**NZQA**

**Approved**

Achievement standard: 91365 Version 3

Standard title: Demonstrate understanding of advanced concepts used in manufacturing

Level: 2

Credits: 4

Resource title: Taking milk to the world

Resource reference: Generic Technology VP-2.12 v2

Vocational pathway: Primary Industries

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| Quality assurance status | These materials have been quality assured by NZQA. NZQA Approved number A-A-02-2015-91365-02-8265 |
| Authenticity of evidence | Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material.Using this assessment resource without modification may mean that learners’ work is not authentic. Assessors/ educators may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

Vocational Pathway Assessment Resource

Achievement standard: 91365

Standard title: Demonstrate understanding of advanced concepts used in manufacturing

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Resource title: Taking milk to the world

Resource reference: Generic Technology VP-2.12 v2

Vocational pathway: Primary Industries

Learner instructions

# Introduction

This assessment activity requires you to demonstrate understanding of advanced concepts used in the manufacture of milk powder.

You are going to be assessed on how comprehensively you demonstrate your understanding of advanced concepts used in the manufacture of milk powder.

The following instructions provide you with a way to structure your work so you can demonstrate what you have learnt and achieve success in this standard.

Assessor/educator note: It is expected that the assessor/educator will read the learner instructions and modify them if necessary to suit their learners.

# Task

In this activity you will research milk powder manufacturing. Your assessor/educator may arrange for you to visit a dairy factory or invite a plant manager to talk to you. Alternatively, you could interview a plant manager in person or by email. You could also conduct research in a library or on the internet.

You may work individually or in a group to conduct research but you must produce your report or presentation individually. You might present your findings as a written report, a portfolio, or an oral or audio-visual presentation. Confirm the format with your assessor/educator.

As you work, gather evidence you could use in your report or presentation. You could include photographs, diagrams, notes you have written, and material from books, magazines, brochures or websites. Make sure you keep a record of the sources of this information.

Create a report or presentation in which you do the following:

* Identify safety issues associated with milk powder manufacturing and explain how these are addressed, such as any NZFSA (New Zealand Food Standards Authority) food safety regulations which may apply, and using HACCP (Hazard Analysis and Critical Control Point) to identify, evaluate and control hazards that are significant to the manufacture of milk.
	+ Consider safety issues associated with the milk supply and other inputs, the workers, plant and equipment involved in the manufacturing process, the environmental implications of production and the final product.
	+ Consider how and why quality management techniques (such as Total Quality Management (TQM) or Six Sigma, for example) have been important in changing practices related to safety.
* Identify new technologies and/or techniques and explain their impact on quality control and their suitability for different manufacturing systems used to produce milk powder.
	+ Consider how and why quality management techniques (such as TQM or Six Sigma) have been important in adopting (or not adopting) particular new technologies and/or techniques.
	+ For example, you might consider how the introduction of data logging technologies has increased the possibility of quality control at the milk powder factory you studied. Is this technology suitable for the manufacturing system used in this factory? Is it suitable for other milk powder manufacturing systems (such as batch manufacturing, assembly line manufacturing or flexible manufacturing)?
	+ Consider how the milk powder manufacturer approaches quality management to ensure on-going improvement of its processes and product. You may refer to planning, quality control, quality assurance and quality improvement techniques, and particular approaches such as Lean Manufacturing.
* Identify what influences customer, social and environmental drivers have on priorities in the milk powder manufacturing process.
	+ For example, you could find out who the milk powder manufacturer’s main customers are and why they purchase the milk powder.
	+ Find out what social trends or values influence people’s choices of milk powder. For example, is there a preference for locally made products, for carbon-neutral products and/or for batch production? Which of these trends have influenced the milk powder manufacturer’s decisions about its manufacturing process?
	+ What environmental considerations (such as the management of waste and by-products) have been seen as important by the manufacturer? How have these influenced the milk powder manufacturer’s decisions about its manufacturing process?
* Discuss how and why quality management techniques (such as TQM or Six Sigma) have been important in changing (or not changing) manufacturing practices in response to these influences.

Use diagrams, photographs and other visuals to illustrate your discussion, as appropriate.

Make sure you acknowledge all your sources of information. You need to provide references to make it clear where your information has come from.

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Assessor/Educator guidelines

# Introduction

The following guidelines are supplied to enable assessors/educators to carry out valid and consistent assessment using this internal assessment resource.

As with all assessment resources, education providers will need to follow their own quality control processes. Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material. Using this assessment resource without modification may mean that learners' work is not authentic. The assessor/educator may need to change figures, measurements or data sources or set a different context or topic. Assessors/educators need to consider the local context in which learning is taking place and its relevance for learners.

Assessors/educators need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing learners against it.

# Context/setting

This activity requires learners to produce a report or presentation in which they demonstrate their comprehensive understanding of advanced concepts – safety issues, the impact of new technologies and/or techniques, and customer, social and environmental influences – on the process used to manufacture milk powder.

Learners may present their report or presentation in a format that best suits their needs. Ensure that the format selected allows the learner to meet the requirements of the standard.

# Conditions

Learners could gather and analyse their evidence independently or in groups or pairs, but they need to write their reports independently and will be assessed individually.

# Resource requirements

Learners will require access to relevant information about the manufacturing process selected for this assessment activity. You may arrange a site visit or guest speaker, for example, or guide learners in approaching a manufacturer for an interview.

