|  |  |
| --- | --- |
| |  | | --- | | **BODY FAT: HARD FACTS ABOUT SOFT TISSUE**  by M. Doug McGuff, M.D.  Fat is an amazing tissue. It has ensured survival of our species through two ice ages and never ending drought and famine. A mere pound of fat stores an astounding 3,500 Calories for delayed use at any time in the future. As dormant tissue, there is almost no metabolic cost for keeping it on the body. As a members of the human species we all owe our existence to fat. Even more amazing than fat's capabilities are the number of misconceptions surrounding this specialized body tissue.  Probably the biggest misconception regarding fat is the idea that it is unhealthy. Actually, fat is probably the main reason we are even here in the first place. Throughout human history, the ready availability of food was the exception rather than the rule. Our ability to eat when food was available and to store excess caloric energy for future use allowed us to survive when food was not available. Fat storage is the sign of good health, it signals that metabolic resources are abundant and the organism is healthy. An extreme overabundance of bodyfat places stresses on the body and can be unhealthy. However, the degree of leanness (or lack of bodyfat) that is currently in vogue is probably just as unhealthy for up to 80% of the population. Unhealthy levels of bodyfat have been increasing every decade. It seems that an adaptation that has allowed us to survive through history is now killing us in modern times.  Ask almost anyone why modern man is becoming more obese and you will get a similar answer from just about everyone. Most people believe that the labor-saving technologies of modern life have made us more sedentary, and we are much less physically active than our predecessors. Since physical activity burns calories, and we are less physically active than we once were, we are unable to burn off the calories like we used to. This argument seems logical, but the argument is incorrect for 2 basic reasons. First, physical activity burns much less calories than we have been lead to believe (we will discuss this in detail later in this chapter). Suffice to say that to survive we must be able to use our energy efficiently lest we starve to death in the process of hunting and gathering food. Secondly, our ancestors were not as physically active as we think they were. The work of anthropologists who observe primitive peoples in various regions of the globe show that a primitive hunter/gatherer lifestyle is much less physically active than that of modern man. In Australia, aborigines alternate between the modern world and traditional aboriginal life. While in their more primitive mode, these aborigines are noted to be much less active. So, despite popular opinions to the contrary, it does not appear that increased activity is the solution to modern obesity.  The real problem with modern obesity is food abundance. If I were to give you a jumbo industrial role of toilet paper and allowed you to hold it while I unraveled it, we wound end up with a very long strand of toilet paper. If I tore off the last square of toilet paper and gave you the entire rest of the strand, we could use your long strand of toilet paper to represent the length of human history where starvation was a real day to day threat. The single square in my hand would represent the length of human history where starvation was not much of a threat. Not since the end of the Great Depression and World War II has starvation not been a real possibility. We have about 150,000 generations where efficient fat storage was essential for survival, and 3-4 generations where efficient fat storage can lead to obesity. The problem is not that we are inactive, the problem is that calories are so readily available to be consumed. An hour of jogging will burn only about 150 calories above your *basal metabolic rate*, but it only takes about 30 seconds to eat 150 calories of cookies. We judge the value of our meals on the size of the portions we are given. When we go out to eat, we want to leave *full*. Studies show that there are about 1,000 Calories between being satisfied and feeling full. Even more frightening is that there are between 2,000 and 3,000 calories between feeling full and feeling stuffed. If you go out to an all-you-can-eat food bar and leave feeling stuffed, you may have consumed as many as 4,000 unneeded calories. When this happens we typically go out for a jog the next day to "*burn off those calories*". But to burn off that many calories would require you to jog continously for 27 hours. The problem is not that we don't burn enough calories, it's that we put too many calories down our neck.  Leptin: the genetics of fat storage  As anyone with a bodyfat problem knows, there seems to be a strong setpoint for how much body fat a particular individual has. This setpoint is controlled by a gene called the *ob gene* that produces a protein called*Leptin*. Leptin is a strong suppressor of appetitie and food intake. As your bodyfat rises, more leptin is produced and your appetite declines so that your bodyfat stabilizes. If your body fat falls, your leptin production declines and your appetite is disinhibited. It seems that we inherit a bodyfat setpoint that is most effecient for our environment and the environment of our ancestors.  Why exercise doesn't burn many calories  Go to the health club and climb on a stair stepper or treadmill. Program the machine by plugging in your weight, select your speed or program and begin your workout. As you plod along on the apparatus you are driven along by the ever-increasing number on the screen that indicates the number of calories that you have burned. Eventually you go long enough to burn 300 calories and you are left with a feeling of accomplishment. Now, as you wipe the sweat from your brow and catch your breath, let me ask you a question. Why did the machine ask you to program in your weight? If you answered to calculate how many calories you burn you are right. What you most likely failed to consider is the main reason it needs your weight is to calculate your basal metabolic rate. The average male will maintain his weight on about 3200 calories a day. That is about 140 calories an hour at rest. So the 300 calories burned are not calories burned *above* your basal metabolic rate, they are calories burned *including* your basal metabolic rate. So for your time on the treadmill, you burned about 160 calories above your baseline. If you eat just 3 cookies, you have completely undone about an hour's worth of work. Think about it...if we were so metabolically inefficient as to burn 300 calories at the rate the exercise equipment says you do, would we ever have survived as a species. The calories burned hunting and gathering would have caused us to die of starvation before we could ever have found anything to eat. At that rate of calorie burn, we would barely have enough metabolic economy to survive a trip to the grocery store. Most people have accepted blindly the information displayed on exercise equipment and as such have turned exercise into a form of guilt absolution. Have dessert (600 calories of pie) and feel guilty? Just go to the health club and work on the stepper until 600 calories tick by on the screen. Other than the fact that this simply seems pathetic, it also just doesn't work.   Let us assume that you have the determination and time to do such a workout 7 days a week. If we take the 300 calories burned and subtract out your basal metabolic rate of 140 calories, we are left with 160 calories burned. There are 3,500 calories in a pound of fat. If your appetite is not spurned by the exercise (as it commonly is) and you keep a stable calorie intake, it would take you 21.875 days to burn off a pound of fat with the extra activity. This is assuming that no other variables are present. Unfortunately there is a big variable that almost no-one accounts for...muscle loss. In order to exercise long enough to reach the 300 calorie mark on the stepper or treadmill, you have to perform low intensity *steady state* activity. Steady state activity does not place much demand on the muscles, that is why it can be carried out for so long. Rather than demanding use of a large percentage of your muscle fibers, you are actually using a small percentage of your weakest, slow-twitch fibers over and over. When you perform this type of exercise your body can adapt by actually losing muscle. Since you use such a small percentage of your muscle mass to do the work, additional muscle is perceived as dead weight, useless and burdensome. If a person persisted in 7 day a week steady state training the could easily lose about 5 pounds of muscle tissue. Muscle tissue is the most metabolically expensive tissue we have; it takes between 50 and 100 calories a day just to keep a pound of muscle alive. Lets assume the lower number of 50 calories a day. If you lose 5 pounds of muscle over time as you perform your calorie burning exercise that will result in a loss of 250 calories per day that would be used to keep that muscle alive. The 160 calories you burned would probably now be more like 100 burned because with practice, your running or climbing economy improves and requires less effort (most of the perceived conditioning in steady state activity is actually the exercise getting easier not because of improved cardiovascular condition, but because of improved economy of motion. This is why if you take a runner and have him perform another steady state activity such as cycling he will be gasping for air. Indeed, runners who train on treadmills in the Winter notice a large decrease in perceived condition when they hit the road in the Spring). So now if we do the math we will find that you burned about 100 calories above your baseline per day, but we must subtract out 250 calories due to muscle loss. For all your effort you are now 150 calories in the wrong direction. Furthermore, the stress hormones that result from such overtraining also stimulate fat storage. Anyone who has attempted such a program of weight loss can confirm...you will end up feeling washed out, moody, and (worst of all) fatter. The truth is this: you cannot use physical activity to negate excess caloric intake.  Muscle: the real key to burning calories  Remember when you were a teenager and could eat everything in sight and not get fat? Somewhere in your 30's things changed. Now it seems like just looking at food can make you fat. What happened?   The main difference for most people is that they have less muscle in adulthood than they had in their late teens and early twenties. As we age there is a natural tendency to lose muscle and we also are less vigorous in our physical activity, which results in further muscle loss. This loss of muscle tissue results in a decreasing metabolic rate. Lose 5 pounds of muscle and your calories burned per 24 hours decreases by about 250 calories. While this may not sound like much, it adds up. If you continue to eat like you did when you were younger, you will gain a pound of fat in about 14 days. Over a 20 week period you will gain 10 pounds.   The key to getting rid of accumulated body fat is to get back your youthful metabolism by getting back your muscle. You have probably heard people say that "muscle has memory". Well, this is one popular saying that is actually true. With a proper exercise stimulus that dormant muscle can be reclaimed. When you get back the muscle that requires 250 calories a day to keep alive, what used to be an insidious weight-gain problem will become an insidious weight-loss technique. As you become stronger you will have a natural tendency to partake of more vigorous activities. This situation will allow you to lose weight with less attention paid to calorie counting and food selection. The more reasonable your diet can be, the greater your chance to stick with it. As you ride this spiral of success, you may be able to eat more like you did as a teenager. Putting just 5 pounds of calorie burning muscle on your body can really turn things around for you.  