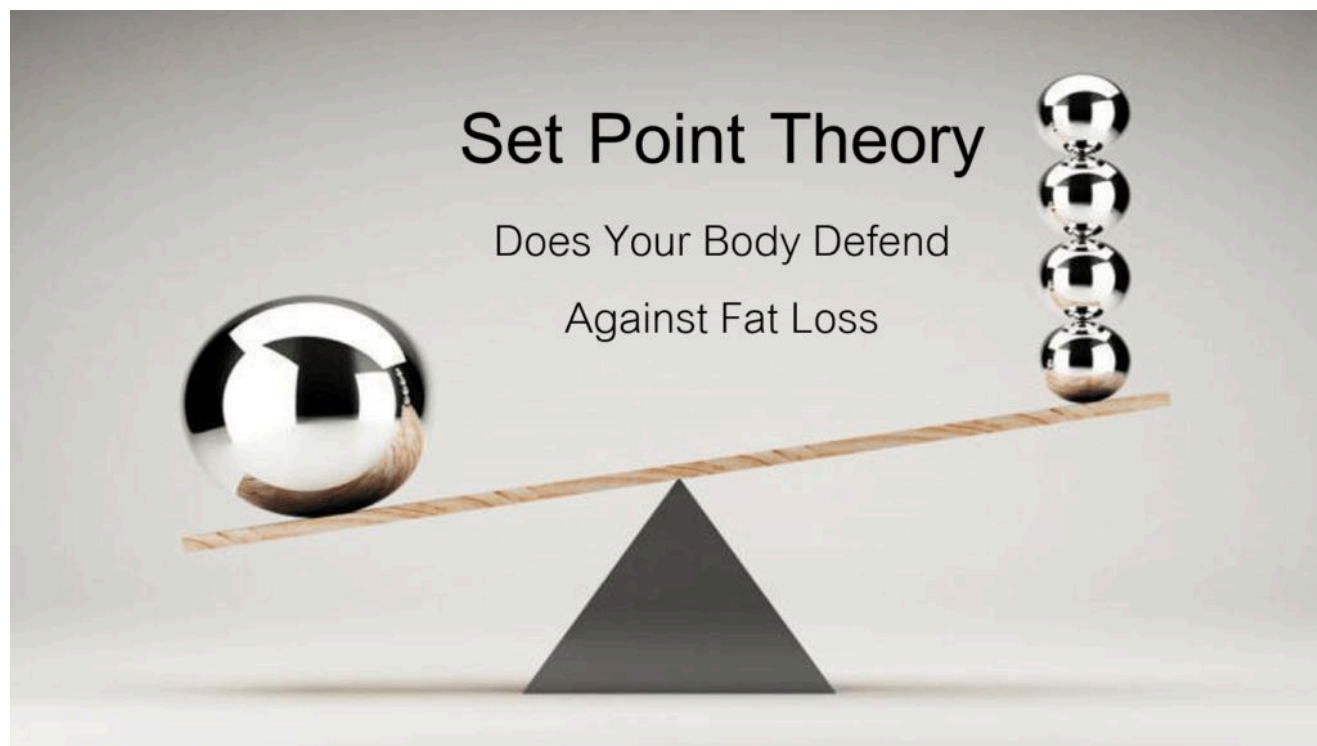


Weight – "Set Point"

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Weight - Set Point

This article looks at the commonly referred metabolic process known as "Set point" - which is an approximate weight that the human body tries to maintain as part of a total body equilibrium/homeostasis.

Historically it was believed that everyone had a rigid "Set Point" that largely determined how much weight we gained or lost. If gain or loss was too extreme (done too quickly), then the body's metabolic homeostasis would fight this change often with the body reverting back to the original weight shortly after the change (eg people who lose weight quickly in most cases put all the weight back on).

The conceptual framework of a biological control of body weight is mainly based on animal studies. For example, when compared with feeding a standard diet, rats with an energy-dense diet (rich in fat and sugar) resulted in overeating and a disproportionate weight gain. After withdrawing that diet and introducing a mixed diet again, rats then spontaneously returned to the weight of continuously mixed-diet-fed control rats. Vice versa, after caloric restriction and weight loss, rats regained body weight with re-feeding, reaching their previous weight again. These findings are taken as evidence for an inherited body weight (or in rats as an inherited weight gain with age) and served as examples of the so-called "set point".

Recent research has updated/modified this view somewhat – and there is still quite a bit of contention around whether this “set point” equilibrium can lead to obesity, etc.

