

The logo for New Zealand PORK features the text "New Zealand" in a black sans-serif font above the word "PORK" in a larger, bold, green sans-serif font. A thick green curved line arches over the text from the top right, curving down to the left.

New Zealand  
**PORK**

**GOOD PRACTICE GUIDE**

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**Home Milling and Mixing of Pig Feed**

***MARCH 2018***

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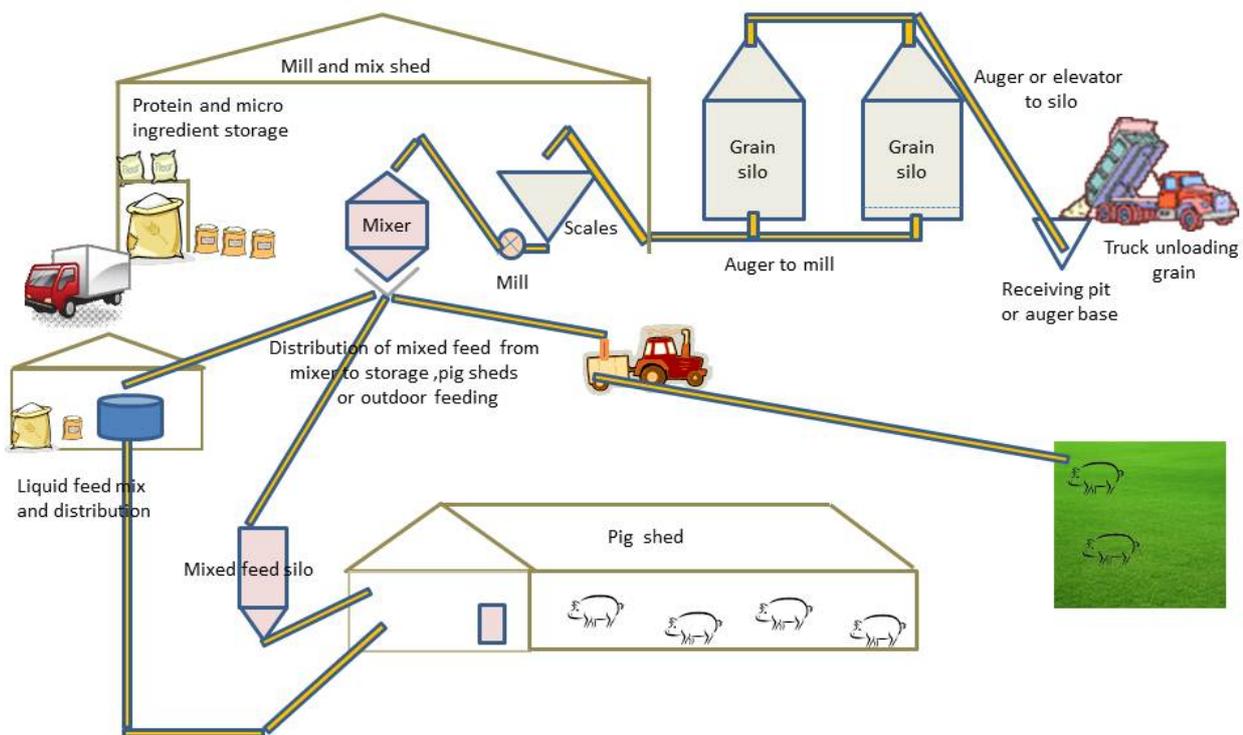
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## Section 1: Objective

To produce pig feed on farm **for that farm's own use** that is 'fit for purpose' i.e. fresh, palatable, safe, nutritionally balanced for the class of stock the feed is intended, compliant with all relevant legislation (see Appendix 1), and with the minimum of wastage.

There is a large range of equipment available for receiving, storing, processing, and distributing grains and mixed feed. There are some requirements that need to be achieved by all systems to achieve the Objective stated above. These common factors are highlighted below.

