

FOOD AND NUTRITION

Paper 0648/01

Theory

General Comments

Although the range of marks gained in this paper was wide there were many outstanding scripts. Many candidates demonstrated a sound knowledge and understanding of the subject and were able to apply that knowledge to a range of questions. Explanations and examples were given where appropriate although weaker candidates tended to give facts without further information. Their answers were often very brief and essays showed little or no evidence of planning.

Candidates seemed to have had sufficient time to answer the required number of questions. There were few rubric errors. Handwriting was generally good although there were occasions when scripts were difficult to decipher because the candidate's writing was too small. Scripts were neatly presented and candidates seemed to have made good use of both mark allocations and the amount of space provided for answers.

Comments on specific questions

Section A

Question 1

- (a) Few candidates were able to give four facts about monosaccharides. There were several possible answers. They are simple sugars, the basic units of carbohydrate and the end product of digestion; they are sweet and are soluble in water. Credit was given if the formula was correctly written. A named example was accepted.
- (b) Most candidates could not give more than two facts. It was hoped that disaccharides would be identified as double sugars that are also sweet and soluble in water. They are broken down into monosaccharides during digestion. Many candidates were able to state that disaccharides are composed of glucose and one other monosaccharide. A correct formula was rarely given although an example was often correctly identified.
- (c) A named example of a polysaccharide was usually given. Additional facts were confined to information about NSP and its functions. Some candidates were able to note that polysaccharides are insoluble in water.
- (d) There were many excellent accounts of the digestion and absorption of starch. In many instances, however, candidates gave details of the digestion of all polysaccharides so there was information about the action of enzymes on sucrose and lactose. Although the information was generally correct, it was unrelated to the digestion of starch so could not be credited. The amount of space available for the answer was often disregarded.
- (e) It was well known that a high intake of sugar could be responsible for tooth decay, obesity, diabetes and coronary heart disease. Many candidates were unable to explain the link between sugar and the conditions identified. It was expected, for example, that candidates would state that excess sugar is stored as fat, leading to obesity and bacteria in the mouth change sugar to an acid; the acid then erodes tooth enamel. The question clearly asked for explanations so the naming of conditions without additional information could only be given part of the maximum mark.
- (f) It was surprising that few ways of reducing sugar were identified. The most frequently given responses were replacing sugar with artificial sweeteners in drinks, eating fewer sweets and biscuits and replacing carbonated drinks with low calorie alternatives. The best answers noted that

fewer convenience foods should be used because they are usually high in sugar, and that studying the nutritional labels on food products could help to make wise food choices.

Question 2

- (a) The majority of candidates were able to explain that iron is found in haemoglobin, the red pigment in blood, which picks up oxygen from the lungs and transports it to cells. It is involved in cell respiration, producing energy. The carbon dioxide, which remains, attaches itself to the haemoglobin and is transported to the lungs for disposal.
- (b) Most candidates were able to give four good sources of iron and gained full marks.
- (c) Anaemia was known to be the deficiency disease associated with iron deficiency.
- (d) Candidates were usually able to identify two symptoms of anaemia.

Question 3

- (a) It was encouraging to note that many candidates were able to give good accounts of the importance of vitamin C. It was known to be associated with growth, a clear skin, the production of connective tissue, blood and the walls of blood vessels; it assists in the absorption of iron and is an antioxidant.
- (b) The most frequently named sources of vitamin C were citrus fruit, green vegetables, tomatoes and green peppers. However, many good examples were given.
- (c) The deficiency disease associated with vitamin C was known to be scurvy. The majority of candidates scored this mark.
- (d) The symptoms of scurvy were less well known although the majority of candidates stated that gums bleed and teeth loosen. Other symptoms were rarely given.

Question 4

Deficiency diseases, other than anaemia and scurvy, were well known and there were many excellent answers. Candidates usually linked the deficiency diseases accurately to the nutrients although some credit was given for identifying four deficiency diseases.

Question 5

There were many outstanding accounts of the points to consider when planning meals for the elderly. Full marks were often scored. Candidates identified nutrients, which were particularly important for the elderly, giving reasons where appropriate. They highlighted the need for small portions of easily digested food and for meals to be low in fat, sugar and salt. The reasons for this were usually explained well. Some candidates noted that meals should have a variety of colour, flavour and texture and should not include highly flavoured ingredients. All valid points were credited.

Section B

Question 6

- (a) This question gave candidates the opportunity to give as much relevant information as they could about food additives. All valid points, and examples to illustrate the points made, were given credit. Additives were known to add flavour, colour and aroma to foods and sometimes add nutrients. Colourings and nutrients are often added to foods if those qualities have been lost during processing. It is more likely that additives are found in convenience foods or processed foods.

