



7. Regulation of long-term energy stores

- A. The issue of balance
- B. Leptin regulates adipose homeostasis
- C. Other players
 - 1) *Insulin*
 - 2) *Ghrelin*
- D. Hypothalamic integration

Brave new world of endocrinology

- Traditional view of energy homeostasis
 - Short term: Carbohydrates regulated by insulin
 - Long term: TAGs in adipose tissue regulated by caloric input vs output
- Current view
 - Insulin & other hormones reflect long-term status of energy stores
 - Adipose stores
 - Regulating through interactions with CNS
 - Hormones from adipose, GI, pancreas & likely other tissues
 - Insulin is key

Long-term regulation is (*was*) necessary

- Modern humans (in the developed world)
 - Food
 - Caloric intake is constant
 - Abundance is the rule
 - Very recent situation
- Humans are 250,000 years old
 - Caloric intake inconsistent
 - Famine common
- Unpredictable energy demands
 - Development
 - Reproduction
 - Environment

Survival depended on balancing caloric intake with long term energy demands despite long term unknowns