

FOOD AND NUTRITION

Paper 0648/01

Theory

General comments

The range of marks achieved for this paper was wide. There were many very good scripts and the overall standard seemed to be similar to that in previous years. Candidates who were able to explain their answers where appropriate were the most successful. Weaker candidates seemed to rely on their ability to recall facts without giving further information, suggesting limited understanding of some topics. When information is learned by rote, it is often difficult to recall appropriate facts when questions are worded in a different way. Sometimes answers were too long because candidates gave all the information they knew on a topic instead of selecting facts relevant to the question.

Candidates seemed to have had sufficient time to answer the required number of questions. There were few rubric errors. Some candidates answered both **Question 8(a)** and **8(b)** instead of choosing only one of them.

In general, scripts were well presented and handwriting was clear, although there were a few scripts which were difficult to read because handwriting was small. Teachers are urged to remind candidates of the need for clear handwriting. Any work which should not be marked by the examiner should have a neat line drawn though it. Correction fluid should not be used.

Mark allocations and the spaces provided for answers in both **Section A** and **Section B** should help candidates to decide on the amount of detail required in their answers. They should encourage candidates to judge the amount of time to spend on each answer and to estimate the amount of detail required. There is never any need to write in margins and in other spaces on the question paper. Candidates should be able to demonstrate their ability to select appropriate information and to tailor their answers to the questions set. It wastes valuable time to write everything known on a topic.

Comments on specific questions

Section A

Question 1

- (a) Carbon, hydrogen and oxygen were known to be the elements which combine to form fat.
- (b) Most candidates were able to give at least two functions of fat. There were many possible answers and the most popular function given was that fat is a source of energy. It was also noted that fat acts as an energy reserve, it protects vital organs, preserves body heat and is a solvent for some vitamins, principally vitamins A, D, E and K. Credit was given for stating that fat gives flavour and texture to foods and gives a feeling of fullness after a meal.
- (c) Many candidates were able to give clear distinctions between saturated fat, monounsaturated fat and polyunsaturated fat. They were able to state that saturated fats contain the maximum number of hydrogen atoms in their structure, that a saturated fat molecule is composed of single bonds, that it is usually an animal fat and is solid at room temperature. Examples include butter, suet and lard, although cocoa butter is an example from a plant. Monounsaturated fat has one double bond in its structure so is able to accept more hydrogen. It is liquid at room temperature and is a plant oil, such as olive oil and rape seed oil (canola). Polyunsaturated fat has more than one double bond in its structure, so it can accept more hydrogen. It is also liquid at room temperature and can be found in plants and animals. Sunflower oil, maize oil, sesame seed oil and cod liver oil were often given as examples.

- (d) There were many excellent accounts of the digestion and absorption of fat. It was noted that the enzymes were correctly placed in the digestive system and that the end products of each were named. Occasionally, candidates gave information about the digestion of other nutrients, but this was not credited.
- (e) It was well known that excess fat is deposited on the inner walls of arteries, narrowing the lumen and sometimes blocking them. This can lead to coronary heart disease, hypertension and strokes. Excess fat may also be stored under the skin or around internal organs, leading to weight gain and possibly obesity.
- (f) There were many ways suggested to reduce the amount of saturated fat in the diet. Some of the most popular were to reduce the consumption of red meat and to choose white meat or fish instead, to grill food instead of frying and to choose low-fat dairy products such as skimmed milk. Credit was given to those who suggested reducing consumption of cakes, biscuits and chocolate.

Question 2

- (a) The importance of Non-Starch Polysaccharide was well explained and full marks were gained by many candidates. They correctly noted that it absorbs water, making faeces soft and bulky and easy to expel. It stimulates peristalsis, helps to reduce cholesterol and to rid the body of toxins. It was well known that NSP can help to prevent constipation, haemorrhoids, diverticular disease and cancer of the colon.
- (b) Good sources of NSP include green vegetables, wholegrain cereals, pulses, celery, dried fruit, potatoes with skin and tomato seeds and skin. Candidates usually scored well.

Question 3

Candidates were usually able to give at least three different uses of water in the body but examples to illustrate them were not always given. It was often stated, for example, that water helps to maintain body temperature but few candidates developed that point by noting that perspiration helps to cool the body. Many uses were correctly identified. Water was known to be a constituent of body fluids, a lubricant for joints and a means of eliminating waste. It helps to maintain water balance and prevents dehydration, it is needed for milk production during lactation and is required in all metabolic reactions, such as digestion.

Question 4

There were many very informative accounts of ways to encourage good eating habits in children. It was usually suggested that children should eat meals at the table with the rest of the family and that food should be cut if necessary to encourage independence. The importance of including fruit, vegetables and milk was often mentioned, as was the need to make foods colourful and interesting. Small portions of food with a variety of colours, flavours and textures will encourage children to grow up liking different foods. Most candidates noted that meal should not contain very much salt, sugar and fat and should be easy to digest. As usual, all valid points were credited.

