

Good Body Fat and Bad Body Fat

There is a common misconception that all body fat is bad. In truth, some body fat is needed to protect the person's health as well as supplying a reservoir of energy for performing various body functions. To better understand this, the *total weight of body fat* can be subdivided into three separate categories:

Weight of "Essential Body Fat" - This amount of body fat is needed to protect the body from infectious diseases and to protect the internal organs from bruising damage.

Weight of "Reserve Body Fat" - The amount of additional body fat that does not cause any medical risks, and provides a reservoir of "fuel" for use by the body.

Weight of "Excess Body Fat" - The amount of body fat that is over and above the combination of Essential Body Fat plus Reserve Body Fat. Excess Body Fat causes the risk of serious health problems such as strokes, heart attacks, diabetes and certain forms of cancer.

The following further discusses the three parts of the total body fat.

ESSENTIAL BODY FAT

During the development of the FUTREX Body Composition Analyzers, approximately thirty medical "gurus," that specialized in the study of body fat on human health, were contacted. These experts were asked what is the minimum percent body fat that is necessary to avoid health problems. Although there wasn't a total consensus, the majority agreed that the minimum healthy body fat is six percent for males, and nine percent for females of normal body weight. These levels are needed to avoid bacterial and viral diseases as well as provide the body with the needed insulation for temperature extremes and to protect internal organs from bruising. This *Essential Body Fat* can be considered composed of two different components.

The fat layer that is directly under the skin - - - called *subcutaneous fat*. This fat layer provides thermal protection and bruise protection.

The body fat that is contained in the muscle - - - called *intramuscular fat*. This is similar to the thin layers of fat you see within meat when you buy a well trimmed steak from a butcher. This fat provides an emergency "fuel" source for the total body and "cushions" (i.e., protects) the vital organs from shock forces. The minimum percent body fat is higher for females than for males because of reproduction needs as well as other body functions.

Male		Female	
Height (in.)	Weight (lbs.)	Height (in.)	Weight (lbs.)
61-66	8	57-61	10
67-72	9	62-65	11
73-77	10	66-68	12
78-80	11	69-72	13
		73-75	14

The weight of needed Essential Body Fat as a function of height.

Admittedly, world class athletes, in order to achieve maximum speed and agility, have body fat below the recommended levels for "Essential Body Fat." For example, world class runners have body fat typically between three and four percent. Similar low levels are typical of professional football wide receivers. Another example, world class gymnasts typically have body fat below three percent. In fact, no member of the United States Olympic Gymnastics Team had body fat above three percent. Yet, it is widely known that such low percent body fat can cause severe health problems later in life.

RESERVE BODY FAT

In the last twenty years, the scientific literature contains many studies to determine what level of body fat is allowable before introducing health risks. Many of these studies were performed at the Cooper Institute (Dallas, Texas), and by the National Institutes of Health's Framingham Studies.

The scientific literature shows that the maximum amount of allowable *Reserve Body Fat* is a function of a person's height, age, and gender. For example, a six foot tall male who is 35 years old can have Reserve Body Fat anywhere between 0 lbs. and 23 lbs. However, for a male 55 years old and six feet tall the allowable Reserve Body Fat can be anywhere between zero and 30 pounds without increasing his health risks.

Males					
Height (in.)	Allowable Range of Reserve Body Fat (lbs.)				
	For ages <30	31-40	41-50	51-60	>60
67	0 - 16	0 - 21	0 - 24	0 - 26	0 - 28
68	0 - 16	0 - 21	0 - 24	0 - 27	0 - 28
69	0 - 16	0 - 21	0 - 25	0 - 27	0 - 29
70	0 - 17	0 - 22	0 - 25	0 - 28	0 - 29
71	0 - 17	0 - 22	0 - 26	0 - 29	0 - 30
72	0 - 18	0 - 23	0 - 27	0 - 30	0 - 31

