MODULE 1 – INTRODUCTION TO NUTRITION

Learning Objectives

- After reading module 1 and class discussion you will be able to:
  - Define frequently used terms in nutrition
  - Identify factors affecting food choices
  - Discuss six major nutrient classes

WHAT IS FOOD?

- Food is anything that we consume to satisfy hunger.
- We eat to live, not live to eat!
- Without food we will not survive in this world
- We are what we eat and how we eat them.
- Food makes us 4G!
- Diet
  - The foods one consumes affects
    - The quality of life now
    - The risk of chronic diseases later
YOU ARE WHAT YOU EAT!

- About 60 percent of our weight is water
- About 20 percent of our weight is fat
- About 20 percent of our weight is a combination of mostly protein plus carbohydrates, minerals, and vitamins.
  “60-20-20 Rule”

WHAT IS NUTRITION?

- It is the study of nutrients.
- It is a science that deals with the relationship of life and food i.e. the science of how the body uses food.
- It is the science of food and nutrients, that is, their action and interaction in relation to health and disease.
- It involves the sources of nutrients and all processes that deal with the intake, ingestion, digestion, absorption, transportation, utilization, and excretion of food and associated substances.

What is Nutrition?

Nutrition is a science that:
- studies nutrients and other substances in foods and in the body and how these nutrients relate to health and disease, and
- explores why you choose particular foods and the type of diet you eat.
- science of foods and nutrients
THE IMPORTANCE OF NUTRITION TO FOODSERVICE PROFESSIONALS

• More people eating away from home – need to be provided with healthy meals.
• Consumers getting more demanding and health conscious.
• Regulations
• Dietary guidelines
• RNI (Recommended Nutrient Intake)
• Food-labeling requirements
• To provide nutritionally balanced meals

Continuation....

• Preservation of nutritional quality
• Understanding of nutrients and actions to prevent losses
• Proper methods of cooking.
• Proper serving of foods.
• Storage and handling to preserve nutritional quality.
• Proper utilization of leftovers.
• Planning well balanced menus.
• Special needs of customers – health reasons.

Nutrients

Nourishing substances in food that provide energy and promote the growth and maintenance of your body.
WHAT IS A NUTRIENT?

• It is a chemical substance that is used by the body for normal growth, reproduction, maintenance of health, and repair of tissues.

• It is a substance that must be taken into the body in sufficient quantity to meet the body’s needs.

• It makes us possible to breathe, move, eliminate waste, think, see, hear, smell, and taste.... And do everything else natural to a living body.

Why study nutrition?

• 4/10 primary causes of death are related to diet

GROUPS OF NUTRIENTS

• Essential nutrients = substances the body must get from food because it cannot manufacture them at all or fast enough to meet its needs

• Non-essential: manufactured in the body

• Chemical composition of nutrients
  - Inorganic vs. Organic nutrients
    - Inorganic = contain NO carbon
    - Organic = contain carbon
    - Organic literally meaning "alive"

• Macronutrients (macro = big): protein, fats and oils, carbohydrates, water.

• Micronutrients (micro = small): vitamins and minerals
FUNCTIONS OF NUTRIENTS

3 Major Purposes:

• Provide structure to the body
• Provide energy
• Regulate body functions

Functions of Nutrients

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Provide Energy</th>
<th>Promote Growth Maintenance</th>
<th>Regulate Body Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrates</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lipids</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proteins</td>
<td>X X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamins</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minerals</td>
<td>X X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>X X</td>
<td></td>
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</tbody>
</table>

The Nutrients

<table>
<thead>
<tr>
<th>TABLE 1.1</th>
<th>Elements in the Six Classes of Nutrients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Carbon</td>
</tr>
<tr>
<td>Inorganic nutrients</td>
<td></td>
</tr>
<tr>
<td>Minerals</td>
<td>✓</td>
</tr>
<tr>
<td>Water</td>
<td>✓ ✓</td>
</tr>
<tr>
<td>Organic nutrients</td>
<td></td>
</tr>
<tr>
<td>Carbohydrates</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Lipids (lipo)</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Proteins?</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>Vitamins?</td>
<td>✓ ✓</td>
</tr>
</tbody>
</table>

*Some proteins also contain the mineral sulfur.
*Some vitamins contain nitrogen; some contain minerals.
Body Composition

Factors Influencing What You Eat

Why do we choose the food we eat?

