NUTR2101 notes (Week 1 to 6)

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LECTURE 1

1. **What are the ADG targets and purpose?**
   The ADG (Australian Dietary Guideline) is designed to target the general healthy population and the purpose of it is to promote healthy eating.

2. **What are the ADG? (descriptions)**
   The Guidelines are as follows:
   - Achieve and maintain healthy weight, PA & choose food to meet your needs
   - Enjoy variety of foods from all 5 groups
   - Limit saturated fat, added salt or sugar and alcohol
   - Encourage breastfeeding
   - Care for your food; prepare and store it safely

3. **What is the food guidance system?**
   The food guidance system is a nutritional education tool that translates scientific understanding and evidence about food-constituents in health/disease and food nutrient composition into customer friendly information. (e.g. Australian Dietary Guidelines, Australian Guide to Healthy Eating). The food guidance system is targeted to the general healthy population to prevent chronic diseases and deficiency associated disease. It is based on the 5 food groups.
   Additional information: the 5 food groups are as follows:
   - Vegetables and legumes.
   - Fruit.
   - Grain (cereal) foods.
   - Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/ beans.
   - Milk, yoghurt, cheese and/or their alternatives.

4. **What is the AGHE?**
   The AGHE (Australian Guide to Healthy Eating) is when we put the ADG into practice. It is a food selection guide which *visually* represents the proportion of the 5 groups recommended for consumption each day. Keep in mind this is for the general healthy population in Australia.

5. **What are the NRV's (definitions and descriptions)**
   The NRV (Nutrient Reference Values) are a set of recommendations for nutritional intake based on currently available scientific knowledge.
   - EAR (Estimated Average Requirement):
     - based on biomarkers
     - 50% of population will have inadequate intake at EAR
     - it will not be set if there is no accurate method (functional marker)
   - RDI (Recommended Daily Intake):
     - based on the EAR (usually *1.2)
     - 2 to 3% of population would have inadequate intake at RDI
   - AI (Adequate Intake)
     - set for some nutrients when there is no information to establish EAR
     - between RDI and UL AI covers 97 to 98% of population
   - SDT (Suggested Dietary Targets)
     - only applies to over 14 years

- a daily average intake of certain nutrients from food/beverages that may help in prevention of chronic diseases
- AMDR (Acceptable Macronutrient Distribution Range)
  - range of intake (% of total energy requirement) that is adequate for the intake of macronutrients and maximizing general health outcomes
  - Only applies to 14 and over

6. **What needs to be stated on a NIP?**
   The NIP (Nutrition Information Panel) should include the following: energy content (in kJ or both kJ and calories), protein, fat, sat. fat, carbohydrate, sugars, sodium, any other nutrient or biologically active substance

7. **What is the definition/difference between digestion and absorption?**
   Digestion is the mechanical breakdown of food into molecules the body can use (e.g. macronutrients to monomers). However, absorption is the uptake of monomers and micronutrients from GIT through absorptive cells, into blood or lymph for transport to organs/cells.

8. **Trace a cheese and salad sandwich through the digestive processes, naming the various structures and secretions involved in the digestion**
   The oral cavity (mouth) chews the sandwich; the food is mixed with saliva and becomes **bolus.** The saliva has lysozyme (breakdown of bacteria), mucus (lubricates and holds bolus together) and amylase (breakdown of starch).
   After the oral cavity, the food flows through the oesophagus and passes through the lower oesophageal sphincter to reach the stomach. Mixed with stomach secretions (HCl which is produced by parietal cells denatures proteins, destroys bacteria and viruses, aids in mineral absorption and aids protein digestion; chief cells which secrete gastric lipase; gastrin which is a hormone that controls release of HCL and pepsinogen; and mucus which protects the stomach from being digested), it becomes **chyme**. The chyme then passes through the pyloric sphincter to the small intestine. Gastric inhibitory peptide (GIP) slows the release of chyme into small intestine.
   The small intestine is where most of the digestion and absorption takes place. There are three sections in the small intestine (duodenum, jejunum and ileum). The nutrients are absorbed by the villi and microvilli which line the intestinal wall and increase the surface area of the lumen. Villi are lined with goblet cells (produce mucus), endocrine cells (produce hormones), enterocytes (absorb nutrients and produce metabolism enzymes and have a brush border made of microvilli) and microvilli are covered with glycocalyx which are protein projections which aid protein and carbohydrate digestion.
   The chyme then goes to the large intestine as it passes through the ileocecal valve. This is where the electrolytes and water from the sandwich are absorbed. After this, the food goes to the rectum, then the anus, which is the final site for absorption of water and electrolytes. All the remaining waste is excreted through the defecation of faeces.

9. **Describe the different forms of absorption**
   1. Passive – moves down concentration gradient and is substrate concentration dependent
   2. Facilitated – requires a carrier protein; moves down concentration gradient
   3. Active – requires ATP + Na; can move against the concentration gradient