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| **Title** | **Describe the manufacture of ultra-heat treated products in a dairy processing operation** | | |
| **Level** | **5** | **Credits** | **15** |

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| **Purpose** | People credited with this unit standard are able to describe: the properties of milk; the principles of the ultra-heat treated (UHT) process for milk-based dairy products; sterilisation requirements and process control points for a UHT milk-based dairy product; the fouling and cleaning of a UHT process; and the sampling and grading of UHT products, in a dairy processing operation. |

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| **Classification** | Dairy Processing > Milk Products |

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| **Available grade** | Achieved |

**Guidance Information**

Legislation and regulations relevant to this unit standard includes but are not limited to:
- Animal Products Act 1999;
- Health and Safety at Work Act 2015;
- Animal Products (Dairy) Regulations 2005.

## Outcomes and performance criteria

### Outcome 1

Describe the properties of milk in a dairy processing operation.

**Performance criteria**

1.1 Describe the properties of the major solid components in milk in terms of their influences on the UHT process and on the product.

Range fat, protein, lactose, minerals.

1.2 Describe deteriorative mechanisms in milk in terms of their effect on product quality.

Range deteriorative mechanisms may include but are not limited to – micro loading, spore formers, enzymes, age of milk (titratable acidity);
evidence of three deteriorative mechanisms is required.

1.3 Describe the suitability of products for UHT in terms of low and high acid food categories.

**Outcome 2**

Describe the principles of the UHT process for milk-based dairy products in a dairy processing operation.

**Performance criteria**

2.1 Describe a UHT process in terms of the processing principles.

Range processing principles may include but are not limited to – batch processing, continuous processing, vertical sterilising, horizontal sterilising, direct UHT, indirect UHT;
evidence of four processing principles is required.

2.2 Describe a UHT packaging process in terms of packaging principles.

Range packaging process may include but are not limited to – aseptic storage, aseptic packaging;
evidence of two principles is required.

**Outcome 3**

Describe the sterilisation requirements and process control points for a UHT milk-based dairy product in a dairy processing operation.

**Performance criteria**

3.1 Describe sterilisation requirements and control measures in the UHT process in terms of reducing microorganisms.

Range microorganisms may include but are not limited to – thermophiles, coliforms, yeasts, moulds, salmonella, listeria, spore former bacteria;
evidence of four microorganisms is required.

3.2 Describe control strategies in terms of the main unit operations of the UHT process.

Range main unit operations include but are not limited to – milk treatment, storage, preheating, homogenisation sterilisation, ingredient addition, reject valve, filling, packing.

3.3 Describe control strategies in terms of product quality parameters.

Range evidence of four common quality parameters for one selected UHT product is required.

**Outcome 4**

Describe the fouling and cleaning of a UHT process in a dairy processing operation.

**Performance criteria**

4.1 Describe the fouling of a UHT process in terms of its detection and impacts on production.

Range impacts may include but are not limited to – flow rate, microbial kill rates, run length;
evidence of three impacts is required.

4.2 Describe cleaning variables in terms of their influence on the cleaning effectiveness of a UHT process.

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

4.3 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, packing system cleaning;
evidence of two regimes is required.

**Outcome 5**

Describe the sampling and grading of UHT products in a dairy processing operation.

**Performance criteria**

5.1 Describe sampling and grading of UHT products in terms of achieving specifications.

Range sampling and grading may include but are not limited to – microorganism limits, chemistry limits, sensory evaluation, functionality, packaging integrity and market requirements;
evidence of one specification for each is required.

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| **Planned review date** | 31 December 2026 |

**Status information and last date for assessment for superseded versions**

| Process | Version | Date | Last Date for Assessment |
|---|---|---|---|
| Registration | 1 | 18 June 2015 | 31 December 2024 |
| Review | 2 | 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.