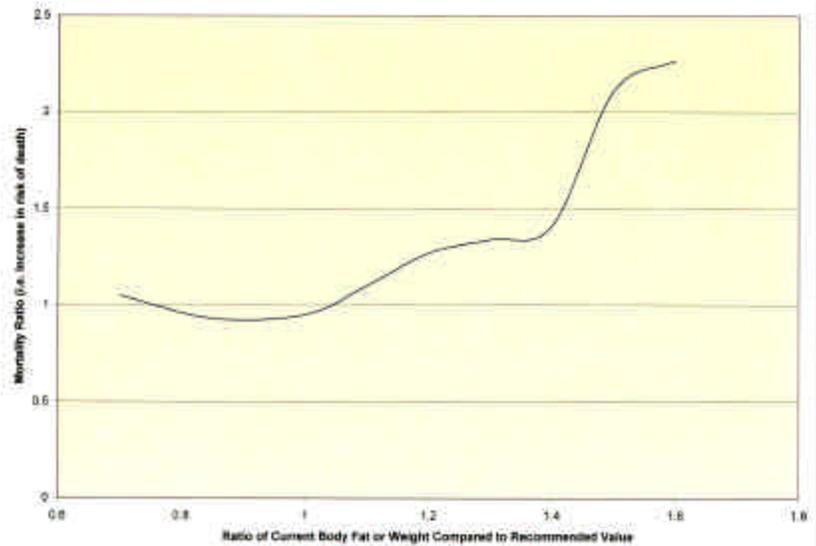
Examples of the amount of Reserve Body Fat that are allowed

Any amount of body fat over and above the combination of Essential and Reserve Body Fat introduces serious health risks. Moreover, NIH research shows that these risks increased as the amount of Excess Body Fat increases

From the accompanying figure, two facts are obvious:

It is much better to be underweight than it is to be overweight (there is much lower "mortality ratio"; i.e., the statistical death rate is lower).

As you become more overweight, the curve tends to run away. In other words the risk of death is greatly increased.



Risk of death as a function of person's relative weight and body fat percentage

HOW TO LOSE EXCESS BODY FAT

Conceptually, it appears to be simple to lose weight or body fat. "All" you would have to do is to be sure that the energy expended from your body is more than the energy in the food that you eat. However, as anyone who has ever been on a diet can tell you, losing weight is anything but simple.

ENERGY INTAKE

This is the energy content of the food you eat. It is normally considered in two parts:

- The energy content for the types of food you eat, and
- The total amount of each type of food you eat.

Obviously, if you have *Excess Body Fat*, you should attempt to limit the amount of fat that you eat. Moreover, any high caloric content food should also be avoided. For example, one can of Coca Cola contains 140 calories. By switching to Diet Coke, it would eliminate all of these calories. Similarly, there is very little taste and satisfaction difference between canned fruit in natural juices and canned fruit in heavy syrup. Yet the calories of fruit in heavy syrup is considerably higher. However, simply changing to diet types of foods seldom allows losing a significant amount of weight. Normally, the total amount of foods eaten must be reduced.

There are many different types of diets that are promoted - - - e.g., the Atkins Diet, the South Beach Diet, the Beverly Hills Diet, etc. All of the above diets do have one thing in common. They reduce the total caloric intake of the body. Unfortunately, this usually causes hunger pains, and lowers the *Basal Metabolic Rate*, and thus, dieting is a difficult chore.

BODY'S ENERGY EXPENDITURES

The energy expended by the body can be considered to be composed of four separate items:

Basal Metabolic Rate (BMR) – This is the amount of energy the body must expend while it is totally at rest, but not sleeping, in order to have the body function and to remain at its normal temperature of approximately 98.6° F.

Food Digestion – The amount of energy the body expends to digest foods that have been eaten. In the technical literature, this is called “Specific Dynamic Action” or “SDA.”

Daily Activities – The energy you use in your daily activity such as going to work, performing activities at work, doing normal home activities; (e.g., playing with children), etc.

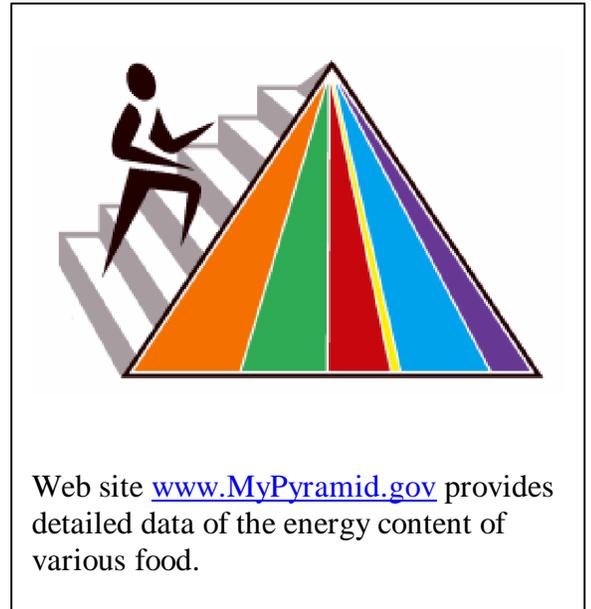
Exercise – Performing either aerobic or anaerobic exercise to improve or preserve the fitness of your body.

