APPLIED

WJEC Level 3 Applied Diploma in

FOOD SCIENCE AND NUTRITION

REGULATED BY OFQUAL AND CCEA REGULATION
DESIGNATED BY QUALIFICATIONS WALES

SPECIFICATION

Teaching from 2015
For award from 2017

Version 2 September 2018

SUMMARY OF AMENDMENTS

Version	Description	Page number
2	Learners are allowed two resits of each external unit	5 and 12
	For internal assessment please consult WJEC's 'instructions for conducting controlled assessment'.	7
	Clarification of the 'near pass' rule *	11
	Clarification of resit rules	64

*Please note the UMS required for the N grade was incorrectly listed and has now been corrected August 2019.

Contents

1 INTRODUCTION

1.1 Qualification title and code

This specification covers the following qualifications:

601/4552/3 WJEC Level 3 Applied Diploma in Food Science and Nutrition

1.2 Statement of purpose

An understanding of food science and nutrition is relevant to many industries and job roles. Care providers and nutritionists in hospitals use this knowledge, as do sports coaches and fitness instructors. Hotels and restaurants, food manufacturers and government agencies also use this understanding to develop menus, food products and policies that that support healthy eating initiatives. Many employment opportunities within the field of food science and nutrition are available to graduates.

This is an Applied General qualification. This means it is designed primarily to support learners progressing to university. It has been designed to offer exciting, interesting experiences that focus learning for 16 - 19 year old learners through applied learning, i.e. through the acquisition of knowledge and understanding in purposeful, work-related contexts, linked to the food production industry.

The structure of the qualification is shown here.

	WJEC Level 3 Applied Diploma in Food Science and Nutrition		
Unit Number	**Unit Title**	**Structure**	**Assessment**
1	Meeting Nutritional Needs of Specific Groups	Mandatory	Internal and External
2	Ensuring Food is Safe to Eat	Mandatory	External
3	Experimenting to Solve Food Production Problems	Optional	Internal
4	Current Issues in Food Science and Nutrition	Optional	Internal

Learners complete three units: two mandatory and one optional.

The first mandatory unit will enable the learner to demonstrate an understanding of the science of food safety, nutrition and nutritional needs in a wide range of contexts, and through on–going practical sessions, to gain practical skills to produce quality food items to meet the needs of individuals.

The second mandatory unit will allow learners to develop their understanding of the science of food safety and hygiene; essential knowledge for anyone involved in food production in the home or wishing to work in the food industry. Again practical sessions will support the gaining of theoretical knowledge and ensure learning is a tactile experience.

Studying one of the two optional units will allow learners the opportunity to study subjects of particular interest or relevance to them, building on previous learning and experiences.

Each unit within the qualification has an applied purpose which acts as a focus for the learning in the unit. The applied purpose demands authentic work related learning in each of the available units. It also requires learners to consider how the use and application of their learning impacts on themselves, other individuals, employers, society and the environment. The applied purpose will also enable learners to learn in such a way that they develop:

- skills required for independent learning and development
- skills to ensure their own dietary health and well being
- a range of generic and transferable skills
- the ability to solve problems
- the skills of project based research, development and presentation
- the ability to apply mathematical and ICT skills
- the fundamental ability to work alongside other professionals, in a professional environment
- the ability to apply learning in vocational contexts.

The range of units available would support learners' progression from study at Level 2, but in particular GCSE`s in Hospitality and Catering, Home Economics: Food and Nutrition, Biology, Physical Education, Humanities and Design and Technology.

Together with other relevant qualifications at Level 3, such as AS and A levels in Biology, Chemistry, Sociology and Maths and/or Level 3 qualifications in Hospitality or Science, learners will gain the required knowledge to be able to use the qualification to support entry to higher education courses such as:

- BSc Food and Nutrition
- BSc Human Nutrition
- BSc (Hons) Public Health Nutrition
- BSc (Hons) Food Science and Technology

In addition to this qualification, WJEC also offer the Level 3 Certificate in Food Science and Nutrition. This is a smaller qualification with one unit as shown in this structure table:

	WJEC Level 3 Certificate in Food Science and Nutrition		
Unit Number	**Unit Title**	**Structure**	**Assessment**
1	Meeting Nutritional Needs of Specific Groups	Mandatory	Internal and External

This Certificate size qualification would complement learning related to health and social care or sport, where an understanding of nutrition and diets would be useful to care managers and sport fitness instructors. It would also be of relevance to those learners with no prior experience of the content when applied to a vocational context. As such, learners may decide to continue to study the subject through the Level 3 Diploma in Food Science and Nutrition.

2 QUALIFICATION STRUCTURE

WJEC Level 3 Applied Diploma in Food Science and Nutrition

	WJEC Level 3 Diploma in Food Science and Nutrition				
Unit Number	**Entry Codes**	**Unit Title**	**Structure**	**Assessment**	**GLH**
1	Internal: 4563UA* 4563NA* External: 4563UB* 4563NB*	Meeting Nutritional Needs of Specific Groups	Mandatory	Internal and External	180
2	4563U2* 4563N2*	Ensuring Food is Safe to Eat	Mandatory	External	90
3	4563U3* 4563N3*	Experimenting to Solve Food Production Problems	Optional	Internal	90
4	4563U4* 4563N4*	Current Issues in Food Science and Nutrition	Optional	Internal	90
Cash-in Diploma	4563QD* 4563CD*				

* English Medium UA, UB, U2, U3, U4 and QD
* Welsh Medium NA, NB, N2, N3, N4 and CD

Qualification Accreditation Number: 601/4552/3

3 ASSESSMENT

The WJEC Level 3 Diploma in Food Science and Nutrition is assessed using a combination of internal and external assessment.

3.1 External assessment

Unit 1: Meeting Nutritional Needs of Specific Groups will be both internally and externally assessed. Details of internal assessment can be found in section 3.2. Details of how the unit is graded can be found in section 4.

Details of the external assessment are as follows:

- 90 minute examination; plus 15 minutes reading time
- Total of 90 marks
- Three sections on each paper
    - Section A is short answer questions
    - Section B is extended answer questions
    - Section C relates to a case study
- Each paper will be available in June of each year
- Learners are allowed two resit opportunities. The highest grade will contribute towards the overall grade for the qualification
- WJEC will produce a mark scheme which will be used as the basis for marking the examination papers
- The paper will be graded Level 3 Pass, Level 3 Merit and Level 3 Distinction. See section 4 for further details
- LO1, LO2, LO3 and LO4 will be assessed at every assessment opportunity. Assessment Criteria will be sampled within each assessment within the mark allocation below:

Assessment Grid

Learning Outcomes	Assessment Criteria	Marks	%
LO1 Understand the importance of food safety	**AC1.1** Explain how individuals can take responsibility for food safety	14-22	15-25%
	AC1.2 Explain methods used by food handlers to keep themselves clean and hygienic		
	AC1.3 Explain methods used to keep work areas clean and hygienic		
	AC1.4 Analyse risks associated with food safety		

Learning Outcomes	Assessment Criteria	Marks	%
LO2 Understand properties of nutrients	**AC2.1** Explain how nutrients are structured	14-22	15-25%
	AC2.2 Classify nutrients in foods		
	AC2.3 Assess the impact of **food production methods** on nutritional value		
LO3 Understand the relationship between nutrients and the human body	**AC3.1** Describe functions of nutrients in the human body	22-31	25-35%
	AC3.2 Explain characteristics of unsatisfactory nutritional intake		
	AC3.3 Analyse nutritional needs of specific groups		
	AC3.4 Assess how different situations affect nutritional needs		
LO4 Be able to plan nutritional requirements	**AC4.1** Evaluate fitness for purpose of diets	22-31	25-35%
	AC4.2 Calculate nutritional requirements for given individuals		
TOTAL		**90**	**100%**

Unit 2 Ensuring Food is Safe to Eat is externally assessed. Details of the external assessment are as follows:

- An assignment will be produced each academic year and cannot be opened before May1st each year
- It is an **eight** hour timed, supervised assessment
- Learners are not allowed to collaborate during times when they are working on assessment tasks
- The externally set assignment will set out the resources that must be provided for all learners
- Learners must complete the assessment within three weeks of it being opened by the centre
- Centres must ensure that where learners complete the external assessment in more than one session, there are processes in place to ensure that their evidence cannot be accessed between sittings
- Each session must be logged. A time sheet will be provided by WJEC for this purpose
- Each assessment will cover all learning outcomes for the unit. It will indicate which assessment criteria are targeted for the assessment
- Each external assessment will involve the learner in bringing together and making connections between the knowledge, understanding and skills learned throughout the unit and applying these by responding to information provided in a scenario. The scenario will relate to a food safety situation. It will require learners to analyse the information and make judgements regarding the potential food safety risk
- WJEC will produce a mark scheme which will be used by WJEC examiners as the basis for marking the external assessment
- The assessment will be graded Level 3 Pass, Level 3 Merit and Level 3 Distinction
- Supervision and timing of externally assessed units must be fully documented in accordance with WJEC requirements.

3.2 Internal assessment

The following units are internally assessed:

- **Unit 1: Meeting Nutritional Needs of Specific Groups.** This unit is also externally assessed. Details of the external assessment can be found in section 3.1. Details of the unit grading are in section 4.
- **Unit 3: Experimenting to Solve Food Production Problems**
- **Unit 4: Current issues in Food Science and Nutrition**

For internal assessment please consult 'WJEC's Instructions for conducting controlled assessment'. This document can be accessed through the WJEC website (www.wjec.co.uk). Each centre must ensure that internal assessment is conducted in accordance with these controls.

The following principles apply to the assessment of each internally assessed unit:

- Units are assessed through summative controlled assessment
- Controls for assessment of each internally assessed unit are provided in a model assignment
- Each internally assessed unit must be assessed independently. Learners may produce a piece of evidence that contributes to assessment criteria for more than one unit. This is acceptable provided it can be clearly attributed to a specified assessment criterion and has been produced under the appropriate controlled conditions for each unit
- Performance bands are provided for Level 3 Pass, Level 3 Merit and Level 3 Distinction. Evidence must clearly show how the learner has met the standard for the higher grades.

There are three stages of assessment that will be controlled:

- Task setting
- Task taking
- Task marking.

Task setting

For internal assessment, WJEC has produced model assignments for each unit. Centres are, however, allowed to modify the assignment within specified parameters. This will allow centres to tailor the assessment to local needs. The model assignment has been written to ensure the following controls are in place:

- Each unit is assessed through one assignment
- Each assignment must have a brief that sets out an applied purpose. An applied purpose is a reason for completing the tasks that would benefit society, a community, organisation or company. Further details are in the statement of purpose in Section 1.2
- The assignment can specify a number of tasks but tasks must be coherent, i.e. show how the assessment requirements all contribute to the achievement of the applied purpose of the assignment
- The assignment must provide each learner with the opportunity to address all assessment criteria and all performance band requirements
- The assignment must indicate the acceptable forms of evidence. These must conform to those forms set out in the model assignment
- Where a centre has adapted the model assignment, there must be evidence of quality assuring its fitness for purpose. Sample documentation for this activity is available from WJEC.

Task taking

There are five areas of task taking that are controlled: time, resources, supervision, collaboration and resubmission.

Time

Each model assignment will specify the total amount of time available for summative assessment. Centres have the discretion for how that time is allocated to each task.

Resources

The assessor can determine which resources should be provided to all learners to ensure fair and valid assessment takes place. Where specific resource controls must be in place, these will be stated in the model assignment.

Supervision

Learners must normally be supervised by an assessor whilst completing controlled assignment tasks. Model assignments will specify if supervision is not required. Centres must have in place systems to ensure learners cannot access evidence they have been developing outside of supervised activities.

