcg

Functions/Benefits: Essential for blood clotting and for normal liver function. It is needed to aid the body in holding onto calcium in the bones. It regulates tissue mineralization and cell growth; given to women to help relieve menstrual pain, or to reduce the nausea and vomiting of pregnancy; sometimes used as a preservative in foods; it helps control fermentation.

Natural Food Sources: Raw spinach (74mcg/4 oz), beef liver (89mcg/3oz), raw cauliflower (96mcg), raw turnip greens (182 mcg/4oz), broccoli (58mcg/4oz), medium raw tomato (28 mcg), alfalfa, kelp and naturally present in healthy intestines.

Deficiency symptoms: Rare, except in newborn infants where bleeding tendencies are possible. Elevated levels of Vitamin K can interfere with the effects of blood thinning medications.

Water-Soluble Vitamins: The body only absorbs the amount of the water-soluble vitamins it needs and will excrete the rest. Urine can become bright yellow when this occurs. We must obtain these vitamins daily because we do not store them.

Vitamin B1

Thiamine: RDA: 1.1 to 1.2 mg/day

Functions/Benefits: Helps regulate nerve growth, mental functions and memory. Thiamin also helps convert food to energy, i.e. glucose metabolism; also helps convert carbohydrates to fat for storage; it aids in the protein synthesis as well as development of myelin sheath around the nerve cells.

Natural Food Sources: Wheat germ 7.67 mg/oz), whole wheat, enriched white flour, oatmeal (.26 mg/8oz), sunflower seeds (1.95mg/3 oz), peanuts (.3mg/3 oz), medium potato (.22mg), Brewer's yeast, blackstrap molasses.

Deficiency symptoms: Marginal deficiency: appetite and weight loss, nausea, vomiting, nervous system problems, and depression. Gross deficiency: muscle weakness, decreased reflexes, edema (swelling), heart enlargement, and beriberi.

Vitamin B2 (Riboflavin): RDA: 1.1 to 1.3 mg/day

Functions/Benefits: Releases energy, assists in normal growth and development and is needed for normal red blood cells and hormones. It is essential for healthy eyes, skin, nails and hair.

Natural Food Sources: Liver (1.2 mg/oz), low-fat milk (.52 mg/8oz), yogurt (.49mg/8oz), cottage cheese (.42mg/8oz), ground beef (.20mg/3oz), large egg (.26mg), whole grains, Brewer's yeast.

Deficiency symptoms: Marginal deficiency: red eyes, loss of facial color, sores around mouth, sore throat, raw, red lips, skin sores, rash on face and/or genital area. Severe deficiency: anemia and nerve disease.

NOTES: Women who take estrogen or birth control pills, people on such antibiotics as sulfa, and those under stress need additional amounts of riboflavin.

Vitamin B3 (Niacin): RDA: 14 to 16mg/day

Functions/Benefits: Acts as co-enzymes involved in DNA processing, cell differentiation and calcium mobilization. Niacin releases energy, assists in hormone production, assists in toxin removal and assists in keeping cholesterol levels normal. Also, it is important for normal functioning of the nervous and digestive systems.

Natural Food Sources: Lean beef (2.3 mg/oz), tuna (3.4 mg/oz), peanuts (4.8 mg/oz), chicken Breast (8/5mg/3oz), beef liver (4mg/3oz) cooked mushrooms (3.5 g per/4oz), other organ meats, salmon, halibut, Brewer's yeast, dried beans and peas, wheat germ, brown rice, avocados, dates, figs, and prunes, milk and eggs.

Deficiency symptoms: Mild: canker sores, diarrhea, dizziness, fatigue, bad breath, headaches, indigestion, insomnia, poor appetite, and skin problems. Severe: pellagra, a serious disease with symptoms of dry, cracked, scaling skin aggravated by sunlight, dementia and extreme diarrhea.

NOTES: Only a small amount of this vitamin is taken from the food. Most of it is converted from Tryptophan. Niacin is used to treat a wide variety of psychological symptoms including senility, alcoholism, drug problems, depression and schizophrenia.

