

Appendix B: Evolution and Why Diet is Important

In chapter four, Let's Go for a Walk, we briefly talked about Herman Pontzer's work on the health of modern hunter gatherer societies. One aspect I mentioned and did not elaborate on was his findings on daily calorie expenditure of these societies as compared to modern man. What his research has shown is that, relative to lean body mass and age, the total energy expenditure of these individuals is not very different from Westerners with both active or sedentary lifestyles. This means that the average sedentary American and your average gym going American both burn about the same number of calories as your average hunter gatherer.^[1]

That last bit may have perked your ears up a bit and quite honestly, it kind of blew my mind a bit as well. In another comprehensive review article on the energy expenditure on primates, Pontzer demonstrated that this ***constrained total energy expenditure is species specific with a definitive upper limit regardless of additional physical activity.***^[2]

I highlighted that last statement because I realize it's complicated. What it means in layman's terms is that regardless of how much exercise you get, there is a limit on how many calories you can burn in a day. This means we have to control our calorie intake if we want to control our weight.

To summarize what we learned in chapter four, we evolved to walk upright and have big brains. These two things allowed us to navigate and travel long distances to hunt and gather food. We store fat more easily than other primates to prevent starvation on our long journeys. Another survival advantage were our complex societies that allowed for task and food sharing. Our brains and bodies are intrinsically linked to perform those tasks. Without those tasks, our bodies and our brains do not function optimally.

The crux of that research is that we require physical activity for physical health, brain health, and optimal cognitive function. It is not however the most effective way to decrease excess body fat which is important for our overall health. Although physical activity does help improve health markers in the overweight, it is not to the same degree that occurs in healthy weight individuals. Physical activity ***and*** fat loss are optimal for reducing disease and joint damage.^[3] Excess weight can cause a number of orthopedic issues that affect the spine, shoulders, knees, feet, wrists, and ankles. These include osteoarthritis, chronic pain, and a greater risk of injury.^[4] Joint pain also prevents us from being more physically active which in turn, decreases our resistance to disease.

For the record, I do not advocate that everyone need to walk around with six pack abs or look like a fitness competitor. Those levels of body fat are not particularly healthy either, especially for women. As I stated at the end of chapter three, you can use BMI or waist circumference to determine if you are at a healthy weight.

Why doesn't increasing our physical activity significantly increase the number of calories we burn?

Our bodies ***do*** increase daily energy expenditure (DEE) with exercise and the fitter you are, the higher your DEE is likely to be . . . to a point. Our bodies are masters at adapting to stress and one of the ways we adapt to regular exercise is to become more fuel efficient, ie, over time we will burn fewer calories for the same amount of activity. This happens a couple of ways:

1. Our bodies get better at burning fat for fuel rather than sugar which makes us more fuel efficient. Fat contains more than twice the calories per gram than sugar and so relying on fat

burning pathways actually slows down how much fuel we use. For example, it has been shown in runners that energy expenditure increases to a certain point when they begin training. After several weeks, this plateaus and does not increase despite large increases in daily activity.^[5]

2. Introducing a moderate to vigorous exercise routine to individuals often results in them being less active in other parts of their day. They sit more and move less overall whether it be not getting up as often or simply not fidgeting as much. In other words, they rest more to make up for the energy they just expended.^[6]
3. At higher levels of activity, our bodies may begin to shunt calories during exercise away from non-muscular functions such as hormone production, immune system activities, and other maintenance activities.^[7]

This upper limit on energy expenditure in humans regardless of activity level is important in that less than half of the energy we expend is due to physical activity. The majority of the calories we burn are spent on our body's basic operation and maintenance activities.^[8] The less healthy we are, the more maintenance we require. Instead of having energy available for fighting off infections and moving more, energy is mostly spent on things an otherwise healthy body doesn't need. In order to be optimally healthy, we have to move.

“Our bodies are evolved to require daily physical activity, and consequently exercise does not make our bodies work more so much as it makes them work better. . . . Instead exercise regulates the way the body spends energy and coordinates vital tasks.”