Authentication

Supervision is in place to ensure the authenticity of evidence produced for summative assessment. Assessors should not provide input or guidance to learners during the controlled assessment time. This includes providing formative feedback on the evidence being produced. Assessors can provide guidance on the requirements of the task and remind learners of the performance bands and how they can be interpreted. Assessors must intervene where there is a Health and Safety hazard observed.

Learners can review and redraft evidence independently within the time controls for the assessment.

Learners must sign a declaration to confirm that all evidence submitted for moderation is their own work and that any sources used have been acknowledged.

Assessors must sign a declaration to confirm that evidence submitted for moderation was completed under the controlled conditions set out in the model assignments.

Collaboration

The model assignment will indicate whether:

- Group work must take place;
- Group work is forbidden;
- Centres can elect to complete tasks through group work.

Where group work takes place, the following principles must be applied:

- Tasks should allow each member of the group to have full access to all performance bands for all assessment criteria
- Learners **must** provide an individual response as part of any task outcome
- Evidence of individual response may include written evidence (e.g. notes, evaluations, mind maps, etc.) and/or audio-visual evidence (e.g. recordings, photographs, drawings, designs, etc.)
- Evidence must be clearly attributable to each individual member of the group;
- Individual contributions must be clearly identified and stated on the accompanying authentication sheet which must be signed by both the teacher and the candidate
- Assessment of the individual must be based on the individual contribution to the evidence produced;
- Learners' achievement must not be affected by the poor performance of other group members
- Learners' achievement must not benefit from the performance of other group members.

Re-submission

Learners may re-enter internally assessed units. The learner must submit a new assessment, completed within the same levels of control. They cannot improve previously submitted work.

Learners have one resit opportunity for each assessed unit.

Where an individual learner who has previously submitted group work for assessment wishes to resit an internally assessed unit, one of the following options **must** be taken:

- the candidate must create a new piece of work within the same group
- the candidate must create a new piece of work within a new group
- the candidate must create a new piece of work with non-assessed candidates
- the candidate must create an individual piece of work.

The same levels of control for group work, as outlined above, will apply to candidates who choose to resit.

Task marking

All marking of evidence must be made against the assessment criteria and performance band statements given in each unit specification. Evidence marked must comply with the controlled requirements set out in the model assignment.

Written evidence must be annotated to show how it relates to the assessment criteria and performance band requirements.

Performance evidence, for example of giving a presentation, must be made on observation records. Observation records will include a description of learner performance as well as a summative statement on the quality of that performance. Where performance is observed by someone other than an assessor, the 'witness' must complete a witness statement. Assessors will need to authenticate the statement either through scrutiny of supporting evidence and/or questioning of the learner and/or witness. If the statement is authenticated, it can be allowed to contribute to the evidence for assessment. Evidence of authentication will also need to be included.

Marking should only be undertaken by a designated assessor. An assessor should have appropriate expertise in the subject and level for a specified unit. The assessor is responsible for ensuring that:

- Assessment is conducted under specified controlled conditions
- They are clear about the requirements of the learning outcomes, assessment criteria and performance band statements prior to commencing controlled assessment
- Evidence presented for assessment is authentic
- Assessment decisions are accurately recorded
- Evidence is appropriately annotated
- Observation records contain sufficient detail for objective corroboration of decisions
- Judgements are only made against the performance band statements.

3.3 Synoptic assessment

Synoptic assessment is:

'assessment which requires a candidate to identify and use effectively in an integrated way an appropriate selection of skills, techniques, concepts, theories, and knowledge from across the course content'

'Level 3 Vocational Qualifications for 16 -19 year olds and Performance Tables: Technical Guidance for Awarding Organisations' DfE p14

All units in WJEC Level 3 Diploma in Food Science and Nutrition have been designed to require learners to develop their learning by working towards work related purposeful tasks. Learners will select and apply their learning in completion of these tasks.

Units 1 and 2 are mandatory and provide a core breath of knowledge and understanding. Learners must choose either Unit 3 or Unit 4. Both of these units require the learner to draw on the knowledge, skills and understanding gained in Units 1 and 2 in order to complete the assessment requirements. The 'amplification' section of the unit content in units 3 and 4 indicate where learners will draw on learning from other units. The grade that learners receive for this unit is dependent upon their using learning from other units.

3.4 Standardisation

Centres are expected to standardise internal assessment decisions. This is the process by which centres ensure that all learners are judged to the same standard across different assessors, teaching groups and from year to year. Evidence of standardisation should be submitted with learner evidence.

Where more than one assessor is involved, the centre must appoint a Lead Assessor. The role of the Lead Assessor is to:

- document all activities
- ensure that the assignment presented to learners is fit for purpose and complies with all controls
- ensure all assessors have appropriate documentation in place to support fair and valid assessment decisions
- ensure all assessment activities are in accordance with the task taking controls for the unit
- sample assessment judgements at appropriate times to ensure the performance bands are correctly and consistently applied
- provide feedback to assessors
- provide support to assessors on interpretation of performance band requirements.

4 GRADING

Unit achievement is based on a learner's ability to meet the assessment criteria. Units can be awarded a summative grade of Level 3 Pass, Level 3 Merit or Level 3 Distinction.

Internally Assessed Units

Performance bands have been written to enable learners to demonstrate their ability against the assessment criteria. There are no additional requirements to achieve higher marks. A range of marks are allocated for each performance band. Assessors select the 'best fit' performance band for the evidence submitted and award the relevant mark. The total of all marks allocated are submitted to WJEC.

A 'near pass' rule has been introduced for all **external units**. A candidate will achieve a pass (or higher) grade for the qualification if they meet the following two requirements:

i) Achieve the total UMS required at the relevant grade for the qualification
ii) Obtained at least the minimum UMS for the relevant external units

Externally Assessed Units

Each external assessment is marked according to the detail provided in a mark scheme.

Grades

An Award meeting is held each year to set the grade boundaries. An experienced awarding committee attend the Award meeting and refer to a range of information to set grade boundaries for each unit. Further details of grade descriptors can be found in section 4.3. Once grade boundaries have been set by WJEC, learner marks are then converted to UMS marks.

The UMS/grade equivalences for the Level 3 Diploma in Food Science and Nutrition units are:

Unit Number	Unit Title	Assessment	Total UMS mark	UMS grade boundaries			
				D	M	P	N
1	Meeting Nutritional Needs of Specific Groups	Internal	100	80	60	40	
		External	100	80	60	40	30
2	Ensuring Food is Safe to Eat	External	100	80	60	40	30
3	Experimenting to Solve Food Production Problems	Internal	100	80	60	40	
4	Current Issues in Food Science and Nutrition	Internal	100	80	60	40	

Grading the qualification

The WJEC Level 3 Diploma in Food Science and Nutrition qualification is reported on a four point scale: Pass, Merit, Distinction and Distinction*.

The attainment of learners who do not reach the minimum standard for a pass grade will receive a U (unclassified) grade and will not receive a qualification certificate.

Learners may only resit the internally assessed units once, and may resit the externally assessed units twice, with the better result counting, before aggregation for the qualification award. A learner may retake the whole qualification more than once.

The qualification grade will be based upon the overall UMS mark and learner achievements in all units.

To achieve a Pass, Merit, Distinction or Distinction* grade, learners must obtain:

- the minimum UMS mark for the qualification grade

and

- a minimum of a pass grade in **ALL** units.

The grade equivalences for the Level 3 Diploma in Food Science and Nutrition qualification are:

Grade	Distinction*	Distinction	Merit	Pass	Max
UMS	360	320	240	160	400

Grade descriptors

Grade descriptors give a general indication of the standards of achievement likely to have been shown by learners awarded particular grades. The descriptors must be interpreted in relation to the content specified by the unit; they are not designed to define that content. The grade awarded will depend in practice upon the extent to which the learner has met these descriptors overall. Shortcomings in some aspects of the examination may be balanced by better performances in others.

The following grade boundaries will be set at an Award meeting:

- Distinction/Merit
- Merit/Pass
- Pass/Ungraded.

Descriptors shown are those that are equivalent to the threshold performance at each grade that will be awarded.

Level 3 Pass

Learners have gained a basic understanding of food science and nutrition and the impact of food and nutrition on the lives of individuals and on society today. They will have gained a basic understanding of how to identify hazards and minimise risks when producing food to meet the nutritional needs of specific groups. They demonstrate some knowledge of the different properties of nutrients, how the body processes nutrients and how nutritional needs change over time. They are able to use their understanding and knowledge to plan dishes and dietary plans to meet nutrition needs of specific individuals. Learners can carry out practical tasks (including experimental work), analyse results and draw basic conclusions from their findings. Learners will be able to use a number of generic skills e.g. research, analysis, planning and evaluation fairly independently, in order to address food safety scenarios in a range of environments, and/or to produce a research project on a chosen issue within food science and nutrition. Learners will be able to identify and transfer knowledge and understanding from one task to another, thus using learning in an integrated and synoptic way.

Level 3 Merit

Learners have gained a good understanding of food science and nutrition and the impact of food and nutrition on the lives of individuals and on society today. They will have gained a clear understanding of how to identify hazards and minimise risks when producing food to meet the nutritional needs of specific groups. They demonstrate good knowledge of the different properties of nutrients, how the body processes nutrients and how nutritional needs change over time. They are able to use their understanding and knowledge to accurately plan dishes and dietary plans to meet nutrition needs of specific individuals. Learners can carry out practical tasks (including experimental work) with ease and can analyse results and draw basic conclusions from their findings. Learners will be able to use competently a number of generic skills e.g. research, analysis, planning and evaluation in order to address food safety scenarios in a range of environments, and/or to produce a good research project on a chosen issue within food science and nutrition. Learners will be able to identify and transfer accurately knowledge and understanding from one task to another, thus clearly demonstrating using learning in an integrated and synoptic way.

Level 3 Distinction

Learners have gained an in depth understanding of food science and nutrition and the impact of food and nutrition on the lives of individuals and on society today. They will have gained a sound understanding of how to identify hazards and minimise risks when producing food to meet the nutritional needs of specific groups. They demonstrate detailed knowledge of the different properties of nutrients, how the body processes nutrients and how nutritional needs change over time. They are able to use their understanding and knowledge to plan complex dishes and in depth dietary plans to meet the nutrition needs of specific individuals. Learners can carry out practical tasks (including experimental work), competently and confidently demonstrating flair and precision and analyse results and draw sound conclusions from their findings. Learners will be able to use a range of generic skills e.g. research, identification of key factors, analysis, planning and evaluation independently and with ease and accuracy, in order to address food safety scenarios in a range of environments, and/or to produce an in depth research project on a chosen issue within food science and nutrition. Learners will at every opportunity be able to identify and transfer accurately in depth knowledge and understanding from one task to another, thus clearly demonstrating using learning in an integrated and synoptic way.

5 UNITS

Unit 1	**Meeting Nutritional Needs of Specific Groups**
Guided learning hours	180

Aim and purpose

The purpose of this unit is for learners to develop an understanding of the nutritional needs of specific target groups and plan and cook complex dishes to meet their nutritional needs.

Unit introduction

Why do we need to follow food hygiene regulations? What is cross contamination? How do you know something is cooked and safe to eat? What are nutrients? Why do we need them? Is any food "bad" for us? Could fizzy drinks replace water? How does loss of mobility affect what I need to eat? Should we eat more in the winter? Can vitamin tablets replace fresh fruit? How can you make sure that when you cook a meal, everything is ready on time? How can you a make a dish look attractive?

Understanding food hygiene is an essential requirement for anyone who handles food in an industrial or domestic situation. The study of nutrition is essential in society as there are huge pressures on the global food system and increasing incidences of poor nutrition, despite a growth in interest in food related issues. Understanding nutritional requirements for a balanced diet will allow us to make informed dietary choices. Those working in food production need an appreciation of the nutritional value of food and the effect of this on individuals, as nutritional requirements can vary according to age, health, religion and lifestyle choices. Care sector workers need to ensure that meals meet the needs of specific patient groups: elderly, sick and nutritionally vulnerable. Those working as personal trainers understand how the nutritional intake of an athlete can impact on their performance and know the most effective methods of preparing food in order to maximise its nutritional value.

