Dietary and Nutritional Science

NUT 1™ Marking Guide For Faculty Use Only

PROFESSIONAL KINESIOLOGY PRACTICE

Activities to consolidate your skill and understanding

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Dietary and Nutritional Science

Dedication

Dedicated to all our students, for whom PKP™ Professional Kinesiology Practice has become a way to achieve high-level wellness and vitality: to Learn, Grow in knowledge and wisdom & Embrace life to the fullest in this world of dis-ease and dis-illusion.

Special Note #1

The procedures and techniques described in this manual are solely for information purposes. The authors and the International College of Professional Kinesiology Practice are not directly nor indirectly presenting any part of this work as a diagnosis or prescription for any reader or student, nor even recommending these natural procedures or any of the ideas reported. Persons using the evaluations and balances reported here, do so entirely at their own risk.

Special Note #2

Always ask your teacher if you do not understand or need help to do any class activity. Performing techniques incorrectly or not following instructions can lead to problems.

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1. Digestive System, Overview of Foods, Energy & Metabolism

Activities to consolidate your skill and understanding

1. Which of the following is not a part of the digestive system? *(Circle one)*

   a. mouth

   b. stomach

   c. spleen

2. Identify the food that is high in each of the following macronutrients

   a. a food that is high in carbohydrates is pasta

   b. a food that is high in proteins is meat

   c. a food that is high in fats is butter

3. Micronutrients are substances that are required in **large / small** amounts. *(Circle one)*

4. Which of the following is an element that is necessary in the body? *(Circle one)*

   a. calcium

   b. magnesium

   c. sodium

   d. all of the above

5. Which of the following is the amount of heat energy required to heat 1 gram of water by 1°C? *(Circle one)*

   a. 1 calorie (c)

   b. 1 joule (j)

   c. 1 kilocalorie (C)

   d. 1 kilojoule (kj)

6. Describe the role of ATP in the cell:
   to trap energy within the cell and to allow the transfer of energy from one structure to another

7. Creatine phosphate directly transfers phosphate to **ADP / ATP.** *(Circle one)*

8. Lactic acid is produced as a by-product of **anaerobic / aerobic** exercise. *(Circle one)*

9. State one waste product that is formed from the complete catabolism (breakdown) of glucose in the process of ATP production:
   carbon dioxide and water are the two waste products formed

10. Which energy system is most prevalent during low intensity, long duration activities (such as jogging)? *(Circle one)*

    a. the phosphagen system

    b. the glycogen – lactic acid system

    c. the aerobic system

2. Nutritional Strategies

Activities to consolidate your skill and understanding

1. Everybody has the same nutritional requirements T / (F)

2. Define the basal metabolic rate:

   the amount of energy required for basic existence

3. Significant activity could be described as 1.7 – 2.2 times the BMR. (T) / F

4. Using the Harris Benedict calculations, calculate your BMR and state it:

5. Brown rice is a good source of fats. T / (F)

6. Most fats in the diet should come from **saturated** / (**unsaturated**) fatty acids. *(Circle one)*

7. State why it is important to not skip breakfast:

   Breakfast allows you to break the fast from the nights rest and
   to allow you to start the metabolism for the days activities

8. Describe why several small meals are better than one large one :

   to allow for better digestion and absorption rather than
   overloading the stomach and other organs of digestion

9. Juices are often a high GI substance due to the large mount of fibre present in the juice. T / (F)

10. Flaxseed oil can be used to increase the amount of _____essential fatty acids_____ in the diet.

11. In general you should **increase** / (**decrease**) the amount of salt added to foods. *(Circle one)*

12. Describe why foods that are fried are often higher in fat than foods that are grilled:

    during the grilling process, the fats drain off rather than coating
    the food as occurs in frying

13. The ingredients that are used for stir frying should be cut into small portions to increase the time taken for cooking them. T / (F)

14. Cooking in a fan forced oven usually requires **longer** / (**shorter**) cooking times than in a regular oven. *(Circle one)*

