Signals After Supper

Evaluate how hormones contribute to hunger and fullness

HAP.13.6 "Evaluate the role of hormones (i.e., gastrin, leptin, and insulin) in the regulation of hunger and satiety/fullness."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle each hormone's name, underline what it does, and write 1 beside meal-related signals or 2 beside the longer-term stored-energy signal.

Why a Meal Is Not the Whole Story

1. At the first bites of dinner, food entering the stomach stimulates cells in its lining to release gastrin. Gastrin tells the stomach to release acid and helps coordinate movement that mixes food for digestion. Its rise shows that the stomach has received food, but gastrin is not a dependable switch that turns hunger off. A large meal can stretch the stomach, and that stretch can add to a feeling of fullness through nerve signals. If someone says gastrin alone caused that fullness, they have confused a digestion signal with the many signals the brain uses to judge hunger.

2. After a meal containing carbohydrates, digestion sends glucose into the blood. The pancreas responds by releasing insulin, which helps cells take up and store glucose. Insulin also acts as a signal to the brain that energy is available, helping reduce appetite after eating. Its concentration usually rises after a meal and falls between meals, but insulin does not measure how much food remains in the stomach. A person might still want food even when insulin is present because appetite also depends on other signals, habits, and surroundings. No single insulin reading can prove that a person feels full.

3. Leptin provides a different kind of information. Fat cells release leptin, and its level generally reflects the body's stored energy over time. Leptin acts on the brain to reduce hunger when energy stores are sufficient. If body fat falls over weeks of eating too little, leptin usually falls, which can increase hunger. A single dinner does not instantly reset leptin to match that meal. Imagine two people eating similar dinners, but one has recently lost substantial body fat. Both may show a meal-related rise in insulin and gastrin, yet their longer-term leptin signals may differ. Fullness after eating and hunger across weeks need not agree.

2 ANSWER WITH EVIDENCE

Use the passage

1. Someone feels full after a large dinner. Why is a rise in gastrin alone not enough to explain that feeling?

2. A friend says insulin only helps cells use glucose, so it cannot affect appetite. How does the passage challenge this claim?

3. Two people eat similar dinners, but one has lost substantial body fat over several weeks. Why might their hunger differ despite similar meal-related hormone rises?

4. Why can a rise in insulin after dinner not prove that someone feels full? Use two details from the passage.

3 YOUR TURN

Your own words

A classmate claims, "A big dinner switches hunger off for the whole week because gastrin, insulin, and leptin all rise together." Write 4 or 5 sentences evaluating the claim. Describe what each hormone indicates or does, and distinguish meal-related effects from longer-term stored-energy signals.

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PART 1 · READ AND MARK

Circle each hormone's name, underline what it does, and write 1 beside meal-related signals or 2 beside the longer-term stored-energy signal. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Someone feels full after a large dinner. Why is a rise in gastrin alone not enough to explain that feeling?	**Gastrin helps the stomach digest food, but it is not a dependable fullness switch. Stomach stretch can also contribute to fullness through nerve signals.**
2	A friend says insulin only helps cells use glucose, so it cannot affect appetite. How does the passage challenge this claim?	**Insulin helps cells take up and store glucose, and it also signals to the brain that energy is available, helping reduce appetite after eating.**
3	Two people eat similar dinners, but one has lost substantial body fat over several weeks. Why might their hunger differ despite similar meal-related hormone rises?	**The person who lost body fat may have lower leptin, which can increase hunger even if both people have meal-related rises in gastrin and insulin.**
4	Why can a rise in insulin after dinner not prove that someone feels full? Use two details from the passage.	**Insulin signals that energy is available, but it does not measure how much food remains in the stomach. Appetite also depends on other signals, habits, and surroundings.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A big dinner does not switch hunger off for a week. Gastrin rises when food enters the stomach and helps with digestion, but it is not a dependable fullness switch. Insulin often rises after a meal and can help reduce appetite by signaling that energy is available. Leptin generally reflects stored energy over time, so one dinner does not instantly reset its level. These signals work on different timescales and cannot guarantee how long someone will feel full.

Accept answers that distinguish gastrin's digestive role, insulin's meal-related appetite signal, and leptin's longer-term link to stored energy. Do not accept claims that any one hormone guarantees fullness.