Whether cooking for two people at home, 100 clients at a conference or 1000 people in a hospital, any chef or cook will make sure they have a plan of action, which fully addresses health and safety factors to ensure any food prepared is safe to eat. They will also make sure they have all of the commodities and equipment needed and enough time to prepare and cook the dishes on the menu.

Through this unit, you will have gained an understanding of how to identify hazards and minimise risks when producing food to meet the nutritional needs of specific groups. You will learn about different types of nutrients and how those are used by the body to ensure you can plan a balanced nutritious diet. You will develop skills for preparing, cooking and presenting nutritious dishes that meet specific needs.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO1 understand the importance of food safety	**AC1.1** explain how **individuals** can take responsibility for food safety	**Individuals** • Employers • Employees	There are many ways that individuals are made aware of their responsibilities, for example through induction and training. There are also ways in which they can take responsibility such as in monitoring activities and establishing systems that ensure compliance with legislation. Learners should understand the means by which individuals know their responsibilities and what their responsibilities are.
	AC1.2 explain **methods** used by food handlers to keep themselves clean and hygienic	**Methods (food handlers)** • Personal hygiene • Protective clothing	Learners should understand the importance of personal hygiene and how the methods used meet regulatory requirements.
	AC1.3 explain **methods** used to keep work areas clean and hygienic	**Methods (work areas)** • Waste disposal • Signage • Kitchen design	Learners should understand how different methods of keeping work areas clean and hygienic mitigate risks related to food safety. The most significant risk to consider is cross-contamination.

	AC1.4 analyse **risks** associated with food safety	**Risks**
		• Causes
		  ○ Bacteria
		  ○ Food spoilage
		  ○ High risk foods
		  ○ Contamination
		  ○ Allergens
		• Implications
		  ○ To consumers
		  ○ To businesses
			Learners need to understand the causes and implications of actions that can lead to food safety issues. They need to consider potential causes and the implications to both consumers and businesses.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO2 understand properties of nutrients	**AC2.1** explain how **nutrients** are structured	**Nutrients** • Proteins • Lipids • Carbohydrates • Minerals • Vitamins • Water	Learners should understand how nutrients are structured and use chemical terms and models.
	AC2.2 classify nutrients in foods	**Classify** • Biological value • Glycemic Index • Nutrient density • Sources of nutrients • Complimentary actions of nutrients	Learners should know the main and secondary sources of all nutrients and classify in different ways. Learners should know how to use different types of resources to classify nutrients in foods e.g. • Food labels • Recipes • Nutritional values.
	AC2.3 assess the impact of **food production methods** on nutritional value	**Food production methods** • Cooking methods • Packaging /Storage methods • Preservation methods • Fortification of foods	Cooking methods could include: • Boiling • Steaming • Roasting • Deep fat frying. Packaging/Storage methods could include: • Vacuum packing • Cold store • Aseptic Food Processing and Packaging (AFP). Preservation methods could include: • Freezing • Jamming • UHT.

Learning outcomes	Assessment criteria	Content	Exemplification
The learner will:	***The learner can:***		
LO3 understand the relationship between nutrients and the human body	**AC3.1** describe **functions** of nutrients in the human body	**Functions** • Growth and development • Production of energy • Regulate metabolism	Learners should be able to describe the functions of each type of nutrient specified in AC2.1 and be aware of their complimentary actions.
	AC3.2 explain **characteristics** of **unsatisfactory** nutritional intake	**Characteristics** • Visible • Non-visible **Unsatisfactory** • Nutritional deficiencies • Nutritional excesses	Learners need to understand the characteristics of unsatisfactory nutritional intake. This should be current and not historical nutritional deficiency/excess problems. Issues are likely to relate to: • Obesity • Digestion problems • Anaemia • Skin conditions • Dental problems • Coeliac disease • Rickets.
	AC3.3 analyse nutritional needs of **specific groups**	**Specific groups** • Different life stages o Childhood o Adulthood, Female Pre/Post natal, Pre/Post-menopausal, Male o Later adulthood • Medical conditions o Type 1/Type 2 Diabetes o Hypercholesterolemia o Anaemia o Lactose intolerant o Coeliac disease • Culture o Religious beliefs o Vegans/vegetarians o Lifestyle choices	Learners need to analyse nutritional needs of specific groups including: • How needs change through life stages • How different medical conditions affect nutritional intake • How culture affects nutritional intake.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
	AC3.4 assess how different **situations** affect nutritional needs	**Situations** • Different environments • Different activities • Physical activity factor	Different environments could include workplaces, home, holiday settings, weather, hospital. Different activities could include special occasions, work (manual, sedentary), leisure activities, work patterns such as shift work, hobbies, ill health. Physical activity factors could include different types of sport, work requirements.

LO4 be able to plan nutritional requirements	**AC4.1** evaluate **fitness for purpose** of diets	**Fitness for purpose**
		• Nutritional
		• Against guidelines
		• Weight maintenance
		• To satisfy personal needs
		  ○ Hunger
		  ○ Avoid monotony
		  ○ Eating patterns
			Learners should be able to analyse diets and evaluate how well they meet the needs of individuals or policy.

	AC4.2 calculate nutritional requirements for given **individuals**	**Calculate** • BMR • Dietary reference values • Physical activity factor • Deficit/Excess nutrient intake **Individuals** • Different life stages • Different activity levels • Different medical conditions • Different eating patterns • Different environments	Learners should be able to use resources to calculate requirements. These could include: • Use of computerised programmes • Mobile phone apps • Food tables • Recommended nutritional intake charts and tables.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO5 be able to plan production of complex dishes	**AC5.1** interpret recipes for **complex menus**	**Complex menus** • Combination of hot and cold dishes • Using advanced techniques • Using technical terms • No processed foods **Interpret** • Skills and techniques required • Commodities required • Technical terms • Timings	Learners should have the opportunity to use recipes from a wide range of resources/sources both new and old e.g. recipe books, internet web sites, magazines.

	AC5.2 plan production of menus	**Plan**
		• Sequencing
		• Timing
		  ○ Preparation
		  ○ Cooking
		  ○ Presentation/finishing
		• Waste
		• Equipment
		• Tools
		• Methods
		• Presentation/finishing of final dishes
		• Contingencies
		• Health, safety and hygiene
		• Quality points
		• Storage
		• Service style
			Learners should be able to plan for the production of more than one dish at a time. They should be able to produce logical orders of work to cover mise en place, production and completion/finish with food hygiene and safety working practices clearly identified.

Learning outcomes	Assessment criteria	Content	Exemplification
The learner will:	***The learner can:***		
LO6 be able to cook complex dishes	**AC6.1** use tools in preparation of commodities	**Tools** • Knives • Utensils • Equipment • Electrical equipment **Use** • Preparing commodities • Using advanced techniques • Minimising waste	Learners should develop skills in the use of tools and equipment as available within the centre. The focus should be on using tools with precision and speed.
	AC6.2 use **advanced techniques** in preparation of commodities	**Advanced techniques (preparation)** • Turning • Shaping • Carving • Larding • Boning (meat) • Tenderising • Blending • Mincing • Enriching • Separating • Filleting (fish) • Moulding	Learners should develop skills needed to use the advanced techniques listed. Learners should be familiar with the names of the techniques, the skills and methods involved and how to use techniques with speed and precision.
	AC6.3 assure **quality** of **materials** to be used in food preparation	**Quality** Smell/Aroma Touch Sight Storage Packaging **Materials** • Equipment • Tools • Commodities	Learners should have sufficient understanding to competently carry out quality checks on accepting materials to be used throughout the cooking processes.

Learning outcomes	Assessment criteria	Content	Exemplification
The learner will:	***The learner can:***		

	AC6.4 use **advanced techniques** in cooking of commodities	**Advance techniques (cooking)**
		• Boiling
		  ○ Water court - bouillon, milk, stock
		• Poaching
		  ○ Shallow, deep
		• Stewing
		  ○ Water, stock, sauce
		• Braising
		  ○ Brown i.e. joints and cuts of meat
		  ○ White i.e. vegetables and sweetbreads
		• Steaming
		  ○ Direct, indirect, high pressure
		• Baking
		  ○ Dry baking, baking with increased humidity, baking with heat modification
		• Roasting
		  ○ Oven, on a spit
		• Tandoori cooking
		• Grilling (griddling)
		  ○ Overheat, underheat, between heat
		• Frying
		  ○ Shallow, deep, sauté, stir-fry
		• Paper bag/en papillotte
		• Microwave
		• Pot roasting
		  ○ Poele
			Learners should develop skills needed to use the advanced techniques listed. Learners should be familiar with the names of the techniques, the skills and methods involved and how to use techniques with pace, speed and precision.

Learning outcomes	Assessment criteria	Content	Exemplification
The learner will:	***The learner can:***		
	AC6.5 present cooked complex dishes using advanced presentation techniques	**Presentation techniques** • Piping • Carving • Shaping • Moulding • Glazing • Rolling • Cutting • Sugar work • Couverture	Learners should develop skills needed to use the advanced techniques listed. Learners should be familiar with the names of the techniques, the skills and methods involved and how to use techniques with pace, speed and precision. Learners should work in consideration of the following presentation standards: • Taste • Smell/Aroma • Appearance • Texture.
	AC6.6 use **food safety practices**	**Food safety practices** • As specified in LO1	Learners need to show individual responsibility for working safely and hygienically by applying food safety practices learned in LO1.
	AC6.7 monitor food production	**Monitor** • Timescales • Commodities • Techniques • Sequencing • Quality points/critical control	Learners need to learn how to monitor progress throughout all stages of food production. They should be able to take responsibility for monitoring progress and checking for critical control measurers during all stages of food production.

Learning Outcome	Assessment criteria	Performance bands		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO1 Understand the importance of food safety	**AC1.1** Explain how individuals can take responsibility for food safety	Explains with some reasoning how individuals can take responsibility for food safety in relation to the case study. 1	Explains with some clear reasoning how a range of individuals can take responsibility for food safety in relation to the case study. 2	Explains with clear and detailed reasoning how a range of individuals can take responsibility for food safety in relation to the case study. 3
	AC1.2 Explain methods used by food handlers to keep themselves clean and hygienic	Explains with some reasoning methods used by food handlers to keep themselves clean and hygienic. Methods have some relevance to the case study. 1	Explains with some clear reasoning a range of methods that food handlers use to keep themselves clean and hygienic that are mainly appropriate to the case study. 2	Explains with clear and detailed reason a range of methods that food handlers use to keep themselves clean and hygienic that are appropriate to the case study. 3
	AC1.3 Explain methods used keep work areas clean and hygienic	Explains with some reasoning methods used to keep work areas clean and hygienic. Methods have some relevance to the case study. 1	Explains with some clear reasoning a range of methods used to keep work areas clean and hygienic that are mainly appropriate to the case study. 2	Explains with clear and detailed reasoning a range of methods used to keep work areas clean and hygienic appropriate to the case study. 3
	AC1.4 Analyse risks associated with food safety	Analyses some information to determine a limited range of appropriate risks associated with food safety in relation to the case study. 1	Analyses information to determine a range of risks to food safety which are mainly appropriate to the case study. 2	Analyses a range of information to determine a range of risks to food safety which are appropriate to the case study. 3