Vitamin B5 (Pantothenic Acid) AI: 5 mg/day

Functions/Benefits: Releases energy from food and assists in the production of Vitamin D, hormones and red blood cells; relieves fatigue and stress through its support of the adrenal glands; used after surgery to stimulate GI peristalsis; used to treat nerve disorders such as neuritis, epilepsy and multiple sclerosis.

Natural Food Sources: Lentils (1.26mg/8oz), chicken liver (4.63 mg/3oz), other organ meats, black beans (.42mg/8oz), corn (.72 mg/4oz), lima beans (.79mg/8 oz), cooked mushrooms (1.69mg/4oz), whole grain breads, cereals, peanuts, Brewer's yeast, egg yolk, fish, sweet potatoes, avocados; also made by the bacterial flora of human intestines.

Deficiency symptoms: Nausea, numbness in extremities, sleep disturbances, muscle spasms and cramps, poor muscle coordination, headaches, fatigue, stomach pain and gas, diarrhea, decrease in hydrochloric acid production.

Vitamin B6 (Pyridoxine): RDA: 1.3 to 1.7 mg/day

Functions/Benefits: Wide variety of metabolic functions include amino acid and in the central nervous system; conversion of tryptophan to niacin and arachidonic acid to prostaglandin E2; facilitates the release of glycogen from the liver and muscles; helps in antibody and red blood cell production, both DNA and RNA; needed to make hormones and enzymes. It is also believed to help prevent heart disease; used by the brain to convert tryptophan to serotonin, an antidepressant neurotransmitter.

Natural Food Sources: Beef liver (.78mg/3oz), medium baked potato with skin (.70mg), medium banana (.66mg), half medium avocado (.40mg), wheat germ (.38mg/2oz), raisins (.32mg/5oz), peaches, molasses, fish, poultry, prunes, egg yolk, soy beans, walnuts, prunes, cauliflower, cabbage, collards, turnip, mustard greens, garlic, mushrooms, spinach, bell peppers, avocados, raw sugar cane.

Deficiency symptoms: Irritability, confusion, nervousness, numbness of extremities, rashes, sores on lips, tongue and mouth, seizures, anemia.

NOTE: The higher the level estrogen, the greater need there is for B6. Pregnant women need a higher level of B6.

Vitamin B9 (Folic Acid) RDA: 400mcg/day

Functions/Benefits: Used in cell growth and division. Folic Acid also prevents neural tube birth defects and assists in the prevention of heart disease.

Natural Food Sources: Cooked asparagus (1.32mg/4oz), lentils (358 mg/8oz), navy beans (255mg/8oz), chickpeas (382mg/9oz), kidney beans (229 mg/8 oz), cooked spinach (131mg/4oz), Brewer's yeast and broccoli.

Deficiency Symptoms: Anemia, irritability, weakness, sleep disturbances, pallor, sore and reddened tongue.

NOTE: Folic Acid supplements are recommended for pregnant women as a lack of Folic Acid can result in birth defects.

Vitamin B12 (Cobalamin): RDA: 2.4 mcg/day

Functions/Benefits: Helps the body process carbohydrates, proteins and fats from food into energy. It also forms the protective covering on nerve cells, keeps red blood cells healthy and helps prevent heart disease.

Natural Food Sources: Steamed clams (84.06 mg/3oz), beef liver (68mg/3oz), flounder (2.13mg/3oz), tuna (2.55mg/3oz), ground beef (2.1 mg/3oz), low-fat yogurt (1.28mg/8oz), Brewer's yeast, sunflower seeds and bananas.

Deficiency Symptoms: Common among the elderly are pernicious anemia, unsteady gait, chronic fatigue, constipation, depression, digestive disturbances, headaches, drowsiness, dizziness, liver enlargement, irritability and mood swings, nerve disorders, palpitations, tinnitus, spinal cord degeneration and hallucinations.

