Food Preparation and Nutrition GCSE AQA

Whole course content for the written exam paper

Food, nutrition and health

Macronutrients

Protein

Content	What you must know and understand	R	A	G
• Low and High biological value proteins (LBV, HBV) • Protein complementation • Protein alternatives e.g. textured vegetable protein (TVP), soya, mycoprotein and tofu	• The functions • Main sources • Effects of deficiency and excess • Related dietary reference values			

Fats

Content	What you must know and understand	R	A	G
• Saturated fats • Unsaturated fats (monosaturated and polyunsaturated)	• The functions • Main sources • Effects of deficiency and excess • Related dietary reference values			

Carbohydrates

Content	What you must know and understand	R	A	G
• Starch (polysaccharides) • Sugars (monosaccharides/ disaccharides) • Dietary fibre	• The functions • Main sources • Effects of deficiency and excess • Related dietary reference values			

Micronutrients

Vitamins

Content	What you must know and understand	R	A	G
Fat soluble • Vitamin A • Vitamin D • Vitamin E • Vitamin K	• The functions • Main sources • Effects of deficiency and excess • Related dietary reference values			
Water soluble • B group – B1 (thiamin), B2 (riboflavin), B3 (niacin), folic acid, B12 • Vitamin C (ascorbic acid) • Loss of water soluble vitamins when cooking (B group and vitamin C)	• The functions • Main sources • Effects of deficiency and excess • Related dietary reference values • How preparation and cooking affects the nutritional properties of food			
Antioxidant functions of vitamins • Vitamin A • Vitamin C • Vitamin E	• The role of antioxidants in protecting body cells from damage			

Minerals

Content	What you must know and understand	R	A	G
• Calcium • Iron • Sodium (salt) • Fluoride • Iodine • phosphorus	• The functions • Main sources • Effects of deficiency and excess • Related dietary reference values			

Water

Content	What you must know and understand	R	A	G
• The importance of hydration and the functions of water in the body	• Functions of water to eliminate waste from the body, cooling and for digestion • How water is lost from the body • How much water / fluid is needed each day • Occasions when extra fluid are needed			

Nutritional needs and health

Making informed choices for a varied and balanced diet

Content	What you must know and understand	R	A	G
• The current guidelines for a healthy diet • Portion size and costing when meal planning • How peoples' nutritional needs change and how to plan a balanced diet for different life stages • How to plan a balanced meal for specific dietary groups • How to maintain a healthy body weight throughout life	• The current guidelines for a healthy diet e.g. eatwell guide • Nutritional needs for the following life stages: Young children, teenagers, adults and the elderly. • How to plan a balanced meal for specific dietary groups: vegetarian and vegan, coeliac, lactose intolerant and high fibre diets.			

Energy needs

Content	What you must know and understand	R	A	G

• The basal metabolic rate(BMR) and physical activity level (PAL) and their importance in determining energy requirements
• The recommended percentage of energy intake provided by protein, fat and carbohydrates (starch and sugar)
	• Factors which affect the BMR, such as age, gender and PAL. Their importance in achieving energy balance.
	• The percentage of recommended energy sources from nutrients:
	  • Protein 15%
	  • Fat 35% or less
	  • Carbohydrate 50% (of which 45% is from starches, lactose in milk and fruit sugars and a max of 5% from fee sugars)			

How to carry out nutritional analysis

Content	What you must know and understand	R	A	G
• How to plan and modify recipes, meals and diets to reflect the nutritional guidelines for a healthy diet.	• How to use current nutritional information and data e.g. food tables, nutritional analysis software to calculate energy and nutritional value.			

Diet nutrition and health

Content	What you must know and understand	R	A	G

• The relationship between diet, nutrition and health
• The major diet related health risks
	• How diet can affect health and how nutrition needs change in relation to:
	  • Obesity
	  • Cardiovascular health (coronary heart disease (CHD) and high blood pressure)
	  • Bone health (rickets and osteoporosis)
	  • Dental health
	  • Iron deficiency anaemia
	  • Type 2 diabetes			

Food Science

Cooking of food and heat transfer

Why food is cooked and how heat is transferred to food

Content	What you must know and understand	R	A	G

• The reasons why food is cooked
• The different methods of heat transfer
	• Food is cooked to:
	  • Make food safe to eat
	  • Develop flavours
	  • Improve texture
	  • Improve shelf life
	  • Give variety in the diet
	• How preparation and cooking affect the appearance, colour, flavour, texture, smell and overall palatability of food.
	• How heat is transferred to food through:
	  • Conduction
	  • Convection
	  • Radiation			

Selecting appropriate cooking methods

Content	What you must know and understand	R	A	G

• Selection of appropriate preparation, cooking methods and times to achieve desired characteristics	• How the selection of appropriate preparation and cooking methods can conserve or modify nutritive value or improve palatability:
	  • Water based: steaming, boiling, simmering, blanching, poaching, braising.
	  • Dry methods: baking, roasting, grilling, dry frying.
	  • Fat based: shallow frying, stir fry
	• How preparation and cooking affect the appearance, colour, flavour, texture, smell and overall palatability or food e.g. the use of marinades to denature protein.			

