

**MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers**

9336 FOOD STUDIES

9336/01

Paper 1 (Theory), maximum raw mark 100

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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

Page 2	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

www.PapaCambridge.com

1 (a) Absorption and uses of calcium and iron

calcium

formation of bones and teeth – works with phosphorus –
 vitamin D promotes absorption – 1 / 3 absorbed – remainder lost –
 normal functioning of muscles – and nerves – clotting of blood –
 phytic acid – from wholegrain cereals and pulses –
 interferes with absorption –
 oxalic acid – from spinach and rhubarb – makes calcium unavailable –
 absorption increases if calcium level in body is low – but not in old people –
 or in women at menopause – due to reduction of oestrogen –
 may lead to osteoporosis –
 calcium from milk and milk products absorbed better than calcium from vegetables –
 lactose increases absorption –

iron

for formation of haemoglobin – red pigment (inside red blood cells) – transports oxygen – to
 cells –
 as oxyhaemoglobin – cells need oxygen to oxidise glucose –
 to release energy –
 when blood cells break down iron is used for new cells –
 taken to bone marrow – all cells use iron –
 5%–20% absorbed from food – depending on body's need –
 depends on form of iron in food – haem iron from meat –
 non-haem iron from eggs / vegetables / cereals –
 found in ferric (Fe^{3+}) form – absorbed as ferrous (Fe^{2+}) –
 vitamin C reduces iron from ferric to ferrous – allowing absorption –
 phytic acid – from whole grains and pulses – interferes with absorption –
 tannin – from tea – reduces absorption –

32 points (2 points = 1 mark)

[16]

(b) Deficiency of calcium and iron

calcium

rickets in children – bones not hardened – bend under weight of body – skeletal
 abnormalities e.g. bow legs –
 pigeon chest – due to lack of vitamin D –
 osteomalacia in adults – calcium withdrawn from bones for other uses –
 bones become brittle – easily fractured –
 osteoporosis may occur after menopause –
 women require calcium + exercise + oestrogen – to keep bones strong –

iron

anaemia – red blood cell numbers reduced – less oxygen carried –
 pale colour – lethargic – lack of energy – headaches – dizziness –

12 points (2 points = 1 mark)

[6]

Page 3	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

www.PapaCambridge.com

(c) Local sources of calcium and iron

calcium

milk – cheese – yoghurt – canned fish (or named e.g.) –
fish eaten with bones / sardines / whitebait (or named e.g.)
green vegetables (or named e.g.) – hard water –

iron

eggs – red meat (or named e.g.) – corned beef – liver – kidney – cocoa –
dried apricots – plain chocolate – wholemeal bread –

6 points (2 points = 1 mark)

[3]

2 (a) Structure of saturated and unsaturated fats

all fats are triglycerides – 1 molecule of glycerol + 3 molecules of fatty acid –
'E' shaped structure (credit diagram to show formation) –
triglyceride formed by condensation reaction –
simple triglyceride has all the same fatty acid –
usually mixed triglycerides – containing 2 or 3 different fatty acids –
naturally occurring fats and oils are mixtures of different mixed triglycerides –
therefore contain a number of different fatty acids –
about 40 different fatty acids – of two types (saturated and unsaturated) –

saturated fatty acids

hydrocarbon chain saturated with hydrogen – cannot accept more –
molecule has only single bonds (credit if shown in diagram) – stable – solid at room
temperature –

unsaturated fatty acids

hydrocarbon chain not saturated with hydrogen – can accept more –
at least one double bond in molecule (credit if shown in diagram) –
monounsaturated has one double bond –
polyunsaturated has more than one double bond –
can become saturated during hydrogenation process –
double bond(s) broken – nickel catalyst used –
hydrogen added at double bond(s) – fats become harder –
unsaturated fats are softer – can be oils –

12 points (2 points = 1 mark)

[6]

(b) Digestion and absorption of fat

in the duodenum – bile – stored in gall bladder – made by the liver –
emulsifies fat – increases surface area – breaks into tiny droplets –
lipase – from pancreatic juice – converts fats into fatty acids –
and glycerol –
breakdown of fat continues in ileum –

