

Hormone Functions and Alterations in Obesity and/or During Weight Loss and Maintenance¹⁻⁵

Hormone	Source	Normal function	Alteration in Obesity and/or During Weight Loss and Maintenance
Amylin	Pancreas	Affects glucose homeostasis and gastric motility; promotes satiety	<ul style="list-style-type: none"> Decreased levels with weight loss and maintenance (past one year)
Cholecystokinin	Duodenum	Suppresses appetite; affects gastrointestinal motility; stimulates the gallbladder to secrete bile to aid in the digestion of fats	<ul style="list-style-type: none"> Postprandial levels lower and slower in individuals with obesity Decreased levels during calorie restriction and weight loss (past one year)
Glucose-dependent insulinotropic polypeptide	Duodenum, jejunum	Stimulates insulin secretion, particularly following carbohydrate ingestion; stimulates glucagon secretion	<ul style="list-style-type: none"> Increased levels during calorie restriction and weight loss
Ghrelin	Gastric fundus	Stimulates appetite, particularly for high-fat, high-sugar foods	<ul style="list-style-type: none"> Altered compensatory response in individuals with obesity Increased levels during calorie restriction, weight loss, and maintenance (past one year)
Glucagon-like peptide 1	Ileum, hindbrain (very small amount)	Suppresses appetite; increases satiety; delays gastric emptying; stimulates glucose-dependent insulin secretion	<ul style="list-style-type: none"> Decreased function in individuals with obesity, pre-diabetes, or diabetes. Decreased during weight loss
Insulin	Pancreas	Regulates glucose levels and energy balance; signals satiety to brain; promotes lipogenesis and inhibits lipolysis	<ul style="list-style-type: none"> Reduced sensitivity in persons with obesity Decreased meal-stimulated levels during weight loss and maintenance (past one year)
Leptin	Adipocytes	Regulates energy balance; suppresses appetite; informs the brain about fat stores	<ul style="list-style-type: none"> Decreased levels during active treatment of obesity (weight loss), which remain decreased with maintenance (past one year)
Peptide YY	Distal small intestine	Regulates satiety; delays gastric emptying	<ul style="list-style-type: none"> Decreased levels in individuals with obesity and during weight loss and maintenance (past one year)

1. Adamska E, et al. *Prz Gastroenterol.* 2014;9(2):69-76. 2. Sumithran P, et al. *Clin Sci.* 2013;124(4):231-241. 3. Sumithran P, et al. *N Engl J Med.* 2011;365(17):1597-1604. 4. Okonkwo O, et al. Biochemistry, cholecystokinin. Updated 2023 May 1. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024. Accessed May, 9, 2024. <https://www.ncbi.nlm.nih.gov/books/NBK534204/> 5. Santoro A, et al. *Cell Metab.* 2021;33(4):748-757.

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