BI3101 EKOLOGI Semester I 2016/17:

***Handout* Kuliah Minggu 4 – EKOLOGI INDIVIDU**

Pokok Bahasan Kuliah:

HUBUNGAN ORGANISME DAN SUHU

- Habitat mikro
- Faktor-faktor penting yang menentukan habitat mikro
- Suhu tubuh hewan: istilah *endotherm, ectotherm*, homeotherm, poikilotherm
- Heterotherm: istilah torpor, hibernasi, aestivasi

HUBUNGAN ORGANISME DAN AIR

- Gradien konsentrasi dan ketersediaan air bagi hewan dan tumbuhan (*review* fisiologi)
- Keseimbangan air pada organisme: contoh-contoh

HUBUNGAN ORGANISME DAN ENERGI/NUTRIEN

- Biologi trofik (makan-memakan): autotrof dan heterotrof
- Istilah fotosintetik, kemosintetik, herbivora, karnivora, detritivore
- Contoh pertahanan mangsa: pewarnaan aposematik, *Műllerian mimicry, Batesian mimicry*
- *Functional response* I, II dan III

Sumber ilustrasi:

- Molles, M.C.Jr. 2013. Ecology: concepts and applications. 7th. Edition (atau edisi lainnya). McGraw-Hill, New York. Dari 4th edition (2008): **Gambar 5.3; 6.4; 6.5; 6.7; 6.20; 7.20; 7.22**
- Stiling, P. 2012. Ecology: global insights and investigations. McGraw-Hill, New York: **Gambar 5.2**
- www.colby.edu/biology/BI271/Lectures/TempRelations.ppt

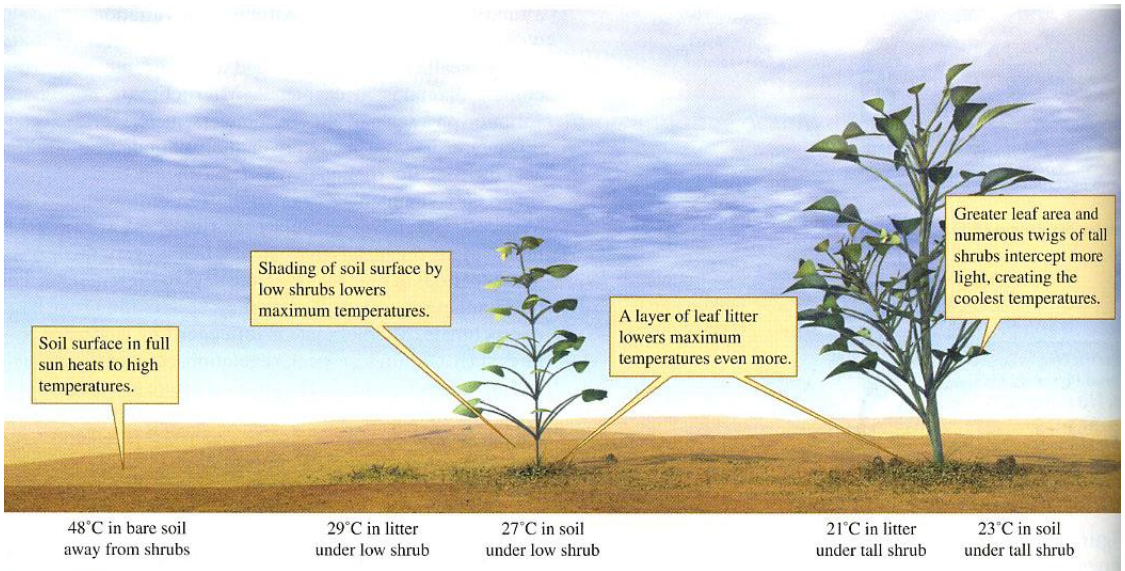
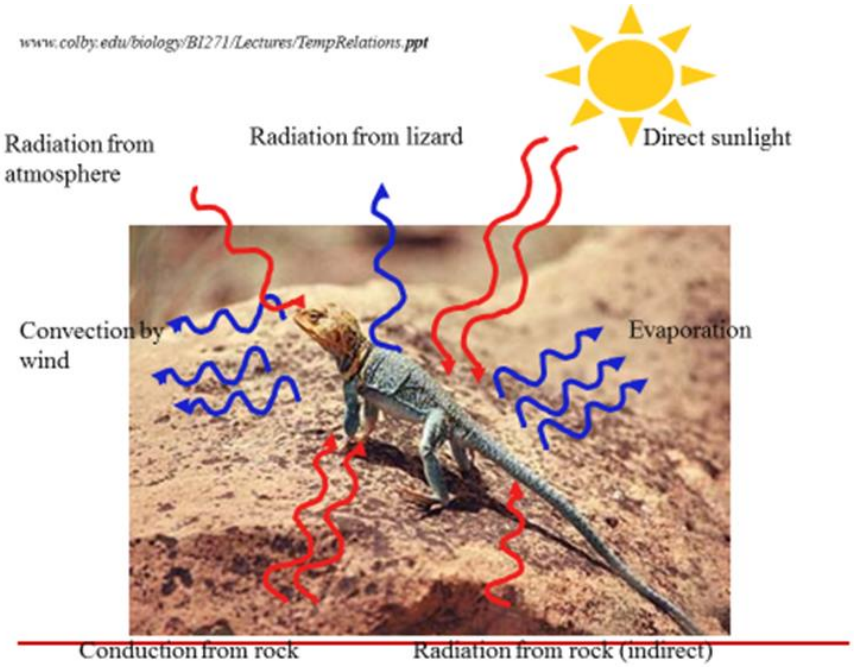
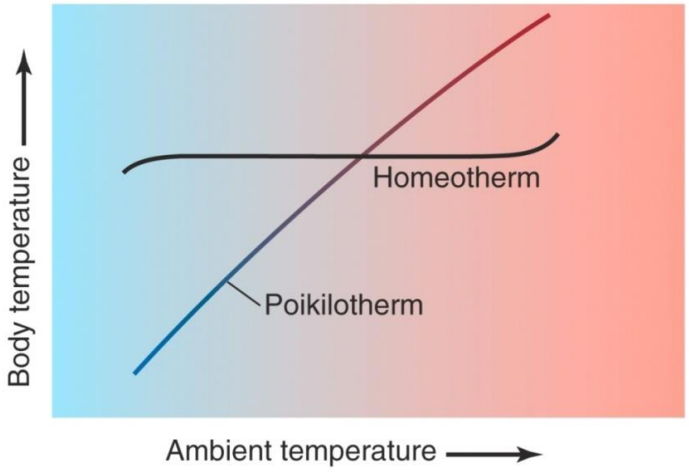