Section B

Question 5

- (a) Most candidates knew that plain flour is used for shortcrust pastry because the raising agent is air. White flour makes pastry rise more easily because of its lighter texture. Soft flour which has a low gluten content will produce a more crumbly pastry. Credit was given to those who stated that wholemeal flour could be used or it could be mixed with white flour; the result would be a pastry with a nutty flavour and a rougher texture and which contains iron and NSP.

The fat used for shortcrust pastry should be hard and cold so that it does not melt during the rubbing-in process. Lard will give a crumbly pastry but it has a poor colour and flavour. Margarine and butter have a good colour and flavour, although butter is more expensive. A mixture of lard and margarine will have the qualities of both fats so is often used.

- (b) There were many excellent accounts of the making of shortcrust pastry. Reasons for each process were usually given. It was apparent that candidates were familiar with the process.

- (c) Most candidates were able to name some of the dishes that could be made with shortcrust pastry. Popular suggestions were meat pie, Cornish pasties, fruit pie, quiche, sausage rolls, lemon meringue pie and jam tarts.
- (d) A number of candidates were able to explain that pastry shrinks during baking because it has been stretched during rolling out and shaping. Shrinking could also occur if pastry is not allowed time to rest before it is baked. Pastry could be hard and tough after it has been baked if the fat melted during rubbing-in or the wrong proportions of fat and flour were used. It can also be the result of over-handling or the use of too much flour when rolling out the pastry. Most candidates were able to give some correct points to explain the faults.

Question 6

- (a) The reasons for cooking food were well known. Candidates noted that cooking food changes the colour, texture and flavour of food, it makes it safe to eat by destroying micro-organisms and it destroys enzymes that bring about food spoilage. It was often correctly stated that cooking reduces bulk, as in the cooking of green vegetables, it makes food more digestible, and adds variety to meals either by allowing foods, for example potatoes, to be cooked in different ways, or by mixing together different foods to make new dishes. Credit was also given for examples to illustrate the reasons mentioned.
- (b) The majority of candidates stated that frying is a quick method of cooking, which brings about the browning of the surface of the food and gives the food a crisp surface. Some of the disadvantages highlighted related to the absorption of fat by the food. This could make digestion difficult and could be linked to obesity and coronary heart disease. Many candidates noted that frying can be a dangerous method of cooking because if fat is overheated it can ignite. For this reason, it needs constant attention. Again, it was apparent that candidates were familiar with this method of cooking, so they were able to give a range of advantages and disadvantages.
- (c) Most candidates were able to suggest one or two ways of saving time when cooking family meals but there were few occasions when full marks were awarded. Credit was given for noting that electrical equipment, for example mixers and blenders, could be used and that microwave ovens and pressure cookers shorten cooking time. It was hoped that candidates would mention that cutting potatoes, for example, into smaller pieces and putting lids on pans would shorten cooking time. It was usually suggested that convenience foods would save time because some of the preparation and cooking may have been done already. Examples were often given to illustrate the use of convenience foods to save time. Frying and grilling are both quick methods of cooking. Generally answers lacked detail. Candidates need to make more than one or two points for an answer with an allocation of 5 marks.

Question 7

- (a) There were many good accounts of the changes which take place when meat is cooked by a moist method. Full marks were scored by those who were able to state that fat melts, the meat shrinks and there is a change of colour from red to brown. Better answers noted that the colour change is due to the oxyhaemoglobin becoming haemachrome. Collagen, an insoluble connective tissue, is converted by moist heat into soluble gelatine. This allows the muscle fibres to loosen, making the meat tender and easier to chew. The protein in meat coagulates at 60°C.
- (b) Many candidates gave very accurate accounts of the changes which take place when a loaf of bread is baked. They noted that the warmth of the oven encourages fermentation. This produces carbon dioxide, which causes the dough to rise, and alcohol, which evaporates. The gas expands on heating and, together with the steam produced from the liquid in the dough, pushes up the mixture. The heat of the oven eventually causes the protein, gluten, to coagulate. This sets the shape of the loaf. The starch on the outside of the loaf dextrinises and a brown crust is formed. The starch in the dough gelatinises because of the moist heat within the loaf. The most successful candidates were able to give most of the details noted above.
- (c) There were many excellent accounts of the changes which take place when a roux sauce is made. Candidates accurately described each stage of the process and gave reasons for the method followed. Full marks were frequently achieved. Gelatinisation was known to be the name of the process which involves the use of starch for thickening liquids.