Margarine, for example, has vitamins A and D added. Some additives improve the keeping quality of food allowing it to be kept in shops longer before it is sold and preventing waste in the home. Some fats contain anti-oxidants which prevent rancidity, ice-cream and mayonnaise have emulsifiers to prevent their separation and aerosol creams have propellants. Additives must be used in the smallest possible amount to produce the desired effect. Those with an E prefix have been approved with the European Community.

Their long-term effect, however, is not known. Some people believe that they can be carcinogenic, others develop allergic reactions. Some children are known to become hyperactive if they consume certain food colourings.

Many candidates noted that additives could be natural or synthetic; it is a legal requirement that their use is stated on packaging.

- (b) There were many possible uses of fats and oils but candidates tended to limit their answers to the use of oil for frying. Some noted that fats such as butter are used for spreading and give a pleasant flavour. Others mentioned that fats can trap air when creaming with sugar or when rubbing in with flour. It was often explained that oils help to form emulsions when making mayonnaise or are used as salad dressing when mixed with vinegar and other ingredients. It was a common misconception that oils should be used instead of fats for frying because oils contain fewer calories. As in the previous part of the question, all correct information was credited; this included the identification of different uses and examples to illustrate it.
- (c) There were many good accounts of reasons for choosing a vegetarian diet. Again, all valid points were credited. The question gave candidates the opportunity to discuss their understanding of the topic.

Religious beliefs were usually cited and named examples of religious groups that follow a vegetarian diet were given. Moral issues about the slaughter of animals were explored, as was the economical debate about using land to rear animals rather than use it for crops to feed more people.

Some noted that meat is expensive and cannot be afforded by some families; some do not like the taste or the texture of meat. Meat contains saturated fat which contains cholesterol. This is associated with CHD so for this reason some people choose to follow a vegetarian diet. Several candidates mentioned recent health scares associated with meat such as bird flu and BSE.

Question 7

- (a) Most candidates were able to give several reasons for the importance of cereals. They are cheap, versatile, easy to grow, easy to store, contain starch for energy and are filling. They are a source of LBV protein but only contain NSP if unrefined. Some candidates wrote at length about breakfast cereals. Cereals are an important part of the syllabus so it was surprising that such answers were given.
- (b) The majority of candidates found it easy to name four cereals so full marks were usually gained.
- (c) It was well known that cereals should be stored in a cool, dry place to prevent germination or the growth of bacteria and insects. Containers should be covered to prevent the entry of dust and insects and should be sealed to keep out moisture. Most candidates were able to state that old and new stocks should not be mixed and that cereals should be used in rotation. A few accounts noted that wholegrains do not keep as long as refined grains because the fat in the germ becomes rancid. There were many possible points on storage of cereals and credit was given whenever possible.
- (d) Some candidates seemed to understand clearly that strong flour should be used for bread making because it has a high gluten content. This becomes stretchy with moisture and kneading so is able to hold gases when they are produced during fermentation. Many noted that plain white flour is preferred; SR flour has a chemical raising agent so should not be used. Wholemeal flour contains NSP but produces a closer texture.
- (e) There were many excellent accounts of the changes which take place when a loaf of bread is baked. There was evidence of a thorough understanding of the fermentation process in many answers. All candidates were able to state that bread rises, it browns on the surface and a crust forms. Better answers described the production of carbon dioxide and alcohol during fermentation and noted that as the gases expand and the water evaporates, the dough is pushed upwards. The heat of the oven kills the yeast and sets the risen shape when the gluten coagulates because it is a protein. The starch gelatinises, forms dextrin on the outside of the loaf and Maillard browning

occurs, enhancing the brown colour on the outside of the loaf. Full marks could only be gained by those who gave a detailed response.

Question 8

- (a) Creaming was known to be used when making Victoria sandwich cakes and Queen cakes. Other examples of cakes made by the creaming methods were equally acceptable. It was hoped that candidates would state that equal quantities of fat and sugar would be beaten with a wooden spoon or an electric mixer until light and fluffy. This incorporates air, which helps the mixture to rise. Butter or soft margarine gives a good colour and flavour and caster sugar has finer grains, which dissolve readily during the creaming process. No credit was given for adding eggs or flour since these ingredients are not creamed into the mixture.
- (b) Many candidates were not familiar with the term *basting*. It involves pouring or spooning hot fat over the surface of food during roasting or grilling to prevent drying or burning of the surface. It adds flavour from the fat and extractives from the meat, which have dripped into the roasting tin or grill pan. The usual examples were roast chicken, grilled steak or barbecued burgers.
- (c) The majority of candidates were familiar with the method of making a roux. However, many believed that the whole sauce-making method was what is known as making a roux. The roux is the cooked mixture of fat and flour. A roux sauce is made when milk is added and the liquid is boiled. Those who noted that equal quantities of fat and flour are used scored full marks. The fat is melted, the flour is stirred in and the mixture is cooked over a gentle heat so that the starch absorbs the fat. This is the roux and is the basis of a sauce or soup.
- (d) Sautéing was known to be a type of frying using only a small amount of fat. Small pieces of food are tossed in hot fat over a gentle heat, with a lid on the pan, until the fat is absorbed. It is often used to cook onions and mushrooms or to brown cooked, sliced potato. It is a very quick method of cooking.
- (e) Most candidates were able to give a good account of the preparation of stock. Pieces of food or bones are boiled for a long time to develop flavour. The liquid is strained and can be added to soups, sauces and casseroles instead of water. Commercial stock cubes can be used instead. The most common stocks are chicken, fish, beef and vegetable.

