Bare Bones Books presents:

What You Should Know About How to Lose Fat!

By Gerry Esguerra

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Introduction

First, a distinction: **Fat loss is not equivalent to weight loss.**

With obesity now an epidemic, many programs are now espousing weight loss. And they gauge progress with weight scales. But weight loss does not mean fat loss.

To illustrate, there was a time a couple of decades ago when everyone was telling me that I was getting thin – except the scales! While all who saw me then told me that I was getting thin, the scales showed that I gained 15 pounds! So for health purposes, the tape measure and the fit of your clothes are better than the scales. We must aim to lose fat, not just weight.

So how do we lose fat?

I can already hear you say, “Simple, eat less calories than you use” – negative calorie balance.

Wrong!

While we do get fat by eating more calories than we use, the reverse is not true. We do NOT lose fat by eating less calories than we use. Every biochemical and physiological pathway shows this, in spite of what you might have heard. We might lose weight, but it won’t be fat.

However, as I would show, the way we lose fat is indeed quite simple.

The Way We Lose Fat

First, let me jump to the "secret" we need to know to lose fat. It's a simple process that is already going on in our bodies. All we need to do is to ensure that this process is running. Again, physiology textbooks have been showing this process for years, though unfortunately, such books themselves still espouse negative calorie balance to lose fat. Don't ask me why. (Maybe it's because they still equate weight loss to fat loss?)

What is that process?

It's this: Muscle, at rest, consumes fat.

It's that simple.

If you want to lose fat, then you simply let your muscle use it up when resting. And this process occurs even if we are in an isocaloric or even positive calorie balance! (Remember how I was getting thin but gaining weight?)

So why then is obesity becoming a real health problem?

Because this process is being blocked by the way we live and eat. If we simply see to it that this process occurs, then we would be burning fat whenever our muscles are inactive.

Why Negative Calorie Balance Does Not Cause Fat Loss

Now that I've given you the "secret," let's go back to see why negative calorie balance does not lead to fat loss.

One of the body's priorities is to maintain our blood glucose level. When this level goes down, as in negative calorie states, the body tries to keep this level up. It first draws on its stores of glucose: glycogen molecules stored in our liver – up to 6% of the liver's weight. (The glycogen in our muscles cannot go back to the blood.) Once these liver stores of glycogen are used up, then the body starts making glucose to maintain the blood glucose level.

Where does it make glucose from?

NOT from fat. Fat is not turned into glucose.

Instead, the body breaks down protein into amino acids so that it could convert the glucogenic (glucose-producing) amino acids into glucose. Our body does this until it uses up most of its glucogenic amino acids… or until the next meal which supplies a fresh supply of glucose.

If no next meal arrives, and glucogenic amino acids are running short, the body converts fat to ketone bodies to be used by the cells for energy. But this happens only in starvation conditions, that is, zero calories for an extended period of time. Negative calorie balance will not do this because there will always be a

next meal. This next meal will boost the blood glucose level temporarily, probably even replenishing some stores. Then, because the next meal is still less calories than what we need, our body will again reach the state wherein it breaks down protein to produce glucose from amino acids (also replenished to some extent by the previous meal).

Therefore, unless we actually go into starvation – zero calories, not just negative balance – this pathway of negative calorie balance will not burn fat at all!

Now where would the amino acids come from?

Mainly, from our muscles!

And we do not want this because, as shown earlier, it is our muscles that burn up fat during rest. If we use up these muscles, then we are losing the very tissue we need to burn off fat. A negative calorie balance can indeed lead to weight loss, but the weight lost is not fat.

So instead of a negative calorie balance, how then should we use up our fat?

It has been mentioned already: our muscles use up fat during rest, even if we are eating more calories than we use up. We don’t have much to do about this.

However, we must make sure that this process goes on. We should make sure that this process is not blocked, and we should also make sure that this process can occur.

Making Sure That Fat-Burning Is Not Blocked

Muscle stops using fat when glucose can enter it. Then it uses glucose instead of fat.

Now when can glucose enter muscles?