8 points

in ileum – villi – in intestinal wall –
absorbs glycerol and fatty acids – by diffusion – reform into fat – pass into lacteal of
lymphatic system –
by diffusion
fat is transported in an emulsified form – as minute droplets of lipoprotein –
known as chylomicrons –

4 points

12 points (2 points = 1 mark)

[6]

Page 4	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

(c) Consumption of fat in a healthy diet

only 30–35% energy value of a diet should be supplied by fat –
energy requirement depends on many factors – BMR – body size –
gender – occupation – age – state of health – weather –
energy intake should = energy output – energy balance –
if energy intake is too high extra calories stored as fat – adipose tissue –
under skin – or around internal organs – risk of obesity – CHD –
hypertension – other problems e.g. breathlessness / low self esteem –
important for insulation – provide calories to maintain body temperature –
protect internal organs – convey fat-soluble vitamins / ADEK – satiety –
essential fatty acids important for structure of cell membranes –
makes food more palatable – encouraging over-consumption –
proportion of fat consumed is greater in affluent countries – named examples to compare –
CHD and obesity most common in developed countries –
linked to consumption of fat – less fat = more healthy diet –
learn which foods contain highest amount of fat – fast foods – junk foods –
should reduce intake of fat in developed countries –
replace saturated fat with unsaturated fat – reduce trans fatty acids –
to lower cholesterol level –

14 points (2 points = 1 mark)

[7]

(d) Link between fat and coronary heart disease (CHD)

cholesterol – $C_{27}H_{47}O$ – a fat-like substance – found in all animal tissue –
synthesised in liver – transported in blood –
high amounts in egg yolk – butter – cream – dripping – suet – lard – which are all saturated
fats – poultry and fish low in cholesterol –
none in fruit and vegetables –
too much cholesterol has accumulates in blood –
deposited along artery walls – arteries become narrower –
lumen smaller – may lead to hypertension – arteries may become blocked – increases
chances of blood clot forming – possible heart attack –
association between level of cholesterol in blood and incidence of CHD –
animal fats are usually saturated fats –
use of polyunsaturated fats may reduce level of cholesterol in blood –
HDL (High Density Lipoprotein) can reduce cholesterol –
taking it back to liver – so reducing the risk of CHD –
LDL (Low Density Lipoprotein) can contribute to CHD –
the proportion / ratio of each in the blood is important –
LDL can be decrease by eating a low fat diet –
HDL can be increased by exercising –
trans fatty acids produced when unsaturated fats are hydrogenated –
increased trans fatty acid in diet increases risk of CHD –

12 points (2 points = 1 mark)

[6]

Page 5	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

3 (a) Structure of carbohydrate, fat and protein and their use for energy

carbohydrate in the form of starch and sugar provide energy –
 composed of C H O – broken down to $C_6H_{12}O_6$ during digestion –
 enzyme maltase – converts starch – to glucose –
 sucrase / invertase – converts sucrose – to glucose and fructose –
 lactase – converts lactose – to glucose and galactose –

starch

polysaccharides – $(C_6H_{10}O_5)_n$ –
 oligosaccharides – 3-10 monosaccharides – found in legumes –
 can be in the form of an amylose chain – 50-500 units –
 or amylopectin – branched – 100,000 units

sugar

sucrose and lactose – disaccharides – $C_{12}H_{22}O_{11}$ –
 fructose – monosaccharide – $C_6H_{12}O_6$ –
 hydrolysed by digestive enzymes – absorbed as monosaccharides –
 absorbed by active transport – into blood capillaries – of villi –
 into blood circulation – pass to hepatic portal vein – then to liver –
 liver converts monosaccharides to glucose – which passes to cells –
 oxidised in cells –
 releasing energy – cell respiration –
 oxygen breathed in – carbon dioxide breathed out – aerobic respiration –
 pyruvic acid produced (anaerobic respiration) –
 pyruvic acid broken down – during strenuous exercise –
 lactic acid formed in cells when there is insufficient oxygen –
 ATP – can store energy until required –
 energy required to convert ADP to ATP – removal of phosphate group releases energy –

