**NZQA**

**Approved**

Achievement standard: 91084 Version 3

Standard title: Demonstrate understanding of basic concepts used in preservation and packaging techniques for product storage

Level: 1

Credits: 4

Resource title: Courses for horses

Resource reference: Processing Technologies VP-1.62 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-02-2015-91084-02-7383 |
| 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: 91084

Standard title: Demonstrate understanding of basic concepts used in preservation and packaging techniques for product storage

Level: 1

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Learner instructions

# Introduction

This assessment activity requires you to demonstrate your understanding of basic concepts used in preservation and packaging techniques for storing a range of horse feeds.

You are going to be assessed on how you demonstrate comprehensive understanding of basic concepts used in preservation and packaging techniques for product storage of a range of horse feeds.

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

You need to prepare a presentation containing information that includes:

* controls over storage to limit decay in horse feed
* legal requirements about labelling
* comparison and contrast of preservation and packaging techniques used in storing horse feed.

Focus on a range of horse feeds used in the New Zealand equine environment and investigate:

* Types of decay that typically occur in these feeds, and why we [need](http://technology.tki.org.nz/Glossary#glossary_31803) to preserve these products to maintain their integrity over time
	+ for example types of decay may include microbial growth, separation, loss of colour, loss or gain of moisture, loss of viability, loss of nutritional content.
* Preservation techniques used to control the decay of horse feeds
	+ for example preservation techniques may include chilling, freezing, heating, dehydration, control of humidity, provision of nutrients, use of chemical additives.
* Packaging techniques used to maintain the integrity of horse feeds
	+ for example packaging techniques may include cellophane and plastic bags, plastic and cardboard boxes, glass and plastic bottles and jars.
* Reasons why these packaging techniques are effective in helping to prevent decay.
* Storage conditions that will limit decay of those horse feeds.
* The legal requirements for labelling horse feeds for use in New Zealand.
* Reasons for New Zealand’s legal requirements regarding labelling.

## Create a presentation

Include in your presentation the following:

* identify and [explain](http://technology.tki.org.nz/Glossary#glossary_31835) the links between types of decay and preservation techniques in horse feeds in the New Zealand equine environment
* explain why a particular preservation and packaging technique was chosen for one of the feeds you have investigated
* discuss how to control the storage environment to limit decay in different types of horse feeds during storage
* compare and contrast preservation and packaging techniques for horse food to be stored in a New Zealand equine environment
* discuss why labelling of horse feed is, or should be, legally required in New Zealand and what those requirements are.

# Resources

## Useful websites

<http://www.equestrianandhorse.com>

## Useful reading

Murano, P 2002, *Understanding Food Science and Technology,* Brooks Cole, United States.

Hallam, E 2005, *Understanding Industrial Practices*, Nelson Thornes, United Kingdom.

Robinson, J Roberts, H Barnard, E and Shepard, T 2001, *Design and Make It – Food Technology*, Nelson Thornes, United Kingdom.

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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 demonstrate their comprehensive understanding of concepts that relate to techniques used to preserve, package, and store horse feeds for use within the New Zealand equine environment.

# Conditions

The learners could work independently or in groups to develop their understanding, but they need to create their presentation independently, and will be assessed individually.

# Resource requirements

The assessor/educator will provide learners with the opportunity to explore different products requiring diverse preservation and packaging techniques used to address types of decay and legal requirements.

The assessor/educator will assist learners in the refinement of reflective and inquiry questions related to understanding how product integrity can be established and/or maintained through preservation and packaging suitable for storage conditions in local environments.

Learners will require access to the internet for research.

# Additional information

None.

## Other possible contexts for this vocational pathway

These include demonstrating comprehensive understanding of preservation and packaging techniques to store sheep feeds, dairy feeds and supplements, fish farm feeds, deer feeds.

