(A)

ESTIMATE OF GLOBAL PRODUCTION

estimated global dairy production

$E_{dairy} \approx 0.1 \cdot E_{day} \approx 200 \text{ kcal} \cdot \text{day}^{-1}$

$\rho_{dairy} \approx ½ \text{ kcal} \cdot \text{g}^{-1}$

$$m_{dairy} \approx \frac{200 \text{ kcal}}{\text{day} \cdot \text{person}} \cdot \frac{1 \text{ kg}}{500 \text{ kcal}} \cdot \frac{365 \text{ days}}{1 \text{ year}} \cdot \frac{7 \cdot 10^9 \text{ people}}{\text{planet}}$$

$\sim 10^{12} \text{ kg} \cdot \text{year}^{-1} \sim 1000 \text{ Mt} \cdot \text{year}^{-1}$

estimated global beef production

$E_{beef} \approx 0.1 \cdot E_{day} \approx 200 \text{ kcal} \cdot \text{day}^{-1}$

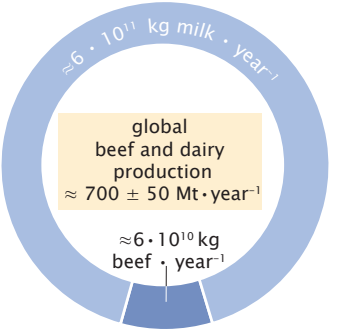
$\rho_{beef} \approx 3 \text{ kcal} \cdot \text{g}^{-1}$

$$m_{dairy} \approx \frac{200 \text{ kcal}}{\text{day} \cdot \text{person}} \cdot \frac{1 \text{ kg}}{3000 \text{ kcal}} \cdot \frac{365 \text{ days}}{1 \text{ year}} \cdot \frac{7 \cdot 10^9 \text{ people}}{\text{planet}}$$

$\sim 10^{11} \text{ kg} \cdot \text{year}^{-1} \sim 100 \text{ Mt} \cdot \text{year}^{-1}$

AGGREGATED DATA

data source: FAOSTAT (2010–2018)
mean ± std



(B)

ESTIMATE OF GLOBAL PROCCESSING

total global dairy cattle population (milked)

$m_{dairy} \sim 10^{12} \text{ kg} \cdot \text{year}^{-1}$

$$V_{milk\ production} \approx \frac{30 \text{ kg}}{\text{day}} \cdot \frac{300 \text{ lactation days}}{\text{cow}} \approx 10^4 \frac{\text{kg milk}}{\text{cow}}$$

$$N_{cattle}^{(dairy)} \approx \frac{10^{12} \text{ kg}}{\text{year}} \cdot \frac{1 \text{ cow}}{10^4 \text{ kg}} \sim 10^8 \text{ dairy cattle} \cdot \text{year}^{-1}$$

total global beef cattle population (slaughtered)

$m_{beef} \sim 10^{11} \text{ kg} \cdot \text{year}^{-1}$

$m_{edible} \approx 500 \text{ kg} \cdot \text{cow}^{-1}$

$$N_{cattle}^{(beef)} \approx \frac{10^{11} \text{ kg}}{\text{year}} \cdot \frac{1 \text{ cow}}{500 \text{ kg}} \sim 10^8 \text{ beef cattle} \cdot \text{year}^{-1}$$

AGGREGATED DATA

data source: FAOSTAT (2010–2018)
mean ± std