fats

composed of C H O – hydrocarbon chains –
 emulsified by bile from gall bladder – forms tiny droplets –
 increases surface area – lipase – from pancreas –
 splits fat into glycerol and fatty acids – diffuse into villi –
 triglycerides reform – pass into lymphatic system – via lacteal –
 stored fat transferred from adipose tissue – to liver –
 hydrolysed to glycerol and fatty acid – glycerol becomes pyruvic acid –
 oxidised as carbohydrate –
 fatty acids oxidised as carbohydrate –

protein

broken down to amino acids during digestion – all amino acids composed of C H O N – some
 also contain S –
 deaminated in liver –
 nitrogen removed – excreted as urea – oxidised as carbohydrate –

30 points (2 points = 1 mark)

[15]

Page 6	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

(b) Identify and explain different individual energy requirements

gender – women have lower BMR than men – have proportionally more body fat – less energy required to maintain tissue –

men require 10–20% more energy per kg of body weight than women –

age – children have smaller body size – less heat loss from surface –

average BMR falls with increased age –

energy required for growth –

body size – greater surface area means greater heat loss –

activity of thyroid gland – secretion of hormones containing iodine –

e.g. thyroxine – controls metabolic rate – overactive thyroid increases BMR –

thermogenic effect of food – intake of food stimulates metabolism –

metabolic rate increases after a meal – extra energy in form of heat –

occupation – sedentary workers require less energy than manual workers –

activity level – sportsmen require more energy –

state of body / health – energy required to produce new cells – after injury

and for production of new cells during pregnancy –

and for production of milk during lactation –

climate – more energy required in cold conditions –

to maintain body temperature –

to maintain constant body weight – weight differs between individuals –

to reduce body weight energy output must be greater than input –

energy obtained from stored body fat –

personality – calm placid individuals require less energy than nervous

amount of sleep – more hours of sleep reduce energy requirement –

activities need more energy than sleeping –

stage in life cycle – affects amount of sleep / activity / food intake –

6 points + 6 explanations

12 points (2 points = 1 mark)

[6]

(c) Results of an energy intake which is greater than the body's needs

glucose – converted to glycogen – stored in liver – and muscles –

readily available source of energy –

stored as fat – stored under skin – adipose tissue – around internal organs

obesity – associated issues e.g. breathlessness / problems during surgery –

fat may be deposited in artery walls – reducing lumen –

narrowing arteries – blocking – CHD – strokes –

hypertension –

diabetes – if body lack insulin to convert glucose to glycogen –

8 points (2 points = 1 mark)

[4]

Page 7	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

- 4 (a) Factors which influence an individual's choice of food
- availability of food**
 - famine – climate – type of land – lack of technology –
 - lack of money for agricultural development –
 - lack of food storage facilities – lack of variety of local crops –
 - poor transportation – availability of convenience foods –
 - economy**
 - what can be afforded – no luxury foods –
 - use of locally grown crops – seasonal foods – garden produce – wild food – local fish –
 - preservation of excesses / gluts – employment level –
 - availability of subsidised meals –
 - food programmes – shopping facilities –
 - culture and social habits**
 - influence of parents – food only to satisfy hunger? – social status –
 - entertaining – importance of certain foods – religion – example linking food and religion e.g. Jewish faith and pork –
 - staple foods – nutritional value of staples –
 - importance of dairy foods –
 - migration to other areas and other countries – take culture with them –
 - eating together as a family / eating alone because of lifestyle –
 - nutritional knowledge**
 - Is this food good for me? – education – allergies –
 - state of health**
 - special diets – loss of appetite – follow medical instructions –
 - knowledge of deficiency diseases – motivation to eat –
 - appearance, flavour and texture of food**
 - Does it look attractive? –
 - garnishes / decorations –
 - methods of cooking available locally – skills of cook – equipment available – time available –

10 well-explained points
20 points (2 points = 1 mark)