Figure 4.3 Desert shrubs create distinctive thermal microclimates in the desert landscape (data from Parmenter, Parmenter, and Cheney 1989).





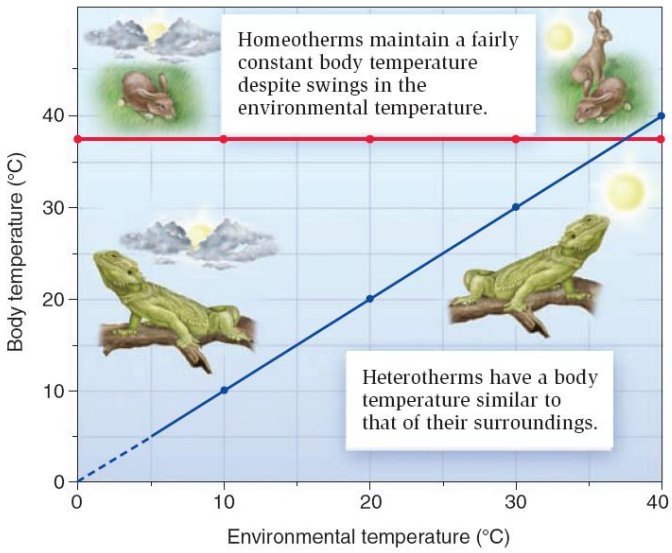
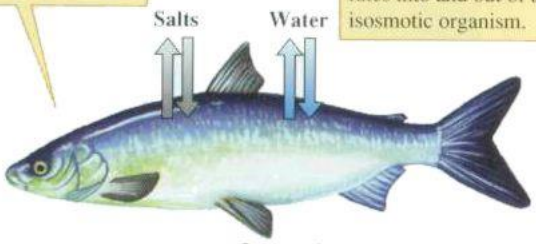


Figure 5.2 **Body temperature of homeotherms and heterotherms in different environmental conditions.** Homeotherms maintain stable body temperatures across a range of environmental temperatures, whereas the body temperature of heterotherms varies with the external temperature.

