

Tool: Roundup of Biological Theories

What are the five main biological theories of eating and why don't they work? Reference this table as a reminder.

Gastric Theory	Glucose Theory	Glucose Utilization Theory	Central Theories	Set-Point Theory
<p>Claim Eating behavior is regulated by how full or empty the stomach is.</p> <p><i>Empty stomach = eat</i> <i>Full stomach = stop eating</i></p>	<p>Claim Eating behavior is regulated by how high or low blood glucose level is.</p> <p><i>Low glucose = eat</i> <i>High glucose = stop eating</i></p>	<p>Claim Eating behavior is regulated by how much glucose is currently being used to produce energy.</p> <p><i>Low glucose utilization = eat</i> <i>High glucose utilization = stop eating</i></p>	<p>Claim Eating behavior is regulated by stimulating two structures in the hypothalamus: the LH, which is correlated with hunger, and VMH, which is correlated with satiety.</p> <p><i>Stimulate the LH = eat</i> <i>Stimulate the VMH = stop eating</i></p>	<p>Claim Hypothalamus works to maintain body weight at a genetically coded "set point."</p> <p><i>Body fat content below set point = eat more</i> <i>Body fat content above set point = eat less</i></p>
<p>Problem Humans do a poor job of accurately estimating how full their stomachs are.</p>	<p>Problem Doesn't account for diabetics, who have high blood glucose and still feel hunger.</p>	<p>Problem The parasympathetic nervous system stimulates insulin production, which increases the utilization of glucose before eating even begins.</p>	<p>Problem Kennedy's research proves that rats with lesioned VMHs neither eat themselves to death nor return to their previous body weight—suggesting that brain structures are not the final determinant of eating behavior.</p>	<p>Problem The hypothalamus needs some way to read how close body weight is to the set range. So far, no bodily substance has been proven to be this link.</p>
<p>General evidence against biological theories</p> <ul style="list-style-type: none"> • Caloric intake and expenditure are constant in the long term, so body weight maintenance can be explained mathematically. • When skipping meals or fasting, people do not make up the full amount of missed calories in the next meal, which you would expect if the body were keeping track. • No single neurochemical has been found that is related to only eating behavior. • Alternate explanations exist for why stimulating/lesioning hypothalamic structures can induce or inhibit eating behavior. • Studies with identical twins show that the genetic determinant of body weight is only about 50%. 				