

<b>Title</b>	<b>Explain key parameters and process variables that influence the stickiness of a specialty spray dried dairy product</b>		
<b>Level</b>	<b>5</b>	<b>Credits</b>	<b>5</b>

<b>Purpose</b>	<p>This theory-based unit standard is for experienced people carrying out milk products processing in a dairy processing operation.</p> <p>People credited with this unit standard are able to explain: the key compositional factors influencing powder stickiness for specialty spray dried products with high fat, protein or carbohydrate contents, the role of outlet air humidity and temperature in affecting the stickiness of specialty powders; the role of airflow patterns and velocities within a spray drying plant in determining powder stickiness; and the steps that may be taken to resolve a selected processing problem, in a dairy processing operation.</p>
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<b>Classification</b>	Dairy Processing > Milk Products
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<b>Available grade</b>	Achieved
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**Guidance Information**

- 1 Legislation  
 Legislation relevant to this unit standard includes but is not limited to the Animal Products Act 1999, Health and Safety in Employment Act 1992, and Animal Products (Dairy) Regulations 2005.
- 2 Definitions  
*Key* – being of more significance and absolutely essential in comparison to other choices which, while also important, have less significance in terms of difficulty, uniqueness or other property.  
*Parameter* – a variable which is, or can be, explicitly expressed.  
*Processing problem* – a problem that may arise during processing, that will result in an interruption to processing or plant shutdown, a reduction of plant capacity or efficiency, and/or a quality problem in the final product.  
*Specialty product* – a product that is made to a non-standard specification and/or requires special expertise and equipment not required for the manufacture of standard products. Examples of specialty products include nutritional milk powders, cream powders, cheese powders and protein-rich milk powders. Examples of standard products include general trade skim milk powder and whole milk powder.

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## Outcomes and performance criteria

### Outcome 1

Explain the key compositional factors influencing powder stickiness for specialty spray dried products with high fat, protein or carbohydrate contents in a dairy processing operation.

Range major components of specialty powders include but are not limited to – fats and oils, casein and whey proteins, carbohydrates such as lactose, sucrose, oligosaccharides, malto-dextrins.

### Performance criteria

1.1 The effect on powder stickiness of the surface viscosity of powder particles is explained in terms of exposure to humid air.

Range effects include but are not limited to – average glass transition temperature, use of malto-dextrins, liquid fat content.

### Outcome 2

Explain the role of outlet air humidity and temperature in affecting the stickiness of specialty powders in a dairy processing operation.

### Performance criteria

2.1 Humidity is explained in terms of absolute humidity, relative humidity, saturation and dew point.

2.2 The effect of humidity changes throughout the spray drying process is explained in terms of the role of inlet and outlet temperature in determining the outlet air humidity for a spray drier and mixing air of different temperatures and water vapour contents.

2.3 The effect of temperature and relative humidity on powder stickiness is explained in terms of a high sugar and a high fat powder.

### Outcome 3

Explain the role of airflow patterns and velocities within a spray drying plant in determining powder stickiness in a dairy processing operation.

### Performance criteria

3.1 The role of airflow patterns within a spray drying plant in determining stickiness is explained in terms of airflow modification.

Range airflow patterns include but are not limited to – air dispersers, chamber airflow patterns.

- 3.2 The role of air velocity within a spray drying plant in determining stickiness is explained in terms of excessively low and high airflow velocities in ducts and cyclones and pneumatic conveying systems.

**Outcome 4**

Explain the steps that may be taken to resolve a selected processing problem.

Range processing problems may include but are not limited to –lumps in fluid beds, heavy deposits of powder on drier roofs, walls or cone, blockages in cyclones, rapid increase in baghouse pressure drop; evidence is required of two processing problems.

**Performance criteria**

- 4.1 A comprehensive range of potential causes of the problem is explained in terms of the total process.
- 4.2 Potential causes are ranked in order of most to least likely and explained in terms of a course of action.
- 4.3 The most probable cause or causes of the problem are explained in terms of a scenario based on an actual or a simulated process and product information.

**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	25 November 2000	31 December 2014
Revision	2	13 June 2003	31 December 2014
Rollover	3	26 January 2007	31 December 2016
Review	4	18 June 2015	31 December 2024
Review	5	28 April 2022	31 December 2024

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