Learners may also require access to a library or the internet.

Learners may require access to a camera or to photos taken during a site visit.

A useful website related to milk powder manufacturers is <http://www.fonterra.com/nz/en>.

# Additional information

None.

# Assessment schedule: Generic Technology 91365 – Taking milk to the world

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner demonstrates understanding of advanced concepts used in manufacturing by: * explaining how safety issues are addressed in milk powder manufacturing

For example: The learner explains food safety practices (as set out in the NZFSA food safety regulations) followed by a specific milk powder manufacturer, covering the milk supply, the manufacturing equipment, plant ‘clean rooms’, processing methods, packaging and storage, and safe delivery of the milk powder to the customer. The learner explains how identifying and evaluating hazards (HACCP) has allowed all associated monitoring and testing to be carried out more effectively.* identifying the impacts of new technologies and/or techniques on the suitability of different types of manufacturing systems and increased possibilities for quality control

For example: The learner identifies a new waste disposal method used in milk powder production and its suitability for the type of manufacturing system used. The learner identifies the improvements in quality control this has allowed.* identifying the influences of customer, social and environmental drivers on priorities within a milk powder manufacturing process

For example:The learner considered influences, as follows: *Customers and potential customers influence the production of milk powder. What is important to these customers and potential customers is high quality and sustainable farming practices. These are the priorities in a milk powder factory …* *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates in-depth understanding of advanced concepts used in manufacturing by:* explaining how safety issues are addressed in milk powder manufacturing

For example: The learner explains the food safety practices (as set out in the NZFSA food safety regulations) followed by a specific milk powder manufacturer, covering the milk supply, the manufacturing equipment, plant ‘clean rooms’, processing methods, packaging and storage, and safe delivery of the milk powder to the customer. The learner explains how identifying and evaluating hazards (HACCP) has allowed all associated monitoring, testing and documentation to be carried out more effectively.* identifying the impacts of new technologies and/or techniques on the suitability of different types of manufacturing systems and increased possibilities for quality control

For example:The learner identifies a new waste disposal method used in milk powder production and its suitability for the type of manufacturing system used. The learner identifies the improvements in quality control this has allowed.* identifying the influences of customer, social and environmental drivers on priorities within a milk powder manufacturing process

For example:The learner considered influences, as follows: *Customers and potential customers influence the production of milk powder. What is important to these customers and potential customers is high quality and sustainable farming practices. These are the priorities in a milk powder factory …* * explaining how quality management techniques have impacted on a milk powder manufacturing process

For example: The learner explains what key changes have been made over the years to improve the efficiency of milk powder production and the quality of the final product. Examples are given by the learner explaining why these changes were made, how quality management has impacted on safety practices at the dairy factory they studied and how the milk powder manufacturer has made use of new technologies to improve quality control. The explanation also covers why these technologies are suitable for the factory’s particular manufacturing system and within the manufacturing process what influences impact on quality management decisions.*The above expected learner responses are indicative only and relate to just part of what is required.*  | The learner demonstrates comprehensive understanding of advanced concepts used in manufacturing by:* explaining how safety issues are addressed in milk powder manufacturing

For example:The learner explains the food safety practices (as set out in the NZFSA food safety regulations) followed by a specific milk powder manufacturer, covering the milk supply, the manufacturing equipment, plant ‘clean rooms’, processing methods, packaging and storage, and safe delivery of the milk powder to the customer. The learner explains how identifying and evaluating hazards (HACCP) has allowed all associated monitoring, testing and documentation to be carried out more effectively.* identifying the impacts of new technologies and/or techniques on the suitability of different types of manufacturing systems and increased possibilities for quality control

For example:The learner identifies a new waste disposal method used in milk powder production and its suitability for the type of manufacturing system used. The learner identifies the improvements in quality control this has allowed.* identifying the influences of customer, social and environmental drivers on priorities within a milk powder manufacturing process

For example:The learner considered influences, as follows: *Customers and potential customers influence the production of milk powder. What is important to these customers and potential customers is high quality and sustainable farming practices. These are the priorities in a milk powder factory …* * discussing how and why quality management techniques have been important in changing manufacturing practices

For example:The learner discusses how the production manager at a local milk powder factory uses review techniques to keep up with global changes in the industry, extensively reading industry magazines, daily newspapers, and flyers, for example. They explain that review techniques are used because the manufacturer wishes to remain an iconic milk powder manufacturer in its market.The learner discusses how the product, processes and brand are placed within the local market. They explain why branding is an important part of the success of the company and how it reflects its history.The learner links the branding priorities identified by the company with the customer, social and environmental trends and drivers, and with on-going quality management and improvement.They discuss the importance of consistency in production to ensure a high-quality milk powder product that is the same from batch to batch and year to year.The learner considers why changes, such as the introduction of factory filters, automated air conditioners, and new packaging materials have changed the manufacturing process and are in keeping with the overall branding of the company.The learner discusses the rationale for decisions to implement new technologies (or decisions not to implement) and other changes in the manufacturing practices. They identify environmental impact as a key driver.*The above expected learner responses are indicative only and relate to just part of what is required.*  |

Final grades will be decided using professional judgement based on an examination of the evidence provided against the criteria in the Achievement Standard. Judgements should be holistic, rather than based on a checklist approach.