Learning Outcome	Assessment criteria	Performance bands		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO2 Understand properties of nutrients	**AC2.1** Explain how nutrients are structured	Explains with some reasoning how a limited range of nutrients are structured. Relevance of nutrients to case study is implicit. 1	Explains with some clear reasoning how a range of nutrients are structured. There is some explicit link between the nutrients and the case study. 2	Explains with clear and detailed reasoning how a range of appropriate nutrients are structured. There are explicit links between the nutrients and the case study. 3
	AC2.2 Classify nutrients in foods	Classifies nutrients accurately using one method. Appropriateness of method is not clear. Classification includes main and secondary sources. Relevance of nutrients to case study is implicit. 1	Classifies nutrients accurately using different methods. There is some reference to the selection of classification method. Classification includes main and secondary sources. There is some explicit link between the nutrients and the case study. 2	Classifies nutrients accurately using different methods. Reason for selection of classification methods is clear. Classification includes main and secondary sources. There are explicit links between the nutrients and the case study. 3
	AC2.3 Assess the impact of food production methods on nutritional value	Assesses how a range of food production methods impact on nutritional value. Assessments have some reasoning in relation to the case study. 1	Assesses how an appropriate range of food production methods impact on nutritional value. Assessments are mainly reasoned in relation to the case study. 2	Assesses how an appropriate range of food production methods impact on nutritional value. Assessments are clear and well-reasoned in relation to the case study. 3

Learning Outcome	Assessment criteria	Performance bands		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO3 Understand the relationship between nutrients and the human body	**AC3.1** Describe functions of nutrients in the human body	Describes the functions of a range of nutrients in the human body. Description has some relevance to the specific groups in the case study. 1	Describes the functions of a mainly appropriate range of nutrients in the human body. Description is mainly relevant to the specific groups in the case study. 2	Describes in detail the functions of an appropriate range of nutrients in the human body. Description is relevant to the specific groups in the case study. 3
	AC3.2 Explain characteristics of unsatisfactory nutritional intake	Explains with some reasoning the characteristics of unsatisfactory nutritional intake. There is some relevance to specific groups and information in the case study. 1	Explains with some clear reasoning the characteristics of unsatisfactory nutritional intake. Evidence is mainly appropriate to the specific groups and information in the case study. 2	Explains with clear and detailed reasoning the characteristics of unsatisfactory nutritional intake. Evidence is appropriate to the specific groups and information in the case study. 3
	AC3.3 Analyse nutritional needs of specific groups	Analyses some information to determine a limited range of nutritional needs of specific groups in the case study. 1	Analyses information to determine a range of nutritional needs of specific groups which are mainly appropriate to the case study. 2	Analyses a range of information to determine nutritional needs of specific groups which are appropriate to the case study. 3
	AC3.4 Assess how different situations affect nutritional needs	Assesses how different situations affect nutritional needs of specific groups in the case study. Assessments have some reasoning with limited evidence in support of conclusions. 1	Assesses how different situations affect nutritional needs of specific groups in the case study. Assessments are mainly reasoned with some evidence in support of conclusions. 2	Assesses how different situations affect nutritional needs of specific groups in the case study. Assessments are clear and well-reasoned with evidence in support of conclusions. 3

Learning Outcome	Assessment criteria	Performance bands		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO4 Plan nutritional requirements	**AC4.1** Evaluate fitness for purpose of diets	A limited range of information is evaluated to determine fitness for purpose of diets. Conclusions have some reasoning with limited evidence in support of conclusions. 1	Information is evaluated to determine fitness for purpose of diets. Conclusions are mainly reasoned with some evidence in support of conclusions. 2	Information is evaluated to determine fitness for purpose of diets. Conclusions are clear and well-reasoned with evidence in support of conclusions. 3
	AC4.2 Calculate nutritional requirements for given individuals	Nutritional requirements of specific groups in the case study are calculated. Calculations have some minor errors and omissions. 1	Nutritional requirements of specific groups in the case study are calculated. Calculations are mainly accurate, may have some omissions and are drawn from valid sources. 2	Nutritional requirements of specific groups in the case study are calculated. Calculations are accurate, clearly presented and drawn from valid sources. 3
LO5 Plan production of complex dishes	**AC5.1** Interpret recipes for complex menus	Recipes are interpreted to identify requirements. There may be some minor errors. 1	Recipes are interpreted to accurately identify requirements. 2	
	AC5.2 Plan production of menus	Plan has some detail and is mainly appropriate but may have some omissions and errors that require amendment. There is some consideration of contingency planning. 1	Plan has detail with some minor omissions. Plan does not require changes to achieve planned outcome, but would benefit from minor amendments. There are well considered contingencies. 2	Plan is comprehensive and detailed, incorporating well considered contingencies for most situations. 3

Learning Outcome	Assessment Criteria	Performance Bands		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO6 Be able to cook complex dishes	**AC6.1** Use tools in preparation of commodities	A range of tools are used in the preparation of commodities. Skills demonstrated may show limited precision. Consideration to food safety given throughout. 1	A range of appropriate tools are used with precision in the preparation of commodities. Consideration to food safety given throughout. 2	
	AC6.2 Use advanced techniques in preparation of commodities	A range of advanced techniques are used. Skills demonstrated may show limited precision and require additional time to meet minimum requirements. Consideration to food safety given throughout. 1	A range of appropriate advanced techniques are used. Skills demonstrated may show limited precision or require additional time to meet minimum requirements. Consideration to food safety given throughout. 2	A range of appropriate advanced techniques are used with speed and precision. Consideration to food safety given throughout. 3
	AC6.3 Assure quality of materials to be used in food preparation	A range of materials are checked for quality throughout preparation and issues identified and resolved. 1		
	AC6.4 Use advanced techniques in cooking of commodities	A range of advanced techniques are used. Skills demonstrated may show limited precision and require additional time to meet minimum requirements. Consideration to food safety given throughout. 1	A range of appropriate advanced techniques are used with limited guidance. Skills demonstrated may show limited precision or require additional time to meet minimum requirements. Consideration to food safety given throughout. 2	A range of appropriate advanced techniques are used with speed and precision. Consideration to food safety given throughout. 3

Learning Outcome	Assessment Criteria	Performance Bands		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
	AC6.5 Present cooked complex dishes using advanced presentation techniques	Dishes are presented using some advanced techniques. Quality of dishes meets minimum standards for appearance, smell and taste. Consideration to food safety given throughout. 1	Dishes are presented using a range of appropriate advanced techniques with some precision. Quality of dishes exceeds some minimum standards for appearance, smell and taste. Consideration to food safety given throughout. 2	Dishes are presented using a range of appropriate advanced techniques with precision. Quality of dishes exceeds most minimum standards for appearance, smell and taste. Consideration to food safety given throughout. 3
	AC6.6 Use food safety practices	Use appropriate food safety practices. 1		
	AC6.7 Monitor food production	Food production plans are monitored and adapted as required at key stages throughout the process. 1	Food production plans are monitored and adapted throughout the process. 2	

Assessment

Requirements for centres

This unit is both internally and externally assessed. Both assessments will provide a grade for the unit. Details of how the approach to assessment contributes to grading can be found in Section 4 of the specification.

Details of requirements for centres for both internal and external assessment are shown below.

External assessment

The external assessment will be available in the June of each year. The specification for the external assessment is as follows:

Duration: 90 minutes plus 15 minutes reading time

Number of marks: 90

Mark allocation:

	LO1	LO2	LO3	LO4
%	**15-25%**	**15-25%**	**25-35%**	**25-35%**
Marks	**14-22**	**14-22**	**22-31**	**22-31**

Grading: Level 3 Pass, Level 3 Merit, Level 3 Distinction
Structure: Three sections

- Section A is short answer questions
- Section B is extended answer questions
- Section C relates to a case study.

Internal assessment

The outcomes of internal assessment will be externally moderated. All assessment must be conducted under controlled assessment conditions and controls have been determined for each stage of the assessment process: task setting, task taking and task marking.

Task setting

To assist centres in the assessment of this unit, WJEC has provided a model assignment along with guidance and criteria related to using it. The model assignment consists of tasks that are applied and holistic in their approach. Model assignments are designed so that they can be used as they are or adapted by centres to fit with the local sector needs and allow the usage of local resources available to the centre. The model assignment includes information on which aspects of the assignment can be adapted.

Task taking

Under the process of task taking, controls are set for the key aspects of time, resources, supervision and collaboration.

- The time taken will be specified within the model assignment
- Resources must be provided that give learners fair and full access to the marking criteria and are appropriate for the assessment and requirements of the unit. Details of specific controls will be given within the model assessment
- Directions on where direct supervision is provided in the model assignment
- Directions on where collaboration is allowed within this unit will be detailed in the model assignment for this unit
- Guidance on collaboration, and where it is permitted, will be given with the model assignment.

Within WJEC model assignments, timing may be suggested for some individual tasks within the overall assessment time. The purpose is to give consortia additional guidance to help to manage the assessment task.

Task marking

The centre must mark learner's assessment evidence against the performance bands for each assessment criteria. The performance bands describe the depth which the assessment criterion has been achieved by the learner.

Guidance for Delivery

It is important that learners recognise that the knowledge, understanding and skills they develop are vocationally relevant. There are a number of ways this can be achieved:

- Arranging visits to workplaces such as a day centres for adults and investigating how menus meet nutrition and food safety requirements
- Arranging talks by an Environmental Health Officer
- Carrying out a work based activity such as cooking nutritious meals for a group of adults preparing for a sporting event
- Arranging visits to workplaces such as a hospital kitchen to observe how large scale food production is planned and implemented
- Arranging talks by visiting speakers, for example a quality manager for a food processing plant to discuss quality checks used in food production.

The following are examples of approaches to delivery which could be used to enhance the learning and understanding of the vocational importance of preparing and cooking dishes to meet the nutritional needs of specific groups.

Example 1

A Personal Trainer could introduce learners to one or more of their clients. Learners develop their communication skills by working with the clients to determine their activity levels and diet. Learners identify nutrient needs based on the individual and calculate BMR, taking into account physical activity factor. Having calculated their nutritional requirements, learners work with the personal trainer to develop nutritious dishes. They prepare and cook the dishes and share these with the clients of the personal trainer, together with details of how the dishes meet their clients' nutritional needs.

Example 2

Learners are provided with information, including medical information, on groups of people within a care environment. Learners work in groups to develop a generic daily menu that includes all vital nutrients and meets the requirements of all. Learners advise the Care Manager or Catering Manager of their recommendations and produce the dishes for tasting by the residents. Learners receive feedback from the residents and the Care and Catering Managers on the quality of their food and menus.

Example 3

A Chef from the local community provides learners with a selection of recipes and methods that are used in his establishment. Learners have to work in groups to produce orders of work for each recipe that an apprentice could follow, which pay absolute detail to critical control points and hazard prevention. Learners review the outputs and the menus and assess their nutritional value for different specific groups.

Example 4

A food production company provides details of their products and the processes used to create them. Learners work in teams to evaluate the nutritional value of the products, pre and post production and produce a report to representatives of the company. Learners prepare and cook the same dishes to demonstrate how nutritional values can be improved.

Example 5

A playgroup could set learners a project to produce meals for young children that could be cooked in their kitchens. Learners develop the technical skills for presenting dishes that would be appealing to children.

Example 6

A chef from a restaurant gives learners recipes from the menus. Learners are given limited time to work under pressure to produce the dishes, using plans provided by the chef. The quality of the final dishes is evaluated by the staff of the restaurant. Learners discuss with the chef how the plans could be adapted.

Making contacts

Examples of organisations that may be approached to provide help include:

- Environmental Health Departments
- NHS professionals
- Catering managers
- Contract catering organisations
- Charities that provide food to service users
- Hotels and restaurants
- Food production organisations.

