CAMBRIDGE
International Education

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FOOD & NUTRITION **0648/11**

Paper 1 Theory **October/November 2025**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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PUBLISHED

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	<u>'List rule' guidance</u> For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standard isation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	Correct point or mark awarded
	Incorrect point or mark not awarded
BOD	Benefit of the doubt given
^	Information missing or insufficient for credit
REP	Repetition in response
I	Incorrect or insufficient point ignored while marking the rest of the response
R	Incorrect point or mark not awarded
CON	Contradiction in response, mark not awarded
SEEN	Point has been noted, but no credit has been given or blank page seen
	Key point attempted / working towards marking point / incomplete answer / response seen but not credited / blank page seen

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Question	Answer	Marks
1	*term used to describe excess consumption of nutrients* overnutrition;	**1**

Question	Answer	Marks
2(a)	*term used to describe protein food that lacks at least one essential amino acid* low biological value / LBV / incomplete protein;	**1**
2(b)	*reasons why teenagers require a good supply of protein in their diet* (need protein for) building muscle mass; maintain / repair / renew worn out / damaged cell / body tissue / muscles; needed for rapid growth / growth spurt; production of hormones;	**3**
2(c)	*enzyme found in the stomach necessary for the digestion of protein* protease / pepsin / rennin;	**1**

Question	Answer	Marks
3	*health issues from eating too much carbohydrate* (excess carbohydrates are) stored as fat so become overweight / gain weight / become obese; risk of complications during surgery / pregnancy; problems with the knees / hips / spine / arthritis; high blood pressure / hypertension; CHD / heart disease / stroke; psychological problems / low self-esteem; type 2 diabetes; dental caries / tooth decay; IBS;	**4**

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Question	Answer	Marks
4(a)	*characteristics of monounsaturated fats* usually liquid (at room temperature); contains only one double bond / has one unsaturated carbon bond in the molecule; molecule can accept more hydrogen; found in plant foods; can help to lower (LDL) cholesterol;	**4**
4(b)	*foods that are a good source of monounsaturated fats* avocado; canola / rapeseed; nuts or named example e.g. almonds, cashews macadamia, pecan, pistachio, walnut; olive; peanut / groundnut; rice bran; seeds or named example e.g. chia, pumpkin, flax, safflower, sesame, sunflower; soya;	**4**

Question	Answer	Marks
5	*action of lactase in the ileum* breaks down lactose / sugar in milk; (breaks down lactose) into glucose; (breaks down lactose) into galactose;	**2**

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Question	Answer	Marks
6(a)	*health issues that could result from a high amount of salt in the diet* may cause high blood pressure / hypertension; (hypertension can result in) increased risk of strokes / heart disease / CHD; (too much salt can cause) water retention / excess fluid in tissues / oedema; (water retention leads to) kidney damage / kidney stones; dehydration; osteoporosis, due to the rate calcium is lost from the bones;	**3**
6(b)(i)	*sources of iodide* cod liver oil; cranberries; dairy foods or one named example e.g. cheese, milk; egg; fortified bread; green leafy vegetables / vegetables grown near the sea e.g. spinach, kale, broccoli; iodised salt / sea salt; iodised water; prunes; seafood; seaweed e.g. kelp / kombu, nori, wakame;	**3**
6(b)(ii)	*part of the body affected by goitre* thyroid (gland);	**1**

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Question	Answer	Marks
6(c)	*foods a lacto-vegetarian could eat that provide a good source of iron* black treacle / molasses; cocoa / plain chocolate / dark chocolate; curry powder / cumin; dried fruit e.g. apricots, raisins, dates, prunes, figs; eggs; fortified breakfast cereals; fortified flour / bread / products; green leafy vegetables e.g. broccoli, cabbage, spinach, kale, watercress; named soya product e.g. tofu, tempeh, TVP, flour; nuts e.g. almonds, walnut, pistachio, cashew, pine, macadamia; pulses e.g. peas, beans, lentils, peanuts; seeds e.g. sesame, pumpkin, sunflower; wholegrain flour / products / cereal e.g. brown rice, oats, pasta;	**4**
6(d)	*functions of potassium in the body* normal functioning / contraction of muscles; normal functioning of nerves; maintenance of fluid / water balance inside cells; pH balance / electrolyte balance; neutralises effects of sodium / helps reduce the risk of hypertension;	**3**