In humans, observational studies on large populations do not provide consistent evidence for a biological control of body weight, which, if it exists, may be overridden by the influences of the *obesogenic environment** and culture on personal behaviour and experiences.

** The sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations. This concept states that a potential weight “Set Point” can be overridden by for example; overeating for months/years.*

Just to update the understanding behind this concept, there are now several potential mechanisms:

1. A “set point” – a specific weight that the body tries to keep within a small standard deviation (above or below).
2. A “settling point” rather than a specific set point, reflects metabolic adaptations to energy imbalance without any need for feedback control.
3. A “dual intervention point” model combines both paradigms with two set points and a settling point between them.

Over a short time period – the body is adept at maintaining a homeostatic weight (as it will do with most physiological systems such as strength, endurance, etc). The only way to overcome this resistance to change is to make small but regular changes to the system (eg small increases in training loads or body weight) that will lead to a longer term more permanent change.

What determines your “set point”?

Your heredity and your environment determines your set point. Over the long term, excess food and insufficient exercise will override your body's natural tendency to stay at its set point and lead to a higher set point.

A slow, gradual weight gain will fool your body into thinking that your set point should be higher – and in fact, this type of weight gain does reset your set point. Then, when you try to lose weight, your body defends that higher weight, making weight loss more difficult.

Internal Controls vs. Environmental Factors

There are internal controls that govern this complex process. These controls include a combination of hormones and Central Nervous System control centres (Hypothalamus), but ultimately, your obesogenic environment can trump your physiology. This can be influenced in a couple of ways:

- Regular consumption of oversized portions of high-calorie foods.
- Modern conveniences reducing our NEAT (Non Exercise Activity Thermogenesis).

The Physiology of Weight Gain

Fat requires minimal energy to be stored.

Every person has an optimal number of Kcal they need to eat to provide energy for all their metabolic processes. If they eat more Kcal than required, the body stores these calories for another day.

If they have put on some weight (adipose), this is directly related to eating more Kcal than they needed. If they then reduce their Kcal intake back to the required amount their body requires, then they should stop gaining weight. It is important to note here that they have reduced their Kcal back to the energy their body needs every day – not under eating, so there isn't a Kcal deficit.

Unfortunately under this above situation there is an expectation that as Kcal has been reduced there should be a concomitant decrease in weight – but all that has been achieved is a reduction in their Kcal intake to the recommended level which will result in a weight plateau, not a loss (causing grief to anyone who has cut down on their food intake but are not losing any appreciable weight).

As a numerical example:

Starting Weight ~85kg

RMR - 2000Kcal

Kcal Intake - 2200Kcal

Daily Excess - 200Kcal

Ave 12-month Excess - 73,000Kcal (~10kg of additional weight/fat/year).

Ending Weight (12-months) ~95kg

If at this time the client then reduces their intake down to 2000Kcal – they shouldn't expect to lose any appreciable weight at all – as they are now consuming the correct amount of Kcal/day that their body requires to complete their daily functions.

If they dramatically under eat to lose weight then a reduction in RMR and other changes will occur as this is their body's attempt to reduce rate of weight loss (reduction in NEAT, etc).

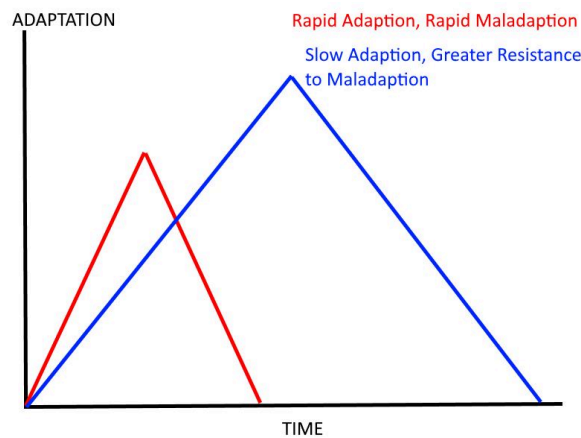
Unfortunately most people do expect to lose weight when reducing to the correct Kcal intake. What many clients fail to understand is that fat storage is like putting "stuff" into your garage – once it is in the garage you don't have to continue to put more stuff in to keep the amount that is already in there.

This is the same for adipose tissue – once you have increased the size of your adipose cells (Stored fat), you don't have to continue to overfeed them to keep that fat stored. This is often what causes overweight people to believe that their obesity is due to some metabolic factor, where in fact it has been due to the slow incremental increase in weight through many years of over eating.

