



# Glycogen and Weight Fluctuations



If you have lost weight in the past, you have likely observed your weight fluctuate on the scale. This can be very frustrating and demotivating at times. What is important to understand is that short-term fluctuations on the scale are due to shifts in glycogen and water and do not necessarily represent changes in body fat. As a result, the scale does not always show true progress over short periods of time. By learning the facts, you can work toward changing your emotional response to the scale so that it doesn't lead to giving up.



Figure 2. "Glycogen spike" after vacation

## Weight Fluctuations in Weight Loss

Have you ever wondered why your weight can fluctuate so much? When you are eating a lot—enough to be storing excess energy (i.e. gaining weight)—you are at the heavy spectrum of total body water. At that point you weigh what you weigh, plus a lot of water weight. When you start to eat fewer calories—an amount that causes weight loss—your body shifts to the lower end of the spectrum of total body water. This is why dieters will often see big weight loss numbers in the first week or two of weight loss. They are going from high to low total body water. The water shift can be anywhere from two to eight pounds!

What about the other direction? What if you go from eating a number of calories that has you losing weight, to eating enough that you are maintaining or gaining weight, even if it is only for one day or one meal? The opposite happens: you shift up in water weight anywhere between two and eight pounds!

The good news is that these fluctuations are benign, water-based and reversible within two to three days. If you just go back to eating well and creating calorie deficits, the extra water usually disappears within 48 to 72 hours. The bad news is that the temporary gain in weight can lead to frustration, demotivation, feeling bad about yourself and thinking about giving up. Fortunately, once you understand this normal physiological phenomenon, you can avoid the negative—and false—thoughts that can be associated with temporary weight gain and become more resilient.

The graph below (see figure 1) shows the discrepancy between scale results and true changes in body fat that result from normal water weight fluctuations. Notice in the graph the line depicting "fat loss" and the line depicting "scale results." The "scale" weight loss has an initial quick loss followed by an illusion of a plateau and then includes up and down variability while true fat losses are slow and steady.

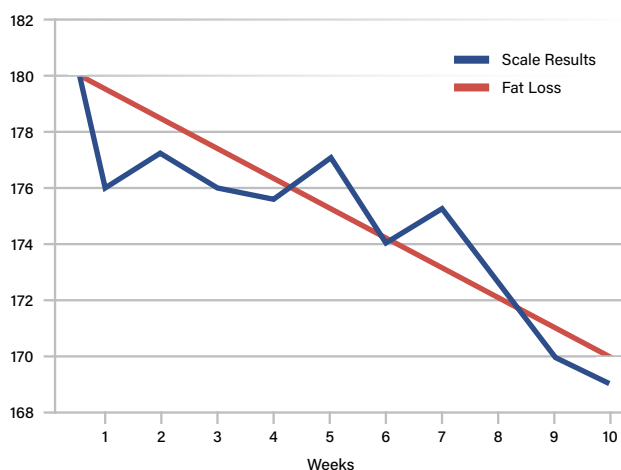


Figure 1. Scale results vs fat loss

The graph (see figure 2) is an example from a client who aimed for maintenance on vacation. Despite doing an excellent job of sticking to his maintenance calorie target, he was up eight pounds on the scale when he returned home!

Fortunately, this was mostly water weight, over half of which was gone within a few days.



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## Glycogen: The Other Fuel

Water weight fluctuations happen because of shifts in a fuel in our body called **glycogen**. Glycogen is our “other” fuel; humans operate on a hybrid fuel system of fat and glycogen.

Glycogen is produced in the liver from glucose, which is the end product of carbohydrate digestion. When you are eating enough to meet your energy needs, extra glucose is available and stored as glycogen in muscle cells and the liver for later use. When glycogen is stored, it is stored along with water, which makes it very heavy.

When a calorie deficit is created, stored glycogen is used up for energy quite quickly and the extra water goes with it. The opposite is also true: when calorie intake increases, whether it is the result of a planned maintenance day or an overeating episode, glycogen is stored and along with it comes extra water. This is why many dieters experience a dramatic weight difference in the first week or two of a weight loss program or shortly after a weight gain that resulted from an overeating episode.

Glycogen storage capacity varies greatly from one person to the next, which is why glycogen and water weight fluctuations can vary so much between individuals (anywhere from two to eight pounds). But the fact is that changes in body fat go up and down in a very slow manner, usually in the range of one half to two pounds per week and never jumping or fluctuating quickly. Fat changes are only based on differences between how much energy we use (Total Energy Expenditure) and how much energy we take in (eat and drink). Glycogen shifts are what account for the majority of the frustration with seemingly inexplicable weight fluctuations during weight loss.

Getting emotional about glycogen shifts is like crying over spilled water. Just know they happen and focus on more reliable evidence of your weight loss progress. Your tracking is the best predictor of what is happening with your fat stores. If you are creating calorie deficits you are likely losing body fat and the scale will eventually catch up. You can also pay attention to trends in your weight. Over the short term your weight will go up and down, but in the longer term while losing weight, you’ll likely see a new low weight on the scale every week or two and an overall downward trend in your weight.





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