[10]

Page 8	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

(b) Dietary needs of the elderly

- HBV protein – for repair / maintenance –
- iron – prevention of anaemia etc.
- calcium – maintain bones / teeth – blood clotting – muscle function –
nerve function –
- phosphorus – bones / teeth – energy production –
- vitamin A – to combat infections – formation of visual purple –
- vitamin D – absorption of calcium – bones / teeth –
- vitamin B – to release energy from food –
- vitamin C – to fight infections –
- less fat – reduced energy requirement – maintain body temperature –
insulation – protection of internal organs –
convey fat-soluble vitamins – reduce risk of obesity / CHD –
- less sugar – less need for energy –
reduce chance of obesity – diabetes – mobility problems –
- less salt – reduce risk of hypertension – link to strokes CHD –
- NSP – prevent constipation – improve digestion by keeping food moving –
- water – prevent dehydration – headaches – lethargy – maintain organs

10 nutrients + 10 qualifications
20 points (2 points = 1 mark)

[10]

(c) Other points to consider when planning meals for the elderly

- should be easy to eat / chew – may have dental problems –
- remove bones from fish – easier to eat – eyesight may be poor
- small portions – reduced appetite – too much food is off-putting
- easy to digest – fried food and fatty foods take a long time to digest –
- attractive to look at – to encourage elderly person to eat –
- variety of flavours / textures – relieves monotony of meals
- easy to cook – may not be able to stand for a long time – lack equipment
- not too expensive – may have limited amount of money for food
- may use convenience foods – single portions – no waste – little preparation – no need to buy many ingredients
- may use cheaper source of HBV protein – eggs / dairy foods –
- avoid reheated foods – danger of food poisoning –
- can prepare meals for more than one meal – saves time later – can freeze –
- short cooking time – to save money on fuel etc.

10 points (2 points = 1 mark)

[5]

Page 9	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

- 5 (a) The importance of raising agents in the preparation and cooking of dishes
gives a light texture – more pleasant to eat – attractive appearance –
gives characteristic structure to a product – gives bulk –
and shape to a product – increases volume – gives a variety of textures –
more digestible product –

4 points (2 points = 1 mark)

[2]

- (b) Advice, with reasons, on the choice of flour for bread making

stoneground – 100% whole grain – nothing added or removed –
contains NSP – but germ contains fat – shorter shelf life –
brown colour – nutty flavour – rough texture – close texture –
because bran and germ reduce rise –

wheatgerm – 70% extraction – 10% treated germ added –
germ first cooked with salt –
prevents spoilage by fat and enzymes – flour keeps longer –
rich in B-vitamins –

brown flour / wheatmeal – 80-85% extraction – contains 8.4% bran –
source of NSP – but coarse particles removed –

strong flour – 72% extraction – from spring wheat –
high gluten / protein content – gives elastic dough –
high water absorbency properties – gives light texture –
and good volume –

plain flour – no raising agent – yeast is raising agent –
mixture of wholemeal flour and white flour – gives colour and flavour –
some NSP – rises better than brown flour on its own –
starch-reduced flour – some starch washed out in preparation –
gluten remains – gives light, open texture –

but

not self-raising flour – contains baking powder – yeast is raising agent –
soft flour – low protein content –

not plain, white flour – soft – from winter wheat –
low gluten content – 7-10% gluten

10 points (2 points = 1 mark)

[5]

Page 10	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

www.PapaCambridge.com

- (c) Changes taking place when a loaf of bread is baked
 gluten – from strong flour – developed with moisture – and manipulation when dough is kneaded – distributes yeast evenly – becomes elastic – stretches to hold CO₂ when it evolves – left to rise
 kneaded again – to break large bubbles of CO₂ – and give an even texture – some CO₂ lost – proved – fermentation continues – complex starches / polysaccharides – split into disaccharides – then monosaccharides / glucose – produce alcohol and carbon dioxide – gluten protein denatures – dough rises during baking – as CO₂ expands – yeast activity increases as temperature rises – dough rises quickly – yeast destroyed at about 55 °C – fermentation stops – water absorbed by starch grains – grains swell – gelatinise – support structure of loaf – alcohol evaporates – CO₂ escapes – shape sets – as gluten coagulates – at 73 °C – crust forms – dextrinisation of starch – in dry heat – sugar caramelises – brown colour – further rising lifts crust – takes time for heat to penetrate to centre of loaf – and kill yeast in centre – keeps on rising – known as 'oven spring' – water evaporates – helping to push up dough