Functional and chemical properties of food

Proteins

Content	What you must know and understand	R	A	G
• Protein denaturation • Protein coagulation • Gluten formation • Foam formation	• The scientific principles underlying these processes when preparing and cooking food: • The working characteristics, functional and chemical properties of proteins: • E.g. how acids denature protein and marinades add flavour and moisture when preparing vegetable, meat fish and alternatives • Setting of egg mixtures e.g. in a quiche • Gluten formation when making pasta using a pasta machine and bread using a bread maker • How marinades tenderise and flavour meats and alternatives • How whisking eggs produce a gas-in-liquid foam e.g. in a whisked sponge			

Carbohydrates

Content	What you must know and understand	R	A	G
• Gelatinisation • Dextrinization • Caramelisation	• The scientific principles underlying these processes when preparing and cooking food: • The working characteristics, functional and chemical properties of carbohydrates • E.g. starch gelatinisation in a roux sauce, the need for agitation (stirring) • Caramelisation of vegetables (e.g. onion tart) • Dextrinization with the browning of bread when baking.			

Fats and oils

Content	What you must know and understand	R	A	G

• Shortening
• Aeration
• Plasticity
• emulsification
	• The scientific principles underlying these processes when preparing and cooking food:
	• The working characteristics, functional & chemical properties of fats & oils
	  • E.g. shortening and plasticity when pastry making.
	  • Aeration using the creaming method with food mixer or hand for cake
	  • Making an emulsion sauce such as a salad dressing, mayonnaise or hollandaise sauce.			

Fruit and vegetables

Content	What you must know and understand	R	A	G

• Enzymic browning
• oxidation
	• The scientific principles underlying these processes when preparing and cooking food:
	  • E.g. prevention enzymic browning of fresh fruits by using lemon juice
	  • oxidation e.g. preventing water soluble vitamin loss when preparing and cooking vegetables			

Raising agents

Content	What you must know and understand	R	A	G

• chemical (baking powder, bicarbonate of soda, self-raising flours which produce carbon dioxide)
• mechanical (whisking, beating, folding, sieving, creaming and rubbing in – all incorporate air into the mixture)
• steam is produced when the water in any moist mixture reaches boiling point
• biological (yeast)
	• The scientific principles underlying these processes when preparing and cooking food:
	• The working characteristics, functional and chemical properties of raising agents
	  • E.g. using chemical agents to make cakes,
	  • using steam in a mixture to raise choux pastry or batter,
	  • use eggs as a raising agent to:
	  • create a gas-in- iquid foam
	  • Whisk egg whites
	  • Whisking a savoury roulade (or swiss roll)
	  • Yeast in bread making			

Food safety

Food spoilage and contamination

Microorganisms and enzymes

Content	What you must know and understand	R	A	G
• the growth conditions for microorganisms and enzymes and the control of food spoilage • bacteria, yeasts and moulds are microorganisms • high risk foods • enzymes and biological catalysts usually made from proteins.	• Growth conditions for microorganisms: role of temperature, moisture, food and time. • Control of microorganism growth: temperature control, PH, water availability • High risk foods: ready to eat moist foods, usually high in protein that easily support the growth of pathogenic bacteria and do not require any further heat treatment or cooking. • Control enzymic action: blanching of vegetables before freezing, use of acids to prevent enzymic browning			

The signs of food spoilage

Content	What you must know and understand	R	A	G
• Enzymic action • Mould growth • Yeast action	• Enzymic action: ripening of bananas, browning of some fruits. • Mould growth: e.g. on bread and cheese, recognise the signs of mould growth on foods. • Yeast action on fruits e.g. grapes, strawberries and tomatoes			

Microorganisms in food production

Content	What you must know and understand	R	A	G
• The use of microorganisms in food production	• Moulds in the production of blue cheese • Yeasts to raise bread • Bacteria in yoghurt and cheese production			

Bacterial contamination

Content	What you must know and understand	R	A	G
• The different sources of bacterial contamination • The main types of bacteria which cause food poisoning • The main sources of control of different food poisoning bacteria types • The general symptoms of food poisoning	• Contamination from: • Other contaminated foods including the following raw foods: meat, poultry, eggs, seafood and vegetables • Work surfaces and equipment the people cooking • Pets • Waste food and rubbish • Campylobacter • E-coli • Salmonella • Listeria • Staphylococcus aureus			

Principles of food safety

Buying and storing food

Content	What you must know and understand	R	A	G

• The food safety principles when buying and storing food	• Temperature control:
	  • Freezing: -18°C
	  • Chilling: 0 to below 5°C
	  • Danger zone: 5-63°C
	  • Cooking: 75°C
	  • Reheating: 75°C
	• Ambient storage
	• Temperature danger zone
	• Correct use of domestic fridges and freezers
	• Date marks
	• “best before” and “use by” dates
	• Covering foods			