-Herman Pontzer^[9]

Beyond a certain point, no matter how many additional calories you add, how much sleep you get, or how well-trained you are, excess exercise will result in overtraining syndrome, a rather serious condition that results in chronic fatigue, depression, and damage to the nervous system and immune function. This typically happens in high level athletes, however it can happen in anyone with a physically demanding job. What is happening here is that the level of activity the individual is engaging in requires more calories than your body is willing to part with and as a result, begins to shut down.^[10]

On the other end of the spectrum, how do we account for a relatively high daily energy expenditure in heavier-set, more sedentary individuals?

This one is a bit easier to answer and you can think of this as the antithesis of the overtrained elite athlete. In individuals with higher body fat percentages, regular activities are much more physically taxing and so they are performed less often and with more rest in between efforts.^[11] And it's not surprising, imagine how difficult it would be to do all of your daily activities with an extra hundred pounds or two strapped to your back. Additionally, larger bodies not only require more calories for basic movement, they also require more physiological maintenance and repair than average individuals and this accounts for a large portion of the calories burned.^[12] Like the overtrained athlete, there is a limit on how energy can be spent on repair and maintenance.

We simply cannot choose diet OR exercise; they both play important, but separate roles in our health and body composition.

What is Important to Know About Diet

There are many thoughts about how many calories, carbohydrates, fats, and protein we need each day and it's hard to sift through all the information and come up with an exact number. Even though traditional hunter-gatherer lifestyles are associated with good health and lower body fat, their diets are extremely varied and so it is difficult to glean any conclusions about what an ideal human diet may be. The only commonalities seem to be that most humans eat a mixture of plants and animals and cook their food.^[13]

It gets even more complicated than that. When we eat, we are feeding both our bodies and our gut bacteria. Gut bacteria has been implicated in excess body fat accumulation and this seems to be based on both the type of bacteria and what the bacteria is feeding on. Optimizing nutrients becomes for both our own unique selves and the microorganisms in our gut is never going to be a cut and dried exact prescription.^[14] The truth is, nutritional research is still in its infancy and so be wary of anyone telling you that a certain macro-nutrient ratio is the gold standard for everyone. They are wrong.

As an aside, after cutting to fourteen percent body fat for a figure competition, even though my protein intake was extremely high, I dealt with six months of pretty extreme hair loss and joint pain. I don't think it would take a rocket scientist to figure out that it was most likely the direct result of my very low fat and/or carbohydrate intake during the three months leading up to that goal. Again, this was an extreme fitness goal and I used the tools that would achieve that goal. Those tools, however, are not necessarily very healthy for the long term, or even the short term as it turns out.

Finding the ideal diet for you and your lifestyle is going to require some observation and practice. You need to start by having a realistic understanding of portion sizes and nutrition facts. These are readily available on all food packaging, in a number of books, websites, and food tracking apps you can download to your phone. Tracking your diet is not something you necessarily have to commit to for a lifetime. It is, however, something you should learn to do. Tracking your diet, even for a couple of months, will give you a much better idea as to how many calories you are consuming each day as well as how many grams of carbohydrates, fats, and protein.

Daily Calorie Recommendations are just a starting point

It is important that you understand that when you do an initial calculation to determine your caloric needs that this is just a starting point. Everyone is different and will require different numbers of calories depending on their unique genetics and daily activity. That being said, there isn't a great deal of variation. The quality of your food will make a big difference in how much volume you can eat and how many nutrients you will get out of your food. For example, a snickers bar only has 70 fewer calories than a grilled chicken sandwich on a whole grain roll with honey mustard, lettuce, and tomato. That chicken sandwich has way more protein and nutrients. I'm not saying you can't have a snickers bar, just that if you do, it just took a big chunk out of your daily calorie requirement without supplying many essential nutrients. Choose your foods wisely.

If you need a starting number, most adult females need between 1800 and 2400 calories a day. Most adult males need between 2200 and 2800 calories a day. These numbers range from sedentary to very active lifestyles and will also have some variation based on body size, age, and genetics. Regardless, as

you can see, they aren't very different so start tracking what you are eating and make conservative changes as you go. For more information, check out the FDA's resource, myplate.gov.^[15]

Protein

The number one nutrient that most people are deficient in is protein. It used to be thought that high protein diets were bad, especially for older adults. It was erroneously thought that high protein diets would cause bone loss or kidney problems. This is not true.^[16] Older adults are actually at risk of losing muscle as they age and as we talked about in Chapter five, this muscle loss, sarcopenia, is associated with early death. A higher protein diet in combination with resistance training has been shown to prevent and reverse sarcopenia in elderly patients.^[17] Higher protein diets are also thought to prevent or slow the progress of dementia and Alzheimer's as well.^[18]

It must be noted here that the quality of the protein matters. A diet high in saturated fats, sugars, and processed foods will not benefit your health regardless of how much protein you are eating. Fish, poultry, lean cuts of meat, legumes, whole grains, and lean dairy are all good sources of protein.