The following section provides further explanation of each of these four methods of expending body energy.

Basal Metabolic Rate (BMR) – BMR is the energy needed to maintain the body's chemical processes while the body is at rest but not sleeping. Although the body is externally at rest, the inner workings of the body are still expending energy. Energy is expended continuously for pumping blood, breathing, keeping the body temperature constant and other quiescent functions (e.g., thinking). BMR is normally measured in units of kilocalories per minute (kcal/min.).

BMR is composed of three different components:

- 1) The Temperament Component – Different people use different amounts of energy when they are supposedly “at rest.” This is true, even if the two people are of the same weight, height and sex. For example, people who “fidget” use more energy.
- 2) The Weight Component – The heavier the person, the more energy is expended by the heart and other muscles to pump blood, etc., in the body. Thus, even at rest, heavier people “burn up” more energy because they have more blood that needs to be pumped through the body.
- 3) The Surface Area Component – Humans, like all mammals, require their body to be kept at a constant temperature. Thus, the larger the person, the more skin area the person has; thus, they need more area to radiate heat (i.e., energy) away from the body at 98.6°F.



BMR is an extremely important characteristic of the body. To calculate your BMR, go to web site www.Futrex.com/BMR.

Food Digestion (SDA) – This is the energy used to digest the food that is eaten. As is obvious, the more food that is eaten, the more energy is “burned” in the digestion process. A reasonable approximation, valid for over 95% of all people, is that 6% of the caloric value of the food eaten is “burned” in digesting the food.

Daily Activities – Any movement of the body uses energy. This is the energy expended over and above the BMR. The amount of “activities expenditure” can be considered composed of three parts:

Activity	Total Calories burnt in 10 Min. Weight = 150 lbs.	“P” (Cal/lbs./Min.)
Sleeping	12	0.0080
Walking – 15 min./mi.	62	0.0416
Cycling – 10.9 min./mi.	50	0.0336
Shoveling snow	78	0.0520
Weeding garden	59	0.0392
Light office work	30	0.0200

The Type of Activity – The more strenuous the more energy is used in a given period of time.

The Duration of Activity – The longer you continue an activity, the more energy is consumed.

The Weight of the Individual – The heavier the person is, the more energy is expended for a given activity. *One discouraging aspect of this is that as you lose weight you must exercise more to continue to burn off the same amount of calories.*

Calories expended during some typical daily activities

Exercise (Recreational) Activities – Many people use health clubs or independently exercise on a regular basis. Such exercise activities are perhaps the best single way to expend (burn) energy from the body. The accompanying figure shows the amount of calories that could be burnt off by various exercise and recreational activities.

Activity	Total Calories burnt in 10 Min. Weight = 150 lbs.	“P” (Cal/lbs./Min.)
Aerobics (continuous)	132	0.0880
Basketball	70	0.0464
Golfing	40	0.0264
Jogging (10.9 min./mi.)	108	0.0720
Swimming (crawl – 20 yd/min.)	48	0.0320
Tennis	67	0.0448

Calories expended during some common exercises

SUMMARY

- 1) If you have Excess Body Fat, the risk of having serious medical problems, and death at a younger age, are greatly increased.
- 2) The more Excess Body Fat you have, the higher and higher the medical risks.
- 3) There are only two practical approaches of getting rid of Excess Body Fat: Either changing your eating habits by lowering the amount of calories of food you eat, or increasing your exercise and other activities.
- 4) For a typical person, losing Excess Body Fat is best accomplished by combining a change in eating habits with increasing exercise activities.

By Changing Eating Habits

Each 1 lb. loss of weight is typically composed of 0.75 lbs. loss of Excess Body Fat, and 0.25 lbs. loss of desirable Lean Body Mass.

From Exercise

Each 1 lb. loss of weight is typically composed of 1.25 lbs. loss of Excess Body Fat, and 0.25 lbs. gain of desirable Lean Body Mass.

The fastest way to lose Excess Body Fat is a combination of changing eating habits with an increase in exercising.