



- **Generally, we have 2 ways to regulate our food intake:**
  - **Homeostatic regulation:** which aims to store energy present in food as fat storage in the body.
  - **Hedonic regulation:** which is related to the reward system (e.g. sometimes you go to the restaurant with your wife to enjoy your time and feel good not only to store energy or because you are hungry).
- **Homeostatic regulation: it is receiving signals from the following:**
  - **Digestive system:** ghrelin, CCK and PYY.
  - **Adipose tissue:** leptin.
  - **Pancreas:** insulin.  
Notice that most of these substances are inhibiting food intake (anorexigenic) except for ghrelin which signals hunger (orexigenic). The target of these substances is arcuate nucleus.
- **Hedonic regulation:**
  - Reward signals from VTA will secrete dopamine to nucleus accumbans.
- **Corticotropine-releasing factor (CRF) results in suppression of spontaneous feeding responses demonstrating its anorexigenic properties.**
  - Notice that high serum cortisone has a negative feedback on CRF → leading to obesity.
- **Hypothalamus: it is the regulator of the internal environment in our body (homeostasis)**
  - **Hypothalamus regulates feeding through:**
    - ✓ Lateral hypothalamus: which is stimulating hunger/food intake.
    - ✓ Ventromedial nucleus of hypothalamus: responsible for satiety (inhibiting food intake)
  - Notes:**
    - ❖ These areas are receiving neural afferents from the GI tract.
    - ❖ Lesion of the ventromedial nucleus of hypothalamus will result in obesity.
    - ❖ Lesion of the lateral hypothalamus will result in weight loss (anorexia).
- **Stretching of the stomach wall by food will inhibit feeding.**
- **Short-term regulation of food intake:**
  - GI filling.
  - CCK (secretion of which is stimulated by the presence of fat in the duodenum), PYY (secreted by the ileum and colon and reduces appetite), glucagon and insulin (secretion of which is stimulated by the presence of food in the stomach).
  - Oral receptors.
  - Ghrelin.
- **Intermediate-term regulation of food intake:**
  - Blood concentration of glucose, amino acids and fatty acids.
  - **Body temperature:**
    - ✓ Cold: stimulates feeding.
    - ✓ Warmth: inhibits feeding.
- **Long-term regulation of food intake:**
  - **Leptin which is secreted by fat tissues appears to be the overall satiety signal:**
    - ✓ Acts on arcuate nucleus to suppress NPY production (which is a potent appetite stimulant).
    - ✓ Increases the metabolic rate by stimulating the sympathetic nervous system.  
**Note:** obesity is probably due to absence of appropriate response to leptin (defects in receptors) rather than leptin deficiency.
- **Other factors include:**
  - **Orexin:** which is synthesized in lateral hypothalamus and increases appetite.
  - **Amphetamine** suppresses appetite by releasing norepinephrine (NE) in CNS.
  - **Serotonin** suppresses feeding