If a person wishes to lose the additional weight (fat) that they have accrued over potentially decades, then there firstly needs to be a change in the Calorie input:output equation for this to take place.

Secondly, people need to understand that as weight gain is a very gradual process, weight loss should also be gradual. It is when someone tries to speed up the loss of this additional weight that their problems begin.

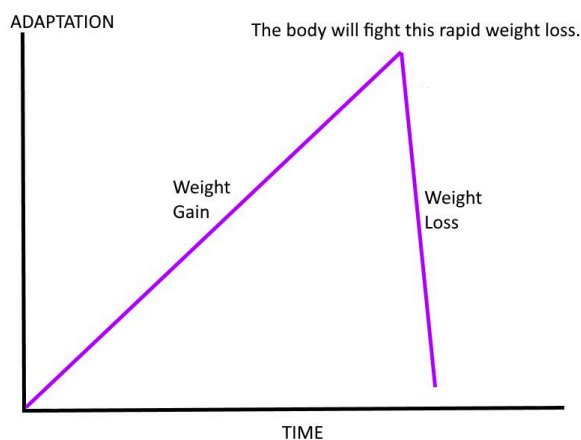
The mistake I often see with weight loss clients is them ignoring the adaptation-maladaptation principle.



What this principle states is that the faster you gain some attribute (eg strength, power, endurance or weight/fat), when you stop doing what you are doing then the body will quickly revert back to its original position.

As an example, if you put on several kg over Christmas, in most cases these extra kg's disappear shortly into the new year when you go back to a normal eating/life pattern.

Opposite to this rapid change, the longer you take to develop an attribute (eg. putting on weight), the longer/slower it takes for that change to revert back to a baseline (and in the case of body weight – if you have increased your “set weight” during this “long adaptation phase”, then your body won't revert back to your initial weight but will plateau at your new “set weight”).



What we often see with weight gain/loss is the following:

A long time gaining weight (in some cases decades), then for the client to try to lose some/all of this additional weight in a short time frame. In all but a few extreme cases, these individuals have put all the weight back on (and even more in some cases).

A good example of the failure of this approach is with the popular TV series, “The biggest Loser” - the majority of contestants have put all their weight back on after the show finished.

Rapid changes in any attribute is not tolerated by the body's finely balanced homeostasis system.

In this circumstance, the body will do everything it possibly can to minimise this rapid weight loss and resume the previous set weight, with these changes including:

1. Reducing Resting Metabolic Rate (lowering the amount of Kcal needed per day).
2. Reducing the effectiveness of Lipase on the hypothalamus (Satiety response).
3. Reducing the amount of NEAT (Non Exercise Activity Thermogenesis) the client undertakes.
4. Increased craving for sweet/salty/fatty foods.

So what is a potential solution?

The longer you have taken to make a physiological change, then you should aim to take a similar amount of time (and incremental changes) to revert back to your original situation.

Unfortunately this doesn't suit anyone!!!! No one who has taken 20+ years to get overweight wants to take another 20 years to lose this weight.

I am not suggesting that it should be year for year – but if you try to lose weight too fast regardless of the mechanism, there is a very high likelihood that you will ultimately fail and not only gain back the weight but also do potential psychological damage as you will see your attempt as having failed, being weak mentally, etc.

The 10% Solution

Scientific evidence supports losing no more than ~10% of your body weight in a short time frame (<6months). It turns out that the body's set point and its many regulatory hormones dictate the effectiveness of the 10% loss. That's the amount of weight you can lose before your body starts to fight back. Many clinical studies have confirmed this phenomenon. Of course, some people can lose more than 10% at a time, but precious few can then maintain that loss.

I personally think 10% is too much, I would rather a client focus on a 5% weight change.

After they maintain their new, lower weight for ~6 months, they then repeat the cycle and reset their set point again by losing potentially another 5%. Through small, gradual changes in their daily habits, they will more easily stay at the new, lower weight for longer. This prescription is vital to outsmarting the body's natural tendencies to regain weight.

On a final note, a trick that might help with longer term weight control, don't try to continue to lose weight during Winter – During these colder months we typically eat more Kcal dense foods & do less NEAT/exercise and often we go into a human form of hibernation during this cold weather. My advice to clients is to use the Winter months to maintain the weight they were at when summer/autumn ended, (giving their body time to adapt to this new weight) and once the weather starts to warm up in mid to late Spring, then they aim to drop their weight further if they feel it is warranted.

SUMMARY:

Weight gain is a slow process – Any goal to lose this additional weight gained over time should also be planned over a long time frame to limit the metabolic stress that the body will be placed under when under-eating.

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