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Question	Answer	Marks
7(a)	*foods that are a good source of vitamin D* dairy foods or one named example e.g. butter, cheese, cream, milk, yoghurt; eggs; fish liver oils (or named example); fortified breakfast cereals; liver; margarine; oily fish / named example e.g. salmon, sardines, herring, mackerel and fresh tuna; (red) meat or named example;	**3**
7(b)	*groups of people who may not be able to make enough vitamin D from sunlight* people who are housebound so not exposed to sunlight; use of sun creams with sunblock which reduce the natural synthesis under the skin; reduced exposure to sun during winter months / living in a climate with restricted sun light; people who live in industrial / polluted areas / surrounded by high buildings where sunlight is prevented from reaching them due to smoky atmosphere / in shadows of other buildings; people / women who wear long robes and head coverings for religious reasons as the sun cannot reach their skin; people with dark skin have greater amounts of the pigment melanin in the epidermal layer which reduces the skin's ability to produce vitamin D from sunlight; elderly people as the ageing process reduces the skin's ability to synthesise / convert vitamin D from the sun;	**3**

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>8(a)</td><td>functions for each ingredient used in making a sponge cake

<table>
<tr><td>ingredient</td><td>function</td></tr>
<tr><td>butter</td><td>adds colour;
adds flavour / taste, richness;
extends shelf life;
gives soft / light / fluffy / spongy texture / structure;
increases moisture / prevents drying out;
provides nutrients (fat, vitamin A vitamin D)
traps air;</td></tr>
<tr><td>flour</td><td>allows browning / dextrinisation of surface during baking;
helps cake rise / gives volume;
(gluten in flour) holds / binds cake together / forms framework / shape / structure;
provides nutrients (protein, starch / carbohydrate / vitamin B, calcium, iron);
SR flour (has low gluten and) gives tender crumb, soft / light / fluffy / spongy texture / structure;
traps air during sieving which helps cake rise / gives volume;</td></tr>
</table></td><td>6</td></tr>
<tr><td>8(b)</td><td>how to make the sponge cake mixture using the creaming method

cream butter and sugar;
cream with wooden spoon / electric mixer;
(cream) until light and fluffy / pale in colour / white / soft dropping consistency;
beat eggs;
add beaten eggs gradually / in stages to creamed mixture / one by one;
beat well between each addition of egg until fully incorporated;
sieve flour;
gently fold flour into mixture;
use a metal spoon / spatula to obtain soft dropping consistency;</td><td>6</td></tr>
</table>

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Question	Answer	Marks
9(a)	*other methods of frying* air-frying; deep frying; dry frying; sautéing; shallow frying;	**3**
9(b)	*process of conduction when stir-frying* heat is conducted, by contact, from one molecule to another; heat is conducted from heat source to metal pan; heat from pan transfers heat energy to oil / food inside pan; molecules in oil / food that are hot then vibrate rapidly; vibrating food molecules cause neighbouring molecules to vibrate which transfers / conducts heat through food;	**3**
9(c)	*benefits of stir-frying as a method of cooking* budget friendly / economical – method uses only small amount of oil; economical of fuel – as only one burner used / ingredients cooked quickly; makes food attractive / appetising – as quick cooking maintains colour of ingredients; more vitamins / nutrients are retained than some other methods of cooking – as no water is used and only small quantity of oil and short cooking time required; only uses one pan – so less washing up; quick method of cooking – so suitable for people in a rush / food cut into small pieces so needs less time to cook / saves time; reduces risk of obesity / CHD – because method only uses a small amount of oil; stimulates appetite / helps digestion – as food produces an appetising aroma; variety of dishes can be created – as endless combinations of ingredients can be used with different tasting sauces; vegetables tender yet crisp and crunchy – so provides variety of texture to meal;	**4**

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Question	Answer	Marks
9(d)	*disadvantages of frying as a method of cooking* adds fat / increases calorific value to product which can lead to obesity / CHD; as fat / oil is expensive there is a tendency to use it too often with the result that tastes are absorbed by the fat / oil and passed onto the food; can be a dangerous process so needs skill and careful temperature control to avoid burning food / burning cook; cannot cook large amounts at once; destroys heat-sensitive nutrients; fried food may be difficult to digest; frying can cause a lot of mess with hot fat splatter / steam from cooking food so adds to cleaning routine; if deep frying can be expensive to buy enough oil for deep fat pan; if fat too cool food will absorb oil / become soggy / unappetising; if fat too hot food will be overcooked on outside and raw inside; needs constant attention during cooking / cannot leave unattended in case food overcooks / burns or oil ignites; when shallow / deep frying must strain oil when cool to remove crumbs of food which can decompose and give a bitter flavour or leave dark specks on food;	**4**
9(e)	*guidelines to follow to avoid accidents when stir-frying* always make sure ingredients are prepared ahead of starting to stir-fry; do not throw ingredients into pan / place ingredients in carefully to avoid splashing of any oil / tilt pan away from you when adding ingredients; fat / oil should be at correct temperature / not too hot when food is placed in it; hold handle of pan / wok / use gloves to prevent burning hand; make sure pan is stable on hob / burner / use a wok cradle to prevent wobbling; make sure pan / food is dry as adding water to hot oil will cause spitting; make sure to use oil with a high smoking point; needs constant attention during cooking / do not leave unattended; do not use too much oil / do not over fill pan with oil; use heat resistant utensils for stirring; use big enough wok / pan / don’t overfill with ingredients; wear protective clothing and footwear / no long sleeves or dangling clothing / tie back or cover long hair;	**6**

