



Weight Gain

Weight gain is an increase in body weight, which can either be an increase in muscle mass, fat deposits (adipose tissue), or excess fluids such as water. Weight gain without increased calorie rich food intake might be a symptom of a serious medical condition. This handout is concerned with fat gain.

Simple formula

A simple formula for weight gain (or loss) by increase (or decrease) in body fat is given based on the simple fact that it takes 3,500 calories of stored energy to make 450g of fat.

$$w_f = w_i + \frac{e_i - e_b}{3500}$$

Where w_f is your weight, in 450g (one pound) increments, after gain/loss, w_i is your weight, in pounds, before gain/loss, e_i is your caloric intake during the time period in question, and e_b is your caloric burn during the time period in question. The constant 3500 represents the aforementioned conversion factor: 3,500 kcal = 450g of fat.

Effects: Excess adipose tissue on a human can lead to medical problems; however, a round or large figure does not of itself imply a medical problem, and is sometimes not primarily caused by adipose tissue. If too much weight is gained, serious health side effects / medical conditions may follow. See below: Health consequences are categorised as being the result of either increased fat mass (osteoarthritis, obstructive sleep apnoea, social stigma) or increased number of fat cell (diabetes, cardiovascular disease, non-alcoholic fatty liver disease, some forms of cancer). There are alterations in the body's response to insulin (insulin resistance) a pro-inflammatory state and an increased tendency to thrombosis (pro-thrombotic state).

Causes: With regards to adipose tissue increases, a person generally gains fat-related weight by increasing food consumption, becoming physically inactive, or both. When energy intake exceeds energy expenditure (when the body is in positive energy balance), the body can store the excess energy in a dense, high-energy form as fat. 450g of fat stores 3500 calories of energy, so over time, excessive energy intake and/or lack of exercise can contribute to fat gain and obesity. **Here are some of the common causes:**

Sleep: Another contributing factor to weight gain may be lack of sufficient sleep. The two hormones responsible for regulating hunger and metabolism are leptin, which inhibits appetite and increases energy expenditure, and ghrelin, which increases appetite and reduces energy expenditure. Chronic sleep deprivation is associated with reduced levels of leptin and elevated levels of ghrelin, which together result in increased appetite, especially for high fat and high carbohydrate foods. As a result, sleep deprivation over time may contribute to increased caloric intake and decreased self-control over food cravings, leading to weight gain.

Gut Bacteria: Studies have shown that changes in the gut flora can increase the rate at which we absorb fats and carbs, and increase the storage of calories as fat. This means that someone with excessive bad gut flora could eat the same amount of food as someone with a healthy gut, but extract more calories from it and gain more weight. Unfortunately, several features of the modern lifestyle directly contribute to unhealthy gut flora:

- Antibiotics and other medications like birth control and anti-inflammatories
- Diets high in refined carbohydrates, sugar and processed foods
- Diets low in fermentable fibres
- Dietary toxins like wheat and industrial seed oils that cause leaky gut (intestinal permeability)
- Chronic stress

Stress: When life's demands get too intense, our bodies go into survival mode. Cortisol, the "stress hormone," is secreted, which causes an increase in appetite. And of course, we may reach for high-calorie comfort foods in times of stress as well. This combination is a perfect breeding ground for weight gain.

Medications and medical conditions that can cause weight gain:

Drugs that can cause weight gain include:	Hormone changes or medical problems causing weight gain, due to:
Birth control pills	Cushing syndrome
Corticosteroids	Underactive thyroid, or low thyroid (Hypothyroidism)
Some drugs used to treat bipolar disorder, schizophrenia, and depression	Polycystic ovary syndrome
Some drugs used to treat diabetes	Menopause
	Pregnancy

Age: We don't burn as many calories at 40 or 50 as we used to burn at 20, as our metabolism slows down. So we need to increase our exercise – and eat less food - to keep our metabolism going. Some studies show that exercise might be even more important than the diet for long-term weight maintenance.

What you can do to prevent unwanted weight gain?

Boosting metabolism: Our metabolism increases with food intake. Eating breakfast is the key for kick starting your metabolism, but remember to reduce the carbs and sugars and include proteins. Choosing metabolism boosting foods like **Asparagus, Broccoli, Cauliflower, Celery, Lettuce, Courgettes & Dark Green Leafy Veg**, as they contain so few calories that the mere act of digestion will burn more calories than they contain. Eating frequent, small healthy meals helps to keep metabolism raised for a longer duration, and your body from running out of fuel.

Dietary Changes: Omega 3 oils (**oily fish, nuts and seeds**), complex carbs and fibre (**wholegrains / starchy veg**), green leafy veg, lean protein (**chicken, turkey, eggs etc.**) all help to keep the metabolism active, the latter three groups breaking down slower – keeping you fuller for longer. Include all in your daily diet at every opportunity.

Cut back on the Carbs: It's obvious to cut back on certain fats like saturates, but most people don't realise the effect that carbs have on weight gain. Too many carbs eaten in one sitting cause the body to store the excess energy they provide as fat, so if you eat too much then you will scupper any chances of you losing weight.

Count the Calories: Contrary to popular opinion, if you want drastic results then you really need to understand where the calories are coming from and this can be achieved by looking at food labels. Try eating fewer calories, or lower calorie foods. A food journal or an online calorie calculator / app can estimate how many calories you need to maintain or lose weight.

Exercise: Increasing the amount of energy you use in relation to what you consume will only lead to one thing, weight loss! Try to include any exercise that you do into your daily routine, as this is the only way you will sustain any weight loss.

Read the Weight Loss - Boosting Your Metabolism handout from 2015: Ask the catering manager to print this off for you for further information, or you can find it on our website shown below.

Please Note: This handout should only be used as a guide to help inform you as to the lifestyle and dietary modifications foods that may support a healthy weight. It should not be used as definitive guide to losing weight.