20 points (2 points = 1 mark)

[10]

- (d) Discuss the role of yeast in bread making
 raising agent – during fermentation – needs food – moisture – warmth – and time – optimum temperature 37 °C
 maltase and sucrase / invertase – convert monosaccharides to disaccharides – diastase in flour – converts starch to maltose – to feed yeast – zymases in yeast – breaks down simple sugars to CO₂ and alcohol – carbon dioxide pushes up dough – gives risen shape – heat of oven kills yeast – characteristic smell as alcohol evaporates in oven –

10 points (2 points = 1 mark)

[5]

- (e) Ways to shorten the preparation time when making bread
 Chorleywood process – initial fermentation replaced by intense agitation – gluten develops quickly – gases retained more easily – rises quicker – ADD (Activated Dough Development) – chemically developed with ascorbic acid – and amino acid cystine – fermentation time reduced – use 25 mg vitamin C / 500 g flour – add more yeast – but this increases flavour of yeast in finished product – use food processor and dough hook to knead – reduce amount of fat / sugar in dough – fat / sugar inhibit fermentation – rise / prove in a warm place – ideal temperature of 37 °C – omit first rising / mix, shape and prove – use dried yeast – requires no sponging time –

6 points (2 points = 1 mark)

[3]

Page 11	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

- 6 (a) Different uses of sugar in the preparation of dishes
- sweetener – in beverages / sauces – different texture – toffee / fudge
 - add colour – brown sugar used in gingerbread
 - small amount in bread making gives brown crust –
 - retains moisture – prevents rich cakes from drying out –
 - helps fat to incorporate air – creaming method of cake making –
 - prevents development of gluten – in cakes and pastries –
 - gives a more crumbly result –
 - food for yeast – in bread making –
 - delays coagulation of protein in eggs and gluten –
 - gives more time for gases to expand – cakes / meringue
 - strengthens protein in stiffly-beaten egg white – helps retain air –
 - in meringues
 - preserves – micro-organisms cannot multiply in 60% sugar concentration –
 - in jam-making
 - retards enzyme action in frozen products – raspberries, strawberries
 - improves quality of some frozen products –
 - prevents formation of large crystals – in fruit
 - prevents coagulation of protein in egg yolk on freezing –
 - cake decorations – glaze icing / glaze / butter icing / royal icing / dusted icing sugar –
 - changes form when heated – confectionary –
 - sugar syrup adds moisture to finished baked goods – savarin / rum baba –

20 points for uses + examples (max. 1 per use) + further information
(2 points = 1 mark)

[10]

Page 12	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

www.PapaCambridge.com

(b) Problems associated with high sugar intake and ways to reduce intake

problems

Tooth decay – acids produced by bacteria – break down sugar in plaque – produce lactic acid – eats through enamel – forming dental caries

Obesity – calorie intake greater than output – excess stored as fat under skin – as adipose tissue – and around internal organs –

sugar is 'empty' calories – no nutritional value other than energy – obesity problems (e.g. hypertension, varicose veins) –

CHD – fat narrows arteries – and blocks them –

Diabetes mellitus – obesity reduces body's ability to metabolise glucose – must control glucose in blood – insulin –

usually converts glucose to glycogen for storage in liver / muscles –

if this cannot happen in body, level must be controlled by sugar intake –

eating large amounts of readily absorbed carbohydrate –

can cause rapid rise in blood sugar levels –

ways to reduce sugar intake

use sweetener instead of sugar in drinks – omit sugar from drinks –

include more naturally sweet foods e.g. fruit into meals –

reduce amount of sugar in recipes – less foods with extrinsic sugar –

limit intake of sugary foods –

breakfast cereals which are not sugar-coated –

low sugar jams and spreads –

canned fruit in fruit juice instead of syrup –

read labels on processed food to find out sugar content –

eat less convenience foods – sugar used to preserve –

20 points to cover both areas (2 points = 1 mark)