Biotin (sometimes known as Vitamin H): AI: 30 mcg/day

Functions/Benefits: Essential for body processes that break down fats, proteins and carbohydrates into fuel for the body.

Natural Food Sources: Produced in your intestines by billions of friendly bacteria, beef liver (8.2 mcg/3oz), Brewer's yeast (73mcg/3oz), peanut butter (12 mcg/2tbsp), large egg (10mcg), brown rice (9mcg/4oz), and medium banana (6mcg).

Deficiency symptoms: (Extremely rare) Hair loss, red rash around eyes, nose, mouth and genital area, depression, lethargy, hallucinations, numbness and tingling of extremities.

Vitamin C (Ascorbic Acid): RDA: 75 to 90mg/day

Functions/Benefits: Needed to make collagen, the strong connective tissue that holds your skeleton together, attaches muscles to bones, builds strong blood vessels and keeps organs and skin in place. It is an anti-oxidant. It aids in proper immune system functioning. It aids in the formation of neurotransmitters, dopamine and epinephrine and stimulates adrenal function.

Natural Food Sources: Medium yellow bell pepper (341mg), medium pink grapefruit (39mg), cranberry juice (67mg/6oz), medium kiwi (75mg), orange juice (124 mg/9oz), medium mango (57mg), strawberries, rosehips, tomatoes, sprouted grains.

Deficiency symptoms: Mild: poor wound healing, bleeding gums, bruising easily, nosebleeds, joint pain, lack of energy, susceptibility to infection. Severe: scurvy.

Choline: AI: 425 to 550 mg/day

Natural Food Sources: Grains and legumes as lecithin and as free choline in vegetables, especially cauliflower and lettuce.

Deficiency symptoms: (very rare) Linked to liver disorder.

Functions/Benefits: Helps the body make the main components of our cell membranes and is required for the proper metabolism of fats.

Minerals

Calcium: AI: 1,000 to 1,200 mg

Functions/Benefits: Calcium is by far the most abundant mineral in your body, making up about 2% of total body weight, mostly in your bones. It is also found in your teeth and blood. Calcium regulates heartbeat, controls blood pressure, assists in blood clotting, muscle contraction and sending nerve messages. It is needed to make numerous hormones and enzymes and for normal kidney function.

Natural Food Sources: Ricotta cheese (337 mg/4oz), milk and yogurt (300mg/8oz), sesame seeds (360 mg/oz), salmon with bones (203 mg/3oz), cooked turnip greens (99mg/4oz), navy beans (128 mg/8oz).

Deficiency symptoms: Osteomalacia, osteoporosis, rickets, seizures and muscles spasms.

Magnesium: RDA: 310 to 420 mg

Functions/Benefits: Assists in regulating the neuromuscular activity of the heart and normal heart rhythm. It is necessary for proper calcium and Vitamin C metabolism; assists in converting blood sugar into energy.

Natural Food Sources: Black beans (121 mg/8oz), tofu (118 mg/8oz), dry roasted almonds (84mg/oz), chickpeas (78 mg/8oz), peanuts (52mg/oz), milk (34mg/8oz), and medium banana (33mg).

Deficiency Symptoms: Convulsions, tremors, confusion, muscle spasms, sleep disturbances, irritability, rapid heartbeat, and upset stomach.

Phosphorus: RDA: 700 mg

Functions/Benefits: The second most abundant mineral in your body, used to make teeth and bones and for many metabolic processes. It forms collagen, assists in acid-based balance in blood plasma, phospholipids, DNA and enzymes.

Natural Food Sources: Found in almost all foods; pumpkin seeds (33mg/oz), almonds (151mg/oz), fish, meat and dairy are good sources.

Deficiency Symptoms: (rare) Bone pain, brittle bones, loss of appetite and weakness.

Potassium: AI: 1.2 to 1.5g/day

Functions/Benefits: Being one of the main blood minerals called electrolytes along with sodium and chloride, it is important to both cellular and electrical function; 98% of it is located within the cells. Potassium, chloride and sodium work together to keep the water balance in your cells and blood at the proper levels. It normalizes heart rhythms, sends oxygen to the brain, stimulates the kidneys to eliminate body wastes, assists in reducing high blood pressure and promotes healthy skin.

