



## Option D – data-based questions

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- a) Africa (4.00 YLD/1000);

b) all-round malnutrition due to drought and food shortages; land unsuitable to support dairy farming; farming meat may be too expensive;
- a) Africa = 4.00 YLD/1000 (+/-0.05), W. Europe = 0.10 YLD/1000 (+/-0.05);  
% difference =  $4.00/0.10 * 100 = 4000\%$  difference;

b) increased food aid; supplies of milk; supplementation; financial aid for farming; reduce western demand for meat, which would lead to less pressure on land;
- a) in all regions except Africa, there was a decrease in YLD/1000 between 1990 and 2000;

b) biggest improvement in S. & C. America;

c) possibly due to imported food products from the USA; increased economic stability; increase in agricultural production; 4 as the population grows, more demand is put on food supplies; possible reversal of the trend (or worsening) in Africa, China & E. Asia as demand outstrips supply; expect continued improvement in developed nations, though difference may be less apparent;

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- a) left ventricle  $\frac{38 - 47}{47} = 19\%$  decrease;

b)  $\frac{8 - 9}{9} = 11\%$  decrease;

c)  $\frac{26 - 29}{29} = 10\%$  decrease;

d)  $\frac{21 - 27}{27} = 22\%$  decrease;
- the base of the aorta;
- lower stroke volume; tiredness/lethargy/abnormal heart beat because of transmission of signal through aorta;

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- a) microvilli;

b) site of absorption; structure maximizes surface area to volume ratio;

c)  $\frac{20 \text{ mm image}}{0.85 \text{ mm}} = 23.5 \times$  magnification;
- a) purple structures;

b) to provide ATP for active transport;
- a) endocytosis;

b) lipids;
- a) tight junction;

b) to hold tissues together/prevent passage of materials;

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- 50%;
- digestible matter increases mean residence time; reduced fibre reduces transit rate and extra water is reabsorbed in the colon;

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- as the rate of bile salt secretion goes up, the rate of flow of bile increases;
  - bile salts draw water into the narrow canaliculi (by osmosis) and this increase the flow rate;
- after the consumption of a meal containing fat;
- secretin causes an increase in the rate of bile flow; at all rates of bile salt release/increase caused is uniform; 4 when concentration of bile salt is zero, there is still flow of bile, indicating something else was drawing water into the tubes;

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- as percent triglycerides increases, density goes down;
  - as percent protein increases, density increases;
  - as percent cholesterol increases, density increases;
- the % cholesterol is very similar in both;
- because LDL contain higher levels of cholesterol which can contribute to plaque formation;

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- 89 beats  $\text{min}^{-1}$ ;
- $\frac{83 - 89}{89} \times 100\% = 6.7\%$  decline;
- decline is small/data is variable; experiment limited: face or total exposure might have a more profound reduction/greater time of exposure might have an effect; data is inconclusive;

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- $\frac{25}{10000}$ ;
- as both increase, death rates increase; increases in systolic blood pressure have a larger effect;
- $160 - 70 = 90$  mm Hg;
- difference appears to be important only at very high systolic rates;

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- high cholesterol rates in young people is correlated with high cholesterol rates in adults;
- it increases/for every pair, adult level is higher;
- in four states, the maximum is exceeded; in a number of other states, the mean is quite close to the maximum; suggests high rates of CHD in Mexico are likely.