Section C

Question 9

- (a) There are many reasons for preserving food and all were given equal credit. Some noted that it allowed food to be enjoyed out of season, others stated that it prevented waste by preventing the action of enzymes and micro-organisms. There are many methods of preservation. Fruit can be frozen, dried, canned or made into jam or pickles so it can give variety to the diet. Food can be stored when there is a glut or when it is cheap for times of shortage or when there is an emergency. Preserving food allows it to be transported more easily; it is less bulky so costs will be lower. Foods from other countries can be enjoyed. Most candidates managed to give several different reasons for preserving food.

Many candidates found it difficult to explain how food spoilage is prevented in named methods of preservation. They were usually able to identify a number of different methods of preservation and could give examples of foods preserved by those methods. They were often, however, unable to explain the principle of their chosen methods. It was hoped that candidates would state, for example, that freezing can be used for fish. At very low temperatures bacteria are dormant, or water is frozen so it is unavailable for bacterial growth. Another example could have been drying which prevents bacterial growth because water has been removed. It was surprising that the majority of candidates who gave canning as one of their examples believed that the sealed lid prevented the entry of bacteria. Canning uses heat to sterilise food, destroying bacteria. The seal prevents further entry of bacteria.

The best answers showed a clear understanding of the conditions required for the growth of micro-organisms. They used this knowledge to explain how a range of methods of preservation either destroy micro-organisms or prevent their growth. Poorer answers consisted of lists of statements, some containing reasons for preservation and others naming methods of preservation. There was

little or no detailed information to explain how specific methods ensured that food could be stored for a longer period of time.

- (b)** Many candidates were able to identify many of the nutrients in eggs. It was expected that vitamins and minerals would be identified. No credit was given for merely stating that eggs contain vitamins and minerals. It was surprising that calcium was frequently listed as a nutrient since it is only found in the egg shell which is not used.

The functions of the nutrients identified were usually given although the level of detail was often poor. Better candidates named the proteins in egg white and egg yolk and often gave more than one function of each nutrient.

The different uses of eggs were well known and appropriate examples to illustrate each use were usually given. It was expected that eggs would be identified as a main meal, for example breakfast. This would allow candidates to give examples such as poached, scrambled or boiled eggs to illustrate the use. Unfortunately a number of candidates just listed different ways of serving eggs. This did not answer the question.

Good answers noted setting, trapping air, glazing, emulsifying, garnishing, binding, setting and thickening and gave good examples.

Most candidates were able to give some information on the changes that take place when an egg heated. The egg white was known to coagulate at 60°C and the yolk at 70°C. It was often stated that if an egg is overcooked the white becomes rubbery, the yolk powdery and the egg difficult to digest, it was usually noted that the transparent egg white becomes opaque on heating. Some candidates noted that a green ring forms around the yolk of a hard-boiled egg but few were able to explain that this is ferrous sulphate, formed from the iron in the yolk and the sulphur in the egg white. The most successful candidates discussed the process of whisking egg white in order to entangle air; the unwinding of the protein in order to trap up to seven times its own volume of air was usually explained well.

Unfortunately a number of candidates wrote at length on the storage of eggs and described methods of testing eggs for freshness. None of this information was relevant to the question so could not be credited.



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Practical

General comments

Many candidates produced work of a reasonable standard and usually answered the questions well. Some Centres arranged their work with the practical test sheets well labelled and in the right order, along with all the relevant mark sheets. However, a number of Centres incorrectly sent both copies of the work to CIE when the second copy (pink) should have been retained at the Centre. Some Centres did not include all the mark sheets required for each individual candidate and for the Centre as a whole and some Centres did not fill in marks on the MS1 as required.

A number of Centres included detailed marking and very good annotation. Other Centres made very brief, general comments about the work of their candidates or occasionally provided no comments at all. It is very important that all work shows evidence of marking and it is not sufficient to award marks without supporting reasons. It is also important that detailed comments, relevant to the specific work of each candidate, are included on the individual mark sheets. Relevant comments are vital in the Methods and Results sections in order to justify the marks awarded as the work completed in these sections is not seen by the Examiner at CIE. Clearly labelled photographic evidence of the results is not compulsory but can be very helpful in verifying the marks.