[10]

(c) Sugar substitutes and their uses

taste sweet – bitter-sweet aftertaste – no nutritive value –

used by diabetics – and weight watchers – made from chemicals –

saccharin – 300× sweeter than sugar – not metabolised in body –

no insulin needed – may be dangerous in large amounts –

sorbitol – found naturally in some fruits and from glucose –

energy value like glucose – used by diabetics –

aspartame used in low-calorie drinks – and some processed foods –

cannot use in same quantities as sugar – very light weight –

e.g. Canderel – has no other properties of sugar (only sweetens) –

may be carcinogenic –

may be used in sugar-free chewing gum – jam for diabetics –

bulk sweeteners have sweetening power similar to sucrose –

used in larger quantities –

only manitol and sorbitol have E numbers – if no E number may be unsure of origin –

10 points (2 points = 1 mark)

[5]

Page 13	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

7 (a) Emulsification

mixture of oil and water – which does not separate – can be oil-in-water –
e.g. milk / cream / mayonnaise / ice cream – or water-in-oil –
e.g. butter / margarine / egg yolk –
two liquids which do not normally mix – need an emulsifying agent –
e.g. lecithin in egg yolk – has hydrophobic group – attracted to oil –
and hydrophilic group – attracted to water –
oil molecules are suspended in water –
small amounts of oil are added at first – e.g. in mayonnaise –
to ensure thorough emulsification – more oil causes thickening –
e.g. creamed cake mixture – liquid egg added to creamed fat and sugar –
do not separate / curdle if added gradually – lecithin is emulsifying agent –
unless too much egg is added at once – (credit any information correctly shown in diagram)

10 points (to include at least one example) (2 points = 1 mark) [5]

(b) Gelatinisation

suspension of starch in water – separates grains – when heated with water –
water penetrates outer layers of starch granule – softens and swells –
at 60°C to 80°C – to 5× original size – mixture becomes viscous –
at 80°C – starch grains break up – granules dispersed throughout water –
long chains of molecules begin to unfold – mixture thickens – forms a sol –
water enclosed in meshwork – forms a gel when cooled –
thickness depends on type of starch – and proportion used –
and temperature of liquid – and the effect of other ingredients e.g. sugar – example of
gelatinisation
e.g. boiled rice / roux sauce / arrowroot glaze / blancmange / custard –

14 points (to include at least one example) (2 points = 1 mark) [7]

(c) Oxidative rancidity

reaction between unsaturated triglycerides – and oxygen from the air –
hydrogen released –
oxygen molecules join across double bond of triglyceride molecule –
form aldehydes – and ketones – unpleasant taste and odour –
rancid – irreversible – accelerated by impurities in fats and oils –
enzymes – and presence of polyunsaturated fatty acids –
may be caused by lipase – which causes fat molecules to break down –
accelerated by heat and light – example of rancidity e.g. butter / fats / oils –

8 points (to include at least one example) (2 points = 1 mark) [4]

Page 14	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

(d) Pasteurisation

Extends shelf-life of a food – using heat –
to reduce the number of spoilage organisms present –
also eliminates pathogenic bacteria – making the product safer – example of use in
milk / fruit juice / liquid egg –

Holder process – held between 62.8 °C and 65.6 °C – for 30 minutes –
rapidly cooled to below 10 °C –

High Temperature Short Time (HTST) – heated to 71.7 °C –
for at least 15 seconds – immediately cooled to below 10 °C –
HTST is continuous flow and more efficient – less loss of flavour
and nutritive value – 10% loss of thiamine –

milk tested to ensure it is free from tuberculosis bacteria –
use phosphatase – inactivated at higher temperature than TB bacteria –
if no phosphatase present the bacteria will have been destroyed

