

Title	Describe principles and application of separation and standardisation processes in a dairy processing operation		
Level	5	Credits	15

Purpose	People credited with this unit standard are able to describe: the general principles and application of centrifugal separation; the principles of gravitational separation; the methods and principles of the standardisation of milk composition; the control of separation and standardisation; the fouling and cleaning of separation and standardisation processes; and the sampling and grading of separated and standardised products to achieve specifications, sources and effects of microorganisms, in a dairy processing operation.
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Classification	Dairy Processing > Milk Processing
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Available grade	Achieved
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Guidance Information

- 1 Legislation and regulations relevant to this unit standard include but are not limited to:
 - Animal Products Act 1999;
 - Health and Safety at Work Act 2015;
 - Animal Products (Dairy) Regulations 2005; and any subsequent amendments.
- 2 Definition
Separation – refers to mechanical separation by centrifugal force.

Outcomes and performance criteria

Outcome 1

Describe the general principles and application of centrifugal separation in a dairy processing operation.

Performance criteria

- 1.1 Describe the principles of centrifugal separation in terms of the substitution of centrifugal acceleration for gravitational acceleration in Stokes' law.

- 1.2 Describe the application of centrifugal separation in terms of the physical conditions of the products to be separated.

Range separation may include but is not limited to – liquid to liquid, liquid to solid, gaseous to solid, gaseous to liquid;
evidence of two types of separation is required.

Outcome 2

Describe the principles of gravitational separation in a dairy processing operation.

Performance criteria

- 2.1 Describe the principles of gravitational separation in terms of sedimentation and flotation velocities according to Stokes' law.
- 2.2 Describe the principles of gravitational separation in terms of factors influencing separation efficiency.

Range principles include but are not limited to – difference in relative densities, relative proportions of the continuous and dispersed phases, particle size and shape, viscosity, temperature.

Outcome 3

Describe the methods and principles of the standardisation of milk composition in a dairy processing operation.

Performance criteria

- 3.1 Describe methods of standardisation in terms of the process steps involved and their relative advantages in relation to process flexibility.
- 3.2 Describe the principles for calculation of relative proportions for standardisation in terms of the Pearson Square method or equivalent.
- 3.3 Describe the principles of standardisation of milk composition in terms of control variables and their influences on the accuracy and consistency of standardisation.

Range control variables may include but are not limited to – fluctuations in fat content of incoming milk, fluctuations in throughput, fluctuations in preheating temperature;
evidence of two control variables is required.

- 3.4 Describe automatic standardisation of milk composition in terms of control loop(s) required, means of measuring the controlled conditions and means for regulation of the manipulated variables.

Outcome 4

Describe the control of separation and standardisation in a dairy processing operation.

- 4.1 Describe control of separation and standardisation processing in terms of process variables that affect overall performance and resulting products.

Range process variables may include but are not limited to – pH, flowrate, time, concentration, temperature, feed type, composition, pre-treatment;
evidence of four process variables is required.

- 4.2 Describe control of separation and standardisation in terms of the function and use of instrumentation and feedback control.

Outcome 5

Describe the fouling and cleaning of separation and standardisation processes in a dairy processing operation.

Performance criteria

- 5.1 Describe the fouling of separation and standardisation processes in terms of its detection and impacts on production.

Range production impacts may include but are not limited to – flow rate, separation efficiencies, achieving standardisation targets.

- 5.2 Describe cleaning variables in terms of their influence on the cleaning effectiveness of standardisation and separation processes.

Range cleaning variables may include but are not limited to – temperature, time, chemical concentration, mechanical action.

- 5.3 Describe types of cleaning regimes in terms of their influence on the cleaning effectiveness and processing effectiveness.

Range cleaning regimes may include but are not limited to – chemical cycling, physical cleans, standardisation system cleaning;
evidence of two cleaning regimes is required.

Outcome 6

Describe the sampling and grading of separated and standardised products to achieve specifications, sources and effects of microorganisms in a dairy processing operation.

Performance criteria

6.1 Describe sampling and grading of separated and standardised products in terms of achieving specifications.

Range specifications may include but are not limited to – microorganism limits, chemistry limits, sensory evaluation, measurement of functionality; evidence of three specifications is required.

6.2 Describe sources and effects of microorganisms in terms of the hygiene difficulties unique to separation and standardisation, concentration of microorganisms during processing, and controls for food safety.

Replacement information	This unit standard and unit standard 32390 replaced unit standard 764.
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Planned review date	31 December 2026
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	28 April 2022	N/A

Consent and Moderation Requirements (CMR) reference	0022
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.