Proper exercise and discriminant weight loss  SuperSlow inventor Ken Hutchins was the first person to ever explain the idea of discriminant weight loss to me. He told me to picture the human body as a corporation that is run by a board of directors. He told me to assume that a body operating on a calorie deficit is like a corporation running at a budget deficit. Each of the body tissues could represent a different department within that corporation. He then presented two scenarios. In the first scenario there is a budget deficit and no department has any unusual demands. In this scenario layoffs can occur in all departments. So your body lays off some fat, some muscle, some bone and connective tissue, as well as nervous tissue . Your corporation (or body) becomes a smaller version of its former self. In the second scenario, there is a large demand placed on the muscle department. In this scenario, no layoffs can occur in the muscle department. Indeed, more muscle has to be hired on. This results in a larger layoff in the fat department. We cannot produce cutbacks in the bone or connective tissue department because we need their support because muscle is not helpful unless it is attached to strong bone by strong connective tissue. This means more fat has to be let go. We cannot lay off any nervous tissue, because our new muscle is useless unless it is innervated by new nervous tissue. This means more fat has to be let go. Under this scenario, all weight loss is shunted toward fat loss. In this scenario, your corporation (body) takes on a dramatic shape change. You have added a modest amount of shape-improving muscle and jettisoned a large amount of shape-ruining fat.  Don't put that in your mouth  It should now be evident to you that the easiest way to create the calorie deficit you need to lose bodyfat is to simply avoid putting the extra calories in your mouth in the first place. Even a very modest calorie reduction of 150 calories will result in significant fat loss over time. In the long run, the self-discipline required is much easier to produce than the effort of running on a treadmill for an hour every day (which is a losing proposition anyway). A calorie intake deficit of 500 calories a day is still fairly easy to achieve, and if you have added some muscle to your body the shape change you can produce in 6-12 weeks can be amazing. Initially, you may have to be very compulsive about counting calories, but within a few weeks you will probably learn to manage simply by controlling the portion size of the foods you eat.  Superhydration  Ellington Darden, PhD (Author and former Research Director for Nautilus Sports/Medical Industries) came up with this concept. The food calories that you count are actually Kilocalories or Calories. A Calorie is the amount of heat energy required to raise the temperature of a liter of water by one degree celsius. The calories that you count are actually just units of heat-energy.  Dr. Darden developed a program of drinking large volumes of ice-cold water throughout the day. The ice water that goes into your system has to be warmed to body temperature. Thus a liter of water at 1 degree celsius that ultimate leaves your body at 37 degrees celsius and thus requires 36 calories of heat energy. If you manage to consume 5 liters of water per day this results in roughly 180 extra calories burned. According to Dr. Darden, superhydration helps fat loss in another way. If you are well hydrated most of your body's waste products can be eliminated through the kidneys. When you are underhydrated much of this burden is assumed by the liver. One of the liver's main functions is the processing of stored bodyfat for use as energy. If your liver is occupied processing waste products it is less efficient at mobilizing bodyfat. Superhydration not only burns calories, it allows your liver to be more efficient at mobilizing fat off of your body.  Plenty of Sleep  Dr. Darden also discovered that plenty of sleep was essential to fat loss. In his research he noted that subjects who were sleep deprived did not lose fat as easily as those who were well rested. It seems that calorie restriction is fairly stressful to the body and any further stressors can result in a protective slowing of the metabolism. My own theory is that a calorie restriction sends a biological signal of starvation and decreased sleep sends a signal that the organism is having to stay up to search for food, or it has to be vigilant because its environment is unsafe. These are probably powerful biological signals that cause a protective slowing of the metabolism.  Simple Dietary Guidelines and Recommended Diets  There are literally thousands of diet books out there. Many of these books make extraordinary claims or involve complex regimines that cannot be carried out long term. By far the best diet books written are those by Ellington Darden, PhD. His books are no-nonsense and have precise regimines that are easy to follow. Most importantly, his diets easily adapt into lifelong eating habits that will keep you lean. Some of Dr. Darden's best books include *Soft Steps to a Hard Body*, *Living Longer Stronger*, and*A Flat Stomach A.S.A.P.* *Protein Power* by Dr's. Michael and Mary Dan Eades is well written and makes a compelling argument for control of carbohydrate intake. Many of my clients have found that producing a calorie deficit on this program is easier for them than many other diets. The bottom line is that you will need to devise a system of reducing calorie intake that seems to work for you.  My own dietary guidelines for people are actually quite simple. It involves looking at your hand. You have five fingers that represent five meals to eat in a day (3 meals and 2 snacks). The serving size of any food you choose should be either the size of your palm or able to fit in the palm of your hand. Meals can have 4 servings from any categorie of food. Snacks have 2 servings. Your five fingers also represent the 5 liters of water you should drink over the course of the day. If you follow these guidelines you will limit your portion sizes so that you should be able to produce weight loss without excessive attention to detail. If you want a more detailed way of portioning your intake, I also suggest the "Food Mover" sold by Richard Simmons on his informercial (although I do not recommend his aerobics-based exercise program that comes with it).  The Bottom Line  The bottom line for fat loss is as follows: 1) Build some calorie burning muscle through proper exercise. 2) Create a modest calorie deficit through dietary restraint. 3) Superhydration. 4) Get some extra sleep. 5) Avoid overactivity or steady-state activities that are popularly thought to "burn calories". If you have the discipline, these simple steps will prove successful beyond your expectations. | |