In an isosmotic aquatic organism, internal concentrations of water and salt equal their concentrations in the environment.

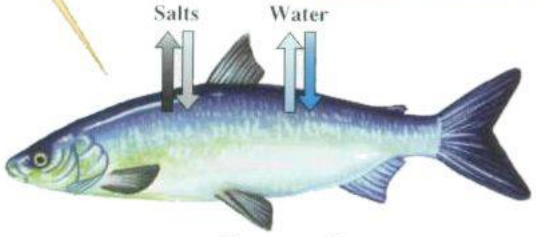
Salts and water diffuse at approximately equal rates into and out of an isosmotic organism.



Isosmotic

Compared to the environment, a hyperosmotic aquatic organism has a lower internal concentration of water and a higher internal concentration of salts.

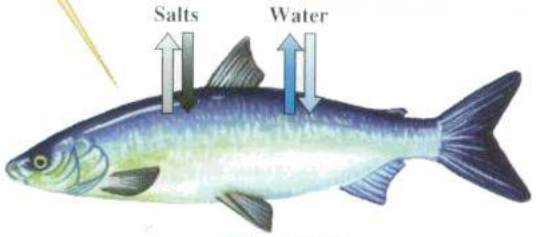
Salts diffuse out of a hyperosmotic organism at a higher rate, while water diffuses in at a higher rate.



