LONDON SOUTH BANK UNIVERSITY

# unit guide

Basic Concepts in Nutrition

SMK-1-300

Faculty of Engineering Science
and the Built Environment

2008/2009

**become what you want to be**

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# 1.0 UNIT DETAILS

| | |
|---|---|
| **Unit Title:** | Basic Concepts in Nutrition |
| **Unit Level:** | 1 |
| **Unit Reference Number:** | SMK-1-300 |
| **Credit Value:** | 1 Credit = 15 CAT Points |
| **Student Study Hours:** | 150 hours |
| **Contact Hours:** | 39 |
| **Private Study Hours:** | 111 |
| **Pre-requisite Learning (If applicable):** | None |
| **Co-requisite Units (If applicable):** | None |
| **Course(s):** | BSc Bioscience<br>BSc Human Biology<br>BSc Food & Nutrition<br>BSc Sports Science<br>HND Applied Biology |
| **Year and Semester** | 2008/09 Semester 2 |
| **Unit Coordinator:** | Dr Mike Hibbs |
| **UC Contact Details (Tel, Email, Room)** | 020 7815 7962<br>hibbsm@lsbu.ac.uk<br>J214 |
| **Teaching Team & Contact Details (If applicable):** | Prof. Martin Chaplin<br>Prof. Jill Davies<br>Dr Mike Hibbs<br>Dr. Michelle Hawkins |
| **Subject Area:** | Human & Exercise Science |
| **Summary of Assessment Method:** | 100% multiple choice Examination |

# 2.0 SHORT DESCRIPTION

There is considerable interest in the role of nutrition in the promotion of health. This introductory unit provides an insight and lays the foundations for further study in this highly relevant and exciting area. The scene is set with identification of factors influencing food choice. The major theme throughout the unit is an examination of food as a source of nutrients and in meeting dietary requirements. Emphasis on planning diets in the context of healthy eating guidelines and in the assessment of food intake for dietary adequacy is given.

# 3.0 AIMS OF THE UNIT

1. Provide an understanding of the fundamentals of nutrition as a basis for further studies on nutrients in health and disease.
2. Develop practical skills in the measurement of nutrient intakes and the assessment of requirements, using UK and international reference standards.
3. Provide a sound basis for a scientific approach to planning healthy diets.

# 4.0 LEARNING OUTCOMES

## 4.1 KNOWLEDGE AND UNDERSTANDING

On successful completion of this unit a student should be able to:

1. Appraise factors determining food choice.
2. Demonstrate knowledge of the basic concepts of the science of nutrition.
3. Appraise the sources of energy and nutrients in the diet, their bioavailability and physiological roles, requirements and the consequences of excess or deficiency.
4. Estimate the nutrient content of a diet and evaluate the adequacy of a diet.
5. Plan healthy diets in accord with healthy eating guidelines.

## 4.2 INTELLECTUAL SKILLS

This unit gives students the opportunity to develop numerical skills. The use of information technology is fostered. A critical approach is encouraged in the interpretation of data.

## 4.3 TRANSFERABLE SKILLS

Students should be able to communicate effectively and take responsibility for self-managed learning.

# 5.0 INTRODUCTION TO STUDYING THE UNIT

## 5.1 OVERVIEW OF THE MAIN CONTENT

- What you eat and why?: overview of the factors influencing food choice.
- Dietary recommendations
- Digestion and absorption of nutrients.
- Food as a source of: energy; macronutrients; micronutrients; water: fibre.
- Dietary assessment.

## 5.2 OVERVIEW OF TYPES OF CLASSES

This unit will be presented in the form of one 3-hour key lecture per week.

Classroom contact will be a series of lectures with a strong base of student centred learning. Classroom contact hours account for only 39 hours, students are therefore expected to contribute a minimum of 111 hours self managed private study.

Assessment of this unit is entirely based on examination.

Students should attend all lectures to successfully pass the unit. Students must be punctual.

## 5.3 IMPORTANCE OF STUDENT SELF-MANAGED LEARNING TIME

It is important for you to plan your work schedule in advance (use this unit guide to help). Use time efficiently. Make effective notes (Use key words, flow charts, diagrams and personal short-hand). Review material (Re-read lecture notes following each session; this will aid learning). Carry out directed reading. Remember, you must make an effort! Lectures are there for overview and guidelines. Learning must come from your own reading. Private study: you are expected to contribute to your learning by participating in the designated private study time associated with this unit. Last year's exam paper is incorporated into this Unit Guide. Make sure that you work through it. The answers will be provided at the end of the course. You will not pass the unit by simply attending sessions. Ask for help (don't be afraid to ask!!)

