Chapter 22. Endothermy

Balancing heat production with heat loss
- Production
  - Specific dynamic effect of food (digestion)
  - Skeletal muscle heat (shivering)
  - Brown fat
- Heat loss – usually above environment
  - Insulation
  - Behavioral heat loss

Temperature Regulation
- Zone of Tolerance (can regulate temp)
  - Thermoneutral zone (TNZ)
  - Lower and upper critical temps
    - Metabolic heat production/ evaporative cooling
  - Lower and upper lethal temps
    - Hypothermia and hyperthermia (lethal)
- Benefits – extended active range
- Costs – energy
  - Limits distribution – see bats

Specializations
- Arctic Endotherms
  - Lower LCT
  - Better insulation
  - Lower UCT
- Migration
  - Whales, hummingbirds
- Torpor – body size correlates
  - Deep torpor vs. daily torpor

Desert environments
- Body size and thermal inertia
  - Relaxation of homeostasis (camels)
- Behavioral thermoregulation
- Mammalian kidneys (water conservation)