

WHY FIVE MEALS IN WEIGHT LOSS DIETS?

INTRODUCTION

Satiety is regulated by several hormones, some of them are implicated in the regulation of gastrointestinal motility, whereas another modulate energy balance. Hence, these hormones ultimately play a role in body weight regulation. The regulation of gastrointestinal motility is mainly produced by two types of mechanisms: mechanical (distension of the stomach) and hormonal. Those are described in this paper focus on signals coming from the stomach, duodenum and distal small intestine. Metabolism also influences in the regulation of eating and body weight by two hormones called adiposity: leptin and insulin.

OBJECTIVES

The main objective is to explain the benefits of doing 5 meals a day, as recommended in slimming diets. To explain clearly and concisely which is the impact of a diets including 5 meals, this paper is focused on the following points:

- Describe the impact on satiety of several mechanisms involved in the regulation of gastrointestinal motility.
- Describe the involvement of insulin and leptin in the regulation of satiety.
- Explain how the issues discussed in the previous points affect the control of body weight.

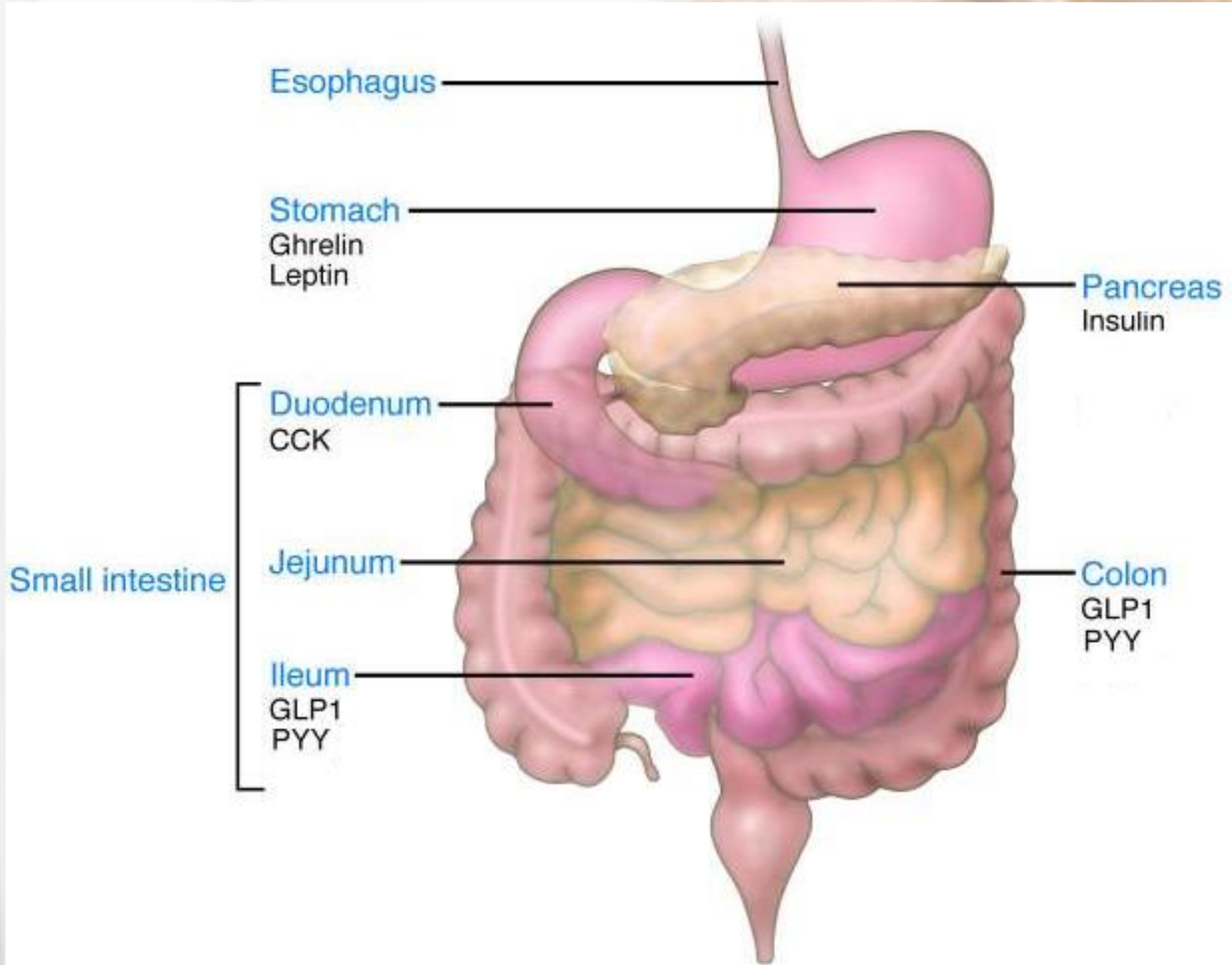
REGULATION OF GASTROINTESTINAL MOTILITY AND ITS INVOLVEMENT IN SATIETY

Hormone	Where is synthesized	Functions
Ghrelin	Fundus of the stomach and other parts of the gastrointestinal tract	Increases food intake, gastrointestinal motility and decreases insulin secretion
Cholecystikin (CCK)	Mucosa of the small intestine when the long-chain fatty acids and proteins reach the duodenum	Reduces intake, enhances the motility of the gallbladder to expel bile into the small intestine, where it plays an important mission in the fat emulsion, inhibits contraction and delays gastric emptying of the stomach.
Glucagon-like peptide-1 (GLP-1)	Distal small intestine	Regulates blood sugar, stimulates insulin gene expression, attenuates blood sugar, inhibits hepatic glucose production and stimulates glucose uptake in both adipose tissue and muscle. Reduces fatty acids and postprandial concentrations of triglycerides, slows gastric emptying, acid secretion, and food intake
Peptide tyrosine tyrosine (PYY)	Distal small intestine. Ingested fats are a strong stimulus for the release of PYY	Inhibits sensations of appetite and food intake.

REGULATION OF SATIETY

Insulin: controls glucose levels in blood. Glucose and serotonin are able to regulate their release. Metabolic and endocrine factors along with nerve signals control insulin production in the pancreas and its secretion, and have a direct impact on circulating levels of insulin and its transport to the brain.

Leptin: Its normal production and action are critical to maintain balance of power. Insulin is the main regulator of leptin production by adipose tissue. Decreases circulating leptin during energy restriction and is related to increased hunger in humans. Therefore, decreasing dietary intake during weight loss can contribute to the strong tendency to weight recovery.



Picture 1: Adapted from Cummings & Overduin, 2007

CONCLUSIONS

Divide food into five meals a day in small amounts and frequently, helps the body maintain optimal energy levels, preventing downloads of glucose throughout the day. This way of eating helps digestion and regulates appetite feeling less hungry to get to the main meals and avoid eating more. Furthermore, these meals should include especially long-chain fatty acids, to promote the release of CCK and PYY, GLP1 and the latter are mediators ileal brake. GLP-1 also enhances insulin secretion, which together with the above factors mean that there is an increased feeling of satiety.