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**TUTORIAL 2**

**ACTIVITY #1**

1. **Compute your BMR using Harris Benedict Equation**

BMR is the amount of energy our body burns at rest on a daily basis

* (Male) BMR = 88.362 + (4.799 x ht) + (13.397 x kg) – (5.677 x age)
* (Female) BMR = 447.593 + (3.098 x ht) + (9.247 x kg) – (4.330 x age)

1. **Compare macro and micronutrients of different food**
2. Select two different foods either from the suggested list of food below or your personal diet or food you wish to compare
3. Log into MyFitnessPal Online Food Search @ <https://www.myfitnesspal.com/food/search>
4. A chart of the recommended daily value of micronutrients (Chart 1) is provided for your reference (NOTE: Daily Values are calculated based on 2000 kcal/per day for an average adult)

**List of suggested food:**

|  |  |  |  |
| --- | --- | --- | --- |
| Double Fillet O Fish (@MacDonald) | Beef Goulash (@Soup Spoon) | Spaghetti Bolognaise (Homemade) | Roti Prata with Egg (Singapore Hawker) |
| Korean Vermicelli Noodles (Japjae) | Murtabak (@Hawker) | Teriyaki Chicken Don (Japanese) | Seafood Fried Rice (Generic) |
| Char Siew Rice (@Kopitiam) | Fishball Noodle Dry (@Hpb) | Prawn Noodle Soup (@Hawker) | 10-piece Meatballs (@Ikea) |
| Fish and Chips (@Ikea) | Hawaiian Pizza (@Shakey’s) | Chicken Briyani (Indian) | Mac and Cheese (@Popeyes) |

**Chart 1: Micronutrients requirement for an average adult**

|  |  |
| --- | --- |
| **Micronutrient** | **Daily Value** |
| Calcium | 1300mg |
| Magnesium | 420mg |
| Manganese | 2.3mg |
| Phosphorus | 1250mg |
| Potassium | 4700mg |
| Sodium | 2300mg |
| Iodine | 150mcg |
| Iron | 18mg |
| Thiamin | 1.2mg |
| Vitamin C | 90mg |
| Vitamin D | 20mcg |
| Vitamin K | 120mcg |

**For Example:**

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| --- | --- | --- |
|  | **Chicken Rice (Nam Kee)** | **Nasi Lemak (Singapore)** |
| **Total Calories (kcal)** | 618 | 494 |
| **Carbohydrate (g)** | 76 | 80 |
| **Fat (g)** | 23 | 14 |
| **Protein (g)** | 25 | 13 |
| **Dietary Fiber (g)** | 3 | 0 |
| **Sodium (mg)** | 1314 | 838 |
| **Cholesterol (mg)** | 48 | 76 |
| **Calcium (mg)** | 403 | 0 |
| **Potassium (mg)** | 0 | 206 |

**TEMPLATE FOR STUDENTS:**

|  |  |  |
| --- | --- | --- |
|  | **Name of food** | **Name of food** |
| **Total Calories (kcal)** |  |  |
| **Carbohydrate (g)** |  |  |
| **Fat (g)** |  |  |
| **Protein (g)** |  |  |
| **Dietary Fiber (g)** |  |  |
| **Sodium (mg)** |  |  |
| **Cholesterol (mg)** |  |  |
| **Calcium (mg)** |  |  |
| **Potassium (mg)** |  |  |
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**ACTIVITY #2**

1. **Calculate the kcal of food using Atwater General Factor**

i) Kcal of each nutrient

ii) Percentage kcal for each nutrient to Total kcal

The total combustible energy content (or theoretical maximum energy content) of a food can be measured using bomb calorimetry. Not all combustible energy is available to the human for maintaining energy balance (constant weight) and meeting the needs of growth, pregnancy, and lactation.

