

# Deacon's Challenge

## No. 23 Answer

A five day faecal fat collection was homogenised and diluted to 1500 mL. A 10 mL aliquot of the homogenate was subjected to hydrolysis and the fatty acids were extracted. The volume of 0.05 M sodium hydroxide required to effect neutralisation was 22 mL.

Calculate the fat excretion in mmol/24h.

MRCPPath, May 1995

Since 22 mL of alkali are required to titrate 10 mL of extract

$$\frac{22}{10} \text{ mL} = 2.2 \text{ mL will be needed to titrate 1 mL}$$

Since the total volume of extract is 1500 mL then  $2.2 \times 1500 = 3300 \text{ mL (3.30 L)}$  are needed to titrate all of the extract.

The number of moles of fatty acid in the extract is equal to the number of moles of NaOH required to titrate the entire extract and is obtained by multiplying the total volume of NaOH (in litres) by its concentration (in mol/L):

$$\text{NaOH consumed (= total fatty acids)} = 3.30 \times 0.05 = 0.165 \text{ mol}$$

This was excreted over 5 days. Divide by 5 (to obtain the excretion in 24h ) and multiply by 1000 to convert to mmol:

$$\text{Fatty acid excretion} = 0.165 \times \frac{1000}{5} = 33 \text{ mmol/24h}$$

Assuming that fat was originally present as triglyceride this value should be divided by 3 (hydrolysis of 1 mol of triglyceride yields 3 mol fatty acid):

$$\text{Fat (triglyceride) excretion} = \frac{33}{3} = 11 \text{ mmol/24h}$$

## Question No. 24

In a random sample of 100 pathology request cards, 36 were found to have an error associated with either their name or date of birth.

What is the probability that more than 42% of pathology request cards have such errors?

MRCPPath, May 2002