Protein contains four calories per gram and most recommendations fall between fifteen and twenty-five percent of total daily calories although it can be as high as thirty-five percent. If your daily calorie requirement is 2000 calories, twenty-five percent of that is 500 calories. Divide 500 calories by four calories per gram and you will get 125 grams of protein per day.

Carbohydrates and Fat

Carbohydrates and fats are energy calories that also play a vital role in our bodies' structure and function. Carbohydrates contain four calories per gram like protein while fats contain nine calories per gram. Your ratio of fat to carbohydrate calories in your diet is something that should be optimized by your own observations. Personally, I stick to a higher carbohydrate to fat ratio for both energy and body composition. I know others who do the opposite. My typical ratios are about thirty percent protein, thirty percent fat, and forty percent carbohydrates. That varies depending on my goals and how much attention I'm willing to pay.

Fat is a very important part of your nervous system, hormones, cell membranes, and act as carrier molecules for fat-soluble vitamins and other important nutrients. As with protein, the quality of fats in your diet is very important. Although we do need some saturated fats in our diet, diets high in saturated fats and processed foods are more likely to cause a host of health problems. Stick to nuts, seeds, olive oil, lean meats and fish, and avocados whenever possible.^[19]

Carbohydrates are an essential fuel source, especially for our brains. Carbohydrates help us grow and maintain our muscle mass and dietary fiber is great for the health of our digestive tract. In fact, dietary fiber can help reduce our blood cholesterol by absorbing and eliminating bile which would otherwise be resorbed and has been associated with good heart health. As with protein and fats, quality is incredibly important. Try to choose foods that are high in fiber and low in added sugar.^[20]

Why We Over-eat and Why Its Not Necessarily Our Fault

In *The Third Plate*, Dan Barber explores the development of sustainable agriculture that results in both flavorful and nutrient rich foods. One of the anecdotes he tells in the first few chapters explains how soil quality will play a leading role in developing superior plants and livestock. Simply put, its been shown

that cattle grazing on land with nutrient enriched soil consume less grass than cattle grazing on land with nutrient depleted soil. They overeat the less nutritious food in an effort to satisfy their requirement of essential nutrients. When their food is nutritionally dense, they eat less.^[21] How do they know which grass is more nutritious? It may all come down to flavor.

In “The Dorito Effect,” journalist Mark Schatzker reviews how food and food science has changed in the last several decades. It has changed how we grow crops, feed livestock, and create unnatural flavors to mask the bland flavors of mass produced, less nutritious food. Ultimately, taste is supposed to signal to us what nutrients are contained in the food and our brains then learn to crave different flavors based on our needs.

Unfortunately, our farming practices in the last century have focused on appearance, size, and pest resistance; not necessarily flavor. Mass produced foods have become deficient in flavor and compounds that are necessary for our health. They are also deficient in the compounds that send a signal to our body when we’ve had “enough”. Instead of fixing the “bland” problem by raising more high quality foods, artificial flavoring has become the solution for the food industry.^[22]

Artificial flavors falsely indicate nutrients that aren’t present which make us want to eat more. Processed and artificially flavored foods do not contain the nutrients and secondary compounds that would signal that we’ve had enough. There is a saying that the only difference between medicine and poison is the dose. When feeding naturally, animals seem to be able to discern exactly how much of a certain plant (or animal) they need to eat to benefit them with overdosing. Sheep have been known to eat baby birds when they are mineral deficient. However, livestock can also be fooled with artificial flavors. An additive called Sucram is routinely used to increase feeding volume of normally unpalatable foods and get younger animals on solid foods sooner.^[23]

What are these “secondary compounds” that signal us to limit consumption? Plants have naturally occurring compounds that protect them from being consumed. In small amounts, these compounds are benign and even beneficial to our health. If the dose is too high, they may be harmful. When we have consumed the maximum useful amount of these compounds, our bodies tell us to stop. The problem with processed foods is that even though they may contain some of these compounds, they don’t contain enough to limit our consumption to a healthy level. The same company that developed Sucram to promote overfeeding discovered that when using oregano extract for intestinal health in pigs, too high a dose limited how much feed the pigs would eat.²⁴

I want you to think about the times you have eaten to the point of discomfort as compared to the times you felt satisfied and not interested in eating any more. What kinds of foods left you feeling satisfied without feeling uncomfortable?