Section C

Question 8

(a) This question gave candidates the opportunity to demonstrate their knowledge of a variety of raising agents and to discuss their use in the preparation of dishes. Candidates noted the principle that gases expand on heating, pushing up the mixtures in which they are used. Some candidates noted that the risen shape of a mixture is set by the action of heat on protein, either egg or gluten in flour. Air is introduced to mixtures during their preparation; many examples were identified. They included creaming fat and sugar, rubbing fat into flour, sieving flour, whisking egg white, whisking whole eggs and sugar and rolling and folding flaky pastries. Appropriate examples were usually given to illustrate each method of introducing air. Carbon dioxide was generally associated with the use of yeast. Details were given of the fermentation process by many candidates; some were able to name the enzymes responsible for the changes occurring at different stages. The majority of answers included a list of conditions required for fermentation: a source of food, warmth, moisture and time to grow. Bread was always given as an example of its use. Many answers included details about bicarbonate of soda and its use in, for example, gingerbread. Chemical equations were occasionally given to show how carbon dioxide is produced from bicarbonate of soda by the action of moist heat.

Baking powder and its use were usually discussed and examples of dishes using baking powder were given. Self-raising flour was known to be a mixture of plain flour and a fixed amount of baking powder. Rich cakes and scones were the most frequently given examples of its use.

Steam was known to be responsible for the rising of choux pastry, Yorkshire pudding and puff pastry. It can only be used in mixtures with a high proportion of liquid because it depends on the conversion of water to steam in a hot oven to push up the mixture.

There were many excellent answers and those candidates who chose to answer this question were usually able to give a reasonable amount of detail in their answer.

(b) The reasons for following a vegetarian diet were generally well known. Most candidates were able to give at least two or three different reasons. Some cited religious beliefs. Others mentioned a dislike of animal flesh or an objection to the slaughter of animals because it is thought to be cruel. Meat is expensive to buy, it contains saturated fat which is associated with coronary heart disease, and has recently been linked to health issues like BSE and bird 'flu. Candidates often identified different types of vegetarian diet and explained which foods were acceptable to each group.

HBV protein can easily be included in the diet of lacto-vegetarians because dairy products can be consumed. Ovo-lacto-vegetarians will also include eggs. Vegans, however, will need to combine LBV proteins in the same meal so that the indispensable amino acids missing in one food can be supplied by the other. Cereals and pulses can be eaten in the same meal, as can cereals and nuts. Soya is a plant which contains HBV protein, so it is very useful in a strict vegetarian diet. It can be spun into fibres to resemble meat and can be shaped into sausages, mince and chunks. It is generally referred to as Textured Vegetable Protein (TVP). Quorn, a mycoprotein based on mushrooms, is not acceptable to vegans because the fibres are held together by egg white.

There are, however, possible problems associated with vegetarian diets. It is important that vitamins A and D are included, together with calcium and iron. Better accounts identified plant sources of nutrients which may be in short supply in vegetarian diets. Some types of fat and B vitamins may be lacking and ways have to be found to include them. Vegetarian diets can be bulky because of the high NSP content in vegetables. This could lead to digestive disorders. A vegetarian diet could be monotonous, so a variety of cooking methods together with the use of herbs and spices to vary flavour are recommended.

Both of the questions in **Section C** required candidates to plan their response carefully. It is essential that answers contain facts, explanations and examples if they are to be given good marks. Candidates must be sure to read the questions carefully and to tailor their responses according to what they consider to be the key points of the questions. All valid points were credited and many candidates produced excellent responses.

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Practical

General comments

Candidates generally produced work of a reasonable standard and usually answered the questions well. The majority of Centres arranged the practical test sheets in the correct order, labelled them well and included the relevant mark sheets. Some Practical Examination Summary Marksheets were missing from the work and some MS1 sheets were not completed correctly. It is vital that both of these mark sheets are completed correctly and independently checked before they are sent to CIE. Some Centres sent both copies of the work to CIE. It is very important that the pink copies are retained at the Centre until the publication of results.

Many Centres included detailed marking and relevant annotation, while a few Centres made very brief, general comments about the work of their candidates. All work should show evidence of marking, with supporting reasons which are specific to the work of each individual candidate. This is particularly important in the Methods and Results parts of the work so that the Moderator at CIE can understand how the work progressed during the practical examination and how the dishes looked and tasted when they were served. A few Centres included clearly labelled photographs of the dishes. Although photographic evidence of the results is not compulsory this can be helpful in verifying the marks.

It is essential that all sections of the detailed mark scheme are studied carefully before marking the test sheets and before marking the practical examinations. Candidates should be instructed to read the questions carefully so that they can answer the test questions correctly. They should include sufficient skilful dishes to answer the question set and to fill the time allowed. When candidates select inappropriate dishes, dishes with low skills or insufficient work the marks should be adjusted and the annotation should give reasons for the adjustments. It was sometimes necessary to make adjustments to the marks when Centres were not following the mark scheme carefully.