Resources

Books

Bender, D. (2002). *An Introduction to Nutrition and Metabolism* (3rd Ed). Oxford, UK: Taylor and Francis Ltd

Brown, A.C. (2010). *Understanding Food: Principles and Preparation* (4th Ed). USA: Wadsworth Publishing

Campbell J (et al) (2011) *Practical Cookery Level 3* Hodder Education

Cesarani V (2002) *Advanced Practical Cookery: A Textbook for Education and Industry* Hodder Education

Drummond, K.E. and Brefere, L.M. (2009). *Nutrition for Foodservice and Culinary Professionals* (7th Ed). Hoboken, NJ, USA: John Wiley and Sons

Foskett D, Cesarani V, (2007) *Cesarani and Kinton's The Theory of Catering* Dynamic Learning

Food Standards Agency. (2008). *Manual of Nutrition* (11th Ed). London, UK: Stationary Office
Jeukendrup, A. and Gleeson, M. (2004). *Sport Nutrition: An Introduction to Energy Production and Performance.* Leeds, UK: Human Kinetics

Smith, M. and Morton, D. (2001). *The Digestive System: Systems of the body.* London, UK: Churchill Livingstone

Websites

www.foodsafety.gov

http://homefoodsafety.org/app

BBC Health: www.bbc.co.uk/health/healthyliving

British Nutrition Foundation: www.nutrition.org.uk

CORE: http://www.corecharity.org.uk/

Department for Health: www.dh.gov.uk

http://www.dynamic-learning.co.uk/Product.aspx?productID=164

www.excellencegateway.org.uk/askbutler.examples.id295

Food and Drink Federation: www.fdf.org.uk

Food Standards Agency: www.food.gov.uk/aboutus/publications/industrypublications/

Food Vision: www.foodvision.gov.uk

Health Development Agency: www.nice.org.uk

http://www.hoddereducation.co.uk/Colleges/Hospitality---Catering/Practical-Cookery-series-page/Practical-Cookery-Level-3-supporting-resources.aspx

NHS: http://www.nhs.uk/livewell/healthy-eating/Pages/Healthyeating.aspx

National Obesity Forum: http://www.nationalobesityforum.org.uk/

Physical Activity and Nutrition Wales: www.physicalactivityandnutritionwales.org.uk

The British Dietetic Association: www.bda.uk.com

Vegetarian Society: www.veg.soc.org.uk

Unit 2	**Ensuring Food is safe to Eat**
Guided learning hours	90

Aim and purpose

Learners will develop an understanding of hazards and risks in relation to the storage, preparation and cooking of food in different environments and the control measures needed to minimise these risks. From this understanding, learners will be able to recommend the control measures that need to be in place, in different environments, to ensure that food is safe to eat.

Unit introduction

Why should we follow storage recommendations on food products? Why do menus need to highlight products containing nuts? Why should vegetarian dishes be prepared away from those containing meat? Why are temperature probes used in the food industry? How can you be sure the food you eat is safe?

Food needs to be stored, handled, prepared and cooked correctly to ensure its consumption does not affect people's health. For some people, their health is affected because they have food intolerances or allergies, but the health of all people can be affected if they are subjected to food poisoning. Everyone working in the food industry has a responsibility to minimise the risks of causing a food borne illness. Food safety is one of today's major health issues and there are many roles within the food industry related to food safety. Many food scientists work for the Environmental Health departments of local authorities as food inspectors. Food inspectors ensure businesses produce and serve food that is safe to eat; this would include a whole range of businesses from a large bakery to a stall selling pasties at a local festival. Food inspectors also ensure that descriptions of food (on menus for example) do not mislead customers and help to minimise the risks to ill health, for example, noting where certain dishes contain nuts.

In this unit you will learn about food safety, how micro-organisms can affect food safety, how some foods can cause ill health in people that have intolerances or allergies and what controls need to be in place to minimise the risks of food causing ill health. This understanding will allow you to recommend the safety controls that should be in place in different environments where food is stored, prepared and cooked.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO1 understand how micro-organisms affect food safety	**AC1.1** describe **properties** of **micro-organisms**	**Micro-organisms** • Bacteria • Viruses • Fungi **Properties** • Size • Location • Cellular structure • Pathogenicity • Growth/reproduction	Learners should be able to give factual descriptions of each type of micro-organisms using scientific terms and models
	AC1.2 assess how changing **conditions** affect growth of micro-organisms in different **environments**	**Conditions** • Temperature • pH • Oxygen • Water • Nutrients **Environments** • Preparation • Cooking • Serving • Storing • Transporting • Outdoors • Temporary	Learners should know what is required for micro-organisms to grow so that they understand how changing conditions affect growth. They should consider all micro-organisms in AC1.1 and make judgements that incorporate reference to their properties.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
	AC1.3 explain how micro-organisms affect food **quality**	**Quality** • Appearance • Texture • Smell/Aroma • Taste • Non-visible effects • Nutritional content	Learners should understand that micro-organisms have negative and positive effects on food quality and explain how those changes take place. Learners should consider all micro-organisms in AC1.1 and make reference to their properties.
	AC1.4 assess how **preservation methods** prevent the growth of micro-organisms	**Preservation methods** • Freezing • Jamming • Drying • Pickling • Salting • Additives	Learners should gain sufficient understanding to make judgements about the ability of the preservation methods to prevent growth of organisms in AC1.1.

Learning outcomes	Assessment criteria	Content	Exemplification
The learner will:	***The learner can:***		
LO2 understand how food can cause ill health	**AC2.1** explain the physiology of **food intolerances**	**Food intolerances** • Lactose intolerance • Wheat intolerance • Chemicals in foods	Learners should acquire a theoretical understanding of the types of food intolerance and their physiological causes. Chemicals in foods could include caffeine, salicylates monosodium glutamate, and naturally occurring chemicals like histamines.
	AC2.2 explain the physiological basis of **food allergies**	**Food allergies** • Eggs • Milk • Soya • Wheat • Peanuts • Crustaceans • Nuts • Fish	Learners should acquire a theoretical understanding of the types of food allergies and their physiological causes, particularly in relation to immunological response.
	AC2.3 explain the physiological basis of **food poisoning**	**Food poisoning** • Foods affected • Causative bacteria and viruses • Physiological effects	Learners should acquire a theoretical understanding of foods that present a high risk of food poisoning, causes and physiological effects.
	AC2.4 describe the **symptoms** of food induced ill health	**Symptoms** • Visible symptoms • Non -visible symptoms • Length of time until symptoms appear • Duration of symptoms • Level of contagion	Learners should gain knowledge of symptoms related to food intolerances, food allergies and food poisoning. They should be able to describe how symptoms are detected and outcomes diagnosed.

Learning outcomes	**Assessment criteria**	**Content**	Exemplification
The learner will:	**The learner can:**		
LO3 understand how food safety is managed in different situations	**AC3.1** describe food safety hazards in different **environments**	**Environments** • Preparation • Cooking • Serving • Storing • Transporting • Outdoors • Temporary	Learners should consider a range of different environments and the types of hazards that can exist in each.
	AC3.2 assess **risk** to food safety in different environments	**Risk** • Likelihood of hazard • Potential of hazard to harm • Individuals likely to be affected • Foods likely to be affected	Learners should gain sufficient knowledge to differentiate between hazard and risk. Learners should develop sufficient understanding of risk to make judgements that are reasoned and supported by evidence.
	AC3.3 explain **control measures** used to minimise food safety risks	**Control measures** • Good hygiene practices • Preventing cross contamination • Disposal of waste • Following food safety legislation • Effective cleaning • Effective food storage	Learners should consider risks assessed in AC3.2 and understand how each can be minimised.
	AC3.4 justify proposals for control measures in different environments	**Justify** • Presenting a case for action • Use of evidence to support proposal	Learners need to learn how to justify through the use of appropriate language and evidence.

Assessment

This unit is externally assessed. This will be through an assignment produced by WJEC, completed by learners under highly controlled conditions and marked by WJEC.

The specification for the external assessment is as follows

- An assignment will be produced each academic year and cannot be opened before May1st each year
- It is an **eight** hour timed, supervised assessment
- Learners are not allowed to collaborate during times when they are working on assessment tasks
- The externally set assignment will set out the resources that must be provided for all learners
- Learners must complete the assessment within three weeks of it being opened by the centre
- Centres must ensure that where learners complete the external assessment in more than one session, there are processes in place to ensure that their evidence cannot be accessed between sittings
- Each session must be logged. A time sheet will be provided by WJEC for this purpose
- Each assessment will cover all learning outcomes for the unit. It will indicate which assessment criteria are targeted for the assessment
- Each external assessment will involve the learner in bringing together and making connections between the knowledge, understanding and skills learned throughout the unit and applying these by responding to information provided in a scenario. The scenario will relate to a food safety situation. It will require learners to analyse the information and make judgements regarding the potential food safety risks
- WJEC will produce a mark scheme which will be used as the basis for marking the external assessment
- The assessment will be graded Level 3 Pass, Level 3 Merit and Level 3 Distinction
- Supervision and timing of externally assessed units must be fully documented in accordance with WJEC requirements.

Guidance for Delivery

It is important that learners recognise the knowledge and understanding they develop is vocationally relevant. There are a number of ways this can be achieved:

- Arranging focused visits to private and/or public organisations that prepare and serve food. For example in a Hospital kitchen where the importance of food safety is paramount and similarly in a private restaurant. Learners could compare the safety controls in place in each environment
- Arranging for speakers from organisations that monitor food safety, such as local Environmental Health Officers or representatives from the Food Standards Agency
- Developing learning activities with organisations that that must adhere to food safety controls, for example working with catering staff from a local primary school
- Providing work experience within organisations that produces, prepares and/or serves food would also provide learners with first-hand experience of the importance of food safety within the industry. Such a placement could be part of a planned work placement scheme for the course.

The following are examples of approaches to delivery which could be used to enhance the learning and understanding of the control measures that need to be in place, in different environments, to ensure that food is safe to eat.

Example 1

A local nursing home that prepares and serves food to a diverse range of clients, many of whom have health related issues, could be asked to provide a problem based activity for learners. For example, learners could be asked to design an induction leaflet for trainee employees at the nursing home. The leaflet needs to give an explanation of how food can cause ill health, considering food intolerances, food allergies and food poisoning. The leaflet should then have a section specifically for those employees who will be preparing and serving food in the nursing home, describing food safety hazards and control measures that should be in place. The Care Manager and/or employees could give learners feedback on their leaflets

Example 2

Learners could undertake a role play activity based on the outbreak of a food borne infection, which has been traced back to a particular restaurant. Different learners or groups of learners would undertake different roles, such as local environmental officers, staff at the restaurant, owners of the restaurant etc. Each group would need to assess how the outbreak could have been caused and develop an action plan to prevent any further outbreaks. Environmental Health Officers could provide learners with facts about the restaurant, such as the type of food that was being prepared, the storage conditions etc. and review their ideas.

Example 3

Learners could work on a project for a food processing organisation investigating the antimicrobial properties of a particular food additive. Learners investigate and compare the extent of microbial growth on agar plates prepared with a range of food additives. (If possible, learners prepare their own plates). Alternatively, learners could test the freshness of milk samples supplied to a major retailer. Learners prepare plates using aseptic technique for different milk samples and leave all plates in standard conditions. After five days learners analyse the extent of microbial growth on each plate and highlight any differences.

Making contacts

Examples of organisations that may be approached to provide help include:

- Local food producers
- Local food retailers
- Public service organisations that provide food such as
    - nursing homes
    - children's nurseries
    - local hospitals
    - local schools.

Websites

Society for General microbiology: www.microbiologyonline.org.uk

Food spoilage:

http://culinaryarts.about.com/od/safetysanitation/a/bacteria.htm

Food preservation:

http://en.wikipedia.org/wiki/Food_preservation

http://science.howstuffworks.com/innovation/edible-innovations/food-preservation.htm

Food Allergy and food intolerance:

http://www.nhs.uk/conditions/food-allergy/Pages/Intro1.aspx

http://www.food.gov.uk/multimedia/pdfs/publication/allergyfactsheetcoeliac0308.pdf

Food poisoning:

http://www.stopthestomachflu.com/what-is-food-poisoning

http://www.nhs.uk/news/2011/11November/Pages/loyd-grossman-curry-sauce-botulism-recall.aspx

Food Standards Agency, foodborne disease strategy:

http://www.food.gov.uk/multimedia/pdfs/fds2015.pdf

Food safety advice, NHS: http://www.nhs.uk/livewell/homehygiene/pages/homehygienehub.aspx

Food standards Agency: Food hygiene:

http://www.food.gov.uk/multimedia/pdfs/publication/hygieneguidebooklet.pdf

Unit 3	**Experimenting to Solve Food Production Problems**
Guided learning hours	90

Aim and purpose

The aim of this unit is for learners to use their understanding of the properties of food in order to plan and carry out experiments. The results of the experiments would be used to propose options to solve food production problems.