FACTORS AFFECTING FOOD HABITS, ACCEPTANCE, AND PREFERENCES

- Biological, Physiological & Psychological
- Extrinsic Factors
- Socio-Economics
- Cultural and Religious Factors
- Intrinsic Factors
- Personal Factors
MODULE 2
–
PLANNING A HEALTHY DIET

Learning Objectives

- Provide a definition of healthy eating and the principles involved.
- Interpret the Nutrition Facts panel on a food label.
- List the *Malaysian Dietary Guidelines*.

A Healthy Diet

- How do you manage your food intake?
- Do you have special dietary needs?
- Do you have diet-related diseases in your family?
- Do you ever think about the food you eat?
- Have you changed your diet in the past year or have plans to change in the future?
A Healthful Diet

Provides the proper combination of energy and nutrients

**DIET PLANNING PRINCIPLES**

- **Adequacy (dietary)**—providing sufficient energy and essential nutrients for healthy people
- **Balance (dietary)**—consuming the right proportion of foods
- **Calorie (energy) control**—balancing the amount of foods and energy to sustain physical activities and metabolic needs
- **Nutrient density**—measuring the nutrient content of a food relative to its energy content
- **Moderation (dietary)**—providing enough but not too much of a food or nutrient
- **Variety (dietary)**—eating a wide selection of foods within and among the major food groups

**Nutrient Density**

Nutrient-density supports adequacy & moderation

- **Measure of the nutrients in a food relative to energy provided**
- \[ \text{nutrient density} = \frac{\text{nutrients}}{\text{energy}} \]
- \( \uparrow \) nutrients \( \downarrow \) energy = high nutrient density
- \( \uparrow \) energy \( \downarrow \) nutrients = high energy density
ENERGY DENSITY

450 gram breakfast delivers
500 kcal
Energy density of 1.1 kcal/g

144 gram breakfast delivers
500 kcal
Energy density of 3.5 kcal/g

NUTRIENT DENSITY

Provides 145 kcal – 56 kcal from fat, 1 gram fibre & few vitamins/minerals

Provides 145 kcal – 7 kcal from fat, 7 grams fibre, and significant amounts of nutrients like potassium, Vit A & C

DESIGNING A HEALTHFUL DIET

The tools for designing a healthful diet may include:

1. Food Labels
2. Dietary Guidelines
3. Food Guides Pyramid
4. Diet Plans
1. FOOD LABELS

- Appear on virtually all processed foods
- Posters or brochures for fresh products
- Foods not requiring nutrition labels
  - Food products contributing few nutrients
  - Food products made by small businesses
  - Foods prepared & sold in same establishment
  - Individual packages not for resale
    - Unless a health claim is made or fortification done
    - Many voluntarily provide labels
- Restaurants exempt from providing complete nutrition info except if health claim made

WHAT IS A FOOD LABEL AND WHY IS IT IMPORTANT?

New food labels tell a lot about food. They don't suggest what foods to eat—that's your decision. But labels can help you make your “personal best” food choices—choices that benefit you now and in the future, too.

The food label tells you what’s in the package
- To help consumers make informed food choices

Food Labels

The Food Act 1983 requires food labels on most products.

- These labels must include:
  1. A statement of identity
  2. Net contents of the package
  3. Ingredient list
  4. Manufacturer's name and address
  5. Nutrition information (Nutrition Facts Panel)
A nutrition label is a listing of the level of nutrient(s) as displayed on the food label. It is meant to provide factual information about the nutritional content of the product.

