

Title	Apply chemistry fundamentals used in a laboratory in a primary products food processing operation		
Level	3	Credits	5

Purpose	<p>This entry-level unit standard is for people who work in a laboratory, in a primary products food processing operation.</p> <p>People credited with this unit standard are able to: demonstrate knowledge of chemical elements and structures, formulae, reactions and chemical concentrations; conduct titration tests; use a spectrophotometer and conductivity meter; and conduct chemistry tests in a laboratory used in a primary products food processing operation.</p>
----------------	---

Classification	Primary Products Food Processing > Primary Products Food Processing - Operational Skills
-----------------------	--

Available grade	Achieved
------------------------	----------

Guidance Information

- 1 Legislation and references relevant to this unit standard includes but is not limited to – Hazardous Substances and New Organisms Act 1996, Health and Safety in Employment Act 1992, Health and Safety in Employment Regulations 1995, Resource Management Act 1991, ISO/IEC 17025:2005/Cor1:2006 *General requirements for the competence of testing and calibration laboratories*, NZS/ISO 15189:2003 *Medical Laboratories – Particular requirements for quality and competence*, available at <http://www.standards.co.nz>.
- 2 Definitions
Organisational requirements – instructions to staff on policies and procedures which are documented in memo, electronic or manual format and are available in the workplace.
Primary products food processing operation – covers a meat processing, dairy processing, seafood or baking yeasts manufacturing operation.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of chemical elements and structures, formulae, reactions and chemical concentrations used in a primary products food processing operation.

Performance criteria

- 1.1 An element and an atom are described in terms of their differences.
- 1.2 Formulae for common chemicals used in the laboratory are calculated.
- Range evidence of three common chemicals is required.
- 1.3 Chemical reactions completed under experimental conditions are described in terms of their main features.
- Range chemical reactions include but are not limited to – metals and water, solubility and precipitation, heating metals, carbon dioxide test.

Outcome 2

Conduct titration tests in a laboratory in a primary products food processing operation.

Performance criteria

- 2.1 Titration is explained in terms of the critical factors which affect it.
- Range critical factors include but are not limited to – concentration of solutions, chemical reactions that take place, measuring the end point.
- 2.2 The Molarity for HCl, NaOH and AgNO₃ solutions are derived in accordance with organisational requirements.
- 2.3 A 0.1 Molar solution of NaOH is standardised in accordance with organisational requirements.
- 2.4 Lactic acid in food products is tested in accordance with organisational requirements.
- 2.5 The chemical formulae for the reactions of titration tests are described in terms of their effects on food products.

Outcome 3

Use a spectrophotometer and conductivity meter in a laboratory in a primary products food processing operation.

Performance criteria

- 3.1 The basic design of a spectrophotometer and a conductivity meter is described in terms of the main factors.
- 3.2 Instruments are calibrated in accordance with the manufacturer's specifications.

- 3.3 Experiments on each instrument are conducted in accordance with organisational requirements.

Outcome 4

Conduct chemistry tests in a laboratory in a primary products food processing operation.

Performance criteria

- 4.1 Product tests are conducted in accordance with organisational requirements.

Range evidence is required of two tests.

- 4.2 Test results are calculated and recorded and results are compared for consistency in accordance with organisational requirements.

- 4.3 Protein tests are described in terms of the test method used and their relationship to food processing.

Range evidence is required of two tests.

- 4.4 Any non-conformance is dealt with or reported in accordance with organisational requirements.

- 4.5 Solutions are made up to meet the requirements of the job tasks in the workplace in accordance with organisational requirements.

Replacement information	This unit standard replaced unit standard 4312.
--------------------------------	---

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 September 2015	31 December 2021
Review	2	24 October 2019	31 December 2021

Consent and Moderation Requirements (CMR) reference	0033
--	------

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