Food choice

Factors affecting food choice

Factors which influence food choice

Content	What you must know and understand	R	A	G

• To know and understand factors which may influence food choice	• The following factors in relation to food choice:
	  • Physical activity level (PAL)
	  • Celebration / occasion
	  • Cost of food
	  • Preferences
	  • Enjoyment
	  • Food availability
	  • Healthy eating
	  • Income
	  • Lifestyles
	  • Seasonality
	  • Time of day
	  • Time available to prepare / cook
	• You must also be able to cost recipes and make modifications			

Food choices

Content	What you must know and understand	R	A	G
• Food choice related to religion, culture, ethical and moral beliefs & medical conditions	• Food choice linked to the following religions and cultures: Buddhism, Christianity, Hinduism, Islam, Judaism, Rastafarianism & Sikhism • Food choice linked to the following ethical & moral beliefs: animal welfare, Fairtrade, local produce, organic, GM foods • Food choice linked to food intolerances (gluten and lactose) and the following allergies: nuts, egg, milk, wheat, fish and shellfish			

Food labelling and marketing influences

Content	What you must know and understand	R	A	G
• How information about food available to the consumer, including labelling and marketing, influences food choice	• Mandatory information included on food packaging in accordance with current European Union and Food Standards Agency (FSA) legislation • Non-mandatory information: provenance, serving suggestions • How to interpret nutritional labelling • How food marketing can influence food choice e.g. buy one get one free, special offers, meal deals, media influences, advertising, point of sales marketing.			

British and international cuisines

Content	What you must know and understand	R	A	G
• Food products from British tradition and two different cuisines • Cuisine is defined as: “a style characteristic of a particular country or religion where the cuisine has developed historically using distinctive ingredients, specific preparation & cooking methods or equipment & presentation or serving techniques”.	• Distinctive features and characteristics of cooking • Equipment and cooking methods used • Eating patterns • Presentation styles traditional and modern variations of recipes			

Sensory evaluation

Content	What you must know and understand	R	A	G
• Sensory testing methods • How taste receptors & olfactory systems work when tasting foods	• Importance of senses when making food choices: sight, taste, touch & aroma • Preference tests: paired preference, hedonic • Discrimination tests: triangle • Grading tests: ranking, rating and profiling • How to set up a taste panel • Controlled conditions required for sensory testing • Evaluating how senses guide • Evaluating a wide range of ingredients and food from other countries • How to test sensory qualities of a wide range of foods and combinations			

Food provenance

Environmental impact and sustainability of food

Food sources

Content	What you must know and understand	R	A	G
• Where and how ingredients are grown, reared and caught.	• Grown ingredients: fruits, vegetables and cereals • Reared ingredients: meat and poultry • Caught ingredients: fish • An understanding of: • Organic and conventional farming • Free range production • Intensive farming • Sustainable fishing • Advantages and disadvantages of local produced foods, seasonal foods and Genetically Modified (GM) foods.			

Food and the environment

Content	What you must know and understand	R	A	G
• Environmental issues associated with food	• Seasonal foods • Sustainability e.g. fish farming • Transportation • Organic foods • The reasons for buying locally produced food • Food waste in the home/food production/retailers • Environmental issues related to packaging • Carbon footprint			

Sustainability of food

Content	What you must know and understand	R	A	G
• The impact of food and food security on local and global markets and communities	• The challenge to provide the world's growing population with a sustainable, secure, supply of safe, nutritious and affordable high-quality food. You must have an awareness of: • Climate change • Global warming • Sustainability of food sources • Insufficient land for growing food • Availability of food • Fairtrade • Problems of drought and flooding • Genetically Modified(GM) foods • Food waste			

Food processing and production

Food production

Content	What you must know and understand	R	A	G
• Primary and secondary sources of processing and production • How processing affects the sensory and nutritional properties of ingredients	• Primary processing related to the: rearing, fishing, growing, harvesting and cleaning of the raw food material (milling of wheat to flour, heat treatment of milk, pasteurised, UHT, sterilised and micro-filtered milk) • Secondary processing related to: how the raw primary processed ingredients are produce d to produce a food product (flour into bread and /or pasta, milk into cheese and yoghurt, fruit into jams.) • Loss of vitamins through heating and drying • The effect of heating & drying on the sensory characteristics of milk			

Technological developments associated with better health and food production

Content	What you must know and understand	R	A	G
• Technological developments to support better health & food production including fortification & modified foods with health benefits & the efficacy of these	• Cholesterol lowering spreads • Health benefits of fortification • Fortified food: thiamine, niacin, calcium & iron added to white flour • Folic acid and iron added to breakfast cereals • Vitamins A and D added to fats and low fat spreads • The positive and negative aspects of the use of additives: colourings, emulsifiers and stabilisers, flavourings & preservatives • The positive and negative effects of Genetically Modified (GM) foods			