It is most important in the Choice section that the dishes chosen answer the test questions correctly and that dishes are listed clearly for sections **(a)** and **(b)**. Dishes to be served for meals should be listed in the correct order for serving the meal. Meals should be well balanced and consideration should be given to economy in food and fuel. Dishes chosen should show a variety of skills, should include a variety of ingredients and should have an attractive appearance when served. Although many suitable dishes were chosen quite a number of low skill dishes were included, e.g. salad, bread and butter pudding, lemonade, semolina pudding, etc. These dishes should not have been awarded full marks. Methods were sometimes repeated, e.g. creaming, and sometimes the same main ingredients were used in different dishes, e.g. chicken. Again marks should have been deducted. Recipes should be clearly written next to each named dish and should include a complete list of ingredients in exact amounts. These should be checked carefully as occasionally some ingredients were missing.

Many candidates presented well-organised time plans showing brief methods, cooking times, oven temperatures and times for washing up, as required. Serving details were sometimes missing as simply "serve..." is not sufficient. Candidates should indicate briefly how the dishes would be garnished or decorated and in what order the dishes would be served. This is particularly important for the serving of meals when the dishes should be served hot and in the correct order of courses. In the Special Points section of the time plan candidates may find it helpful to indicate the preheating of ovens (with the correct temperature), the preparation of cake tins, etc. before the actual mixing begins. Shopping lists were usually good, although candidates do need to ensure that ingredients are described correctly, e.g. a particular type of meat, fish, cheese, flour, etc. as this can be crucial to the success of the dish.

Many Centres provided detailed explanation for the awarding of marks in the Methods and Results sections of the work. On a few occasions the annotation was very general, describing both the methods and results as "good" without any further evidence for the awarding of particular marks. The mark scheme provides detail on the awarding of marks for both these sections. This should be used to assist Examiners in making

relevant comments and in awarding marks at the correct level according to the work done and the final dishes. It is also very important that Examiners award marks as stated on the mark scheme. On a number of occasions marks were awarded for some dishes in Results which were higher than the allocation on the mark scheme.

Comments on specific questions

Question 1

Most candidates answered this question well. The most usual pasta dishes chosen for part (a) were macaroni cheese or lasagne and candidates usually served suitable accompaniments. Occasionally the meals were not well balanced as additional carbohydrate, e.g. potatoes were prepared to serve with the pasta. For part (b) cakes were prepared well by the correct method but sometimes candidates prepared the biscuits by a different method instead of melting method as required by the question.

Question 2

For this question candidates prepared five dishes using the equipment listed but did not always include a good variety of skills, particularly for the lemon squeezer. A number of candidates prepared lemonade but this shows very few skills. Many other more skilful dishes which include the use of a lemon squeezer could have been prepared, e.g. lemon flavoured cakes, biscuits, sauces or desserts. Savoury dishes could have been prepared such as those using fish with lemon juice as an ingredient.

Question 3

Many candidates prepared suitable meals for children in part (a) and usually included good sources of calcium as required by the question. In part (b) candidates prepared small cakes and a batch of biscuits but sometimes chose to prepare very simple ones, e.g. cornflake crispies and flapjacks, which showed few skills.

Question 4

This was another popular question. Many candidates prepared a good variety of dishes showing their skills and included a good range of colours, flavours, textures, etc. Sometimes candidates prepared simple dishes, e.g. sandwiches or repeated ingredients or methods, so limiting the marks allowed for choice.

Question 5

In part (a) of this question the packed meals were often incomplete. For a packed meal the foods chosen should form a balanced meal and should include variety in colour, texture and flavour. Sweet and savoury foods should be included, the foods should pack and keep well and should be filling for the schoolboys. Many low skill dishes were prepared and little variety was included. In part (b) candidates were required to make two dishes only but some candidates unnecessarily prepared accompaniments to complete the meal. Sometimes ingredients and methods were repeated from part (a).

Question 6

This question was usually answered well. Candidates prepared a good variety of dishes, showing a range of skills. The dishes were served attractively.

Question 7

This was a popular question. Candidates usually answered part (a) well, preparing three pastry dishes which were varied in appearance and fillings. Occasionally candidates prepared the pastry three times when "a batch", in the question, suggests that the pastry should be made once in a large amount and then divided for different uses. Meals were prepared well in part (b) and a good variety of drinks were served.

Question 8

Candidates did not always answer this question well. Sometimes dishes such as chips or vegetables were prepared which were not main-course dishes as required by the question. Some low skill dishes were chosen, particularly for frying and grilling, e.g. fried/grilled pieces of chicken, when very few preparation steps were included other than the cooking. These dishes could have been improved by the preparation of a suitable coating for the chicken and serving the chicken with another food to make a more complete main-course dish.