

How to Measure Body Fat

There are many ways to measure body fat, but by far the most precise method is based on how well you float. The underwater immersion test that involves weighing people on a hanging scale while they are completely immersed in water, is the most precise way for measuring body fat. The more fat that a person has, the more they tend to float and therefore the less they weigh underwater. This test is frightening for many people, takes up a lot of space, and time. Generally, more convenient and less accurate ways of measuring body fat are used in most facilities. The technique that we will use involves measuring the amount of subcutaneous fat, the fat just beneath the skin. When you consider that fat can accumulate in many places, such as around the intestines and muscles, it may seem odd that measurements of fat just beneath the skin would accurately reflect a person's body fat. However, experiments show that this method is amazingly accurate.



The method that we will use is presented in a book called The Ultimate Fit or Fat: Get in shape and stay in shape with America's best-loved and most effective fitness teacher, Covert Bailey, written by Covert Bailey, copyright 1999. The following formulas can be used to calculate body fat:

Women Thirty Years and Younger

$$\text{hips} + (.80 \times \text{thigh}) - (2 \times \text{calf}) - \text{wrist} = \% \text{ body fat}$$

Women over Thirty

$$\text{hips} + \text{thigh} - (2 \times \text{calf}) - \text{wrist} = \% \text{ body fat}$$

Men Thirty Years and Younger

$$\text{waist} + (1/2 \text{ hips}) - (3 \times \text{forearm}) - \text{wrist} = \% \text{ body fat}$$

Men over Thirty

$$\text{waist} + (1/2 \text{ hips}) - (2.7 \times \text{forearm}) - \text{wrist} = \% \text{ body fat}$$

The best way to make the measurements is to use a cloth tape, one that isn't all stretched out.

Waist – Measure your waist relaxed, as you are when nobody is watching you. Don't suck-in your gut or deliberately exaggerate your stomach by inhaling deeply.

Hips – Wrap the cloth tape around your hips and your buttocks. Stand with your feet about four inches apart and measure the largest circumference.

For the following measurements, right-handed people should measure the right and left handed people should measure the left.

Thigh – Stand with your feet about 12 inches apart and measure the upper thigh at the widest part.

Calf – Stand with your weight evenly distributed on both feet. Measure your calf at the widest part half way between your knee and ankle.

Forearm – Flex your forearm by clenching your fist. Measure at the widest part between your wrist and elbow.

Wrist – Measure just above the bony protuberance towards your hand.

Typically, for most men and women, the tape-measure method described above is usually within 2% of the actual results obtained from the immersion test. For some people, the results of the immersion test are quite different from the tape-measure method.

Extremely fit people will get calculations that are 3-5% higher using the tape-measure method compared to the water immersion test because they have less intermuscular fat. On the other hand, people who are skinny but not very fit will usually get a number that is 3-5% lower than the immersion test. People who are unfit and skinny have more than the usual amount of fat inside their muscles.

Lean Body Mass and Your Correct Weight

In order to calculate your correct weight, we will use your lean body mass (LBM) instead of your age, height, or body type. Weight tables that doctors use are useful, however it is clear that they can easily be off by twenty or thirty pounds. It is possible to be overweight according to the charts but actually be very low in fat or vice versa. Lean body mass is the weight of the nonfat part of your body. Even though LBM includes your organs, blood, and water, the main contributors are bone and muscle. Once your LBM has been determined, your ideal weight can be calculated.



The only meaningful way to predict what your correct weight should be is to add the proper amount of fat to your lean body mass. For men, divide pounds of lean body mass by 0.85 (which is simply adding 15%) and for women, divide the lean body mass by 0.78 (which is simply adding 22%).

Men

Lean Body Mass (pounds) \div 0.85 = correct weight to be 15% fat

Women

Lean Body Mass (pounds) \div 0.78 = correct weight to be 22% fat

So once you have your total weight (from a scale) and you have calculated your percent body mass, you can calculate how much of your weight is fat. Subtracting the pounds of fat from your weight, you will obtain your Lean Body Mass (LBM). Dividing this number by the appropriate value given above depending on your gender, you can obtain your ideal weight. An example is shown below.

	Esmirelda (F)	Brutis (M)
Total Weight (from scale)	130 lbs.	160 lbs.
% Fat (calculated from cloth-tape measurements)	25 %	18 %
Fat	32 lbs. (130 x .25 = 32)	29 lbs. (160 x .18 = 29)
Lean	98 lbs. (130 – 32 = 98)	131 lbs. (160 – 29 = 131)
Ideal Weight	125 lbs. (to be 22% fat) (98 \div 0.78 = 125)	154 lbs. (to be 15% fat) (131 \div 0.85 = 154)

Keep in mind that if your ideal weight is lower than your total weight, the answer may not be to lose weight, but to regain muscle mass. Take for example a man named Leo who is six feet tall and weighs 150 pounds and is thin to the point of looking gaunt. Leo is not an athletic person and he eats a lot hoping to gain weight. Although he doesn't look fat, his muscles are loaded with fat. Leo would test at 24 percent fat and oddly enough, his correct weight would come out to be 134 pounds! Ironically, according to this, he should lose more weight and look sick, right? Wrong. Leo needs to do something to regain the muscle he's lost and get rid of the excess fat that isn't visible.