

Unit 3.1.1

Appetite, Satiety, and the Sensory Appreciation of Food

Key Knowledge and Key Skills

Key Knowledge

3.1.1

The physiology and conditioning of appetite, satiety, and the sensory appreciation of food.

Key Skill

3.1.1

Explain appetite, satiety, and the sensory appreciation of food.

Key Skill

3.1.8

Apply the healthy eating recommendations of the Australian Dietary Guidelines and Australian Guide to Healthy Eating to the planning of daily food intake and, through practical activities, create nutritious meals to cater for a diverse range of needs.

VCE Food Studies Study Design p. 20 and 21

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Key Terms and Definitions

Appetite is the desire for food.

Conditioning is a behavioural process whereby a response becomes predictable and expected due to increased exposure.

Physiology is the branch of biology that deals with the normal functions of living organisms and their parts, the physical component.

Satiety is the feeling of fullness or satisfaction after eating food.

Sensory appreciation refers to how we use our senses to determine how we feel about a particular food.

Appetite

The two main factors that influence whether we eat are hunger and appetite.

Hunger is an uncomfortable feeling associated with a lack of food. A few hours after last eating, we begin to experience hunger pains caused by an empty stomach contracting. Hunger is a physical response to the body's need for food and cannot be ignored.

In contrast, appetite is defined as the desire for food, even when the body is not hungry. Appetite can be triggered by the sight of appealing food, the aroma of food, or even talking about food. Our eyes, ears, and nose send messages to our brain, which send messages to other body parts that food is available to eat. Our bodies have physiological responses to these messages, including releasing saliva in the mouth, producing a tingling sensation in the pit of our stomachs to encourage us to eat, contracting the stomach, and starting to produce digestive chemicals in the intestinal glands.

The Physiology of Appetite

An important hormone that plays a role in the body's physiological response to appetite is ghrelin. This hormone is an appetite-enhancing hormone. Several organs release this hormone; however, it is mainly secreted by the stomach. People often say that their stomach is growling when they are hungry. This 'growling' occurs because the stomach is producing ghrelin.

Watch this video to discover more about appetite:

<https://youtu.be/IXiG1 OrPS4>



The Conditioning of Appetite

If the image of a chocolate chip cookie makes your mouth water (salivate), you have learned that when you see or smell food like this, you usually get to eat it! This type of learning is called 'conditioning.' Your mouth salivating is a physiological response to appetite and your learned behaviour is a conditioned response.

In the 1920s, a Russian physiologist, Ivan Pavlov, conducted tests on animal digestion. During Pavlov's experiments, he noticed that just seeing the food dish that was used to feed the dogs would cause them to salivate (drool). He wondered why the dogs responded to the dish before seeing the food. Pavlov set up an experiment where he would ring a bell and give the dogs some meat powder. After repeating this a few times, he noted that the dogs salivated as soon as he rang the bell. The dogs had become conditioned to expect food on hearing the bell. This is referred to as conditioning in relation to appetite.

Some people are conditioned to keep eating when they have an appetite and when they are satisfied. Despite experiencing all the physical signs of fullness, people sometimes continue to eat.

Sometimes we might eat cake at a birthday celebration, despite being full, because we have been taught that it is good manners. We might eat when we are stressed or anxious. We may even seek food as a form of comfort. As children, we may have been made to eat all the food on our plate, despite being full, and then being praised. After years of repetition, we become conditioned to eat the food given even if we are satisfied and no longer require food.

Satiety

Once they have eaten, most people feel full and satisfied and their eating behaviour stops. Feeling a sense of fullness in the absence of hunger is called satiety. Like the beginning of eating, satiety (the end of eating) is also regulated by several physiological responses.

As blood glucose levels increase, the pancreas and liver send signals to the brain to tell the person to stop eating. Fat cells release leptin, also known as the 'satiety hormone,' when someone is satisfied. This process can take around 20 minutes and is our body's physical response to feeling full/satiety. The main role of leptin is to suppress appetite and hunger and control energy intake. The more a person eats, the more leptin is released. The more leptin that is released, the more appetite is suppressed. This results in less food being consumed.

Foods that Provide Satiety

The nutrients food contains and how food is processed determine how satisfying it will be, not the amount of kilojoules in the food. Foods that contribute to satiety (filling foods) can delay hunger, help you eat less at the next meal and ultimately help you lose or maintain weight. Filling foods are often high in protein, low in glycaemic index (GI), high in fibre and unprocessed. Foods high in sugar and, to some extent, fat tend to make us feel 'full' for a short period of time; however, relatively soon, we begin feeling hungry again.