15. Microwaves cook food by exciting the water molecules within the food. (T) / F

3. Carbohydrates

Activities to consolidate your skill and understanding

1. Which of the following is formed from two sugar molecules joined together? *(Circle one)*

   a. monosaccharide

   b. disaccharide

   c. oligosaccharide

   d. polysaccharide

2. Galactose is found in **milk** / **fruit** *(Circle one)*

3. Humans store glucose as starch. **T** / **F**

4. Describe why fibre is a necessary component of our diet:

   to allow for appropriate stool formation and the friction of the stool passing through enables cells to be shed from the lining of the GIT

5. State one example of a source of soluble fibre and one of an insoluble fibre

   Soluble fibre: pectin Insoluble fibre: cellulose

6. The skeletal muscles **can** / **cannot** release glucose into the blood. *(Circle one)*

7. Which of the following forms the bulk of the grain? *(Circle one)*

   a. germ

   b. endosperm

   c. bran

   d. husk

8. Gliadin and glutenin combine together to form gluten

9. Due to processing, white rice is predominantly formed from the germ of the grain, rather than the endosperm. **T** / **F**

10. All cereals are low in simple sugars. **T** / **F**

11. What is added to ground wheat to form the yellow colour of noodles? egg yolk

12. Describe why a high carbohydrate diet may cause weight gain:

    if you have not used the glycogen in the liver and muscles, excess carbohydrates will be converted to fats (via lipogenesis)

3. Carbohydrates - cont.

Activities to consolidate your skill and understanding

13. Kumara (sweet potatoes) have a **higher** / **lower** fibre content than regular potatoes. *(Circle one)*

14. Which component of a grain is not found in wholemeal bread? *(Circle one)*

    a. endosperm

    b. bran

    c. germ

15. The glycemic index (GI) is a measure of a foods ability to lower blood glucose levels. **T** / **F**

16. Describe why the glycemic load is a better nutritional measurement than glycemic index:

    the GI rating measures all of the food item whilst the GL measures only the solid (non water) portion)

17. On average, an active person will require approximately: *(Circle one)*

    a. 1 – 5 grams of carbohydrates per kilogram per day

    b. 6 – 10 grams of carbohydrates per kilogram per day

    c. 11 – 15 grams of carbohydrates per kilogram per day

    d. 16 – 20 grams of carbohydrates per kilogram per day

18. Carbohydrates consumed AFTER activity should have a **low** / **high** GI rating. *(Circle one)*

19. Diabetes mellitus results from an inability to move glucose **into** / **out of** cells. *(Circle one)*

20. Which of the following is not a feature of diabetes mellitus: *(Circle one)*

    a. polydipsia

    b. polyuria

    c. polypenia

4. Proteins

Activities to consolidate your skill and understanding

1. Fish is a good source of protein. (T) / F

2. The **essential** / **non-essential** amino acids are able to be made in the body. *(Circle one)*

3. A complete protein contains all of the essential amino acids

4. Histamine is converted into the neurotransmitter histidine, which allows correct functioning of the nervous system. T / (F)

5. Describe why anaphylaxis may be fatal in people who are allergic to nuts:

   anaphylaxis causes bronchoconstriction which narrows the airways and means that the patient cannot breathe

6. Which of the following is a function of protein? *(Circle one)*

   a. repair damaged muscle tissue

   b. growth of the body

   c. development of the skeletal muscles

   (d. all of the above)

7. Describe why you need to consume more water if you consume more protein:

   due to the excretion of nitrogen from amino acids, the kidneys work harder and need the water to flush through the metabolites

8. Which of the following percentages is the amount of protein in meat (muscle tissue of the animal). *(Circle one)*

   a. 10%

   (b. 20%)

   c. 30%

   d. 40%

9. The function of myoglobin is to trap oxygen within the muscle tissue. (T) / F

10. Meat does not contain all of the essential amino acids and so is not a complete protein. T / (F)

4. Proteins - cont.

Activities to consolidate your skill and understanding

11. Which of the following is not a means of tenderising meat? *(Circle one)*

    a. addition of proteolytic enzymes

    b. physical striking with a mallet

    c. freezing the meat prior to cooking

    d. the use of acidic marinades

12. Which of the following is derived from a young cow (calf)? *(Circle one)*

    a. veal

    b. beef

    c. mutton

13. **Ham** / **bacon** is derived from the hind leg of a pig *(Circle one)*

14. What was the original purpose of curing meat by soaking it in brine?
    to preserve it for a longer time prior to refrigeration technology