Unit introduction

Why does ice cream freeze? How do I stop cream curdling? How do I make cakes rise? Why do salad dressings separate?

Making use of the way certain foods change in order to create new dishes has been the foundation of food development. Food producers and chefs develop new and interesting dishes by experimenting with the properties of food. Today, even greater understanding of the scientific principles of food provides chefs with a range of options as they come up with more and more innovative dishes and ideas. Individuals, chefs and employees within the food industry can now produce dishes that do not use standard ingredients or methods, but provide the consumer with interesting and exciting food choices.

This unit will provide you with an understanding of the scientific properties of food and how these properties contribute to the changes that occur in food. You will also draw on your learning from **Unit 1: Meeting Nutritional Needs of Specific Groups** and **Unit 2: Ensuring Food is Safe to Eat**. You will use this learning to plan and carry out experiments with different types of food. By carrying out these experiments, you will be able to propose options to solve food production problems.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO1 understand the scientific properties of food	**AC1.1** explain how food properties can be **changed**	**Changed** • Denaturation • Gelatinisation • Caramelisation • Emulsification • Sols-gels	Learners should gain a theoretical and practical understanding of the scientific properties of food and how these are changed through the processes identified. *Learners will draw on prior learning to reinforce their understanding.*

	AC1.2 explain **variables** that affect physical properties of food	**Variables**
		• Temperature
		• Chemical reactions
		• Manipulation
		  ○ Stirring
		  ○ Beating
		  ○ Whisking
			Learners should gain an understanding of the effect of the listed variables on properties of food.
			
			Learners will draw on prior learning to reinforce their understanding.

LO2 be able to scientifically investigate changes to food	**AC2.1** set **success criteria** for scientific investigations	**Success criteria** • Comparison to food made with "standard" ingredients • Appearance • Smell/Aroma • Flavour • Texture	Learners should learn how to write success criteria that are clear, measurable and appropriate to the scientific investigation. *Learners will draw on prior learning to determine success criteria.*
	AC2.2 obtain **outcomes** from scientific investigations	**Outcomes** • Valid • Reliable	Learners should be taught how to carry out scientific investigations that lead to valid and reliable outputs and how to check for validity and reliability.

Learning outcomes	Assessment criteria	Content	Exemplification
The learner will:	***The learner can:***		
	AC2.3 record outcomes of investigative work	**Record outcomes** • Format for recording outcomes • Clarity of records • Accuracy of record	Learners need to be able to devise documentation for recording outcomes; ensuring the documentation allows for clarity and accuracy of recording. Learners also need to learn how to collect accurate data.
	AC2.4 process data	**Analyse data** • Statistical methods • Use of ICT **Evaluate date** • Consistency of data • Bias in data • Validity of data	Processing of data includes analysis and evaluation of data collected. It also includes the manipulation of data, using appropriate mathematical and statistical techniques. Learners should learn how to process data using with and without the use of ICT software.
	AC2.5 review **suitability of investigative methods**	**Suitability of investigative methods** • Merits • Limitations	Learners should gain an understanding of different approaches to scientific investigations and how to make judgements regarding the suitability of approaches for the purpose.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO3 be able to solve food production problems	**AC3.1** analyse food production situations	**Types of Issue** • Lack of ingredients • Lack of cooking facilities • Environmental conditions • Customer needs	Learners should gain an understanding of food production situations so that they can analyse information to identify specific issues. *Learners will draw on prior learning in order to analyse situations*

	AC3.2 propose practical options to solve food production problems	**Propose**
		• Make suggestions
		  ○ From methods used by innovative chefs
		  ○ From new technologies
		• Advantages/disadvantages of different options
		• Use of scientific language, ideas and models
			Learners should develop communication skills to make proposals.
			They should use prior learning in order to support proposals made.

	AC3.3 scientifically justify proposed options	**Scientifically justify options** • Use supporting primary investigative evidence • Use supporting secondary evidence	Learners should develop sufficient understanding to use primary and secondary data and information to justify proposals made.

Learning Outcome	**Assessment criteria**	**Performance bands**		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO1 Understand the scientific properties of food	**AC1.1** Explain how food properties can be changed	A range of relevant foods properties are considered. Explanations have limited reasoning and accuracy. 1	A range of relevant foods properties are considered. Explanations are mainly reasoned and accurate. 2	A range of relevant foods properties are considered. Explanations are well-reasoned and accurate. 3
	AC1.2 Explain variables that affect physical properties of food	A range of variables are considered that are mainly appropriate. Explanations are mainly accurate with some limited reasoning. 1	A range of appropriate variables are considered. Explanations are mainly reasoned and accurate. 2	A range of appropriate variables are considered. Explanations are well-reasoned and accurate. 3

Learning Outcome	**Assessment criteria**	**Performance bands**		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO2 Be able to scientifically investigate changes to food	**AC2.1** Set success criteria for scientific investigations	A range of success criteria are set, some of which are clear and relevant. 1	A range of success criteria are set which are clear and relevant. 2	A range of success criteria are set which are clear and relevant. Success criteria are SMART. 3
	AC2.2 Obtain outcomes from scientific investigations	A range of outcomes are obtained from scientific investigations. Some valid and reliable outcomes are obtained. 1	A range of valid and reliable outcomes are obtained from scientific investigations. 2	Required outcomes are obtained from scientific investigations which are valid and reliable. 3
	AC2.3 Record outcomes of investigative work	Outcomes of investigative work are recorded using documentation that is mainly fit for purpose. Recording is mainly accurate. 1	Outcomes of investigative work are recorded using documentation that is fit for purpose. Recordings are accurate with some minor omissions. 2	Outcomes of investigative work are accurately recorded using documentation that is fit for purpose. 3
	AC2.4 Process data	Most collected data is analysed and reviewed. There may be some omissions. Conclusions presented may have some inaccuracies. 1	Collected data is analysed and evaluated. There may be some omissions. Conclusions are presented that are mainly valid and reliable. There may be some inaccuracies. 2	Collected data is analysed and evaluated. Valid and reliable conclusions are presented. 3
	AC2.5 Review suitability of investigative methods	Investigative methods are reviewed and straightforward conclusions are presented. There is limited evidence presented in support of conclusions. 1	Investigative methods are reviewed and some reasoned conclusions presented. There is use of some evidence to support conclusions. 2	Investigative methods are reviewed and clear and well-reasoned conclusions presented. There is use of evidence to support conclusions. 3

Learning Outcome	**Assessment criteria**	**Performance bands**		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO3 Be able to solve food production problems	**AC3.1** Analyse food production situations	Analyses information relating to a food production situation. Shows some understanding of key issues to validly identify a problem. 1	Analyses information relating to a food production situation. Key issues are identified and problems inferred. 2	Analyses information relating to a food production situation. Categorises issues to clearly identify problems. 3
	AC3.2 Propose practical options to solve food production problems	A range of options are proposed. Some are practical. There is some consideration of most options presented. Some use of appropriate technical language, with some minor errors. 1	A range of practical options are proposed. Use of technical language is mainly appropriate. There may be minor errors in use, but these will not detract from clarity of meaning. 2	A range of considered, practical options are proposed. Use of technical language is consistently appropriate. 3
	AC3.3 Scientifically justify proposed options	Executed practical work addresses some of the issues and is carried out mainly effectively and efficiently. Clear but basic conclusions are drawn. Justification shows evidence of drawing on some prior learning. 1	Executed practical work addresses most of the issues and is carried out effectively and efficiently. Clear, fairly detailed conclusions are drawn. Justification is mainly reasoned, drawing on some evidence and prior learning. 2	Executed practical work addresses all of the issues and is carried out extremely effectively and efficiently. All conclusions are detailed and good use is made of technical language. Justification is well-reasoned and drawn from scientific investigation and prior learning. 3

Assessment

Requirements for centres

This unit is internally assessed and externally moderated. All assessment must be conducted under controlled assessment conditions and controls have been determined for each stage of the assessment process: task setting, task taking and task marking.

Task setting

To assist centres in the assessment of this unit, WJEC has provided a model assignment along with guidance and criteria related to its use. The model assignment consists of tasks that are applied and holistic in their approach. Model assignments are designed so that they can be used as they are or adapted by centres to fit with the local sector needs and allow the usage of local resources available to the centre. The model assignment includes information on which aspects of the assignment can be adapted.

Task taking

Under the process of task taking, controls are set for the key aspects of time, resources, supervision and collaboration.

- The time taken will be specified within the model assignment
- Resources must be provided that give learners fair and full access to the marking criteria and are appropriate for the assessment and requirements of the unit. Details of specific controls will be given within the model assessment
- Direction on requirements for direct supervision is provided in the model assignment
- Guidance on collaboration, and where it is permitted, will be given with the model assignment.

Within WJEC model assignments, timing may be suggested for some individual tasks within the overall assessment time. The purpose is to give consortia additional guidance to help to manage the assessment task.

Task marking

The centre must mark learner's assessment evidence against the performance bands for each assessment criteria. The performance bands describe the depth to which the assessment criterion has been achieved by the learner.

Guidance for Delivery

It is important that learners recognise the knowledge and understanding they develop are vocationally relevant. There are a number of ways this can be achieved:

- Arranging focused visits to organisations that prepare, produce or manufacture food or food stuff where the constraints of design (such as shelf life) could all be observed and viewed
- Arranging talks from speakers such as an Executive Chef from a local hotel could be asked to discuss the stages in the development of a new recipe for the hotel menu
- Carrying out activities based around a work based scenario such as creating a new and exciting range of party foods for children containing natural stabilisers or colourings, for a supermarket chain

- Providing work experience within a workplace that is adapting foods. This may be within a food processing organisation where learners could work in the research and development department
- Using case studies developed by organisations that that prepare, produce or manufacture food or food stuffs

The following are examples of approaches to delivery which could be used to enhance the learning and understanding how the outcomes of experimentation can be used to propose options to solve food production problems.

Example 1

Learners could work with a major catering organisation asked to tender for the catering of a major event, such as a gala dinner for the sponsors of the Grand Prix. The organiser wants all high quality home made products but the catering manager is concerned how to ensure high quality sauces are achieved. Learners will need to consider the variables involved in the production of sauces that may be served as accompaniments to dishes and carry out experiments to determine which options would be valid. They present their conclusions to a team preparing the tender.

Example 2

The manager and the cook of a local nursing home are concerned that the meat dishes they serve often vary in tenderness. They have asked learners to help in planning and preparing a range of main course dishes using meat that would consistently appeal to their clients and enhance existing provision. Working in teams, learners would plan and experiment working with different types of meat and cooking methods. They would analyse and interpret their results and discuss proposals with the nursing home representatives.

Example 3

A national supermarket retailer has identified a demand for ready-made desserts for vegans. The retailer has asked food producers to express an interest in fulfilling this demand to develop appropriate products and bring them to the market with the support of the retail chain. Learners could be asked to complete the expression of interest. This would require them to plan and carry out experiments and use their outcomes to develop ideas. They would give descriptions of the innovative deserts they would produce in their expressions of interest. Learners could present their ideas to supermarket representatives, obtaining feedback from them.