**Schematic layout of home milling and mixing of pig feeds**



This guideline is set out in three sections:

- **Section 1:** Introduction, which also covers objectives
- **Section 2:** Review of key issues associated with home milling and mixing of pig feed
- **Section 3:** Self-assessment guide for good practice home milling and mixing of pig feed. It is recommended that the assessment is completed (at least) annually to encourage on-going improvement. This self-assessment identifies action areas that are recommended to be addressed within three months.

It is home millers'/mixers' responsibility to ensure legal compliance in all aspects of producing and using feed. Refer Appendix 1.

## Section 2: Review of Key Issues Associated with Home Milling and Mixing of Pig Feed

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### Site

The main objective in designing a home milling/mixing site is to allow for easy grain and other ingredient delivery, as well as to minimise the distances augers have to move grain and mixed feed around the site. At the same time, feed storage and feed preparation areas should be isolated as much as practicable and sited with separate access to the main piggery to limit the biosecurity risk. Entry onto the farm of all feed delivery services and feed ingredients need to meet the farm's biosecurity programme (refer NZPork's Guidelines for the Development of On-Farm Biosecurity Standard [\(hyperlink\)](#))

As the home milling / mixing facilities are a part of the piggery, the site must be kept clean, and maintained to the NZPork Piggery Presentation Guideline Standards which is a component of PigCare™ [\(hyperlink\)](#)

Aspects to be addressed in the Presentation guidelines relevant to the feed milling site include: Compact layout, proximity to piggery, vehicle access, all-weather turning, suitable roading for all-weather access, clear gutters, good slope and drainage, and an ability to secure the facility.

### Ingredient specifications

Setting nutrient and physical specifications for the supply of feed ingredients is critical to ensure safe and accurate storage, diet development, and feeding. Records need to be kept of specifications for feed ingredients, finished diets, plus details of ingredients received.

### Inspection on arrival

The objective of inspecting on arrival is to ensure that ingredients meet the farm's specifications. Grain should be inspected **before unloading** for moisture and colour.

### Storage of grain and other ingredients

The objective with **grain storage** is to have:

- Adequate capacity in the grain receiving pit (and removal from the pit to bulk storage) in order to reduce delays with delivery vehicles
- Grain stored at correct moisture levels to prevent damage by moisture, insects and mould
- Grain moisture content below 14.5%
- Checks on storage silos regularly for signs of moisture build-up or insect damage
- Grain storage in weather-tight structures
- Cleaning procedures between batches, entailing contaminant removal and fumigation
- Grain treated with an approved insecticide and cooled with proper aeration
- The weight of grain received recorded
- Timely arrival of ingredients to maintain feed standards and no out of feed events
- No reduction in the feed value of grain.

The objective with **storage of protein feedstuffs and other ingredients** is to:

- Be purchased to nutritional specifications

- Stored correctly on arrival to be:
  - Cool
  - Dry
  - Well-ventilated
  - Not in direct sunlight
- Manage inventory control and stock turnover to minimise long on-farm storage times.

Special requirements for handling and storage of vitamins and minerals and other supplementary additives will require good sealing of opened bags, avoidance of direct sunlight, storage on pallets (or in containers) that keep the ingredients off the ground and free from moisture, and safe from rodents.

### Feed processing

The objective with feed processing is to:

- Ensure grain is accurately weighed through the mill or prior to mixing (grains can be processed by a hammer, roller, or disc mill)
- Ensure accurate mixing. Mixing occurs on farm with a vertical or horizontal mixer and in some cases via a tractor drawn mobile mill and mixer
- Ensure correct diet formulation
- Diets formulated to ensure no residues above allowable limits
- Ensure right mix for the class of pig
- Ensure good quality ingredients
- Ensure feed protein tests or specification are met
- Ensure correct ingredient weights and correct bag weights
- Volumetric measuring of ingredients should be avoided – weighing is the only accurate means of measuring ingredients
- Periodic monitoring of the accuracy of weighing scales
- Ensure correct mixing time
- Ensure correct inclusion of micro ingredients
- Avoid contamination between batches
- Ensure correct particle size
- Have staff trained to be able to correctly identify all ingredients. Only trained staff should be permitted to mix feed.
- Have a cleaning programme to prevent accumulation of dust, dirt and waste feed and ingredients on the floor, machinery, ceilings, roof and wall cavities, ledges and rafters in the mixing shed. The cleaning programme should include formal procedures for control of rodents (which may require use of external experts or suppliers).
- Have planned removal of rubbish-sweepings, bags and other packaging materials (recycling)
- Provide a cool ingredient storage area, while maintaining good lighting, ventilation, easy to clean and minimising dust.