The following foods are required to have mandatory nutrition labelling:

- Foods as listed in Table 1. These foods have been selected because they are frequently consumed and in significant amounts, and are important to the community.
- Foods that have been fortified, enriched, vitaminised, supplemented or strengthened with specific vitamins or minerals (as permitted under Regulations 26 (7)).
- Foods that make nutrition claims.
- Special purpose foods: infant formula, follow-up formula, canned food for infants and young children and cereal-based food for infants and young children.

However, if there is a specific labelling requirement for these foods, they must comply with the individual standard.

### Table 1: Categories of Foods That Require Mandatory Nutrition Labelling

- Prepared cereal food and bread
- Milk product
- Flour confection
- Canned meat, fish and vegetable
- Canned fruit and various fruit juices
- Salad dressing and mayonnaise
- Soft drink
VOLUNTARY NUTRITION LABELLING

Foods that are not required to have mandatory nutrition labelling may also have their nutrient listed. However, they must comply with the format and requirements stipulated in this nutrition labelling and claims regulations.

NUTRITION FACTS PANEL

• The Nutrition Facts Panel contains the nutrition information required by the law

• This information can be used in planning a healthful diet.
Nutrition Facts Panel

1. Serving size and servings per container
   - Serving sizes can be used to plan appropriate amounts of food
   - Standardized serving sizes allow for comparisons among similar products

2. Calories per serving and calories from fat per serving
   - This information can be used to determine if a product is relatively high in fat

3. List of nutrients
   - Fat (total, saturated and trans)
   - Cholesterol
   - Sodium
   - Carbohydrates
   - Protein
   - Some vitamins and minerals
4. Percent Daily Values (%DV)
   – Describes how much a serving of food contributes to your total intake of a nutrient
   – Based on a diet of 2,000 calories per day
   – Can be used to determine if a product is low or high in a particular nutrient

   • Percent Daily Values (%DV) are based on
     – Reference Daily Intakes (RDI) for foods with an RDA value
     – Daily Reference Values (DRV) for foods without an

Figure 2.2

<table>
<thead>
<tr>
<th>Nutrition Facts Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fat: 10g</td>
</tr>
<tr>
<td>Saturated Fat: 3.5g</td>
</tr>
<tr>
<td>Trans Fat: 1g</td>
</tr>
<tr>
<td>Cholesterol: 0mg</td>
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<tr>
<td>Sodium: 300mg</td>
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<tr>
<td>Total Carbohydrate: 44g</td>
</tr>
<tr>
<td>Dietary Fiber: 2g</td>
</tr>
<tr>
<td>Sugars: 4g</td>
</tr>
<tr>
<td>Protein: 15g</td>
</tr>
<tr>
<td>Vitamin A: 4% • Vitamin C: 2%</td>
</tr>
<tr>
<td>Calcium: 15% • Iron: 15%</td>
</tr>
</tbody>
</table>

Figure 2.2
Nutrition Facts Panel

- 5. Footnote
  - Contains general dietary advice for all people
  - Must be present on all food labels
  - Also compares a 2,000 calorie diet with a 2,500 calorie diet

Figure 2.2

WHAT ARE NUTRITION CLAIMS?

A nutrition claim is any claim made on a label of a food product pertaining to its nutritional quality.
On the Label: Labeling Claims

Nutrient Content Claims:
• Describe the level or amount of a nutrient in food product

Health Claims:
• Describe a relationship between a food or dietary compound and a disease or health-related condition

Structure/Function claims:
• Describe how a nutrient or dietary compound affects the structure or function of the human body

Nutrient Claims

○ Must meet MOH definitions
○ No implied claims
○ General terms include free, good source of, healthy, high, less, light or lite, low, more, and organic.
○ Energy terms include kcalorie-free, low kcalorie, and reduced calorie.
○ Fat and cholesterol terms include percent fat-free, fat-free, low fat, less fat, saturated fat-free, low saturated fat, less saturated fat, trans fat-free, cholesterol-free, low cholesterol, less cholesterol, extra lean, and lean.
○ Carbohydrate terms include high fiber and sugar-free.
○ Sodium terms include sodium-free and salt-free, low sodium, and very low sodium.