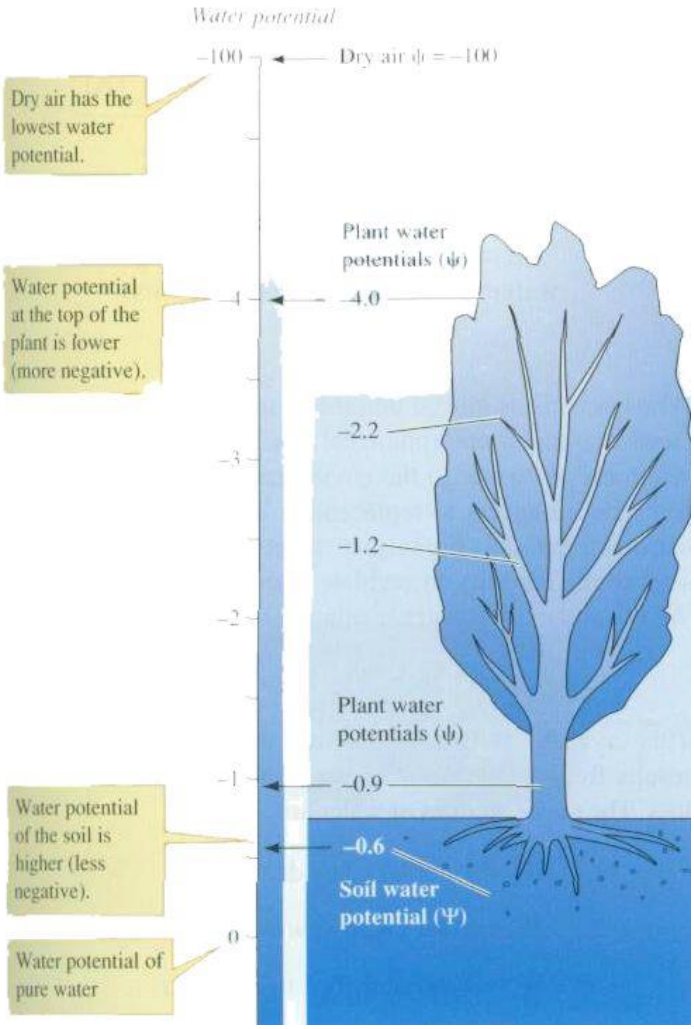
Hyperosmotic

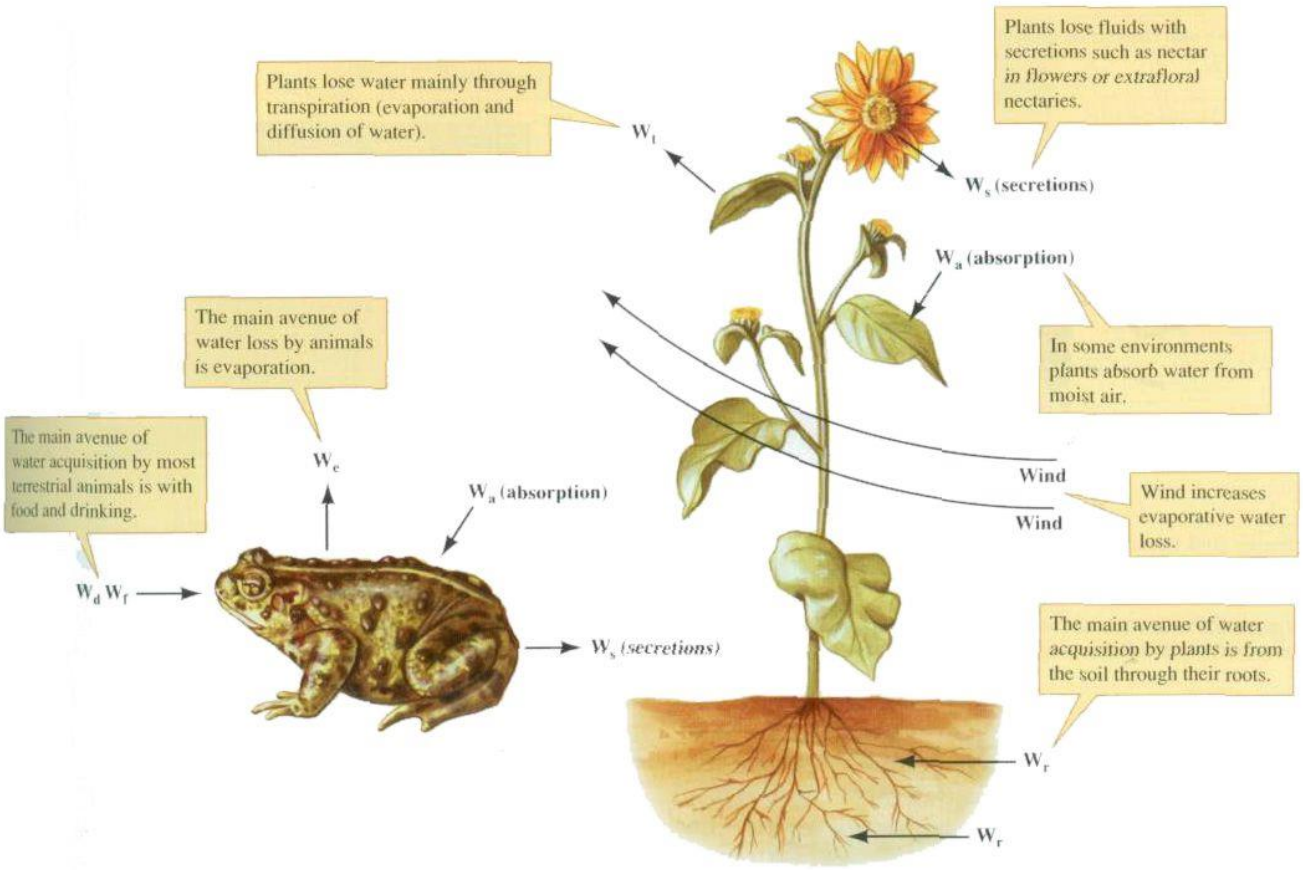
Compared to the environment, a hypoosmotic aquatic organism has a higher internal concentration of water and a lower internal concentration of salts.