## 5.4 EMPLOYABILITY

This unit provides those students with the understanding of the specific nutritional requirements of individuals and provides them with the ability to adapt their prescriptive advice based on macro and micronutrient knowledge.

## 5.5 END OF UNIT REVIEW – YOUR FEEDBACK IS VALUABLE

It is University policy to obtain student feedback at the end of each unit. This is carried out using a standard form that should be completed and returned in a way that should maintain your anonymity. The results of the tick-box responses and any additional commentary are presented and discussed at the Subject Area Review & Planning Meetings that are held twice per year. Should it be required, members of staff at these meetings agree to modify aspects of unit delivery and assessment for the next time that the unit will be presented (usually for the following year).

# 6.0 THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

| Semester week number | Topic | Lecturer |
|---|---|---|
| 1 (19) | Introduction to unit<br>What you eat and why? | Prof. Jill Davies |
| 2 (20) | Energy | Dr. Michelle Hawkins |
| 3 (21) | Fat | Dr. Michelle Hawkins |
| 4 (22) | Carbohydrate | Dr. Michelle Hawkins |
| 5 (23) | Protein | Dr. Michelle Hawkins |
| 6 (24) | Vitamins & Minerals | Dr. Michelle Hawkins |
| 7 (25) | Digestion & Absorption 1 | Dr. Mike Hibbs |
| 8 (26) | Digestion & Absorption 2 | Dr. Mike Hibbs |
| 9 (27) | Dietary Recommendations | Prof. Jill Davies |
| 10 (28) | Dietary Assessment | Prof. Jill Davies |
| Vacation | | |
| 11 (32) | Water | Prof. Martin Chaplin |
| 12 (33) | Fibre | Prof. Martin Chaplin |
| 13 (34) | Revision Session | Dr. Michelle Hawkins<br>Dr. Mike Hibbs<br>Prof. Jill Davies |
| | | |

# 7.0 ASSESSMENT OF THE UNIT

Assessment is a multiple choice examination paper. See recent paper in this Unit Guide.

## ACADEMIC MISCONDUCT

Students are referred to the University's Student Handbook Section 10.12 Academic misconduct, which summarises Chapter 13 of the academic regulations. The full version of the regulations is available from the registry (situated in Technopark building).

# 8.0 LEARNING RESOURCES

## 8.1 CORE MATERIALS

Barasi ME (2007) *Human Nutrition: A Health Perspective*, 3rd edition. Hodder Arnold:London.

Tortora G.J. & Derrickson B (2007) *Introduction to the Human Body: The essentials of Anatomy & Physiology,* 7th edition**.** John Wiley & Sons: New York

## 8.2 OPTIONAL MATERIALS

Department of Health (1991) *Dietary Reference Values for Food Energy and Nutrients for the United Kingdom.* Report on Health and Social Subjects No. 41. The Stationery Office: London.

Food Standards Agency (2002) *Food Portion Sizes*, 3rd edition. The Stationery Office: London.

Food Standards Agency (2002) *McCance and Widdowson's The Composition of Foods. Sixth summary edition.* Royal Society of Chemistry: Cambridge.

Hoare, J Henderson, L Bates, CJ Prentice, A Birch, M Swan, G & Farron, M (2004) *The National Diet & Nutrition Survey: adults aged 19 to 64 years Summary report*. The Stationery Office: London.

Webb, GP (2007) *Nutrition a Health Promotion Approach*, 3ndedition. Hodder Arnold: London.

Widmaier E., Raff H., Strang K. (2004) *Vander Sherman & Luciano's Human Physiology: The Mechanisms of Body Function,* 9th edition. McGraw Hill: New York

**Web Pages**

Guidance on the use of key websites will be given at key lectures.