Natural Food Sources: Found in almost all foods, including fruits, vegetables, beans, meat, milk and grains, baked potato with skin (844 mg), prune juice (706 mg/8oz), tomato juice (658 mg/6oz), half a medium avocado (550mg), medium banana (451 mg), and cantaloupe (494 mg/8oz).

Deficiency Symptoms: Common, especially with aging or chronic disease; fatigue is the most common symptom of chronic potassium deficiency. Other symptoms may manifest as muscle cramps, spasms, lethargy, weakness, poor reflexes and abnormal heart rhythms.

NOTES: Alcohol, coffee and other caffeine drinks, sugar and diuretic drugs cause potassium losses and can contribute to lowering blood potassium.

Sodium: AI: 4.7 g/day

Functions/Benefits: Mainly (60%) extra cellular and works with potassium to maintain proper body water distribution and blood pressure. It helps maintain the proper acid-base balance and assists in the transmission of nerve impulses; also important to hydrochloric acid production in the stomach and is used during the transport of amino acids from the gut into the blood.

Natural Food Sources: Widely available in almost all foods. The majority of healthy adults need to reduce their sodium, or salt, intake.

Deficiency Symptoms: More concern for toxicity from excesses than deficiency, which is usually accompanied by water loss; results in decreased blood volume, blood pressure, muscle cramps and weakness, cellular swelling, water intoxication, anorexia, fatigue, apathy and muscle twitching.

Chloride: AI 1.8 to 2.3g/day

Functions/Benefits: Used to produce hydrochloric acid; the powerful digestive acid in your stomach.

Natural Food Sources: Widely available; combines with sodium to form sodium chloride, better known as ordinary table salt.

Deficiency Symptoms: None observed.

Sulfur:

Functions/Benefits: Involved in a number of enzyme reactions and protein synthesis; needed for formation of collagen; present in keratin for the maintenance of the skin, hair and nails; helps form other substances such as biotin, coenzyme A, lipoic acid and glutathione; important to cellular respiration as it is needed in the oxidation-reduction reactions that help the cells utilize oxygen, which aids brain function and all cell activity.

Natural Food Sources: Meats, fish, poultry, eggs, milk, legumes, onions, garlic, cabbage, Brussels sprouts, kale collards, mustard greens, chard, broccoli, lettuce, kelp and other seaweed and turnips.

Deficiency symptoms: No clear symptoms exist; common when foods are grown in sulfur depleted soil, with low protein diets, or with a lack of intestinal bacteria or exposure to high levels of toxins.

Chromium: AI: 20 to 35mcg/day

Functions/Benefits: Works with insulin in the metabolism of sugar and stabilizes blood sugar levels. It clears the arteries by reducing cholesterol and triglyceride levels; controls appetite and helps transport amino acids.

Natural Food Sources: Brewer's yeast (112 mcg/3oz), whole wheat bread (55mcg/3oz), potatoes (34 mcg/3oz), green pepper (19 mcg/3oz), apple (14mcg/3oz), and cornmeal (12mcg/3oz).

Deficiency Symptoms: (Very rare): Disturbances in fat, sugar and protein metabolism.

Copper: RDA: 900mcg/day

Functions/Benefits: Required for the absorption of iron. It helps to oxidize Vitamin C and works with Vitamin C to form elastin. It aids in the formation of red blood cells and helps proper bone formation and maintenance.

Natural Food Sources: Oysters (1mg/oz), shrimp (.17mg/oz), calf liver (1.2mg/oz), Brazil nuts (2.3mg/3oz), peanuts (.8mg/3oz), and rye grain (.4mg/3oz).

Deficiency Symptoms: (Rare): Anemia, impaired bone and hair formation, retarded growth, abnormal nervous system development.