First, foods are not completely digested and absorbed, and consequently food energy is lost in the faeces. The degree of incomplete absorption is a function of the food itself (its matrix and the amounts and types of protein, fat and carbohydrate), how the food has been prepared, and the physiological state of the individual consuming the food. Second, compounds derived from incomplete catabolism of protein are lost in the urine. Third, the capture of energy (conversion to adenosine triphosphate [ATP]) from food is less than completely efficient in intermediary metabolism (Flatt and Tremblay, 1997).

**The Atwater general factor system**

The Atwater general factor system was developed by W.O. Atwater and is based on the heats of combustion of protein, fat and carbohydrate, which are corrected for losses in digestion, absorption and urinary excretion of urea. As originally described by Atwater, carbohydrate is determined by difference, and thus includes fibre. The Atwater system has been widely used, in part because of its obvious simplicity.

* + **4 kcal/g carbohydrate (CHO)**
  + **9 kcal/g lipid (Fat)**
  + **4 kcal/g protein**
  + **7 kcal/g alcohol**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| FOOD ITEM | TOTAL  CALORIES (kcal) | FAT (g) | CHO (g) | PROTEIN (g) |
| (a)Sweet Home Granola (per serving) | 240 | 9 | 36 | 5 |
| (b) Indomie Mi Goreng (per serving) | 410 | 17.2 | 54.3 | 8 |
| (c) True Dutch Whole Milk (100ml) | 274 | 3.6 | 4.6 | 3.7 |
| (d) Nestle Milo Original (can) | 163 | 3.3 | 23.9 | 8.2 |
| (e) Amy’s Vegetable Lasagna (per serving) | 330 | 13 | 44 | 8 |

1. **Which of these food items have:**

* lowest % carbohydrate
* highest % fat
* highest % protein

**For Example**:

**a) Macronutrient Energy Content and Percentage Composition of Sweet Home Granola**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Nutrient** | **Weight (g)** | **Atwater GF** | **Kcal** | **% of Total Kcal** |
| Fat | 9 | 9 | 81 | 33.8 |
| CHO | 36 | 4 | 144 | 60 |
| Protein | 5 | 4 | 20 | 8.3 |

**Follow these steps:**

1. To calculate kcal of each macronutrient, multiply the weight of each nutrient by the appropriate Atwater general factor.
2. To calculate the percentage kcal of each nutrient, divide the weight of each macronutrient by the food’s total calories.

**b) Macronutrient Energy Content and Percentage Composition of True Dutch Whole Milk**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Nutrient** | **Weight (g)** | **Atwater GF** | **Kcal** | **% of Total Kcal** |
| Fat |  |  |  |  |
| CHO |  |  |  |  |
| Protein |  |  |  |  |

**c) Macronutrient Energy Content and Percentage Composition of Nestle Milo Gao Siew Dai**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Nutrient** | **Weight (g)** | **Atwater GF** | **Kcal** | **% of Total Kcal** |
| Fat |  |  |  |  |
| CHO |  |  |  |  |
| Protein |  |  |  |  |

**d) Macronutrient Energy Content and Percentage Composition of Amy’s Vegetable Lasagna**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Nutrient** | **Weight (g)** | **Atwater GF** | **Kcal** | **% of Total Kcal** |
| Fat |  |  |  |  |
| CHO |  |  |  |  |
| Protein |  |  |  |  |

**e) Macronutrient Energy Content and Percentage Composition of Indomie Mee Goreng**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Nutrient** | **Weight (g)** | **Atwater GF** | **Kcal** | **% of Total Kcal** |
| Fat |  |  |  |  |
| CHO |  |  |  |  |
| Protein |  |  |  |  |

**TUTORIAL 3**

Based on your fitness personality test on Colours of Fitness, identify your strengths and potential pitfalls in the context of adopting and sustaining fitness habits.