# Past exam paper

1. The Committee on Medical Aspects of Food and Nutrition Policy (COMA) has been replaced by

A Scientific Advisory Committee on Nutrition (SACN)
B Food Standards Agency (FSA)
C Guideline Daily Amounts Committee (GDA)
D The Nutrition Advisory Committee (NAC)
E National Working Group on Nutrition (NWN)

2. The amount of a nutrient sufficient to ensure that the needs of nearly all (97.5%) of a reference age group are being met is called the

A Lower Reference Nutrient Intake (LRNI)
B Average Nutrient Intake (ANI)
C Mean Nutrient Intake (MNI)
D COMA Sufficient Intake (CSI)
E Reference Nutrient Intake (RNI)

3. The Estimated Average Requirements (EAR) for energy are calculated by multiplying the Basic Metabolic Rate (BMR) by a factor called the Physical Activity Level (PAL). The PAL for most adults is

A 5.0
B 2.8
C 1.4
D 2.4
E 100

4. The Guideline Daily Amount of energy for adults is

A 2200 Calories
B 2000 kilocalories
C 200 calories
D 2500 Calories
E 2000 kJ

5. The Guideline Daily Amount of protein (g) for men is

A 35 g
B 40 g
C 45 g
D 50 g
E 55 g

6. 100 g of whole milk provides approximately

A 1275 kJ
B 100 kJ
C 100 kcal
D 275 kJ
E 275 kcal

7. A BMI value between 25 and 30 is

A underweight
B obese
C healthy
D overweight
E normal

8. The potential nutritional energy from 1 g of fat is

A 9 kJ
B 37 calories
C 37 kcal
D 9 kcal
E 4 kcal

9. The ‘energy value’ of a food can be determined using a

A mass balance
B BMI scale
C Guideline Daily Amount
D bomb calorimeter
E thermometer and insulated chamber

10. The proportion of energy from milk and dairy products in the typical British diet is

A 10%
B 20%
C 30%
D 40%
E 60%

11. Lipids are readily extracted from foods using

A water
B Kjeldahl method
C alcohol
D Soxhlet method
E bomb calorimeter

12. Pure fats and oils are mainly

A free fatty acids
B glycerol
C phospholipids
D saponified fatty acids
E triglycerides

13. Which of these vitamins is a “fat soluble” vitamin?

A A
B $B_2$
C $B_6$
D $B_{12}$
E C

14. How many double carbon bonds does a saturated fatty acid have?

A 0
B 1
C 2
D 3
E 4

15. Linoleic acid is

A a saturated fatty acid
B a trans fatty acid
C a phospholipid
D an essential fatty acid
E cis, 9-octadecenoic acid

16. Lipids are transported in the blood as

A triglycerides
B cholesterol
C lecithin
D free fatty acids
E lipoproteins

17. Most naturally occurring unsaturated fatty acids occur

A in the cis form
B as trans fatty acids (TFAs)
C as saturated fatty acids
D as omega -3 acids
E as short chain fatty acids (n = 4 -7)

18. Which of these is a disaccharide?

A Starch
B Glucose
C Galactose
D Sucrose
E Fructose

19. Low glycaemic index foods have a glycaemic index of less than…?

A 25
B 50
C 60
D 75
E 100

20. Foods have a high glycaemic index because they….?

A Release energy quickly
B Store energy quickly
C Release energy slowly
D Store energy slowly
E Maintain energy stores

21. The Guideline Daily Amount (g) for carbohydrate for women is

A 500 g
B 1000 g
C 2000 g
D 230 g
E 2300 g

22. What percentage of dietary energy should come from 'total fat'?

A 15%
B 25%
C 30%
D 40%
E 42%

23. What are the health consequences of having a Vitamin A deficiency?

A Retarded Growth
B Night Blindness
C Dry Eyes
D Degenerative changes in eye epithelium
E Choose E if you think all of the above are true

24. What is the principal function of Vitamin K?

A Red Blood Cell formation
B Aiding blood clotting
C Protects from free radical damage
D Essential in maintaining cell membranes
E Increases Calcium absorption

25. Which of these conditions is linked with having a Vitamin C deficiency?

A Coeliac Disease
B Scurvy
C Rickets
D Retarded growth
E Anaemia

26. Pellagra is the deficiency of which B-Vitamin?

A $B_1$
B $B_2$
C $B_3$
D $B_6$
E $B_{12}$

27. Which of the following is an essential amino acid?

A Alanine
B Glutamine
C Leucine
D Glycine
E Aspartic acid

28. Which of the following is a protein deficiency disorder?

A scurvy
B rickets
C polio
D kwashiorkor
E scarlet fever

29. Body mass index (BMI) can be calculated using the following formulae:

A body weight (kg) / height (m)
B body weight $^2$ (kg) / height $^2$ (m)
C body weight (kg) / height $^2$ (m)
D height $^2$ (m) / body weight $^2$ (kg)
E height $^2$ (m) / body weight (kg)

30. 1 kilocalorie (kcal) is equivalent to how many kilojoules (kJ)?