The Practical Test questions and the mark scheme should be studied well before starting to mark the work. Some Centres awarded marks which were too high when the dishes chosen did not fully answer the question set or when the chosen dishes were low skill. The mark scheme states clearly that "maximum marks must be reduced for simple dishes" and as some Centres were not following this regulation it was necessary to make some adjustments to the marks. On several occasions in the Results section Examiners were not following the mark scheme correctly and were awarding more than the maximum mark shown on the mark scheme. This is not allowed.

In the Choice section candidates should choose dishes which answer the question set, show a variety of skills and processes and have an attractive appearance when served. If meals are required they should be complete and well balanced. Consideration should be given to economy in food and fuel and there should be an awareness of the time available for cooking. Although many suitable dishes were chosen quite a number of low skill dishes were included, e.g. sandwiches, fruit fool, caramel custard, burgers, etc. Some Examiners incorrectly marked drinks as desserts while a number of others awarded marks for drinks in the Results section when no marks were allocated and no drinks were required in the question. Some candidates did not answer the questions fully, e.g. did not make two desserts for **Question 3(b)** or did not make a creamed cake for **Question 8(b)** as required. A number of candidates repeated the main ingredients in their dishes, e.g. cheese, or used repetitive methods, e.g. rubbing in. Marks should be deducted when candidates do not use a variety of foods or a variety of methods/processes. It is important that parts **(a)** and **(b)** of the tests should be clearly labelled and this was not always the case. Meals should be listed clearly, ideally in the order of serving, yet on some occasions it was not clear which dishes formed the meal. Recipes should be clearly written and should include a complete list of ingredients in exact amounts. These should be checked carefully as occasionally main ingredients were missing.

The time plans should show a logical sequence of work, clear methods, cooking times and temperatures, times for dishwashing and time for serving the dishes. Many candidates presented well organised plans with many of the details as required and information about how the dishes would be served. However, a number of candidates did not include methods, oven temperatures or cooking times in their plans. It is not sufficient to state "prepare..." or "make..." or "cook..." without some further details. Some candidates used their ingredients without indicating any previous preparation, e.g. peeling/chopping. A number of candidates cooked several dishes which required different temperatures at the same time. This cannot help to achieve good results. Many candidates served their dishes as soon as they were ready. Dishes should be served towards the end of the time of the test and if a meal is being prepared the dishes should be served hot and in the correct order of courses.

Some shopping lists were good while many others did not describe ingredients accurately, e.g. a particular type of meat, cheese, flour, etc. The type of food can be crucial to the success of the dish. A small number of candidates did not show total amounts in the shopping lists as required.

Some Examiners provided very detailed explanations for the awarding of marks in the Methods and Results sections. Others simply stated that the methods were “good” and the results “looked good”. This did not really explain how the individual candidates actually worked or exactly how the dishes tasted or appeared when served. The mark scheme gives detail on the marking of these sections and this should help Examiners in making relevant comments and awarding marks at the correct level according to the work done and the quality of the final dishes.

Comments on specific questions

Question 1

Most candidates prepared a reasonable range of dishes, some more skilful than others. A few candidates did not include all the five ingredients as required by the question.

Question 2

This question was not always answered well. Sometimes too few dishes were prepared for the packed meal in **(a)** and sometimes unsuitable ingredients were used, e.g. ice-cream. On many occasions the meals were not well balanced, usually including too many carbohydrate foods. Suitable hot dishes and cold desserts were prepared for **(b)**.

Question 3

Many good meals were prepared for **(a)** but a few candidates made one dessert only when two were required. For **(b)** many suitable types of small cakes and hot drinks were prepared but occasionally large cakes were incorrectly prepared instead.

Question 4

In **(a)** three different methods of cooking were demonstrated in the chosen dishes but not all of the dishes were skilful. In **(b)** meals were prepared but sometimes had accompaniments missing.

Question 5

A good range of suitable dishes were prepared for the children’s party but again some dishes were low skill and there was some repetition in the use of ingredients and methods.

Question 6

Two-course evening meals were prepared well for **(a)**. In **(b)** the two dishes to be taken to work sometimes contained an excess of carbohydrates and sometimes would not have been easy to carry to work.

Question 7

Candidates prepared three dishes using local vegetables for **(a)** but often the same vegetables were used for each dish and methods were repeated. In **(b)** two-course meals were prepared but these were sometimes lacking in protein for the vegetarians.

Question 8

Reasonable two-course midday meals were prepared using the equipment listed for **(a)**. In **(b)** candidates prepared a cake and scones but on many occasions the cake was not prepared by the creaming method as required by the question.