

TWGHs Lo Kon Ting Memorial College
 Mathematics
 STEM Education

S3 Chapter 2

Percentages

Designing a Healthy Diet Menu

Name: _____

Class: _____ ()

Group: _____

Contents

p.3	• Interesting Trivia: The Oldest Verified Male in History
p.4	• Tips
p.4	• Background Information
p.6	• Warm-up for Simple Data Analysis (I)
p.8	• Warm-up for Simple Data Analysis (II)
p.10	• Discussion



Interesting Trivia: The Oldest Verified Male in History



Figure 1 Jiroemon Kimura (木村 次郎右衛門)

The Oldest Verified Male in History

I can live forever as long as my grandchild is here.



Jiroemon Kimura was a Japanese who **lived for 116 years and 54 days**. He became the oldest verified male in history on 28 December 2012. Kimura died from natural causes on 12 June 2013, in a hospital in his hometown. His motto in life is “to eat light and live long”.

Some experts attribute Japan's impressive human life expectancy to **traditional diets low in fat (but, due to the regular consumption of soy sauce and miso soup, quite high in salt)**.

But studies and testimony from centenarians (人瑞) suggest that **lasting friendships, community ties, as well as generous pensions and decent healthcare, can be as important as eating well, avoiding tobacco and drinking in moderation**.



A. Tips

Pay attention to the tips below during the process

- Use Excel effectively to handle repetitive calculations;
- Be aware of the units (kcal, g, mg) of different nutrients.



Mission : Designing a Healthy Diet Menu for Your Maths Teacher

B. Background Information

- What does a healthy diet consist of? What kinds of nutrients should we consider? Would it be different for people with different sex or ages? Try to fill in the following table for the criteria of healthy diet. The following website will be useful!

Centre for Food Safety --- Nutrient Information Inquiry (Nutrients Definition and Function)

<https://www.cfs.gov.hk/english/nutrient/nutrient.php>

Nutrient	Reference Values
1. Energy (Calorie)	18 - 29.9 years old Men: (kcal/day) Women: (kcal/day)
2. Protein	% - % of daily energy intake
3. Total fats	% - % of daily energy intake
4. Carbohydrate	% - % of daily energy intake
5. Dietary fibre	Not less than g per day
6. Calcium	Not less than mg per day for adults

Table 1.1 : Different nutrients with their reference intake values

- Next, try to fill in the following table, which includes some examples of healthy diet. The following websites will be useful!

Department of Health (Student Health Service) --- Healthy Recipes

English Version: https://www.studenthealth.gov.hk/english/health_recipe/health_recipe.html

Chinese Version: https://www.studenthealth.gov.hk/tc_chi/health_recipe/health_recipe.html

Name of the dish (1 serving)	Protein (g)	Fat (g)	Carbohydrate (g)	Fibre (g)	Calcium (mg)
A. <i>Toast with Tuna and Tomato</i>			27.1	3.2	33.8
B. <i>Rainbow Omelette</i>	8.36			2	69.2
C. <i>Salmon and Rice Ball (Salmon Onigiri)</i>	7.2	0.85	29.4		
D. <i>Fusilli with Mushrooms and Sweet Corn Sauce</i>		7.1	115.5		
E. <i>Fruity Kebab</i>		20.2		2.79	
F. <i>High-fibre Pancakes with Banana</i>	10.6				170.3
G. <i>Frozen Strawberry Yogurt</i>	13		28.7	0.16	

Table 1.2 : Different dishes with their nutrient values



C. Warm-up for Simple Data Analysis (I)



It is given that (roughly):

- ✧ a gram of protein has 4 kilocalories (kcal).
- ✧ a gram of fat contains 9 kilocalories (kcal).
- ✧ a gram of carbohydrate contains 4 kilocalories (kcal).

- Assume the energy values of dishes A to G only come from protein, fat and carbohydrate, finish the following tasks with the aid of spreadsheets.

1. With reference to table 1.2, fill in the following table showing the total energy values among the dishes. The first row has been done for you as an example.

Dish	Protein (g)	Fat (g)	Carbohydrate (g)	Protein (kcal)	Fat (kcal)	Carbohydrate (kcal)	Total Energy (kcal)
A	25.9	10.1	27.1	103.6	90.9	108.4	302.9
B	8.36	9.21	8.1				
C	7.2	0.85	29.4				
D	19.7	7.1	115.5				
E	3.16	20.2	0.52				
F	10.6	4.8	72.6				
G	13	8.6	28.7				

Table 2.1 : Different dishes with their (total) energy values

2. With reference to table 1.2 and 2.1, fill in the following table showing the percentages of energy values from protein, fat and carbohydrate among the dishes. The first row has been done for you as an example.

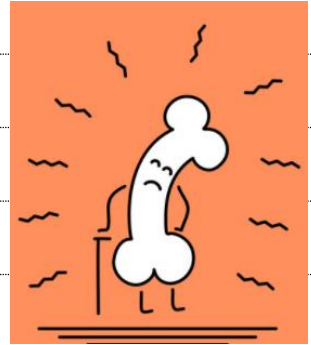
Dish	Protein (g)	Fat (g)	Carbohydrate (g)	Protein (%)	Fat (%)	Carbohydrate (%)
A	25.9	10.1	27.1	34%	30%	36%
B	8.36	9.21	8.1			
C	7.2	0.85	29.4			
D	19.7	7.1	115.5			
E	3.16	20.2	0.52			
F	10.6	4.8	72.6			
G	13	8.6	28.7			

Table 2.2 : Different dishes with their percentages of energy values

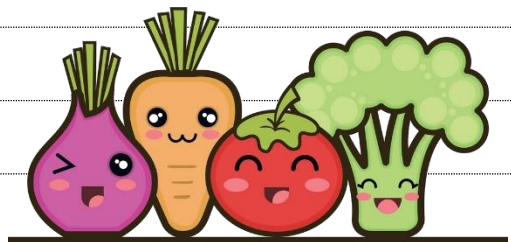
3. Zoe had a dish of A, two dishes of D, and a dish of F yesterday. Did she fulfil the first four criteria of healthy diet in table 1.1?



2. Brain suffers from osteoporosis, a disease that causes the bones to become weaker and easily broken. Calcium is good for bone health. Among the seven dishes, he would like to receive the **greatest amount of calcium with the lowest cost** (i.e. the highest mg/\$). Which dish would you recommend to him?



3. **Cathy does not like fish.** Meanwhile, she suffers from constipation and wants to consume **more dietary fibre with low cost.** Considering her preference and physical need, which **two** dishes would you recommend to her?



4. Dickson's liver is malfunctioned, so he should **avoid eating too much protein.** Considering his physical need, which **two** dishes would you recommend to him?



E. Discussion

Suppose your group has **\$250** and you would like to design a **one-day healthy** diet for your Mathematics teacher. *Based on all you have done from Section B to D*, provide **one set** of possible choices. [For simplicity, assume that (s)he is 18 - 29.9 years old.]

***Please make sure that the diet:

- (1) is **within the budget**.
- (2) fulfils **at least 4 criteria** of healthy diet in table 1.1.

Show your calculation for both (1) and (2).

Your Maths Teacher’s One-day Healthy Diet:

- Breakfast
- Lunch

- Dinner
- Sum of money to be spent:

Total intakes for each nutrient:

Nutrient	Sum of Nutrient Values (Breakfast + Lunch + Dinner)	
Energy		
Protein		
Total fats		
Carbohydrate		
Dietary fibre		
Calcium		