15. Sausages usually contain a **high** / **low** amount of actual meat. *(Circle one)*

16. **Crustaceans** / **molluscs** are invertebrates with a soft body enclosed within a hard shell. *(Circle one)*

17. Which of the following is a saltwater fish? *(Circle one)*

    a. perch

    b. pike

    c. sole

18. Describe why we should consume 2 – 3 serves of fish per week:

    to ensure that we have adequate intake of the essential fatty acids that we must gain from the diet as we cannot make them

19. Fish generally contains **more** / **less** collagen than other types of meat. *(Circle one)*

20. Fish canned in spring water will not have any salt in the water within the can. **T** / **F**

21. Wasabi is important when consuming raw fish meals like sushi be cause it kills the bacteria that may be found in the fish. **T** / **F**

4. Proteins - cont.

Activities to consolidate your skill and understanding

22. When cooking chicken you should **leave the skin on / remove the skin.** *(Circle one)*

23. Eggs **whites / yolks** are high in albumin. *(Circle one)*

24. The enzyme that lactose intolerant people lack is **lactase**

25. Which of the following is not a protein found in milk? *(Circle one)*

    a. casein

    b. whey

    c. fibre

26. Milk fats do not generally contain cholesterol. T / **F**

27. Which of the following is the process of heating the milk to nearly boiling point? *(Circle one)*

    a. pasteurisation

    b. homogenisation

    c. neither of the above

28. The calcium found in milk is easily absorbed with a bioavailability of 90%. T / **F**

29. Which of the following is the least unhealthy. *(Circle one)*

    a. yoghurt

    b. cream

    c. ice cream

30. Which of the following has the least amount of water. *(Circle one)*

    a. cottage cheese

    b. edam

    c. cheddar

    d. parmesan

31. State why many people who are lactose intolerant may be able to consume cheese:

    most of the lactose in milk is drained off with the whey and is therefore not present in large amounts in cheese

32. Kwashiorkor and marasmus result from excessive protein ingestion. T / **F**

33. If the amount of nitrogen excreted is less than the amount of nitrogen ingested in protein, then the person is described as being in **positive / negative** nitrogen balance. *(Circle one)*

5. Fats (lipids), Dangers of Fast Foods

Activities to consolidate your skill and understanding

1. Marbling is due to the fats within the structure of the meat. **(T) / F**
2. Fat is also required for the absorption of fat-soluble vitamins. **(T) / F**
3. Catabolism (breakdown) of fats yields **4 / (9)** kilocalories of energy. *(Circle one)*
4. A tri-acyl-glyceride contains how many fatty acids attached to the glycerol molecule? *(Circle one)*
   a. one
   b. two
   (c. three)
5. If a fatty acid has one double bond between adjacent carbons, it is called a... *(Circle one)*
   a. saturated fatty acid
   (b. mono-unsaturated fatty acid)
   c. poly-unsaturated fatty acid
6. Essential fatty acids cannot be made in the body and must therefore be gained from the diet. **(T) / F**
7. Flax seed oil contains a large amount of... *(Circle one)*
   (a. omega 3 fatty acids)
   b. omega 6 fatty acids
   c. neither omega 3 and omega 6 fatty acids
8. Every cell membrane in the body contains cholesterol. **(T) / F**
9. Plant matter **does / (does not)** contain cholesterol. *(Circle one)*
10. Which of the following are liquid at room temperature? *(Circle one)*
    a. fats
    (b. oils)
    c. both fats and oils
    d. neither fats nor oils
11. Extra virgin olive oil is a high quality, non-refined oil with a high acidity. **T / (F)**

