TOPIC: HUNGER, SATIETY & HORMONES

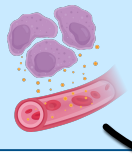
Hunger and Satiety

- **Hunger:** physiological drive to _____.
  - **Appetite:** _____ to eat food – often stimulated by sights and smells.
- **Satiety:** feeling of being _____ → stop eating.

- Body uses _____ measures to determine hunger and satiety.

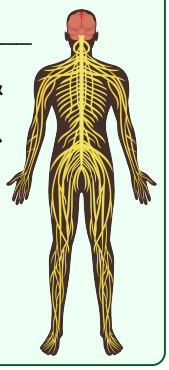
Hormones

- Chemical messengers in the _____.
- Ghrelin, Cholecystokinin, _____, & Leptin.



Nerve Cells

- Detect _____ in the stomach & small intestine → _____ or full.

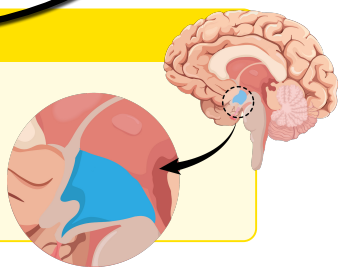


Nutrient Intake

- Nutrients in food can contribute to _____.
- _____ & fiber promote _____.

Hypothalamus

- Region of the _____ that regulates basic functions.
  - Has both a _____ center & a _____ center.
- _____ information & sends signals of hunger or satiety.



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EXAMPLE

For each statement below, determine if it promotes hunger or satiety. If the statement promotes hunger write "H", if the statement promotes satiety write "S", and if it supports both write "B".

Nerve cells detect extension of the stomach: _____

The hormone ghrelin is released when the stomach is empty: _____

Eating a meal high in protein: _____

The hypothalamus integrates incoming sensory information: _____

Nerve cells detect low pressure in the stomach and intestines: _____

PRACTICE

Which of the following statements about hunger and satiety are true?

I) Proteins contribute more to the feeling of satiety than carbohydrates.

II) Hormones contribute to both hunger and satiety signaling.

III) The frontal cortex is the brain region responsible for integrating hunger and satiety signals.

a) I & II. b) II & III. c) I & III. d) I, II, & III.

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Hormones and the Digestive System

◆ **Hormones:** chemical messengers that travel in the blood. Part of the _____ system.

- Released by a _____. → Travels in the _____. → Binds to a receptor in _____ cell.

Regulate Blood _____

◆ **Insulin:** from pancreas → liver to _____ sugar.

◆ **Glucagon:** from pancreas → liver to _____ sugar.

Get the sugar **IN** the liver.

Get the **Glucose Goin**.

Stimulate Hypothalamus _____ **Center**

◆ **Cholecystokinin (_____):** from _____ intestine → gall bladder & pancreas to release fluids.

◆ **Insulin:** from pancreas when blood glucose is ___.

◆ **Leptin:** from fat cells when storing more fat than burning → _____ term intake regulation.

CCK I L your hunger.

Stimulate Hypothalamus _____ **Center**

◆ **Ghrelin:** from stomach when empty.

My stomach is **GREHLIN.**

EXAMPLE

Answer the following questions about hormones and the digestive system.

a) Some hormones that are associated with hunger and satiety are listed below. Put a square around the hormones that trigger hunger and a circle around the hormones for satiety.

Cholecystokinin (CCK) **Insulin** **Ghrelin** **Leptin**

b) Administering leptin was once considered as a potential weight loss treatment. It was later determined, however, that people who are obese tend to already have high leptin levels in their blood. Instead, obese individuals often have leptin insensitivity. If a person was insensitve to leptin, what effect could that potentially have on their likelihood of gaining or losing weight? _____

c) When thinking about hormones, which part of the endocrine signaling system (the gland, the hormone, or the target cell) would not be working properly in the case of leptin insensitivity as described above.

_____

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PRACTICE

Which hormone is the primary hunger hormone released by the stomach?

a) Ghrelin. b) Cholecystokinin (CCK). c) Insulin. d) Leptin.

PRACTICE

Which hormone is released in response to increased blood sugar levels?

a) Ghrelin. b) Cholecystokinin (CCK). c) Insulin. d) Leptin.

PRACTICE

If you have not eaten for several hours, which hormones would you expect to be in relatively high concentrations in your blood?

a) Insulin and cholecystokinin.
b) Glucagon and ghrelin.
c) Glucagon and cholecystokinin.
d) Insulin and ghrelin.