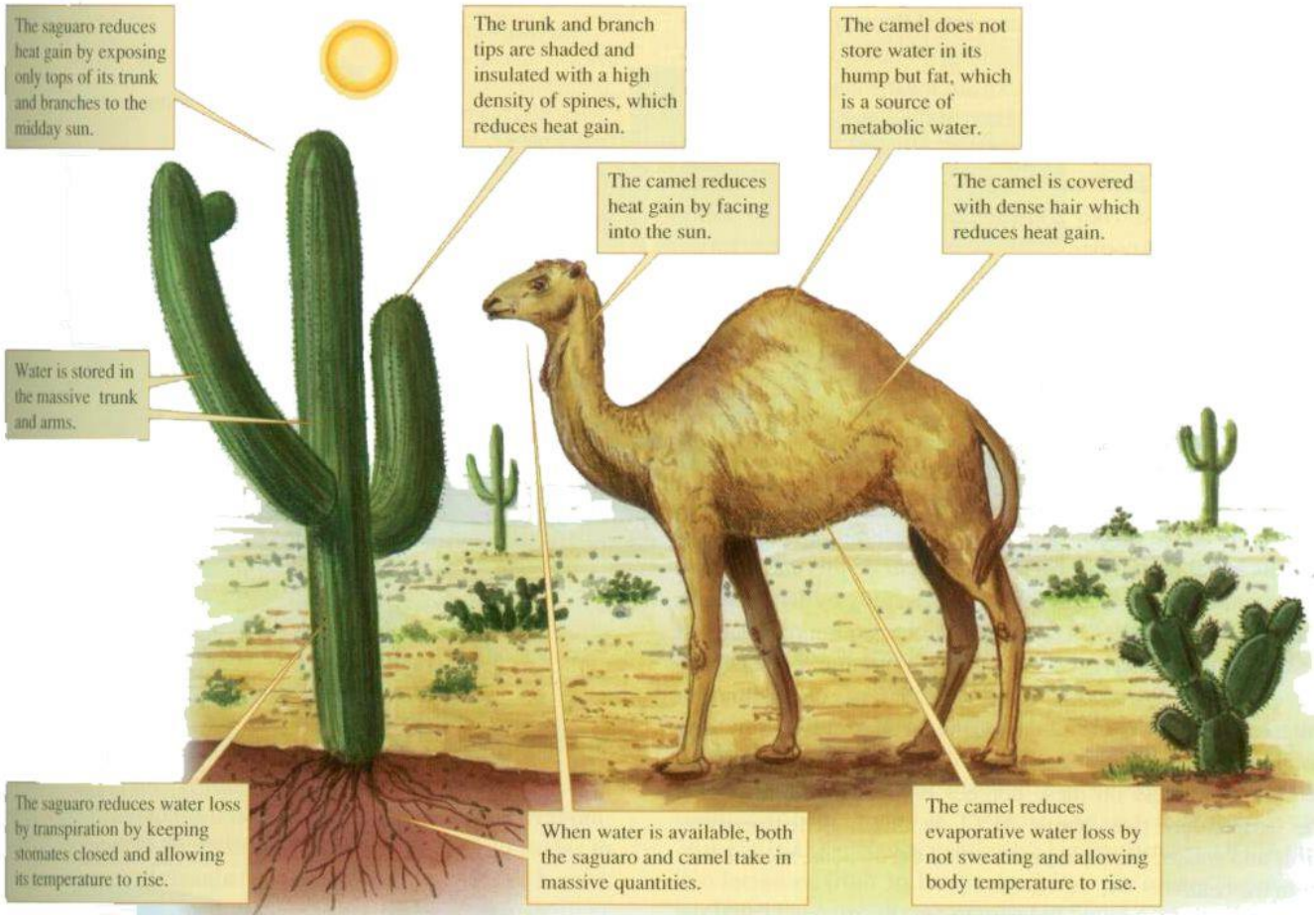
Salts diffuse into a hypoosmotic organism at a higher rate, while water diffuses out at a higher rate.



Hypoosmotic




Plants lose water mainly through transpiration (evaporation and diffusion of water).
W_t
Plants lose fluids with secretions such as nectar in flowers or extrafloral nectaries.
W_s (secretions)
W_a (absorption)
In some environments plants absorb water from moist air.
Wind
Wind
Wind increases evaporative water loss.
The main avenue of water acquisition by most terrestrial animals is with food and drinking.
W_d W_f
The main avenue of water loss by animals is evaporation.
W_e
W_a (absorption)
W_s (secretions)
The main avenue of water acquisition by plants is from the soil through their roots.
W_r
W_r


The saguaro reduces heat gain by exposing only tops of its trunk and branches to the midday sun.
The trunk and branch tips are shaded and insulated with a high density of spines, which reduces heat gain.
The camel does not store water in its hump but fat, which is a source of metabolic water.
The camel reduces heat gain by facing into the sun.
The camel is covered with dense hair which reduces heat gain.
Water is stored in the massive trunk and arms.
The saguaro reduces water loss by transpiration by keeping stomates closed and allowing its temperature to rise.
When water is available, both the saguaro and camel take in massive quantities.
The camel reduces evaporative water loss by not sweating and allowing body temperature to rise.

