

Problem solving activities: body composition and health

Imagine you are working as a nutritionist at a sports centre. The general public who attend the centre would expect you to know about body composition, exercise and health. Have a read through the following questions and write down your answers. Each answer should be no more than 10 lines.

1. The manager comes to ask your advice on what equipment to buy to set up a new body composition suite. What two pieces of equipment would you suggest he should purchase and why?
2. You have a new client to assess.

His weight is 98.4 kg and his height is 1.75 and he wants to know if he should lose weight. You should assess whether he was the correct weight for height, using the body mass index calculation [BMI = wt (kg) / h (m²)]. What is his BMI and what would be your advice to him?

His blood pressure is 155 (diastolic) /100 (systolic). Is this within the normal range?

You ask this new client to tell you what he eats in a day. His menu is as follows:

Breakfast:	Bacon roll, orange juice
Lunch:	Kit-kat, packet of crisps, can of cola and a cheese sandwich.
Dinner:	Chicken curry with fried rice, 3 jaffa cakes, glass of wine

What nutrients might be lacking in his diet?

Suggest 3 changes he could make to improve his diet

3. You have a 30 year old female client who has recently broken her arm when ski-ing. She is worried that she might be at risk of osteoporosis. What test could you conduct to assess whether she was at risk?
You do the test and she has low bone mineral content. What dietary advice could you give her, to ensure maximum protection from developing thin bones?
4. You have a 55 year old man who wants to lose weight. You measure his skinfold thickness and the results are:

	Measurement 1 (mm)	Measurement 2 (mm)	Measurement 3 (mm)	Mean (mm)
Biceps	21.0	21.0	21.0	21.0
Triceps	16.0	16.0	15.8	15.9
Sub-scapular	30.0	30.0	30.0	30.0
Suprailliac	50.0	50.0	50.0	50.0
Sum				116.9

To work out how much body fat she has, first we calculate body density, using the standard equation from Durnin and Womersley (1974):

Density (g/cm³) is: $c - m (\log \text{sum SFT})$

Where

$c = 1.1715$

$m = 0.0779$

Log = logarithm of sum of the mean SFT (=2.07)

So,

$D = 1.1715 - 0.0779 (2.07)$

$D = 1.010$

Once density is calculated, the Siri (1961) equation should be used to estimate percentage body fat:

$$\text{Fat (\%)} = [(4.95 / D) - 4.5] \times 100$$

Where: D = Density (which we calculated as 1.010)

4.95 and 4.5 are the constants calculated by Siri (1961) using the assumptions on the density of fat mass and fat-free mass

What is his body fat content ?

What should he reduce his body fat content to ?