# Assessment schedule: Processing Technologies 91084 – Courses for horses

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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 basic concepts used in preservation and packaging techniques for product storage by:* describing the types of decay and preservation techniques

For example the learner describes:* + the types of decay, referring to micro-organisms using their category names (e.g. yeast, moulds, bacteria)
	+ the preservation techniques: how grains and grasses need to be dried before and during storage as humidity will cause decay of grains by micro-organisms such as fungi and bacteria
	+ how contaminations may come from air, dust, soil, water, insects, rodents, birds, animals, humans, storage and shipping containers, and handling and processing equipment.
* describing the legal requirements for labelling in a local environment

For example:The learner describes the labelling requirements for horse feed in New Zealand.* describing how a specific product in a local environment could effectively be preserved, packaged and stored to maintain product integrity over time

For example, the learner describes:* + how horse feeds are made from grains and grasses, which need to be stored in a cool, dry, clean environment to avoid infestation and to minimise changes in flavour and texture. This may be part of a stable area that needs to be kept clean and dry, with all packaging well-sealed against pests
	+ horse feeds found in New Zealand, which are packed into large sacks, and stored in an ambient environment to increase their life expectancy.

*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates in-depth understanding of basic concepts used in preservation and packaging techniques for product storage by:* explaining the links between types of decay and preservation techniques

For example:The learner explains the identification of a range of different types of decay (e.g. moulds, going stale and softening, loss of nutritional value, and enzymatic degradation), and explains how these are prevented or slowed by particular preservation techniques.*High sugar content is a good way to prevent fungal growth (mould) on grains. As sweet feed is made up from grains (oats, barley, corn) and pellets of proteins, vitamins and minerals that are then combined with molasses, this helps reduce fungi growth. This mixture is then packaged into large woven plastic sacks to further reduce the risk of other contaminates affecting the product such as air, dust, insects, and rodents. Pre-drying of the grains found in horse feed also decreases the chances of fungal growth and lessens the potential for production of mycotoxins in the grain. Sealing and storing the horse feed in plastic bins enhances its preservation, as it stabilises ambient temperatures, decreasing humidity which also slows the growth of mould, and prolongs the life expectancy of the horse feed*.* explaining why a particular preservation and packaging technique was chosen for a specific product to be stored in a local environment

For example:The learner explains the process involved when making sweet feed for horses.*The ingredients are separately dried, processed and stored in sealed packaging. These are then checked to ensure grains remain dry, thus preventing moulds decaying them before being added to the pellets, creating a sweet feed. As the final product has minimal processing and contains molasses, which helps to inhibit mould growth, the contamination from other micro-organisms is reduced. In New Zealand sterilisation occurs before and during the filling of the packaged bags with the sweet feed, which destroys any moulds that may be in the bag. The packed bags are sealed to prevent any entry of insects or moulds after manufacture. As humidity in air promotes growth of moulds over grains and cause decay, sweet feed needs to be stored in ambient temperatures to prevent further contamination*.* describing legal requirements for labelling in a local environment

For example:The learner describes the labelling requirements for horse feed in New Zealand.*The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates comprehensive understanding of basic concepts used in preservation and packaging techniques for product storage by:* discussing how to control the storage environment to limit decay of different types of products during storage

For example, the learner’s discussion:* + describes the conditions that moulds, bacteria and mycotoxins grow in
	+ explains how they cause undesirable colour changes, and/or loss of nutritional value and possible toxins
	+ explains how the storage environment can address these issues.

*Grains need to be thoroughly dried before storage, and kept at ambient temperatures to inhibit the growth of moulds. The sources of microbial contamination of horse feeds are many, but all are traceable to the environment in which grain and grasses are grown, handled, and processed. When grain and grasses are dried, it inhibits the production of fungi, which invade when the grain and grass is high in moisture. Musty odours may become apparent before mould growth becomes visible and is an early warning of mould activity. Mycotoxins cause further deterioration of the grain and can occur throughout the processing of horse feed*.* describing legal requirements for labelling in a local environment and discussing why it is required

For example:The learner describes labelling requirements for different feed types and explains the requirements in terms of the need to know the nutritional value of the feed.* comparing and contrasting preservation and packaging techniques for a product to be stored in a local environment

For example:The learner compares and contrasts the preservation and packaging techniques for horse feed which identifies the advantages and disadvantages for different purposes and consumers, of different techniques and different storage conditions. The discussion makes links between the nutritional value of the product, the length of time it can be stored for, and its intended purpose.*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.