A 4.184 kJ
B 2.000 kJ
C 5.865 kJ
D 20.000 kJ
E 17.000 kJ

31. Which of the following statements is false?

A Several breaks during the day (between meals) with a glass of water is good for well-being.
B Drinking ice-cold water is optimal when the outside temperature is high, it helps to cool down the body.
C To quench strong thirst effectively it is better to drink in small sips at regular intervals than to gulp down a big amount at once.
D The pleasure we experience when we drink a beverage depends also on its temperature.15-18°C is a good choice.
E To drink a glass of water before breakfast is a good idea. The body is ready to absorb it.

32. Which of the following statements are correct?

A Water is a vital nutrient for the life of every cell.
B Water is a carrier.
C Water is a thermoregulator.
D Water is a shock absorber.
E Choose E if you think that all the above are true

33. Which percentage of water accounts for an adult female's total body water?

A 30%
B 45%
C 60%
D 75%
E 90%

34. Who needs more water? (proportional to the body weight)

A an adult man needs proportionally more water than a child
B an adult woman needs proportionally more water than an infant
C an average woman needs more water than an average man
D an elderly person needs more water than a young adult
E an infant needs proportionally more water than a young adult

35. The daily dietary reference value (DRV) for water intake for an adult male is

A 0.5 litres
B 1.6 litres
C 2.2 litres
D 3.7 litres
E 5.3 litres

36. Name a probable health benefit of eating dietary fibre.

A Protection against colon cancer
B Protection against heart disease
C Protection against diabetes
D Protection against diverticular disease
E Choose E if you think that all the above are true

37. How much energy can we get from our dietary fibre, if fermented in the colon?

A 0 kcal/g
B 1 kcal/g
C 2 kcal/g
D 3 kcal/g
E 4 kcal/g

38. Name a major dietary fibre found in seaweed.

A Pectin
B Cellulose
C Carrageenan
D Arabinoxylan
E Stachyose

39. Which of the following dietary fibers is MOST easily fermented in the colon?

A Cellulose
B Alginate
C Pectin
D Arabinoxylan
E Carrageenan

40. Which of the following dietary fibers is LEAST easily fermented in the colon?

A Cellulose
B Stachyose
C Resistant starch
D Arabinoxylan
E Pectin

41. What gas in the breath is used to test whether food is fermented in the colon?

A Hydrogen
B Nitrogen
C Oxygen
D Methane
E Carbon dioxide

42. Approximately, what percentage of the human body is made up of protein?

A 62
B 17
C 14
D 6
E 2

43. You dislike the smell and taste of eggs and refuse to eat them! Where does this fit into Fieldhouse's Food Selection Paradigm?

A Economics
B Culture
C Availability
D Individual Choice
E Religion

44. Variant Creutzfeldt-Jakab Disease is associated with which of the following meats?

A Pork
B Chicken
C Lamb
D Beef
E Turkey

45. What is the main impetus for selecting organic foods?

A Healthier
B Less expensive
C Taste better
D Readily available in the supermarkets
E Free from pesticides and fertilisers

46. Which one of the following must a strict vegetarian (Vegan) exclude from their diet?

A Mushy peas
B Quorn
C Canned chickpeas
D Peanuts
E Tofu

47. Where do doughnuts fit on the “Balance of Good Health” plate?

A Meat, fish and alternatives
B Milk and dairy products
C Bread, other cereals and potatoes
D Foods containing fat and sugar
E Fruit and vegetables

48. In the assessment of iodine intake which of the following Dietary Reference Values (DRV) would you use?

A Lower Reference Nutrient Intake (LRNI)
B Estimated Average Requirement (EAR)
C Individual minimum
D Individual maximum
E Reference Nutrient Intake (RNI)

49. Which of the following food groups from the “Balance of Good Health” provides: Calcium, proteins, B-Vitamins and Vitamins A and D?