In two conditions:

1. Physical activity – muscles in contraction somehow have a changed membrane permeability so that glucose can pass through easily, even in the absence of insulin.
2. Insulin influence – glucose enters muscles (as well as other cells) in the presence of insulin.

We do not have to worry about the first condition. In fact, we'll be making use of this, as you'll see later.

The second condition is the important one. Insulin not only allows glucose to enter muscles (and thus, stop the use of fat), but it also inhibits fat cells from releasing its fat stores. Insulin causes fat cells to store fat, not release it.

Therefore, to make sure that the fat-burning process of our muscles is always taking place, we should control our insulin levels.

How do we control insulin levels?

Two ways:

1. Diet – and I don't mean negative calorie balance. Rather, we control what we eat so that our blood glucose level does not rise dramatically and stimulate insulin release.
2. Physical activity – as shown earlier, active muscles take up glucose even in the absence of insulin. If our muscles take up glucose, insulin will not be released and fat usage goes on. (Now you see why we don't have to worry about the first condition of glucose entry into muscles. We're even going to use it!)

Controlling Insulin Levels With Diet

The obvious: control carbohydrate intake.

Low carb diets are now popular, made famous by Dr. Atkins. Personally, I prefer the approach of the Zone diet developed by Dr. Barry Sears. You can learn a lot about these from internet sources. Here are a couple of good ones:

http://atkins.com

http://www.zoneperfect.com/site/content/guide.asp

However, limiting carbohydrate intake is not the complete picture. Not all carbohydrates raise blood glucose levels at the same rate. There are some that don't even raise it enough to

cause insulin release. And, even protein in high amounts could raise insulin (though it would also release glucagon, which counters some effects of insulin).

Remember, it's the insulin that's important. The diet is only significant as far as it affects insulin levels.

So while dietary carbohydrate is something that we should control, it does not mean we go into zero carbs or that we have to take the starch or carb "blockers" that are now gaining in popularity.

Instead, we should be aware of the following about carbs:

1. Already mentioned: various carbohydrate sources affect blood glucose differently. A measure of this is what has been developed as the glycemic index. This listing of carbohydrate sources compares their ability to raise blood glucose levels if eaten alone. Lists can be found in several sources, including web pages like

   http://www.mendosa.com/gilistold.htm

   http://www.diet-i.com/glycemic-index-foods-list.htm

   There is also a full 52-page article from the American Journal of Clinical Nutrition which you can download here:

   http://www.ajcn.org/cgi/reprint/76/1/5.pdf

Such lists are not meant to make us choose what to eat or not. The lists only show the effect of different foods on blood glucose *if they are eaten alone*, which we rarely do. You use such lists as guides on how you would be dealing with a meal. For example, if you are to eat a highly glycemic type of food, you could either reduce the amount of that food, or mix it with fiber or fat sources (see no. 2 below), or make sure that you do some physical activity afterwards (discussed later). You do not have to avoid something altogether all the time (although that could be an option, too).

2. Factors that affect carbohydrate absorption: fat and fiber delay carbohydrate absorption, and thus, inhibit the rise in blood glucose levels, even in high carbohydrate meals. Therefore, if our meal is to have a lot of carbs, then adding fat (oils, butter, fish oils) and fiber (vegetables) in the meal will inhibit its absorption, and thus, inhibit the rise of blood glucose levels. (This is the reason why ice cream has a low glycemic index – the fat inhibits the absorption of the sugar.) There are now commercial preparations that supposedly accomplish this ("carb blockers") but we don't really have to spend extra in this regard.

Controlling Insulin Levels With Physical Activity

As mentioned, muscles in activity will absorb glucose from the blood even in the absence of insulin. Thus, if you ate a high carbohydrate meal, you can prevent the expected glucose and

insulin spike by indulging in physical activity afterwards. Or, just to be sure, indulge in some physical activity whatever your meal was.

Simply standing up for several minutes after a meal could achieve this. Our massive leg muscles will be in an active state of contraction, and will thus absorb glucose from the blood without the need of insulin. This might even be increased by walking, stair climbing, or doing a few squats.