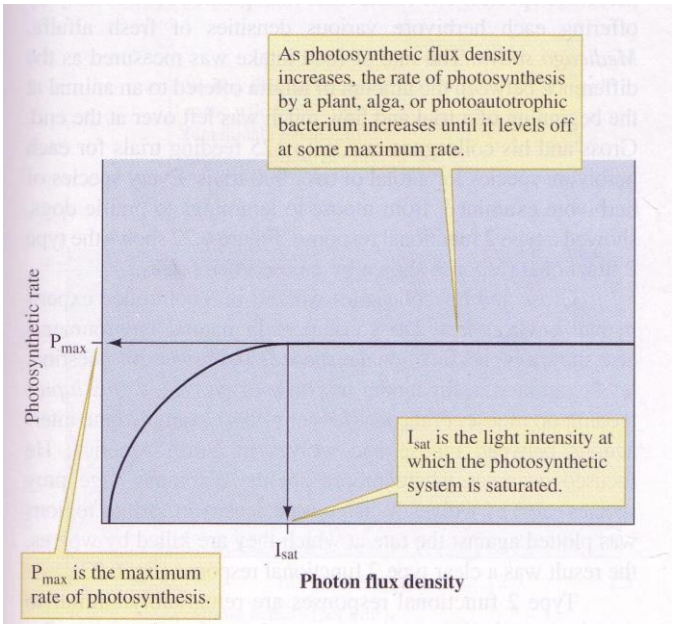


FIGURE 6.19 *A theoretical photosynthetic response curve.*

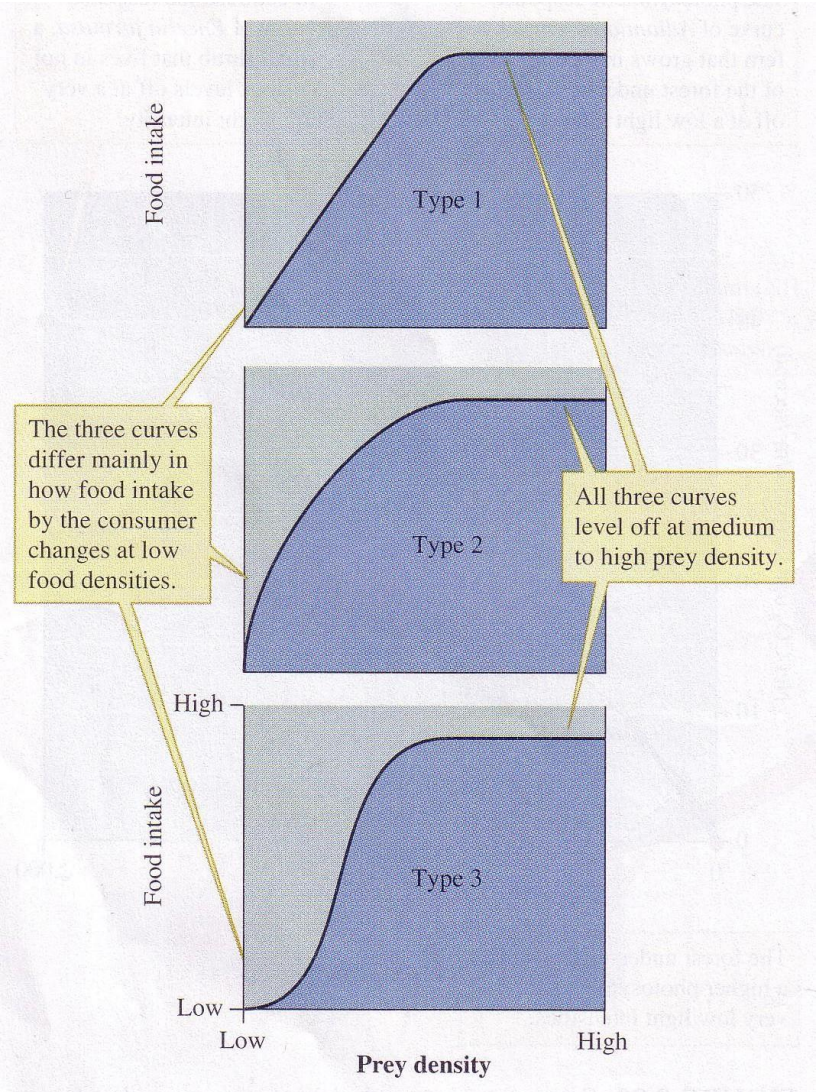


FIGURE 6.21 *Three theoretical functional response curves.*