Foods High in Protein

Protein is the most filling macronutrient as it may reduce the hormone ghrelin, which activates hunger, and increases the levels of hormones that signal satiety. It is the same in kilojoules per gram compared to carbohydrates. Protein stays in the stomach longer than carbohydrates and for this reason may be more likely to contribute to feelings of fullness.

Lean meats, poultry, legumes and beans, fish and seafood, eggs, dairy foods, nuts, and seeds are all excellent protein sources.

Low GI Foods

Carbohydrates with a low GI value (55 or less) keep you feeling full for longer because they are more slowly digested, absorbed, and metabolised. They cause a lower and slower rise in blood glucose and, usually, insulin levels.

Low GI foods include some high-fibre breads and cereals, pasta, basmati, low GI rice, quinoa, barley, legumes, low-fat dairy products, and some fruit.

Foods High in Fibre

Fibre provides bulk and helps you feel full for longer. Fibre may slow down the emptying of the stomach and increase digestion time.

High amounts of fibre can be found in fruits and vegetables, wholegrain foods, oat bran, barley, seed husks, flaxseed, psyllium, beans, and legumes.

Unprocessed Foods

Whole unprocessed or slightly processed foods are also generally more filling than highly processed foods.

Unprocessed foods include vegetables, grains, legumes, fruits, nuts, meats, seafood, herbs, spices, garlic, eggs, and milk that has undergone very little processing.

Watch this video to discover more about foods that contribute to satiety: <https://youtu.be/80m7sElfNgc>

Watch this video to find out more about low GI foods: <https://youtu.be/xm2T2LXZLtU>

Foods that Do Not Provide Satiety

The amount of kilojoules in a portion of food has little to do with how satisfied or full a food makes a person feel. The way nutrients in the food are digested and utilised by the body influences satiety. While fats still provide some degree of satiation, protein and carbohydrates are better choices for longer-term satiety. In contrast, foods containing high amounts of sugar only stimulate satiety and reduce food intake in the short term.



Foods high in sugar.



Drinks high in sugar.



Highly processed foods.

The Sensory Appreciation of Food

Several studies have investigated how our sensory appreciation of food (how much we like the sensory properties of food) influences our appetite and satiety. The results from these studies suggest that the sensory properties of food play a very important role in how people select their food and how much they eat, and that all five senses, hearing, sight, smell, taste, and touch, contribute to an individual's appetite and satiety.

The Senses

Our senses strongly influence our likes and dislikes, which impacts our sensory appreciation of food. Taste and smell are important sensory properties of food but the look, feel, and even the sound of food can also influence how we feel about it and determine how much we want to eat.

Appearance

Size, shape, colour, temperature, and texture contribute to our first reaction to food. If a food does not look appetising, we will be unlikely to eat it. Appearance is important if we want our food to be enjoyed. We often associate particular colours with certain flavours, for example, when we see a pink food product, we often assume it has a strawberry flavour. Also, the stronger the colour, the more intense we imagine the flavour to be.

Words used to describe food appearance include firm, dry, golden brown, round, flat, colourful, and dull.

Sound

The sounds of food being prepared, cooked, served, and eaten all help influence our preferences and sensory appreciation of food. Hearing the sounds of a meal being cooked and eaten enhances our enjoyment of eating.

Words to describe the sounds include loud, popping, bubbling, spitting, breaking, subtle, sizzling, and crackling.

Texture

When we look, touch, and chew food, we evaluate how it feels. When food is placed in the mouth, the surface of the tongue and other sensitive skin reacts to the feel and texture. This is called mouth-feel. Viscosity can be used to describe texture. Viscosity refers to thickness of a liquid and its resistance to flow.

Words to describe texture include crunchy, brittle, smooth, glossy, thick, thin, and runny.

Aroma/smell

The olfactory receptor cells in the nose detect aromas released from food and send messages about the smells to the brain. The sense of smell works with taste to identify the flavours of food. Aroma and taste work together to produce flavour. Words such as strong or weak can also be used to describe the intensity of food smells.

Words that we associate with food are often used to describe aroma, for example, herby, cheesy, and fishy.

Taste

Taste and smell work in unison and the term we use to describe this is flavour. An adult has around 2000–4000 taste buds on the tongue, mouth walls and at the back of the throat. Taste receptors in the mouth send messages to the brain that a particular flavour has been detected.

The tongue can detect five tastes: bitter, salt, sour, sweet, and umami. Umami is a savoury taste associated with ripe tomatoes, vegemite and cheese.

The taste of food gives us clues about what we are eating and contributes to our eating experience. Food that tastes sour often indicates that it is unripe, salty foods indicate that a food contains minerals like sodium, and bitter foods are often considered poisonous.

Words to describe taste include sweet, mild, spicy, weak, strong, fruity, cheesy, tart, and tangy.

