



Australian Government

Department of Education, Employment and Workplace Relations

FDFST5005A Identify the biochemical properties of food

Release: 2

FDFFST5005A Identify the biochemical properties of food

Modification History

April 2012: Minor typographical corrections.

Unit Descriptor

This unit covers the skills and knowledge required to identify and apply a knowledge of biochemical substances and reactions to food product development and processing.

Application of the Unit

This unit applies to technical and management staff who have responsibility for maintaining product safety, quality and efficiency in food processing. The unit can apply to all sectors of food production including general food production, meat and seafood industries. The unit includes applying knowledge of food biochemistry to establish and monitor food safety, quality and processing performance.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Use and apply terms and concepts relating to organic substances important in food processing	1.1 Biochemical terminology relating to food processing is used accurately 1.2 Relevant concepts are applied to explain the biochemistry in food processing
2. Identify biochemical compounds and explain biochemical reactions important in food processing	2.1 Biochemical compounds carbohydrates; amino acids, proteins and lipids are identified and classified 2.2 Molecular structures for important biochemical compounds are depicted 2.3 Chemical and physical behaviour associated with carbohydrates, amino acids, proteins and lipids is identified including the molecular processes taking place 2.4 Basic tests are performed to identify biochemical reactions and the associated physical and chemical changes in food processing
3. Assess the impact of food processing operations on the biochemistry of processed food products	3.1 Biochemical macro constituents and micro constituents of food are identified 3.2 Effect of processing on biochemistry and nutritional value of foodstuffs is assessed 3.3 Biochemical actions of food additives are identified 3.4 Biochemical principles relating to the spoilage and preservation of foods are explained
4. Extract samples of product or raw materials for biochemical testing and apply the results to food production processes	4.1 Properties of biochemical compounds and their extraction techniques are established for a food processing operation 4.2 Sampling is conducted according to the sampling plan and the tests to be conducted 4.3 Sample purity and integrity is maintained prior to testing 4.4 The results of biochemical testing are applied to ingredient selection and process control for a food processing operation

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills include:

Ability to:

- identify the major chemical constituents found in foods
- interpret the biochemical principles relating to the preservation of foods
- apply sampling techniques to test for biochemical properties
- identify the biochemical action of important food additives
- carry out biochemical testing to determine the components of a food product
- apply the results of biochemical testing to maintain product quality and safety in food processing.

Required knowledge includes:

Knowledge of:

- terminology relating to biochemical substances
- the structure and properties of the biochemical compounds carbohydrates; amino acids, proteins and lipids
- the molecular structures for important biochemical compounds
- the chemical and physical behaviour associated with carbohydrates, amino acids, proteins and lipids in terms of molecular theory
- basic tests to identify biologically important biochemical materials including:
 - Benedict's test for glucose
 - Lugol's iodine test for starch
 - Biuret test for protein
 - Sudan III test for fats & oils
- sampling and testing techniques to determine the components and biochemical reactions for food products.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.	
Overview of assessment	A person who demonstrates competency in this unit must be able to design and manage food processing operations based on a knowledge of the biochemistry of food processing.
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Critical aspects of assessment must include evidence of a detailed understanding of biochemistry of food, including the ability to carry out basic chemical tests to identify biochemical compounds, use biochemical knowledge to predict the effects of processing, storage and additives in food processing, and produce or extract representative samples of biochemical compounds.
Context of and specific resources for assessment	Assessment of performance requirements in this unit should be undertaken within the context of food technology. Competency is demonstrated by performance of all stated criteria, including the critical aspects and knowledge and skills elaborated in the Evidence Guide, and within the scope as defined by the Range Statements applicable to the workplace environment. Assessment must occur in a real or simulated workplace where the assessee has access to: - laboratory and related equipment, manufacturers' advice and operating procedures - methods and related software systems as required for collecting data and calculating yields, efficiencies and material variances appropriate to production environment - tests used to report relevant product/process information and recorded results.
Method of assessment	The following assessment methods are suggested: - Observation of candidate conducting a range of tests and sampling procedures - Written and/or oral questioning to assess knowledge and understanding - Completing workplace documentation - Case studies - Field Reports

	• Third party support from experienced practitioner.
Guidance information for assessment	Evidence should be gathered over a period of time in a range of actual or simulated environments.

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

Policies and procedures and legislation	• Australian and international standards • Acts of Parliament • Legislative requirements are typically reflected in procedures and specifications. Legislation relevant to this industry includes the Food Standards Code including labelling, weights and measures legislation and legislation covering food safety, environmental management, occupational health and safety, anti-discrimination and equal opportunity.
Australian and international standards	• Australian and international standards • AS ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories • Food Standards Code 2002 Australia New Zealand (FSANZ) and amendments • AQIS Export Control Orders • NATA accreditation procedures • AOAC standards • Dairy Food Safety standards • ISO 9000 series Quality management and quality assurance standards • AS 2243 Safety in laboratories • AS 2830 Good laboratory practice • AS 2134.1 Flame atomic absorption spectroscopy.
Equipment and materials	• General equipment may include hotplates, ovens, melting point and boiling point apparatus, steam baths, appropriate glassware and chemicals. • Analytical instruments may include spectrometric instruments such as: • ultraviolet/visible • infrared including Fourier transform infrared and near infrared • atomic absorption including flame and flameless.
Biochemical testing	• This may include any tests applicable to food products such as: • Benedict's test for glucose

	• Lugol's iodine test for starch • Biuret test for protein • Sudan III test for fats & oils.
Biochemical reactions	• These may include any reactions relevant to food processing operations including: • oxidation • hydrolysis • enzymic reactions • lipid isomerisation • lipid polymerisation • polysaccharide synthesis • glycolysis • protein denaturing.

Unit Sector(s)

Technical.