A Fruit and vegetables
B Meat, fish and alternatives
C Milk and dairy foods
D Bread, other cereals and potatoes
E Foods containing fat and sugar

50. Which of the following foods fits into the “5 a day” scheme?

A Eggs
B Milk and milk products
C Meat and meat products
D Fruit and vegetables
E Fish and fish products

51. Which is the smallest section on the “Balance of Good Health” plate?

A Meat, fish and alternatives
B Milk and dairy products
C Bread, other cereals and potatoes
D Foods containing fat and sugar
E Fruit and vegetables

52. Which of the following is the ‘gold’ standard for dietary assessment?

A 24-hour recall
B Diet history
C Food frequency questionnaire
D Diet diary
E 7-day weighed inventory

53. On using Tables of Food Composition it is important to know which of the following?

A Origin of the food
B Colour of the food
C Food grouping
D Description of food
E Cost of the food

54. Tables of Food Composition present nutritional data as which of the following?

A Standard portion sizes
B Per 10 grams of food
C Per 75 grams of food
D Per 100 grams of food
E Per 1000 grams of food

55. If 100 grams of mozzarella yields 20.3g fat how much fat is present in a portion weighing 60 grams?

A 12.2
B 12.0
C 11.8
D 11.7
E 11.5

56. If 100 grams of goulash yields 6.9g protein, how much protein is present in a portion weighing 190grams?

A 11.8
B 12.0
C 13.1
D 13.3
E 13.5

57. Which of the following is NOT part of the gastrointestinal tract?

A Oesophagus
B Stomach
C Pancreas
D Small Intestine
E Anal Canal

58. Which of the following is NOT true of the gastrointestinal tract?

A Good blood supply
B Motility and secretion under the control of nerves and hormones
C Layers of circular and longitudinal smooth muscle
D Small intestine adapted for motility and also for absorption
E Oesophagus adapted for motility and also for absorption

59. Which of the following is TRUE of saliva?

A Secretion decreased by activity of the parasympathetic nervous system
B Contains an enzyme which begins protein digestion
C Contains an enzyme which begins carbohydrate digestion
D Contains an enzyme which begins fat digestion
E Secretion increased by activity of the sympathetic nervous system

60. Which of these is NOT a function of the stomach?

A Secretion of hydrochloric acid
B Secretion of fat-digesting enzyme
C Secretion of mucus
D Secretion of hormone
E Secretion of protein-digesting enzyme

61. Which of these is NOT true of stomach (gastric) secretions?

A Stimulated by the smell of food
B Stimulated by the chewing of food
C Stimulated by the release of a hormone called gastrin
D Stimulated by the parasympathetic nervous system
E Stimulated by the release of a hormone called secretin

62. Which of the following WILL inhibit stomach (gastric) secretions?

A High acidity of stomach contents
B Mechanical distension of stomach wall
C Low acidity of stomach contents
D Proteins from food in stomach contents
E Palatable (tasty) food in the mouth

63. Which one of the following will NOT slow stomach (gastric) emptying?

A Pepsinogen in the contents of the duodenum
B Fat breakdown products in the contents of the duodenum
C Protein breakdown products in the contents of the duodenum
D Acid pH in the contents of the duodenum
E Choose E if you think that all the above slow stomach (gastric) emptying

64. Which is NOT true of the cholecystokinin (CCK) hormone?

A Stimulates enzyme secretion from the pancreas
B Slows gastric emptying
C Is secreted by the duodenum
D Stimulates release of bile from gall bladder
E Choose E if you think that all the above are true of CCK hormone

65. Which of the following is NOT a function of the small intestine?

A Mixing
B Propulsion
C Secretion
D Absorption
E Choose E if you think that all the above are true of the small intestine

66. Which is NOT true of the pancreatic juice?

A Secretion stimulated by a hormone called secretin
B Secretion stimulated by a hormone released from duodenum
C Contains enzymes for digestion of fat
D Contains enzymes for digestion of carbohydrates
E Choose E if you think that all the above are true of pancreatic juice

67. Which is NOT true of bile?

A Essential for the processing of fats in the small intestine
B Stored in the gall bladder
C Secreted by the liver
D Contains enzymes for digestion of fats
E Choose E if you think that all the above are true of bile

68. Bile Salts

A Have a hydrophobic region on the molecule
B Have a hydrophilic region on the molecule
C Aggregate into micelles with a hydrophobic core
D Are returned from the small intestine to the liver by the entero-hepatic circulation
E Choose E if you think all the above are true of bile salts

69. Which of the following is INCORRECT?

A Most of the products of digestion are absorbed firstly into the epithelial cells of the small intestine and then into the blood or lymph
B Glucose is absorbed by an active transport mechanism.
C Glucose absorption is dependent upon sodium transport
D Water is absorbed by osmosis
E Most of the fat is absorbed after fermentation by flora (bacteria) in the small intestine