Making contacts

Examples of organisation that may be approached to provide help include:

- Private organisations: national and local food producers, local organisations that prepare food for clients on specialist diets
- Public organisations: local hospitals and local schools that need to produce food to suit particular client groups
- A range of organisations that represent the different aspects of the food industry, as well as the sector skills council for the food and drink manufacturing industry (Improve: http://improveltd.co.uk/).

Resources

Books

McGee H. Food and Cooking: *An Encyclopedia of Kitchen Science, History and Culture*: Hodder-Stoughton: 2004

Barham P. *The Science of Cooking.* Springer-Verlag 2001

Blumenthal H. *Heston Blumenthal at home:* Bloomsbury publishing: October 2011

Joachim D and Schloss A. *The Science of good food*: Robert Rose Inc: October 2008

Websites

http://www.visionlearning.com/library/module_viewer.php?mid=62

http://www.exploratorium.edu/cooking/icooks/11-03-03.html

http://www.exploratorium.edu/cooking/eggs/eggscience.html

http://en.wikipedia.org/wiki/Gelatin_dessert

http://www.food-info.net/uk/colour/caramel.htm

http://www.foodnetwork.com/how-to/how-to-emulsify-liquids/index.html

http://www.rsc.org/Education/Teachers/Resources/kitchenchemistry/00_video.htm

http://sam.davyson.com/a2/chemistry/fssn/

http://foodtech-llangefni.co.uk/en/

http://www.thefatduck.co.uk/Heston-Blumenthal/

The food technology centre in Wales was set up in 1999 to help with the long term development of food processing and manufacturing capacity in North Wales and across the UK. The centre has recently been involved in the design and development of a functional cereal, details of which make for an interesting case study: http://foodtech-llangefni.co.uk/en/news_events/news/details/?entry_id=85

Unit 4	**Current Issues in Food Science and Nutrition**
Guided learning hours	90

Aim and purpose

Through this unit, you will develop the skills needed to plan, carry out and present a research project on current issues linked to issues related to food science and nutrition. This could be from the perspective of a consumer, food manufacturer, caterer and/or policy-making perspective

Unit introduction

Are mass produced economy ready meals meeting the needs of individuals? Why is catering at events such as music festivals and sporting events usually so limited and unhealthy? Why are contract caterers being used for events such as funeral teas, buffets at 18th birthday parties when years ago, the families would have done this themselves? Should cooking skills be compulsory in schools? How much extra will consumers pay for organic food? How important is a sustainable, equitable and affordable diet? How much is packaging affecting consumer buying behaviour? Are diet trends effective? Is food labelling misleading? How is the media influencing our food choices? What are current food trends?

Food processing and production, catering, hospitality organisations and retailers have experienced significant changes in consumer choice and expectations and this has led to them continually responding to demands and changes in the environment. Food scientists, home economists, market researchers and public health analysts are examples of those that would be involved in carrying out research into current issues on behalf of their employers and public policy makers.

Through this unit you will have the opportunity to build on prior learning from **Unit 1: Meeting Nutritional Needs of Specific Groups** and **Unit 2: Ensuring Food is Safe to Eat** and develop knowledge and understanding of issues that are currently affecting food choice and food availability. Through individual and group projects, you will learn about how key stakeholders within the food industry are responding to changes in food related habits. The projects will also help you to develop the skills needed to effectively plan and carry out an individual research project.

Learning outcomes	Assessment criteria	Content	Exemplification
The learner will:	***The learner can:***		
LO1 be able to plan research into a current issue related to food science and nutrition	**AC1.1 propose** research into a **current issue** related to food science and nutrition	**Propose** • Scope and range of research • Rationale for research • Setting a hypothesis • Setting project aims **Current issue e.g.** • Significant to the sector • Significant to the consumer • Sustainability • Economic • Technological • Media related • Social • Ethical	Learners will need to develop skills to clearly set out a research proposal. *Learners should draw on prior learning to set research proposals.*
	AC1.2 plan research into a current issue	**Plan** • Timescales • Sequencing of activities • Methodology • Presentation • Milestones • Outputs and outcomes • Presentation	Learners need to develop planning skills related to research proposals. *Learners should draw on the planning skills developed through prior learning.*
	AC1.3 justify plan for research	**Justify** • How plan secures outputs • How plan secures outcomes • Link to previous projects	Learners need to learn how to justify by using persuasive language and evidence to support proposals. *Evidence will come from their involvement in other research projects. This could come from this unit, or learning activities undertaken in other units.*

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO2 Be able to manage project	**AC2.1 monitor** project progress	**Monitor** • Achievement of milestones • Proposal • Outcomes • Outputs • Timescales • Documenting activities	Learners need to use techniques and skills to monitor project progress and make amendments to plans as required. *Learners will use prior learning from other units related to monitoring progress.*
	AC2.2 evaluate research project	**Evaluate** • Plan • Outcomes • Outputs • Process	Learners need to learn about techniques used to evaluate projects and apply them to different aspects of a project, as outlined in content. *Learners will use prior learning from other units to evaluate the project.*

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO3 be able to investigate current issues in food science and nutrition	**AC3.1** describe **research methodology**	**Research methodology** • Primary • Secondary • Sample • Sources	Learners need to know research methodologies so that they are able to describe the approach to be taken when undertaking research projects.
	AC3.2 design **primary research tools**	**Primary research tools** • Questionnaires • Interview questions • Focus group questions • Recording documentation	Learners will need to know different ways of conducting primary research and understanding issues associated with different methods. They will apply their understanding to the design of research tools used to record information.
	AC3.3 analyse data	**Data analysis** • Collate data • Display/present data • Identify trends, patterns and causal relationships • Use of ICT software • Connect ideas	Learners need to demonstrate application of mathematical and statistical techniques in the analysis and presentation of collected data. They must learn to extract findings from research and present them in different ways to suit the audience.
	AC3.4 evaluate quality of information	**Evaluate information** • Validity • Reliability • Bias • Fact vs opinion • Circumstances • Currency • Accuracy • Limitations	Learners need to develop skills and techniques so that they can evaluate information throughout the process of a research project. Consideration should be given to all content listed throughout the learning experience.

Learning outcomes	**Assessment criteria**	**Content**	**Exemplification**
The learner will:	***The learner can:***		
LO4 understand current issues in relation to food science and nutrition	**AC4.1 analyse** current issues related to food science and nutrition	**Analyse** • Draw conclusions from data • Relationship to other issues investigated • Making justified recommendations where appropriate	Learners should develop sufficient understanding of issues to draw evidence based conclusions from research that highlight and demonstrate understanding of the issue being investigated. *Learners should draw on learning from other units in their interpretation of findings and presenting conclusions.*
	AC4.2 evaluate how **key stakeholders** respond to current issues	**Key Stakeholders** • Food manufacturers • Food processing organisations • Hospitality and Catering organisations • Retailers • Logistics operators • Voluntary sector • Media • Government departments • Consumers	Learners should identify key stakeholders that are relevant to the issues that are researched. They should acquire a level of understanding of the roles, responsibilities and activities of key stakeholders to be able to make reasoned, substantiated judgements regarding their response to issues. *Learners will draw on their understanding of roles, responsibilities and activities of key stakeholders through prior learning.*

Learning Outcome	**Assessment criteria**	**Performance bands**		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO1 Be able to plan research into a current issue related to food science and nutrition	**AC1.1** Propose research into a current issue related to food science and nutrition	Proposal relates to a valid issue for research, includes key requirements, some of which have some detail. 1	Proposal relates to a valid issue for research and includes all requirements, some of which have some detail. 2	Proposal relates to a valid issue for research and includes all requirements in detail. 3
	AC1.2 Plan research into a current issue	Plan addresses most requirements, some of which are in detail. Content and sequencing are mainly reasonable and have some validity in achieving project aims. 1	Plan is comprehensive, with some detail. Content and sequencing are reasonable and mainly valid as a means of achieving project aims. 2	Plan is comprehensive and detailed. Content and sequencing would validly achieve project aims. 3
	AC1.3 Justify plan for research	Plan is outlined with some attempt at justification. 1	Some aspects of the plan are justified with clear reasoning. 2	The plan is justified with clear and detailed reasoning. 3

Learning Outcome	**Assessment criteria**	**Performance bands**		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO2 Be able to manage project	**AC2.1** Monitor project progress	Project progress is monitored at key stages throughout the process. 1	Project progress is monitored throughout the process. 2	
	AC2.2 Evaluate research project	Evaluation of research project may be mainly subjective with conclusions drawn from limited evidence. Evaluation addresses some aspects of the research but with omissions. Evaluation may be mainly descriptive. 1	Evaluation of research project has most conclusions drawn from evidence. Evaluation addresses most aspects of the research. Evaluation is mainly well-reasoned 2	Evaluation of research project is comprehensive and objective with well-reasoned conclusions drawn from evidence from a range of sources. 3

Learning Outcome	Assessment criteria	Performance bands		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO3 Be able to investigate current issues in food science and nutrition	**AC3.1** Describe research methodology	Research methodology is outlined. 1	Research methodology is described with some detail. 2	Research methodology is described in detail. 3
	AC3.2 Design primary research tools	A range of primary research tools are designed. Designs may have some issues in obtaining required data and/or information. 1	A range of primary research tools are designed. Designs are mainly fit for purpose but with some minor issues in one or more tools in obtaining required information. 2	A range of appropriate primary research tools are designed. Designs are fit for purpose. 3
	AC3.3 Analyse data	Analyses data in collating and presenting findings. Some relevant trends, patterns and relationships are highlighted. 1	Analyses data in collating and presenting a range of findings. Relevant trends, patterns and relationships are highlighted. 2	Analyses data in collating and presenting a range of findings. Relevant trends, patterns and relationships are explained. 3
	AC3.4 Evaluate quality of information	Examines a limited range of information sources. Evaluates quality of information against limited criteria giving with some reasoning for conclusions. 1	Examines a range of information sources. Evaluates quality of information against a range of criteria showing mostly well-reasoned conclusions. Most conclusions are relevant to the research project. 2	Examines a range of information sources. Evaluates quality of information against a range of appropriate criteria showing well-reasoned conclusions. Conclusions are relevant to the research project. 3

Learning Outcome	**Assessment criteria**	**Performance bands**		
		Mark Band 1	**Mark Band 2**	**Mark Band 3**
LO4 Understand current issues in relation to food science and nutrition	**AC4.1** Analyse current issues related to food science and nutrition	Analyses current issues related to food science and nutrition. Key aspects will be highlighted. Some conclusions are drawn from evidence. There is limited reference to other issues researched. There is evidence of drawing on some prior learning. 1	Analyses current issues related to food science and nutrition. Key aspects will be highlighted from different perspectives with most conclusions drawn from evidence. There is some application of use of other issues researched. There is clear evidence of drawing on some prior learning. 2	Analyses current issues related to food science and nutrition. Key aspects will be highlighted from different perspectives and with most conclusions drawn from evidence and other issues researched. There is clear evidence of drawing from a range of prior learning. 3
	AC4.2 Evaluate how key stakeholders respond to current issues	Evaluates how a limited range of key stakeholders respond to a current issue. Evaluation is mainly subjective with limited use of evidence. Conclusions are mainly straightforward. 1	Evaluates how a range of key stakeholders respond to current issues. Evaluation makes some relevant use of evidence. Conclusions show some reasoning. 2	

Assessment

Requirements for centres

This unit is internally assessed and externally moderated. All assessment must be conducted under controlled assessment conditions and controls have been determined for each stage of the assessment process: task setting, task taking and task marking.

Task setting

To assist centres in the assessment of this unit, WJEC has provided a model assignment along with guidance and criteria related to its use. The model assignment consists of tasks that are applied and holistic in their approach. Model assignments are designed so that they can be used as they are or adapted by centres to fit with the local sector needs and allow the usage of local resources available to the centre. The model assignment includes information on which aspects of the assignment can be adapted.

Task taking

Under the process of task taking, controls are set for the key aspects of time, resources, supervision and collaboration.