Changing Your Diet Behavior

When I counsel clients on fat loss, I try to take a strategic approach rather than a strict prescription. I feel that most people benefit more from changes in habits and behaviors rather than trying to stick to a rigidly prescribed set of numbers. Rigid prescriptions work for some and is essential if you ever want to compete in a bodybuilding or figure competition. However, speaking from personal experience, that approach can be complicated and stressful. Below are the behaviors that I encourage everyone to adopt over time, the very first one is the most important.

Keep a diet journal

Online apps for tracking your diet make it very easy to do these days. The most important part about keeping a journal is that it allows us to see what works and what doesn't work. Keeping a realistic account of your diet, your training schedule, and general sense of well-being is extremely important to your success. If you are honest with yourself regarding what and how much you eat, you may see some areas you can improve right away. For example maybe that morning latte has way too much sugar or what you thought was one serving of rice was actually three. That being said, don't try and make too many changes too soon. Very few people can make a drastic change in their diet and stick to it for the long term.

Protein first and with every meal

For too long our American diet fads have focused on reducing fat or carbohydrates. However, the key macronutrient that will determine our success in terms of building and repairing muscle and connective tissue, supporting immune function, and synthesizing essential biomolecules such as enzymes and hormones is protein.

Most people don't get enough protein.

The first change we need to make in our diets is to make sure that we are getting our daily protein requirement, roughly one to one-and-a-half grams per kg of bodyweight daily.^[25] For an individual weighing 165 pounds (75 kg), that is a range of 75-113 grams of protein per day.

Every time you plan a meal, whether it be a snack, breakfast, lunch, or dinner, you need to first think about where the protein is coming from and make that the priority of the meal. Be careful to choose lean protein sources. Eating a cheeseburger to get twenty grams of protein isn't going to do you much good if you just added forty grams of fat to your daily intake. Prioritizing lean protein sources will automatically change the character of your meals by adding more whole grains, lean meats, and protein rich vegetables such as legumes.

Keep processed foods to a minimum

All refined and processed foods are broken down very quickly in the gut. In the case of refined flours and sugars, this means that they get into the bloodstream very quickly and efficiently which delivers a huge load of calories that we don't really need. These are also devoid of fiber, protein, and micronutrients that are usually found in real food.

Processed foods often contain fats not found in nature such as partially hydrogenated vegetable oils (trans fats). These fats have been associated with an increased risk of cardiovascular disease.^[26]

Processed foods often contain a lot of seed oils as well and this is the actual reason some people freak out about seed oils and blame them for all the inflammation and evil in the world. But, it is simply guilt by association. Seed oils are not evil and are healthy in moderation. By cutting seed oils, many people are simply cutting the amount of processed food in the diet and so they feel better. That is pretty much all there is to say about seed oils.

Eat more real food. Keep a ready supply of fruit and vegetables in your house or on your office desk. Cook at home as often as possible.

Meal timing is of the utmost importance

The research on frequency and timing of meals indicates that eating the bulk of your calories earlier in the day is more beneficial for both health and weight loss. Consuming the bulk of your calories later in the day rather than earlier is associated with higher cardiovascular disease risk and weight gain.^[27] For those who have an odd schedule or do shift work, think about consuming the bulk of your calories during the most active times of your day. (paoli 11-13) (garulet 7-9)

Meal Prep

The hardest thing about eating well is giving up convenience foods. Our lives are busy, hectic, and sometimes just completely crazy. Getting a cheeseburger at the drive-thru may seem easier than preparing a whole food meal from scratch. Instead, it is relatively easy to make a big batch of stew, a casserole, or even a batch of grilled meat that you can pack into individual containers and use for several days. However, if your lifestyle makes meal prepping difficult, do your research. Most restaurants, including fast food restaurants, post their nutrition information online. Educate yourself and make better choices.