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Question	Answer	Marks
9(f)	*protein foods suitable to be used in a stir-fry* named cereal e.g. Seitan, sweetcorn / maize, rice, noodles; nuts or one named nut e.g. almond, Brazil, hazelnut, walnut, cashew; pulses or legumes or one named example e.g. beans, peas, lentils, peanuts; Quorn (vegan friendly); seed e.g. hemp, chia, flax, pumpkin, quinoa, buckwheat, amaranth; soya product e.g. tempeh, TVP, tofu;	**3**
9(g)	*ways to prevent food poisoning when preparing and cooking a chicken stir-fry* check chicken is fresh / within date mark / use-by-date - to prevent any risk of food poisoning; check juices run clear / chicken is not pink inside after cooking - to ensure chicken is thoroughly cooked and bacteria destroyed; clean / sanitise chopping boards and equipment before / after use – to destroy bacteria / prevent cross-contamination; clean / sanitise hands before / after handling raw meat – to prevent cross-contamination; cook chicken before adding other ingredients / vegetables – to ensure it is completely cooked and other ingredients not over cooked; cut chicken into equal / thin pieces – so it all cooks at the same rate / time / cooks completely / thoroughly; do not wash chicken – harmful bacteria can be spread through kitchen; ensure chicken is piping hot / fully cooked / use a temperature probe / check core temperature is 70–72 °C – to ensure any bacteria destroyed; if using frozen chicken ensure it is defrosted completely before preparation – so it cooks fully / all the way through and will not lead to illness; when preparing do not use the same equipment for raw chicken and other foods / use colour coded equipment correctly – to prevent cross-contamination;	**6**

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Question	Answer	Marks
10	*advantages of using ceramic tiles as a wall covering in a kitchen* able to withstand high levels of moisture / condensation / steam / resistant to water / waterproof; available in a variety / wide range of colours; available in a variety / wide range of finishes e.g. smooth, textured, glossy or matte; available in a variety / wide range of patterns; available in a variety / wide range of shapes; can add a pop of colour to the kitchen making it more aesthetically appealing / attractive; durable / long lasting; easy to clean and maintain so should not allow growth of bacteria and mould; generally resistant to grease / hot oil splashes; relatively inexpensive / affordable;	**4**

Question	Answer	Marks
11	*Pulses are the edible seeds of legume plants. Discuss, with examples:* *the nutritional value of pulses* *the importance of pulses as a cooking ingredient.* *nutritional value of pulses [7 marks max]* source of LBV protein – growth / repair / maintenance /enzymes / hormones / antibodies / energy; soya / quinoa / chia are plant sources that contain all the essential amino acids so are a good source of HBV protein; fat – concentrated source of energy / provides a reserve of energy / provides fat / soluble vitamins / provides insulation / adipose tissue / protects vital organs / kidneys / forms structure of cell membranes; source of carbohydrate / starch; provides energy; source of fibre / NSP / may help lower blood cholesterol / controls blood sugar / increases stool bulk / may prevent colon cancer; vitamin A for visual purple / retina, growth, mucous membranes, support immune system / antioxidant, prevent night-blindness, aid vision in dim light; source of B group vitamins – release of energy from carbohydrates / healthy nervous system / normal growth / prevention of beriberi, pellagra; vitamin C available in fresh / sprouting pulses – enhance absorption of iron, prevent anaemia;	**15**

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Question	Answer	Marks
11	vitamin K to assist blood clotting, aid absorption of calcium for bone development / health; source of iron – production of haemoglobin /red pigment in blood / transports oxygen to cells / for cell respiration / and production of energy / removes carbon dioxide / prevents anaemia; source of calcium for skeletal development; source of potassium – nerve function / water balance / pH balance / neutralises sodium / reduces risk HBP; *importance of pulses [7 marks max]* can be mixed with another LBV food to give HBV protein / complementation so important for vegetarians; wide variety of pulses which include beans, lentils and peas so can provide variety to the diet / versatile; low in fat / saturates / no cholesterol, less risk of heart disease / CHD can be made into other products e.g. soya can be used to make flour / tofu / milk / tempeh / TVP / oil; easy to store as they are a low-risk food, can be canned, dried, frozen so good for emergencies; cheap to produce and buy / cheaper alternative to meat; valuable in vegetarian / vegan diet where HBV protein may be lacking; add sensory benefits to meals e.g. texture e.g. soft / colour e.g. green, red, cream / flavour e.g. earthy, nutty; useful as meat replacement / substitute e.g. soya 'meat', TVP so good for vegetarians, has ethical value; useful as a meat extender e.g. bulk out a dish to make it more filling, cheaper, feed more people; filling / provide satiety due to NSP so prevents overeating / reduces risk of obesity / type 2 diabetes; no waste as all parts of the pulse are edible so valuable for environmental, economic, ethical, and food security reasons; easily available as not seasonal, can be bought in many outlets, in different forms e.g. tinned, dried, frozen; *named examples of use as a cooking ingredient [3 marks max]* hummus; soups; stews; curries; salads; sweet dishes; savoury dishes;	