Benefits of nutrition labelling

Nutrition labeling can help you make food choices that meet the Dietary Guidelines and promote a lifetime of good health.

With today's labels, you can:
- Compare one food with another.
- Choose foods that help provide the balance of nutrients your body needs.
- Plan meals and your whole diet so they are moderate, varied and balanced.
DIETARY GUIDELINES

THE MALAYSIAN DIETARY GUIDELINES

1st - 1999 (8 guidelines)
2nd – 2010 (14 guidelines)

Malaysian Dietary Guidelines 1999

1. Enjoy a variety of foods
2. Maintain healthy body weight by balancing food intake with regular physical activity
3. Eat more rice and other cereal products, legumes, fruits and vegetables
4. Minimize fat in food preparation and choose foods that are low in fat and cholesterol
5. Use small amount of salts and choose foods low in salt
6. Reduce sugar intake and choose foods low in sugar
7. Drink plenty of water daily
8. Practice and promote breastfeeding
Malaysian Dietary Guidelines 2010

• Key Message 1
  • Eat a variety of foods within your recommended intake

• Key Message 2
  • Maintain body weight in a healthy range

• Key Message 3
  • Be physically active everyday

• Key Message 4
  • Eat adequate amount of rice, other cereal products (preferably whole grain) and tubers

• Key Message 5
  • Eat plenty of fruits and vegetables everyday

• Key Message 6
  • Consume moderate amounts of fish, meat, poultry, egg, legumes and nuts

• Key Message 7
  • Consume adequate amounts of milk and milk products
Malaysian Dietary Guidelines 2010

- Key Message 8
  - Limit intake of foods high in fats and minimise fats and oils in food preparation

- Key Message 9
  - Choose and prepare foods with less salt and sauces

- Key Message 10
  - Consume foods and beverages low in sugar

- Key Message 11
  - Drink plenty of water daily

- Key Message 12
  - Practise exclusive breastfeeding from birth until six months and continue to breastfeed until two years of age

- Key Message 13
  - Consume safe and clean foods and beverages

- Key Message 14
  - Make effective use of nutrition information on food labels

TOOLS FOR DESIGNING A HEALTHY DIET –

C. FOOD GUIDE PYRAMID
D. DIET PLANS
What Is a Food Guide Pyramid

Visual diagrams that provide variety of food recommendations to help create a healthy diet

- Food groups and relative proportions

- Various countries have food guidance systems based on their food supply and cultural food preferences.

Healthy Eating Around the World

1992 Food Guide Pyramid
Malaysia Food Guide Pyramid (old – 1999)

- Fats, oils, sugar and salt
  USE SMALL AMOUNTS
- Milk and dairy proteins
  1-2 SERVINGS
- Fruits and vegetables
  at least
  3.5 SERVINGS
- Fish, poultry, meat and legumes
  2 - 3 SERVINGS
- Rice, noodles, bread, other cereals and cereal products, and tubers
  6-12 SERVINGS

Malaysia Food Guide Pyramid (new – 2010)

- Fats, oils, sugar and salt
  USE SMALL AMOUNTS
- Milk and dairy proteins
  2 SERVINGS
- Fruits and vegetables
  at least
  4 SERVINGS
- Fish, poultry, meat and legumes
  2 SERVINGS
- over 70 people
  3 SERVINGS
- Rice, noodles, bread, other cereals and cereal products, and tubers
  5-10 SERVINGS

What’s a Serving? Eat With Your Hai

- A woman’s palm
  1 SERVING
- An adult’s palm
  2 SERVINGS
- An adult’s hand
  3 SERVINGS
- A man’s hand
  4 SERVINGS
- About 1 teaspoon
  of vegetable oil
Fad Diets

Why DO WE Gaining Weight?