I know this seems to go against sage advice that we should not exercise after a meal. But this is not a full-blown workout. It is just some amount of muscular contraction to make the muscles drop the blood sugar levels and thus avoid insulin secretion. Doing some chores that require physical activity can fit the bill nicely.

Doing some simple isometric exercises will also put our muscles in activity, making them absorb glucose from the blood. (They make us stronger, too!)

For example: Bring your palms together in front of your chest, and press them together as strongly as is comfortable for 6 to 10 seconds. This works the muscles of the chest. Then interlace your fingers and pull your hands apart as strongly as is comfortable for 6 to 10 seconds. This works the muscles of the upper back. You could involve more arm muscles with these “exercises” by increasing the distance of your palms from your chest. If you position your palms down to waist level, the same exercises will involve a different part of the chest and the

shoulders. Varying the position of the elbow will also affect different sets of muscles.

You can repeat these exercises several times. Or you can vary them by applying uneven resistance so that there is movement from one side to the other, all the while maintaining muscle contraction. (This would no longer be isometric.)

You would like to involve the big muscle groups, though. The more muscles active, the more to absorb blood glucose. This is why the use of the leg muscles is preferred. Standing up is a form of isometric contraction, too.

The Role of Exercise

Many think that exercise is good for losing fat. Well, not directly.

One hardly loses any fat *during* exercise. We lose fat *after* exercise.

Again, the pathways: During exercise, the muscles use up glucose. First, the stored glycogen in them, and then the glucose it absorbs from the blood. After that, while still active, the muscles still prefer to use glucose, therefore, protein is again broken down to release glucogenic amino acids to be converted to glucose. This is no different from what happens in negative calorie balance. And just like in negative calorie balance, fat

will not be used until the body starts running out of glucogenic amino acids, which is only likely in marathons.

So while it might often be said that you need to burn some 3500 calories for each pound of fat, it does not mean that fat is burned up when you workout expending 3500 calories.

This does not mean that exercise is useless for losing fat. While exercise will not burn up fat while we are doing them, they build muscles which will burn up fat when we are resting.

A sleeping 70-kg man uses up about 70 calories per hour. ***If there is no insulin influence***, most of those 70 calories will come from fat (depending on his muscle mass), whatever the calorie balance. If that person sleeps 8 hours a day, that's some 560 calories of fat burned. The rest of the day, when physically inactive, fat will also be burned in the absence of insulin. The more muscles we have, the more fat will be burned. Therefore, exercise is useful because it builds up muscle. (When I was getting thin but gaining pounds, I was training with weights and thus, building muscle.)

In addition, exercise can cause release of adrenaline. This hormone stimulates the release of fat from fat cells (among its many effects). The released fat will be used up by muscles when glucose and glucogenic amino acids are used up, or during rest later. Exercise also causes the release of growth hormone, which also causes fat burning.

Making Sure That
The Process Can Occur

The process of fat burning during rest depends on a number of other factors in addition to insulin presence and muscle mass.

Adrenaline was mentioned earlier. This hormone stimulates the release of fat from fat cells. Our body produces adrenaline from amino acids phenylalanine and/or tyrosine. Therefore, to ensure that we can make enough of this hormone when needed, we must ensure that we get enough of these amino acids from proteins in our food. Of course, a healthy way to induce adrenaline release is through exercise. (There are some fat loss products based on hot spices like pepper, cayenne and capsaicin. These may be operating on the same mechanism of releasing adrenaline. However, once one gets used to hot spices, the adrenaline released may decrease.)

Growth hormone is also made up of amino acids. So we have another reason to make sure that we are getting adequate supply of protein.

Once fat is released from the fat cells it must enter the cell and go into the mitochondria to be used for energy. For this, carnitine (3-hydroxy, 4-trimethylammonium butyrate) is needed. Carnitine transports the fat molecules into the mitochondria for use. While our body can make this substance, it would be better to make sure that we have enough of this by getting it from our diet. Carnitine comes from animal protein sources: meat, fish, or eggs. The raw materials to make carnitine

also come from proteins. Again, another reason to make sure we are getting adequate protein.

