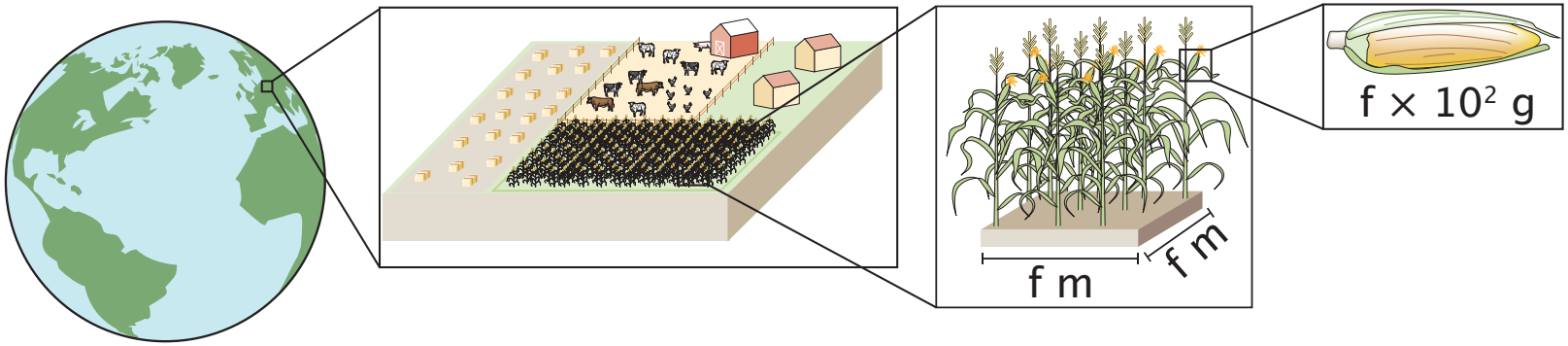
ESTIMATING AGRICULTURAL LAND AREA



consumed plant mass, $m_{plant} \approx \frac{f \times 10^2\ kg}{person \times year}$

edible mass aereal density, $\rho_{plant} \approx \frac{1\ kg}{f\ m^2 \times year}$ assuming one-year growing season

→ cropland per capita, $A_{crop} \approx \frac{m_{plant}}{\rho_{plant}} \approx \frac{f \times 10^2\ kg}{person \times year} \times \frac{f\ m^2 \times year}{1\ kg} \approx \frac{10^3\ m^2}{person}$

→ pasture land area, $A_{past.} \approx f \times A_{crop} \approx \frac{f \times 10^3\ m^2}{person}$

total agricultural land area, $A_{agr.} \approx N_{pop} \times (A_{past.} + A_{crop}) \approx 10^{10}\ people \times \frac{f \times 10^3\ m^2}{person}$

$\approx f \times 10^{13}\ m^2 \approx f \times 10^7\ km^2$