5. Fats (lipids), Dangers of Fast Foods - cont.

Activities to consolidate your skill and understanding

12. Trans saturated fatty acids are created by... *(Circle one)*

    a. adding hydrogen atoms to a fatty acid

    b. removing hydrogen atoms from a fatty acid

    c. neither of the above

13. If a person is deficient of the essential fatty acids, they might experience all of the following, except... *(Circle one)*

    a. dry skin

    b. increased craving for fatty food

    c. decreased allergic responses

    d. decreased secretion from mucous membranes

6. Snacks & Drinks

(fruits, berries, nuts & chocolate; water & sports drinks)

Activities to consolidate your skill and understanding

1. State why high GI snacks should be consumed in the first half an hour after exercise:
   to ensure the replenishment of the muscle glucose following the catabolism of the glucose in exercise

2. Honey is **low** / **high** on the GI scale. *(Circle one)*

3. Which of the following contains saturated fatty acids? *(Circle one)*

   a. avocados

   b. olives

   c. coconut

4. The recommended number of serves of fruit per day is... *(Circle one)*

   a. 1 – 2

   b. 3 – 5

   c. 6 – 10

5. Which of the following is found in grapes? *(Circle one)*

   a. citric acid

   b. malic acid

   c. tartaric acid

   d. oxalic acid

6. Describe how pectin causes apples to be fairly low on the GI scale:
   pectin binds with water to form a gel like mass and slows down the digestion and absorption of the carbohydrates

7. Fruit "ade" contains not less than 50% of the actual juice in the drink **T / F**

8. Most commercial fruit juices are pasteurised. **T / F**

9. Most fruit juices have a **low** / **high** amount of fibre. *(Circle one)*

10. Which of the following is not commonly produced as a dried fruit? *(Circle one)*

    a. apples

    b. bananas

    c. cherries

11. Cranberries are **more** / **less** sweet than raspberries. *(Circle one)*

12. Almonds are a poor source of protein. **T / F**

6. Snacks & Drinks - cont.

(fruits, berries, nuts & chocolate; water & sports drinks)

Activities to consolidate your skill and understanding

13. In terms of water replenishment, you do not need to drink if you are not thirsty. T / (F)

14. Which of the following affects gastric emptying? *(Circle one)*

    a. the volume of water ingested

    b. the temperature of the water ingested

    c. the degree of activity of the digestive system

    (d. all of the above)

15. State the substance that is referred to in the condition of hyponatremia. blood levels of sodium

16. Most of the energy liberated in muscles during metabolism is converted into heat. (T) / F

17. Describe the role of humidity in the evaporation of sweat from the skin:
    humidity is the percentage of water already in the air and if high, reduces the ability of water to form water vapour

18. If cramping during or following activity, you should ingest sodium chloride (salt). T / (F)

19. All athletes who compete in moderate levels of activity for longer than 5 minutes need to consume sports drinks to replenish lost electrolytes. T / (F)

20. Describe one consequence of consuming sugary drinks such as sports drinks or fruit juices:
    dental cavaties (holes in the teeth)

21. Many sugary drinks now contain very sweet corn syrup.

22. An example of an artificial sweetener is... *(Circle one)*

    (a. saccharin)

    b. artarsame

    c. lucrasoze

23. Describe how mineral water is different from distilled water:
    mineral water drains through rocks, gaining minerals whilst distilled water is collected from condensing steam and is pure

24. Which of the following is approximately one standard drink of alcohol? *(Circle one)*

    a. 240 ml of wine

    b. 6 ml of sherry

    c. 28 ml of regular strength beer

    (d. 30 ml of bourbon)

