

Achieving Satiety

Dictionary Definition: Satiety

1: The quality or state of being fed or gratified to or beyond capacity

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The Act of Eating

In today's society, with the prevalence and convenience of food outlets, it can be difficult to control our eating habits. It has been found that eating extremely sweet or fatty foods, fires up the brain's reward system with the release of dopamine, and generates an addictive response. Frequent eating of these types of foods, desensitizes the hunger "off switch" and creates demand for more of the same to reach the corresponding level of satisfaction. In this way eating becomes a habitual act rather than needful one to satisfy our appetite. Our hunger stimulus is important as it helps insure that we consume enough food for our needs. But when a person decides to change their way of eating, or begins to restrict their food intake, this change in diet can make us feel hungry and deprived, when often we are not. This perception can negatively affect the motivation to stick to our new healthy eating goals.

What is satiety and why is it important?

Satiety is the feeling of fullness we experience after consuming a meal or drink, and is a measure of how well a food keeps you feeling satisfied. It suppresses hunger for a period of time after a meal, thus limiting subsequent food intake. This sensation can play an important role in controlling how much we eat or overeat. If we feel really full or 'satiated' then we may eat less or less often. But, if we do not feel very satiated then we are likely to get hungry again more quickly and may be tempted to snack between meals or overeat at the next.

Dietary strategies to help reduce hunger and promote fullness are required for success in making dietary changes. A prime factor influencing that "full feeling" is the type of food that is eaten. Some foods fill your stomach faster and/or remain in your stomach longer, doing a better job to hold off hunger. It is thought that the brain, largely regulated by the hypothalamus, pays attention to blood glucose levels, and triggers appetite when it goes too low. However research shows that it is more complicated than this. Glucose is *one* of the signals, but there are others, such as the levels of leptin (a hormone produced by fat cells) and signals from the gut itself, that help communicate the level of hunger to the brain.

Understanding your own body's response to different foods and its reaction to these feelings of satiety is important. Moreover, signals are also generated in response to how filling we *believe* the food to be as well as the sensory experience we get from seeing and smelling the food. To be able to leave your old habits behind, it is important to encourage satiety when changing your way of eating so that it is easier to achieve the goals you have envisaged.

Measuring Satiety

The Satiety Value of food is the level of sense of food fulfilment given, the opposite to the feeling of hunger. Foods that are of high-energy-density (foods with high calories) per gram, tend to be tasty and pleasant to eat but are not satiating. Foods with lots of salt, sugar, and grease fall into this category. Lower-energy-density foods tend to be the opposite - they provide fewer calories per gram, are less palatable but more satiating. This means you can eat larger portions of lower energy foods to feel full for longer, with less calories ingested. As we eat we can feel our stomach begin to fill, but it can take 20 minutes or more from the last bite, to the time the satiety signals reach the brain.

Caloric Density of Foods

Low-energy-density foods are typically those that contain the most water and the least fat. Fat is a high-density food delivering a high number of calories per gram. Knowing the "caloric density" or "energy density" of foods will give you a guide to the satiety of the food. Eating less energy-dense, high protein snacks (like yogurt) improves appetite control and satiety. The eating of low-energy-dense foods such as fruit, vegetables, whole grains and foods with lots of water added (e.g. soups and stews) will keep you full longer. However it has been demonstrated that liquids with higher calorie content (soda drinks for example) have a weaker effect on satiety and can lead to excess energy intake.

For example a glass of fizzy lemonade will not keep you feeling as full for as long, as the same sized glass of water. Other foods like green vegetables (fibre), whole milk (fat and protein) are considered to have high satiety value too.

The Macronutrients

It has been shown that as well as calorie density, fibre and protein can have an effect on satiety. When you're trying to lose weight by fasting or through portion control, the less that you eat or the longer you postpone eating, the hungrier you become, and the hungrier you are, the more likely it is that you'll overeat. It has been demonstrated that high protein diets provide a tool to promote appetite control, with protein being at the top of the satiety hierarchy. It is still unclear, however, exactly the amount (grams or %) required to promote this. Fibre rich foods have little calorie content, and are thought to affect satiety due to their ability to bulk up foods and with the additional time they take to pass through the gut. Research also shows that hunger decreases and fullness increases following high starch (carbohydrate) servings. The effect of fat though is often disputed in research.

The Glycemic Index

The debate is further complicated by the variability of glycemic responses to carbohydrate intake which also influences satiety signalling. Foods only appear on the Glycemic Index (GI) if they contain carbohydrates. The GI measures, with a scale of 0-100, the impact of carbohydrate containing foods on our blood sugar/glucose levels and the absorption rate of these into the blood. Some studies have shown that lower-glycaemia foods (LG) are more satiating than higher-glycemic (HG) foods. LG foods digest more slowly and therefore keep you fuller for longer, while the carbohydrates contained in HG foods are quickly broken down into glucose, causing blood sugar and insulin levels to rise rapidly. Foods that are high in protein or high in fibre, such as wholegrain bread, pulses, fruit and vegetables, are generally LG foods. Foods that are of similar macronutrient count and calorie values can have quite different GI scores. For example, eating 100gms of plain boiled potato (GI-85 - F1% C94% P5% Cal-86), will satisfy your hunger for a time but eating 100gms of banana (GI-52 F3% C93% P4% Cal-89), will "fill you up" for longer.

Psychology and Physical Aspects of Satiety

Psychology and expectations also plays a role in satiety. It is increasingly recognised that the appraisal of a food before eating, based on its appearance and sensory aspects contributes to appetite control. We often choose food because of past associations - both positive and negative. When eating take note of your food and appreciate how the food looks and smells, and its texture and palatability. This will also help to increase satisfaction with smaller portions. Physical, chew your food for longer and place your eating utensils down between bites. This helps to slow the process of eating and allows the satiating signals to alert the brain sooner. Drinking a glass of water helps too, as often signals are mixed if you have been a habitual eater and you may actually be thirsty rather than hungry.

Putting it all Together

Feeling full can be complicated, listen to your body! During the initial stages of diet change, avoid alcohol and sugar-sweetened sodas as these have been shown to stimulate appetite. Choose a piece of fruit over a handful of raisins - the water and fibre in the fruit will make you feel full longer. High fat food is often smaller in physical size to food that has lesser calories but people tend to believe a small serving of food will not be enough to satisfy their hunger so fill their plate. Then, even after achieving satiety, finish it all! Plan for snacks but restrict these to foods that are high in protein or fibre. Avoid foods with high calorie value. Food that is "whole" take longer to digest and are good for satiation but again limit products that are high in energy. For example there is a difference of 445 cal between 100gms of peanuts (GI-14 - F73% C9% P17% Cal-599) and 100gms of boiled eggs (GI-0 - F64% C3% P33% Cal-154). Both have a very low GI and will keep you full longer, but peanuts are far more calorie dense than eggs!

References for this Guide:

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