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Question	Answer	Marks
12	*A 25-year-old overweight female has been told she has type 2 diabetes. Use your knowledge of nutrition and meal planning to discuss ways this female could make healthier food choices to manage her weight and type 2 diabetes.* avoid missing meals which will prevent dips in blood sugar which could cause hypoglycaemia (the long-term effect of this causes eye problems / damage to internal organs); avoid too much use of diabetic foods as they are often high in fat and calories and contain a nutritive sweetener , some of which have a laxative effect; eat a well-balanced diet / follow nutritional guidelines / tools to avoid becoming overweight; eat regular meals to avoid peaks and troughs in blood sugar / gives better control of diabetes; eat small meals to ensure glycogen / stored energy is released into the bloodstream in a steady prolonged manner preventing fluctuations in blood glucose levels; make meals from scratch so as to know exactly what ingredients are being used in the dish / can control amount of fat, sugar, salt NSP to help with weight / diabetes; read labels to check for sugar, fat and salt and to avoid / prevent from eating foods that contribute to overweight / diabetes; reduce / avoid processed food which is often high in salt, sugar, saturated fat and low in NSP all factors which are not helpful for weight management and control of diabetes; *sugar* decrease / avoid sugary drinks / fruit juices and choose diet drinks or water to lower sugar intake / control weight and manage diabetes; extrinsic / sugar which is added to food can result in a rapid increase in blood glucose and high levels of insulin so should be avoided to help with weight / diabetes; opt for intrinsic / sugar found naturally in foods such fruit / veg as fructose, and in milk as lactose as they do not have such a spike on blood sugar but intake still needs to be monitored to avoid weight increase / diabetic incidents; reduce overall intake of sugar because of its fast rate of digestion and absorption which causes a rapid increase in blood glucose and high levels of insulin as well as not helping with weight control; restrict and reduce sugar intake from foods such as cake, biscuits, sweets, chocolate, added to beverages as these foods add energy and little other nutrients and do not help with weight / diabetes; when baking reduce sugar content in recipes (dried fruit, honey, jams, preserves, fruit canned din syrup) use artificial sweeteners / stevia or replace sugar with naturally sweet foods e.g. fresh fruit to keep sugar content low; when shopping choose products with low sugar / ‘sugar free’ / reduced sugar options, do not buy sugar-coated breakfast cereal to help control overall sugar intake;	**15**

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Question	Answer	Marks
12	*starch / NSP* increase intake of vegetables and fruits as they contain NSP / ACE (antioxidant) vitamins that help prevent heart disease / provide satiety / are less energy dense; opt for pulses and wholegrain / wholemeal carbohydrates which are high in NSP, give a feeling of satiety, helps in weight maintenance which may help control diabetes; reduce intake of refined carbohydrates e.g. white rice, pasta, bread as too many can cause weight gain; *fat* control intake of saturated fat as diabetics are more susceptible to CHD / HBP so avoid processed meats e.g. sausages / pies, replace full fat milk with semi-skimmed / skimmed, use low-fat versions of cheese / yoghurt / spreads / cream / salad dressing; diets rich in monounsaturated fats appear to have beneficial effects for those with diabetes, they help lower blood glucose levels and may reduce insulin resistance; limit the amount of fried food eaten and use alternative cooking methods such as grilling / stir frying / dry frying / baking / steaming / air fryer to reduce fat content of dishes to help control weight; moderate protein intake to avoid excess being stored and choose lean meat / poultry / low fat dairy products / use beans, pulses etc. as alternative protein as they also contain NSP; reduce overall fat content of meals when shopping to help weight management / diabetes by selecting lean cuts of meat, choose white meat rather than red, include more fish; reduce overall fat intake to help weight management / diabetes when preparing and eating foods by removing visible fat from meat / skin from poultry before cooking and not serving food with high fat sauces, dressings; *salt* control salt intake when purchasing food by selecting less bacon / ham / yeast extract / salted fish / salted butter as diabetics more at risk of hypertension / CHD; limit amount of salt used when cooking by not adding / adding less in recipes, in cooking water, use herbs or spices for flavouring, use a salt substitute / potassium substitute, use ingredients such as soy sauce / MSG sparingly;	

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