Another nutrient to consider is the mineral chromium. This mineral has been found to have several effects, including sensitization of cells to insulin (thus, requiring less insulin secretion), muscle mass increase, and fat mobilization. The trace mineral vanadium could have the same action.

Oxygen is also needed in the utilization of fat for energy. Thus, we should make sure we're breathing enough, and have enough red blood cells to carry oxygen to our muscles.

Fat Loss Plans

From the principles given, we can now form effective and simple fat loss plans. These would involve:

1. Controlling of food intake so that blood glucose level does not spike and elicit insulin release.
2. Engaging in physical activity after meals, particularly if such meals are likely to spike our blood glucose level.
3. Exercising to build muscle – the more muscle we have, the more fat we burn during periods of rest or inactivity.
4. Eating so that we receive adequate amounts of protein, carnitine, and chromium, to ensure that the fat burning process can go on.

5. Making proper breathing a habit so that we assure ourselves of the oxygen needed to utilize fat.

Note: With the plan you create, don't expect any miracles. It could have taken you years to reach the state you're in, so don't expect instant progress. Depending on your present state of obesity and your present muscle mass (and how fast you can add to it), you should expect decreases in measurements in about two weeks' time, definitely in a month's time. Don't bother too much with the scales. Base your progress on tape measurements and the fit of your clothes.

"Apologies"

This report discussed the general pathways going on in the body. But each pathway is not exclusive or absolute. All pathways may be running in some part of the body all the time. Some fat is still burned even in the presence of insulin. Protein is continually broken down and built up even in isocaloric or positive calorie states. There is always some amount of insulin circulating in the body. Some fat is burned in exercise. And so on.

The point is that we should live and eat so that the pathways that allow for fat loss predominate.

No doubt there are those who "lost fat" with the negative calorie approach. However, as seen in the biochemical and physiological pathways, it is not the negative calorie aspect that

led to their losing fat. It is highly possible that these people built muscle which eventually burned up the fat.

Another thing is individual differences. The pathways all work in everyone. However, individual differences (such as glucose and insulin tolerance, probably related to blood type as claimed by some) can make the *extent* of response in one person different from another. These points are discussed in my newsletter, as well as other aspects of health and disesase. Make sure you subscribe to it. It's FREE.

Also, note that web sites given could change or disappear. However, the internet is so versatile and one can easily do simple searches for the topics given, such as Atkins and Zone, as well as the glycemic indices. The sites mentioned are just for starters.

A Reference

Here's one of many references that gives a basis for this report:

"During most of the day, muscle tissue depends not on glucose for its energy but instead on fatty acids. The principal reason for this is that the normal *resting muscle* membrane is almost impermeable to glucose except when the muscle fiber is stimulated by insulin. And, between meals, the amount of insulin that is secreted is too small to promote significant amounts of insulin entry into the muscle cells.

"However, under two conditions the muscles do utilize large amounts of glucose for energy. One of these is during periods of heavy exercise. This usage of glucose does not require large amounts of insulin because exercising muscle fibers, for reasons not understood, become highly permeable to glucose even in the absence of insulin because of the contraction process itself.

"The second condition for muscle usage of large amounts of glucose is during the few hours after a meal. At this time the blood glucose concentration is high; also, the pancreas is secreting large quantities of insulin, and the extra insulin causes rapid transport of glucose into the muscle cells. In addition, the insulin increases the activity of *phosphofructokinase* in the muscle, which catalyzes the complete phosphorylation of the glucose, making it available for use in the glycolytic energy system of the muscle cells. Therefore, the carbohydrate metabolic system of the muscle cell becomes temprorarily energized, and this causes the muscle cell during this period of time to utilize carbohydrates preferentially over fatty acids."

Guyton, Arthur C. Textbook of Medical Physiology (6^{th} Edition). Philadelphia: W. B. Saunders, 1981, p. 961

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