Don't starve yourself

I have seen far too many individuals sacrifice energy, overall health, and even bone density in the quest for "skinny". You will look and feel far better if you build a strong body first; any extra pounds will be much easier to shed with metabolically active muscle to help burn it off. On a healthy diet, after the initial adjustment period, you should NOT feel tired, run down, depressed, injured, or unmotivated. This can be a sign that you are missing critical nutrients or simply not getting enough calories. Making small adjustments works far better than drastic changes.

Track your progress

Using a scale is fine. To measure more subtle changes in body composition that aren't reflected in scale weight, tape measurements of your waist, hips, thighs, arms and neck to track progress. Oftentimes the number on the scale will go up when you first begin an exercise program due to increased muscle mass and bone density. The tape measure or simply a weekly selfie in your underwear can show you progress when the scale isn't moving much.

My Experiences with Weight Loss

I have had a variety of experiences with exercise and weight loss over the past three decades and I can honestly say that those experiences line up with the conclusions listed above. I have cut weight to compete in strength competitions while maintaining my strength and performance, I have cut body fat to extremely low levels to compete in a bodybuilding competition, and I have trained for long endurance races that required hours and hours of running every week.

The weight cut and bodybuilding experiences were similar. I was on a calorie controlled (not restricted) diet and added in three to four hours of lower intensity cardio to my four to five hours of strength training each week. The number of calories I was consuming never dropped below 1300, and that low number was only for the last few weeks before competition. During the last weight cut I did, I was able

to cut twenty pounds of body fat in five and a half weeks. Though effective, this was not fun. I experienced a great deal of fatigue, I grew to hate my treadmill, and I frequently napped. So, I was looking at about seven to nine hours of exercise per week with being very minimally active for the rest of my time outside of training.

The endurance training was a bit different. When I trained for the Tough Mudder, I was running six to seven hours per week, doing some maintenance strength training two hours a week, and doing about two to three hours of obstacle specific training in a single session on Saturdays. These sessions included both running and a bunch of silly things like climbing up walls and ropes, crawling, and playing on the monkey bars of my children’s playset. Although I ate a healthy diet, I did not control calories and tried to eat more intuitively during the last twelve weeks of training. Unfortunately, my intuition sometimes thinks pie is a great idea, especially after a ten mile run. Again, this training was pretty taxing and my physical activity levels outside of training were pretty low. Overall, I was getting ten to thirteen hours of exercise per week for about four months. During that time, I gained close to fifteen pounds.

So, to compare and contrast, here is a table:

	hours of exercise per week	total daily calories	weight change
Weight cut	7-9 hours	1300-1500	-20 lbs
Endurance Training	10-13 hours	uncontrolled	+15 lbs

The levels of exercise I was engaging in above were necessary for the performance I was looking to achieve. Exercise for performance is, however, much different from exercise for health. As we discussed in Chapter one, anything over five hours per week is generally not necessary. Instead, let’s look at the training I do on a regular basis simply for health and maintaining a healthy weight when I am not actively training for competition.

In a typical week, I walk my dogs for about thirty to sixty minutes, five days per week. I usually do some resistance training two to three days per week with light weights for about forty-five minutes. Outside of that, I spend a good amount of time sitting and writing or grading papers. I collectively spend an hour or two a day on my feet taking care of my house, my pets, my yard, and cooking meals for my family. I don’t do this all in one session, these are multiple small things I do throughout my day. In fact, if I notice that I have been sitting for longer than an hour, I make an effort to get up and do something for at least a few minutes before sitting back down.

Altogether, that amounts to four to five hours of moderate physical activity and another six to seven hours of light physical activity. My calorie intake is typically between 1800-2200 calories per day and I have plenty of energy to do all the things that might arise throughout my day. If I need to lose a few pounds, I make small adjustments to my diet and activity level. This is a much better life overall and is the one I prefer when not focusing on a demanding performance goal.

The bottom line here is that exercise is just not as direct a route to fat loss as diet. Strength training and aerobic training change our bodies in ways that makes us healthier, more resistant to disease, and able to do more things. Diet, however, is the most direct and more important way to reduce body fat over time. Do not make the mistake of choosing only one, you need both movement and a healthy diet to be as healthy and fit as possible.

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