Fluoride: AI: 3 to 4 mg/day

Functions/Benefits: Assists in preventing tooth decay. It assists in the mineralization of developing tooth enamel and for re-mineralization of surface enamel.

Natural Food Sources: Most municipal water sources, tea (.3mg/cup), liver (.13mg/oz).

Deficiency Symptoms: None known.

Iodine: RDA: 150mcg/day

Functions/Benefits: Aids in the development and function of the thyroid gland. It regulates the body's production of energy and helps to burn excess fat by stimulating metabolic rate.

Natural Food Sources: Widely available in iodized salt, seaweed (18,600mg/oz), and other vegetables that grown near the sea.

Deficiency Symptoms: In childhood, slowed growth and sexual development, mental defects, and deafness are symptoms of deficiency. In adults, goiter (enlarged thyroid) is a symptom.

Iron: RDA: 8 to 18 mg/day (higher level for women)

Functions/Benefits: Essential to carry oxygen in the blood. It builds the quality of the blood and increases resistance to stress. It is necessary for the formation of myoglobin (found only in muscle tissue, supplying oxygen to muscle cells), prevents fatigue and promotes good skin tone.

Natural Food Sources: Beef liver (2.7mg/oz), ground beef (1.8mg/3oz), 6 medium oysters (5.6mg), cooked spinach (3.2mg/4oz), raisins (2.1 mg/5oz), prune juice (3mg/8oz).

Deficiency Symptoms: Anemia, fatigue, listlessness, pale skin, cracked lips or tongue, irritability, difficulty swallowing, dry/coarse hair or hair loss.

Manganese: AI: 1.8 to 2.3 mg/day

Functions/Benefits: Anti-oxidant; catalyst in the breakdown of fats and cholesterol; required for the metabolism of vitamins B1 and E. It assists in blood clotting (is helpful for women with heavy menstrual flow); also, it is important for building strong bones.

Natural Food Sources: Avocado (36mg/oz), pecans (3.5 mg/3oz), barley (1.8mg/3oz), spinach (.8mg/3oz), raisins (.5mg/3oz), and rhubarb (.5mg/3oz).

Deficiency Symptoms: (extremely rare): Skin rashes, changes in hair color.

Molybdenum: RDA: 55mcg/day

Functions/Benefits: Important for the production of several enzymes including xanthine oxidase, which is needed for normal growth and development and to utilize iron properly in the body.

Natural Food Sources: Lentils (155mcg/3oz), cauliflower (120mcg/3oz), green peas (110mcg/3oz), spinach (100mcg/3oz), brown rice (75mcg/3oz), potatoes (30mcg/3oz).

Deficiency Symptoms (rare): Rapid breathing, night blindness, and rapid heartbeat.

Selenium: RDA: 55mcg/day

Functions/Benefits: Anti-oxidant nutrient preserves tissue elasticity. It slows aging and hardening of tissues through oxidation.

Natural Food Sources: Wheat germ (111mcg/3oz), Brazil nuts (103mcg/3oz), whole wheat bread (66mcg/3oz), bran (63mcg/3oz), brown rice (39mcg/3oz), orange juice (19mcg/3oz).

Deficiency Symptoms (very rare): Heart problems, elevated cholesterol, muscle weakness, and fatigue.

Zinc: RDA: 8 to 11mg/day

Functions/Benefits: Aids the functioning of the immune system. It helps in wound healing, keeps skin healthy, helps preserve eyesight and governs contractility of muscles. It is an anti-oxidant, aids in the digestion and metabolism of phosphorus, important for blood stability and maintaining the body's alkaline balance. Also, it assists in the development of the reproductive organs, prostate functions and male hormone activity.

Natural Food Sources: Raw oysters (77.3mg), ground beef (4.6mg/3oz), skinless chicken (2.1mg/oz), chickpeas (2.5mg/8oz), lentils (2.5mg/8oz), wheat germ (3.6mg/2oz).

Deficiency Symptoms: Slowed growth, skin lesions, diarrhea, hair loss, loss of appetite, slowed sexual development.

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