- The time taken will be specified within the model assignment
- Resources must be provided that give learners fair and full access to the marking criteria and are appropriate for the assessment and requirements of the unit. Details of specific controls will be given within the model assessment
- Direction on requirements for direct supervision is provided in the model assignment
- Guidance on collaboration, and where it is permitted, will be given with the model assignment.

Within WJEC model assignments, timing may be suggested for some individual tasks within the overall assessment time. The purpose is to give consortia additional guidance to help to manage the assessment task.

Task marking

The centre must mark learner's assessment evidence against the performance bands for each assessment criteria. The performance bands describe the depth to which the assessment criterion has been achieved by the learner.

Guidance for Delivery

It is important that learners recognise that the knowledge, understanding and skills they develop are vocationally relevant. There are a number of ways this can be achieved:

- Arranging visits to workplaces such as supermarkets to discuss with employees their perspective on consumer issues.
- Arranging talks by visiting speakers, for example a university lecturer responsible for supervising dissertations
- Carrying out a research project set by an employer such as a charity providing support for families living in poverty

The following are examples of approaches to delivery which could be used to enhance the learning and understanding of current issues in food science and nutrition.

Example 1

Learners could work in groups to carry out a research project on behalf of a community group seeking to establish a co-operative sharing produce from allotments or gardens. Learners could investigate other examples and where support could be offered. They could also carry out primary research into the potential for the project. Learners would present their findings to representatives of the community group.

Example 2

Learners could research the potential for a local primary school to introduce cooking lessons into the curriculum. This could include research into the current curriculum and plans for changes in educational policy as well as supervised primary research into the level of interest from pupils and their parents and guardians. Learners could present their ideas to the pupils and school or local authority representatives.

Example 3

Learners could carry out a research project into healthy living on income support. They could research the level of financial support provided to different groups such as single parent families, unemployed individuals in rented accommodation, elderly couples in owned homes. They could also carry out primary research into food preferences, availability and cost. Learners could then develop a healthy dietary programme, on a budget, for one specific group.

Making contacts

Examples of organisations that may be approached to provide help include:

- Supermarkets and other types of food retailers
- Charities that support consumers
- Government departments that set policy or provide information
- Food processing organisations
- Food journalists
- Advertising agencies.

Resources

Websites

Bized: www.bized.co.uk

Co-operative Group: www.co-operative.coop/food/ethics

Department for Environment, Food and Rural Affairs: www.defra.gov.uk

Department for Health: www.dh.gov.uk

Environment Agency: www.environment-agency.gov.uk

Fair Trade Foundation: www.fairtrade.org.uk

Food and Agriculture Organisation of the United Nations: www.fao.org

Food and Drink Federation: www.fdf.org.uk

Food Standards Agency: www.food.gov.uk

Food Vision: www.foodvision.gov.uk

Health and Safety Executive: www.hse.gov.uk

Jamie Oliver: www.jamieshomecookingskills.com

Marks and Spencer: www.marksandspencer.com

Microsoft: www.microsoft.com/education

NHS: http://www.nhs.uk/livewell

Physical Activity and Nutrition Wales: www.physicalactivityandnutritionwales.org.uk

Sainsbury's: www.sainsburys.co.uk

Soil Association: www.soilassociation.org

Sustainable Food: www.sustainablefood.com

Tesco: www.tesco.com

United Nations World Food Programme: www.wfp.org

Vegetarian Society: www.veg.soc.org.uk

6 *ENTRY PROCEDURE*

WJEC Level 3 Applied Diploma in Food Science and Nutrition will be available for certification from June 2017.

Thereafter, the qualification will be available for certification each June.

Centres planning to offer this qualification must be registered as an accredited WJEC centre. For details on the application and accreditation, centres should contact WJEC.

Entries for the June series must be submitted no later than 21 February.

Candidates may resit internally assessed units **once only, and externally assessed units twice**. The best grade will be used for aggregation. If a candidate wishes to resit an internal unit more than once or an external unit more than twice, no results from units taken previously may be used in aggregating the new grade and all units in the qualification must be taken again.

Unit entry

Entry for individual units must be made by submitting the relevant unit codes as indicated on page 4.

Qualification entry

Learners will be entered for the qualification when entering for aggregation (cash-in). Aggregation does not take place automatically: it is necessary to enter the relevant code for aggregation to take place.

7 EXTERNAL MODERATION

The consistency of assessment practices and decisions across centres will be assured through the external moderation of a sample of work.

Each centre will have access to a consultative moderator. The consultative moderator will be available to discuss assessment requirements with centres.

For each series where learners are entered, centres will submit a sample, according to the formula below.

Total number of candidates	*Work to be submitted* *(Numbers relate to alphabetical order)*
1 – 10	All
11 - 19	1st and every second (1, 3, 5, 7 etc.) **plus** the lowest scoring* folder and additional folders as necessary (reflecting the spread of marks) to make a total sample of 10
20 - 45	1st and every fifth (1, 6, 11, 16 etc.) **plus** the lowest scoring* folder and additional folders as necessary (reflecting a spread of marks) to make a total sample of 10
46 - 99	1st and every eleventh (1, 12, 23, 34 etc.) **plus** the lowest scoring* folder and additional folders as necessary (reflecting a spread of marks) to make a total sample of 10

** The score is based upon the points the learners obtain for each of the units being submitted for moderation.*

Centres should ensure they keep all learner portfolios not sent to the moderator in their possession for two months after the closing date for sending samples for moderation. WJEC may require all portfolios for moderation and centres must be able to comply immediately with such a request.

Centres should submit a sample for **each unit** that includes:

- the controlled assignment brief used to set the assessment activity
- a controlled assessment activities sheet completed and signed by the assessor to confirm that the controls for the unit, including authenticity of evidence, have been applied
- completed mark record sheets outlining which performance bands are met by the evidence
- all evidence produced by learners in completion of the controlled assessment, annotated appropriately by the assessor

Moderators will review all evidence presented to ensure standards are aligned. Evidence will be judged against the following criteria:

- Task setting – were tasks set within the controls set by WJEC in the model assignment?
- Task taking – is there evidence that tasks were completed under the controlled conditions set out in the model assignment?
- Performance bands – does the evidence support assessor's judgement of a learner against national standards?
- Annotation – is the evidence produced by learners appropriately annotated?
- Authentication- is it clear that the evidence submitted was authentically produced by the learner?
- Standardisation – is there evidence of effective standardisation/internal quality assurance within the centre?

Timetable

Samples of work must be submitted for external moderation, and related mark sheets returned to WJEC by 15 May for the June series. Centres will need to ensure that internal submission dates are set sufficiently in advance of this to allow for authentication, assessment and standardisation.

Feedback

The outcome of moderation will be to either accept or amend a centre's assessment decisions. Guidance on actions needed before resitting of specified units at a subsequent moderation series will be also be provided.

Feedback will be provided through a centre moderator's report for each certification title, covering the units entered by the centre and will be accessible through WJEC secure website. The report will address the criteria referred to above.

A Principal Moderator's report will be provided for each series.

8 AWARDING AND REPORTING

Awarding and reporting of results in WJEC Level 3 Diploma in Food Science and Nutrition will take place in August of each year.

A **Qualification Certificate,** issued at a later date, will confirm the

- Title
- Level
- Grade of qualification (Level 3 Pass, Level 3 Merit, Level 3 Distinction, Level 3 Distinction*)

9 ACCESS AND SPECIAL CONSIDERATION

Qualifications at this level often require assessment of a broad range of competencies. This is because they are vocational qualifications and prepare candidates for a wide range of occupations and higher level courses.

This specification has been designed to offer fair access for all and to minimise the need to make reasonable adjustments for learners who have particular requirements. It is expected that normally, individual learners' abilities, interests and needs will be appropriately catered for by centres through:

(a) the choice of units and qualifications available, and

(b) the potential for personalisation of controlled assessment.

If there are any queries about the use of this flexibility inherent in the specification to meet learners' needs, or about the use of reasonable adjustments, centres should contact WJEC.

Reasonable adjustments are made for disabled candidates in order to enable them to access the assessments. For this reason, very few candidates will have a complete barrier to any part of the assessment. Information on reasonable adjustments is found in the Joint Council for Qualifications document *'Access Arrangements and Reasonable Adjustments'.* This document is available on the JCQ website (www.jcq.org.uk).

10 POST-RESULTS SERVICES

If a centre wishes to query the outcome of the moderation and/or examination process this must be done formally by the head of the centre, notifying WJEC within 21 days of the publication of results.

The sample of work submitted for moderation will be reviewed by a moderator/examiner not involved in the original process, and the centre informed of the outcome.

Should the centre not be satisfied with the outcome of the review, there is provision for an appeal to WJEC.

11 CLASSIFICATION CODES

Every specification is assigned a national classification code (discounting code) indicating the subject area to which it belongs.

Centres should be advised that where learners take two qualifications with the same classification code, performance indicators for the centre will show that they have only achieved one of the two qualifications. The same view may be taken if learners take two specifications that have different classification codes but have significant overlap of content. The discounting system affects the calculation of performance measures for a school in the performance tables. It does not alter the awards an individual learner has achieved or limit the qualifications they can take.

Learners who have any doubts about their subject combinations should check with the institution to which they wish to progress before embarking on their programmes.

Information on discount codes can be obtained from DfE (www.education.gov.uk) and/or Welsh Government (www. gov.wales)

Appendix - Unit Structure

Unit title

The unit title summarises in a concise manner the content of the unit.

Guided learning hours (GLH)

Guided learning time represents only those hours in which a tutor is present and contributing to the learning process. In some organisations this is known as 'contact time'. This time includes lecturers, supervised practical periods and supervised study time.

Aim and purpose

The aim and purpose provides a brief and clear summary of the unit. It also indicates the applied purpose for the unit.

Unit Introduction

This is written to the learner and gives a summary of the unit content. It sets the vocational context of the unit and highlights the purpose of the learning in the unit. Where units have requirements for learners to draw on prior learning, this is indicated in this section.

Learning outcomes

Learning outcomes state what the learner should know, understand or be able to do as a result of completing the learning in the unit.

Assessment Criteria

The assessment criteria specify the standard a learner is expected to meet to demonstrate that the learning outcomes of that unit have been achieved.

Unit content

The indicative content and exemplification defines the breadth and depth of learning for an assessment criterion. It is expected that all the indicative content will be delivered during the programme of learning. It is not required to assess every aspect of the content when assessing the unit. Learners will be expected to apply the knowledge, understanding and skills acquired through the learning to the specifics of the assessment context.

In some learning outcomes unit content is given as an example (e.g.). This is used to exemplify the content only and learners can use any examples that they are taught in their summative assessments.

For some assessment criteria, no content is specified. Centres can determine the content to be learned based on local circumstances.

The unit content includes 'amplification'. This is intended to provide additional support to those involved in delivery by indicating the extent of depth and/or breadth required. Content presented in *italics* indicates where learners have the opportunity to draw upon prior learning.

Performance Bands

Performance bands set out up to three levels of performance for each criterion. Performance bands do **not** add additional requirements to the assessment criteria, but do expect a higher level of performance. The assessor matches the quality of the learner evidence to the appropriate performance description. Each performance description has a number and this is the mark that is to be awarded for the assessment criterion. Section 4: Grading provides more information on how to use performance bands.

Assessment

WJEC Level 3 Diploma in Food Science and Nutrition units are assessed through controlled internal assessment or external assessment. This section of the unit summarises assessment requirements.

Guidance for delivery

This gives the tutor some ideas on how to deliver the units in a vocational setting consistent with the philosophy of the qualification and intent of the unit. A minimum of three sample contexts are provided for each unit. The guidance also gives ideas of vocational settings for the unit and suggests possible contacts that could be made in the delivery of the learning.

Resources

This identifies useful resources to help in the delivery of the learning. Many of the resources listed are suitable for using with learners.