7. Micronutrients

Activities to consolidate your skill and understanding

1. The B vitamin group is **water / fat** soluble. *(Circle one)*
2. A major symptom of vitamin B group deficiency is lethargy. T / F
3. Vitamin B1 absorption is not impaired by alcohol. T / F
4. Which of the following vitamins is not involved in the production of ATP? *(Circle one)*
   a. vitamin B2
   b. vitamin B3
   c. vitamin B4
5. Vitamin B2 deficiency may cause alopecia. T / F
6. Describe why some people may describe a tingling sensation upon ingesting niacin:
   niacin may cause vasodilation (increased blood vessel diameter), raising blood flow to certain areas
7. Pantothenic acid forms part of co-enzyme **A / Z.** *(Circle one)*
8. Extremely high doses of vitamin B6 may cause peripheral neuropathy. T / F
9. Neural tube defects may occur due to a deficiency of vitamin B9. T / F
10. Vitamin B12 is required for appropriate production of red blood cells. T / F
11. **Biotin / carnitine** allows the transfer of fatty acids into mitochondria. *(Circle one)*
12. Vitamin C is involved in... *(Circle one)*
    a. collagen synthesis
    b. production of steroid hormones
    c. blood clotting
    d. nerve function
    e. all of the above
13. Bioflavonoids oppose the action of vitamin C. T / F
14. Betacarotene is formed from two molecules of vitamin A joined together. T / F
15. Vitamin D may be gained from the skin. T / F
16. Sunflower seeds are a good source of vitamin D. T / F

7. Micronutrients - cont.

Activities to consolidate your skill and understanding

17. Describe the role of vitamin E in the cell membrane:
vitamin E acts as a free radical scavenger and binds with the free radicals before they can damage the fatty acids of the cell membrane

18. Vitamin K is involved in activating enzymes that are involved in the **blood clotting** cascade.

19. The most abundant mineral found in the body is... *(Circle one)*

a. carbon

b. hydrogen

c. nitrogen

d. oxygen

20. Approximately 99% of the calcium in the body is found in the muscles. T / F

21. **Chloride / chromium** increases the activity of insulin. *(Circle one)*

22. Which of the following is most associated with the thyroid hormones? *(Circle one)*

a. copper

b. fluoride

c. iodine

d. magnesium

23. Iron deficiency anaemia occurs because there is too little iron in which of the following blood cells? *(Circle one)*

a. red blood cell

b. white blood cell

c. platelet

24. Kelp is a good source of both potassium and magnesium. T / F

25. Sodium deficiency is more common than sodium excess in our diet. T / F

26. Zinc is involved in the maturation of sperm cells but is not used for female fertility. T / F

8. Special Populations

Cultural or religious implications in dietary practices

Activities to consolidate your skill and understanding

1. Beef is not consumed at all in which of the following faiths? *(Circle one)*

   a. Buddhism

   b. Christianity

   c. Hinduism

   d. Judaism

2. During Ramadan, Muslims fast during the night and consume specific food and drink during the day. T / F

3. Kosher foods are prepared in accordance with Jewish principles. T / F

4. A vegan will only eat foods from an animal origin. T / F

5. Describe why a vegetarian needs to be aware of food combining:

   to ensure the vegetarian gains the total nutrition required, as some nutrients are missing from some foods but present in others

6. Due to intestinal microflora, legumes may cause flatulence in some people. T / F

7. Which of the following is NOT derived from soy beans? *(Circle one)*

   a. miso

   b. tempeh

   c. tofu

   d. cashews

8. Which of the following contains lactose? *(Circle one)*

   a. rice milk

   b. soy milk

   c. both of the above

   d. neither of the above

9. Describe why organic foods need to be consumed sooner than non-organic foods:

   due to the lack of preservatives in organic food, the food will not last as long before degradation and rotting occurs

8. Special Populations - cont.

Cultural or religious implications in dietary practices

Activities to consolidate your skill and understanding

10. **Anorexia / bulimia** nervosa is characterised by decreased eating. *(Circle one)*

11. **Essential / storage** fat is located within the subcutaneous tissue of the skin. *(Circle one)*

12. Which of the following BMI figures is described as obese *(Circle one)*

    a. 15.5 – 18.5

    b. 18.5 – 25

    c. 25 – 30

    d. 30 - 35

13. Which of the following has a slim, non-muscular build? *(Circle one)*

    a. endomorph

    b. ectomorph

    c. mesomorph

14. Which of the following requires the body to be submerged in water

    a. ultrasound testing

    b. MRI testing

    c. pinch / calliper testing

    d. hydrostatic weighing

15. The metabolic changes in short term starvation include **increased / decreased** ketone bodies. *(Circle one)*

16. Describe why there is a tendency to hypothermia in prolonged starvation states:

    decreased metabolic rate / decreased shivering and non shivering thermogenesis