10 points (to include at least 1 example)
(2 points = 1 mark)

[5]

(e) Accelerated Freeze Drying (AFD)

food is first frozen – moisture removed under pressure – sublimation –
leaves an open texture – rehydrates quickly – good colour / flavour / texture – light weight –
easy to carry – no need to refrigerate – but fragile –
avoid contact with water – absorbs water readily – leads to spoilage – example of AFD
e.g. vegetables in instant snacks (Pot Noodles)
strawberries in breakfast cereal / instant coffee –

8 points (to include at least 1 example)
(2 points = 1 mark)

[4]

Page 15	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

- 8 (a) (i) Ways of saving money when purchasing food
buy foods in season – cheaper when plentiful – buy in bulk –
buy direct from producer –
freeze for a time when unavailable / too expensive –
buy fresh vegetables / fruit – less wastage (of outer leaves) –
not too many perishables at once – save wastage –
plan ahead and know what is required – make a shopping list / avoid impulse buys – use
'money off' coupons – look for special offers –
compare unit prices of different brands – use store's own brand –
shop at end of day when fresh foods are reduced in price – cheaper cuts of meat – local
produce – saves transport costs –
avoid convenience foods – packaging and processing costs –
don't take children shopping if possible –
use cash rather than cheques / credit cards

10 points (2 points = 1 mark)

[5]

- (ii) Suggest and explain ways of saving fuel
microwave oven – shorter cooking time – no preheating time –
pressure cooker – raises boiling point of water, food cooks quicker –
many foods at same time – saves use of several hotplates –
little water used so cooking can begin quickly –
quickly tenderises foods which need long, slow cooking –
slow cooker – minimum fuel – large capacity – meat and veg. together –
fill all oven shelves – same heat for many dishes – use zones of heat –
preheat oven for minimum time –
use residual heat – electric cookers retain heat – well insulated –
fan oven – has many shelves – all at same temperature – circulates heat –
can fill oven – uses a setting lower than a conventional oven –
batch baking – many dishes from same basic mixture –
tenderise meat before cooking – cooks quicker – grill / fry foods quickly –
keep lid on pan – steam cooks food –
cut meat into small pieces – choose tender cuts as less cooking time –
only boil the amount of water needed for drinks –
electric kettle more efficient – no loss of heat from flames –
base of pan should be same size as hot plate – to save waste of heat –
do not have gas flame too high – heat wasted around sides of pan –
pans with thick base – to retain heat – flat base –
good contact with hotplate

12 points (2 points = 1 mark)

[6]

Page 16	Mark Scheme: Teachers' version	Syllabus
	GCE A LEVEL – October/November 2011	9336

(iii) Saving time when preparing and cooking food

- make use of raw foods –
- quick methods of cooking – frying, grilling etc.
- foods which cook quickly – tender cuts of meat / thin pieces of meat –
- foods which require little preparation or cooking – convenience foods –
- foods / dishes prepared in advance –
 - batch baked products / foods prepared in bulk –
- long, slow cooking methods which require little attention –
- pressure cooker – microwave oven – slow cooker –
 - automatic timer on stove –
- use ingredients available at home – check available food –
- saves shopping time
- use labour-saving equipment – electric mixer / food processor / blender –
- prepare dishes which are familiar –
- dishes prepared using little equipment – saves washing up time –
- make dishes which can be cooked and served in same equipment –
- soak pulses – cook faster –

12 points (2 points = 1 mark)

[6]

(b) Factors which affect food choice locally

- climate – extreme weather (or examples of)
- war – unavailability of food
- type of land – suitability for particular crops / suitability for animals –
- expensive to import food from other countries –
- availability of equipment e.g. freezers for long-term storage –
- may be near town with supermarket – canned and packaged foods available –
- may not be close to town so choice limited –
- may only be able to buy basic commodities – may grow food in garden –
- or rear animals / poultry – advertising influences choice –
- magazines / television etc. – peer pressure –
- opening of fast food restaurants –

16 points (2 points = 1 mark)

[8]