

Title	Apply laboratory fundamentals in a primary products food processing operation		
Level	3	Credits	10

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 environmental controls, sampling and cleaning and sterilisation of laboratory equipment; use laboratory glassware handling techniques; measure volume, weight, temperature, pH, and apply laboratory practices, in a primary products food processing operation.</p>
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Classification	Primary Products Food Processing > Primary Products Food Processing - Operational Skills
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Available grade	Achieved
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Guidance Information

- 1 Legislation and references relevant to this unit standard include but are 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 environmental controls used in a laboratory in a primary products food processing operation.

Performance criteria

- 1.1 The purpose of red line areas is described in terms of NZS/ISO 15189:2003.
- 1.2 Laboratory housekeeping requirements are identified and described in terms of NZS/ISO 15189:2003.
- 1.3 Types of laboratory environmental tests are described in terms of NZS/ISO 15189:2003.
- Range evidence is required of two tests.

Outcome 2

Demonstrate knowledge of sampling used in a laboratory in a primary products food processing operation.

Performance criteria

- 2.1 Methods of sampling are described in terms of organisational requirements.
- Range methods may include but are not limited to – strategic, stratified, random, compositing, blending, auto samplers; evidence is required of two different methods.
- 2.2 The contamination factors that affect sample integrity are identified and described in terms of their effect.
- 2.3 The importance of sampling used in a laboratory in a primary products food processing operation are described in terms of organisational requirements.
- Range importance may include but is not limited to – product types, types of containers, sample rates, sample identification, sampling areas, handling and storage, special precautions; evidence is required of two factors.

Outcome 3

Demonstrate knowledge of the cleaning and sterilisation of laboratory equipment used in a primary products food processing operation.

Range laboratory equipment includes but is not limited to – glassware, plastic ware, utensils.

Performance criteria

- 3.1 The cleaning equation is described in terms of its importance to the cleaning programme.
- Range cleaning programme includes but is not limited to – soil type, surface type, standard required, safety.

3.2 Soil types are identified and described in terms of the cleaning agents required to achieve clean surfaces.

3.3 Time, temperature and chemical concentrations are identified in terms of the sterilisation requirements.

Range requirements include but are not limited to – heat (dry), heat (wet), alcohol.

Outcome 4

Use laboratory glassware handling techniques in a primary products food processing operation.

Performance criteria

4.1 Changes to the properties of laboratory glassware are described in terms of types of glass, chemical and heat resistance and co-efficient of expansion.

4.2 The safe handling of glassware is described in terms of the properties of glass and laboratory safety requirements specified in NZS/ISO 15189:2003.

Range safe handling includes but is not limited to preventing – breakage, burns, implosion, explosion.

4.3 Glassware support and handling equipment is used in accordance with organisational requirements.

Range equipment includes but is not limited to – clamps, bosshead, desiccators, gloves.

Outcome 5

Measure volume in a laboratory in a primary products food processing operation.

Performance criteria

5.1 Mathematical descriptions of volume measurement are recorded in terms of microliter, ml, litre and cubic capacity.

5.2 Volume of water is measured using a pipette, burette, volumetric flask, measuring cylinder and micro-pipette.

5.3 A volumetric pipette is calibrated in accordance with organisational requirements.

Outcome 6

Measure weight in a laboratory in a primary products food processing operation.

Performance criteria

- 6.1 Mathematical descriptions of weight are recorded in terms of microgram, milligram, gram, kilogram, artefact standard and weight of liquids.
- 6.2 Balances are set up for use in accordance with the manufacturer's specifications and organisational requirements.
- Range balances include but are not limited to – four decimal places, top-loading.
- 6.3 Calibration checks on the balances are performed in accordance with organisational requirements.
- Range calibration checks include but are not limited to – four decimal places, top-loading.
- 6.4 The effects of temperature, electrostatics and evaporation on weight are demonstrated under experimental conditions.

Outcome 7

Measure temperature in a laboratory in a primary products food processing operation.

Performance criteria

- 7.1 The fundamental interval is described in terms of its effect on measuring temperature.
- 7.2 The relationships between temperature units of measurement are described mathematically.
- Range temperature units of measurement include but are not limited to – Fahrenheit, Celsius, and kelvin.
- 7.3 Thermometer calibration is described in terms of ice point, boiling point and traceability to the industry standard.
- 7.4 A mercury in glass thermometer is read in terms of the thermometer's accuracy limits.

Outcome 8

Measure pH in a laboratory in a primary products food processing operation.

Performance criteria

- 8.1 Acids and bases are described in terms of their relationship to the measurement of pH.

- 8.2 Solutions are tested to effect a colour change on indicators.
- Range testing includes but is not limited to – litmus, phenolphthalein, methyl orange, bromothymol blue.
- 8.3 pH scale is defined in terms of logarithmic progression.
- 8.4 Care and maintenance of the pH meter and the electrodes are described in terms of the manufacturer’s operating instructions.
- 8.5 pH meter is calibrated in accordance with the manufacturer’s operating instructions.
- 8.6 Solutions are tested for pH, using a pH meter, and the results are recorded in accordance with organisational requirements.
- Range solutions include but are not limited to – distilled water, milk, .01M HCl, .01 M NaOH, .01 M lactic acid.

Outcome 9

Apply laboratory practices in a primary products food processing operation.

Performance criteria

- 9.1 Environmental controls operating in the laboratory are identified in terms of organisational requirements.
- 9.2 Products relevant to the site are sampled in accordance with organisational requirements.
- 9.3 Microbiological and chemistry glassware and utensils are cleaned in accordance with organisational requirements.
- 9.4 Calibration status procedures of equipment and glassware are identified in terms of volume, temperature, weight and pH.
- 9.5 Balance for tests relevant to the job tasks in the workplace are used in accordance with organisational requirements.
- 9.6 pH meters relevant to the job tasks in the workplace are calibrated and used in accordance with organisational requirements.

Replacement information	This unit standard replaced unit standard 4309.
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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
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

This unit standard is expiring