• We’re eating too much
• We’re getting too little physical activity
Popular Fad Diets

- Atkins
- South Beach
- Protein Power
- The Hamptons Diet
- The Zone
- Sugar Busters
- Dr. Phil’s Ultimate Weight Solution

Beware of Fad Diets

- Promise quick weight loss
- Cut out certain foods or food groups
- Sound too good to be true
- List “good” and “bad” foods

Fad Diets Do Not Perform Magic

- There are no quick fixes
- There are no foods that have special properties that cause weight gain or weight loss
Lose Weight the Healthy Way

- Eat a variety of foods
- Include at least 5 servings of fruits and vegetables each day
- Eat small portions
- Limit sugary foods

Lose Weight the Healthy Way

- Limit foods high in fat, especially saturated fat, and cholesterol
- Be physically active for at least 30 minutes most days

Points to Remember

- Fad diets do not perform magic
- Fad diets can be harmful
- Calories count
- Lifestyle changes are important

Best advice: Become more physically active and eat smaller portions of a well-balanced diet
How much do I need? The Daily Reference Intakes

- Information gathered from expert scientists who studied nutrient needs.
- Needs are set high above the recommended range to meet the needs of most healthy people.
- Recommendations are made based on scientific research.

Dietary Reference Intakes (DRIs):
updated nutritional standards.

- Expand on the traditional RDA values
- Set standards for nutrients that do not have RDA values
Dietary Reference Intakes

• Nutrition recommendations need to satisfy a variety of needs.
• Different types of dietary guidelines target different populations.
• The original dietary standards were the RDAs (Recommended Dietary Allowances).
• The DRIs (Dietary Reference Intakes) are energy and nutrient recommendations that have replaced the RDAs.

Why is intake important?

1. Meet nutritional needs.
2. Avoid nutrient deficiencies.
3. Prevent nutrient toxicity.

Estimated Average Requirement (EAR)

– The average daily intake level of a nutrient that will meet the needs of half of the people in a particular category
– Used to determine the Recommended Dietary Allowance (RDA) of a nutrient
Recommended Dietary Allowances (RDA)

—The average daily intake level required to meet the needs of 97 – 98% of people in a particular category

Adequate Intake (AI)

—Recommended average daily intake level for a nutrient
—Based on observations and estimates from experiments
—Used when the RDA is not yet established: calcium, vitamin D, vitamin K, fluoride

Tolerable Upper Intake Level (UL)

—Highest average daily intake level that is not likely to have adverse effects on the health of most people
—Consumption of a nutrient at levels above the UL is not considered safe
Acceptable Macronutrient Distribution Ranges (AMDR)

— Describes the portion of the energy intake that should come from each macronutrient
Determining Nutrient Needs: AMDR

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>AMDR*</th>
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<tbody>
<tr>
<td>Carbohydrate</td>
<td>45–65%</td>
</tr>
<tr>
<td>Fat</td>
<td>20–35%</td>
</tr>
<tr>
<td>Protein</td>
<td>10–35%</td>
</tr>
</tbody>
</table>

* AMDR ratios expressed as percent of total energy or as percent of total calories.


Estimated Energy Requirement (EER)

—Average dietary energy intake (kcal) to maintain energy balance
—Based on age, gender, weight, height, level of physical activity

Evaluating Nutritional Status

1. Personal History
   - SES, living situation, personal health, family health history, diet history, drug history
2. Anthropometric data
   - Height, weight, blood pressure, pulse rate
3. Physical exam
   - Hair, skin, eyes, tongue...
4. Laboratory tests
   - Cholesterol levels, iron levels...