Title	**Demonstrate knowledge of the structure, properties, and functions of amino acids and proteins**		
Level	**5**	**Credits**	**4**

Purpose	People credited with this unit standard are able to: describe the chemical structure and properties of amino acids; describe the structure and functions of peptides and proteins; and explain the physical and chemical properties of proteins.

Classification	Science > Biochemistry

Available grade	Achieved

Guidance Information

None.

Outcomes and performance criteria

Outcome 1

Describe the chemical structure and properties of amino acids.

Performance criteria

1.1 An L-amino acid is described using a diagram in relation to its structure.

1.2 The system for classifying amino acids in relation to proteins is described.

1.3 Acid-base dissociation characteristics of amino acids are described in relation their structure.

Range characteristics include – isoelectric point, amphoteric, zwitterions.

1.4 Procedures for qualitative and quantitative analysis are described for amino acids.

Range ninhydrin, fluorometric.

Outcome 2

Describe the structure and functions of peptides and proteins.

Performance criteria

2.1 Protein structure is described in terms of levels of organisation.

Range primary, secondary, tertiary, quaternary.

2.2 Physiological functions of peptides and proteins are described in relation to their structure.

Outcome 3

Explain the physical and chemical properties of proteins.

Performance criteria

3.1 Factors affecting protein solubility are explained in terms of their structure.

Range pH, ionic strength, temperature.

3.2 Denaturation and its causes are explained in terms of protein structure.

Range temperature, pH, alcohol, surfactants, salts.

3.3 Precipitation and its causes are explained in terms of protein structure.

Range temperature, solvent, salt concentration, agitation, pH.

3.4 Destructive and non-destructive methods are described in relation to protein determination.

Range two of – biuret, Lowry, UV-absorption, Bradford dye binding, turbidometry.

3.5 A method for the determination of amino acid composition is described in relation to proteins.

Replacement information	This unit standard replaced unit standard 8055.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 September 2010	N/A
Rollover	2	27 January 2015	N/A
Review	3	27 September 2018	N/A

Consent and Moderation Requirements (CMR) reference	0113

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact NZQA National Qualifications Services nqs@nzqa.govt.nz if you wish to suggest changes to the content of this unit standard.