**Colour of Fitness: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |
| --- | --- |
| **BARRIERS** | **TIPS** |
|  |  |

Considering your fitness, write a SMART goal for your exercise plan that is sustainable.

|  |  |
| --- | --- |
|  | **WHAT GOALS ARE YOU SETTING FOR YOURSELF** |
| S  SPECIFIC |  |
| M  MEASURABLE |  |
| A  ACHIEVABLE |  |
| R  RELEVANT |  |
| T  TIIME-BOUND |  |

**TUTORIAL 4**

**ACTIVITY #1**

**RECAP**

* What is the definition of life expectancy (LE)?
* What is the definition of health-adjusted life expectancy (HALE)?
* Think about: How are LE and HALE different? What are some uses of HALE estimates?

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**ACTIVITY #2:**

**PLAYING DETECTIVE: SYMPTOMS AND COMPLICATIONS OF CHRONIC DISEASES**

In Singapore, noncommunicable diseases (NCDs), also known as chronic diseases, cause the most death and disability combined in 2019. Majority of chronic diseases can be traced back to the common risk factors, and the complications can be delayed or prevented through early detection and appropriate management.

As a group, identify and match the clues to determine possible cause(s) contributing to the criticcondition or death of the given scenario.

Think about: risk factors, common symptoms, signs of disease complications

**What do the clues tell you?**

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**State the name of chronic disease you have identified based on the clues given, and discuss what led to your decision**

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**ACTIVITY #3**

**SCREEN FOR LIFE**

Early detection of health risks and lifestyle modifications are possible to prevent or delay the onset of chronic diseases. Visit the Screen for Life website and identify the recommended screenings for your age group.

**RECOMMENDED SCREENINGS FOR ME**

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| --- |
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Based on the assigned age band for your group,

1. Identify the recommended screenings for the age band
2. Identify modifiable risk factors, and
3. Suggest possible lifestyle modifications for the identified chronic disease to be screened for.

**Age Group: \_\_\_\_\_\_\_\_\_\_\_, Condition: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Recommended Screenings** | **Modifiable Risk Factors** | **Possible**  **Lifestyle Modifications** |
|  |  |  |

**(OPTIONAL) ACTIVITY #4**

**HOME CARE OR MEDICAL TREATMENT**

Identify the following:

* What are the common symptoms of the identified illnesses?
* When is medical care needed?
* What are possible preventive measures?

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| --- | --- | --- | --- |
| **ILLNESS** | **SYMPTOMS** | **WHEN TO SEEK MEDICAL CARE** | **POSSIBLE PREVENTION** |
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**TUTORIAL 5**

**RECAP**

Before Tutorial session this week, write your key takeaways from Lecture 5 on the following.

* What is the definition of disease burden?
* What is the definition of disability-adjusted life years (HALE)?
* Think about: How are disease burden and HALE related?

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**ACTIVITY #1**

**GLOBAL BURDEN OF DISEASE (GBD) DATA VISUALISATION**

Go to: <https://vizhub.healthdata.org/gbd-compare/>

**State the Comparison Parameters**

|  |
| --- |
|  |

1. **Describe 3 key observations**
2. **Analyse the observations and suggest possible factors contributing to the similarities or differences in the comparison**

|  |  |
| --- | --- |
| **KEY OBSERVATIONS** | **ANALYSIS** |
|  |  |

**Activity #2**

**HEALTHY CAMPUS**

Imagine you are the Designer and Health expert of a University, and your big project is to develop a Healthy Campus. Your first task is to create a Poster Outline consisting of checklist pointers on possible ways to mitigate the exposures to health risk (in the assigned location on campus).

As you start on this task, you may consider these questions:

* What does a Healthy Campus mean to you?
* What does it look like now?
* What is the ideal environment you envision for a Healthy Campus?
* What are key elements of a Healthy Campus?
* What are the possible exposures to health risks?
* What are the possible measures that students can take to help mitigate exposures to health risks?

More prompts to refine ideas:

* Why would it be important for students to adopt / observe the strategies checklist? Think about the different dimensions of health
* How might the poster create awareness about the importance of a Healthy Campus?
* How might this poster be a starting point to intrigue and engage students to find out more and contribute towards a Healthy Campus? Think about how this will motivate students to adopt healthy behaviours, and where will this poster be.

***Think creative, informative and engaging! :)***