### **Mixed feed**

The objective with mixed feed is to:

- Be conveyed from the mixer to a storage area, or direct to mixed feed silos, near where the pigs are being fed
- Move mixed feed via a variety of conveyance systems which include augers, cables, augers and carts, bins buckets and trolleys. In some situations, feed is mixed in a tank and distributed by pipeline to the pigs with a computer controlled wet-feeding system
- Ensure it is delivered to the right class of pig
- Ensure that dry feed conveyance and storage systems are clean and dry
- Ensure storage systems are cleaned out regularly enough to ensure that feed remains fresh. This includes base of augers, feed bins, hoppers, feeders and wet feed tanks.

### **Hazards**

The objective is to provide a safe working environment and to ensure all hazards are identified, and eliminated, minimised, or controlled.

### **Grain Import System (GIS)**

The objective of the GIS is to provide the framework within which farms that carry out home milling and mixing on farm, operates in a way that ensures that any imported grain used for pig feed is managed to minimize the risk of release of regulated quarantine organisms. In practical terms, this means farms that operate a GIS need to operate a 'closed' system for receiving and handling imported grain.

### **Review date**

The 'Good Practice Guide for Home Milling and Mixing of Pig Feed' will be reviewed at 2-yearly intervals.

### Section 3: Self-assessment Guide for Good Practice Home Milling and Mixing of Pig Feed

Site Assessment	Yes	No	Comment	Action list	Date to Check Progress	Completion Date
Is the grain intake clear of overgrown grass and weeds?						
Does the facility have all-weather vehicle access?						
Does the facility allow all-weather unloading without getting wet?						
Does the site have suitable drainage, soak holes, and clear gutters?						
Is there a receptacle for grain and other ingredient dockets/delivery records?						
Is entrance (by ingredient suppliers) to the grain storage, and to the milling and mixing facility separate from the entrance to the piggery?						

Ingredient Specification Assessment	Yes	No	Comment	Action list	Date to Check Progress	Completion Date
Do you inspect grain before unloading for moisture and colour?						
Does the facility have documented feed ingredient specification requirements for:						
<ul style="list-style-type: none"> <li>• Grains (for moisture content, bushel weight, fines, pinched or broken kernels, weed seeds, soil, and other foreign material and of good colour)</li> </ul>						
Does the facility have documented feed ingredient specification requirements for:						
<ul style="list-style-type: none"> <li>• Proteins</li> </ul>						
<ul style="list-style-type: none"> <li>• Fat</li> </ul>						
<ul style="list-style-type: none"> <li>• Micronutrients</li> </ul>						

<b>Storage Assessment</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Is there routine visual inspection for colour, insects, moulds, and water damage prior to unloading of incoming grain and other feed ingredients?						
Are there records of the feed ingredient sources or suppliers?						
Are records kept of feed ingredient deliveries?						
Do the mill/mixing facility and practices minimise access by rodents, birds, and insects?						
Are there documented control programme for:						
<ul style="list-style-type: none"> <li>• Rodents</li> </ul>						
<ul style="list-style-type: none"> <li>• Birds</li> </ul>						
<ul style="list-style-type: none"> <li>• Insects</li> </ul>						
<ul style="list-style-type: none"> <li>• Feral animals</li> </ul>						

<b>Storage Assessment</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Is there documented routine inspection of grain storage and other ingredient storage areas for damp areas and insect damage?						
Are there procedures documented and in place to minimise cross-contamination between ingredients, between ingredients and finished diets, and between finished diets?						
Are feed ingredients clearly labelled?						
Are walls, floor and equipment clean?						
Are walls, floor and equipment easily cleaned?						
Are the grain storage areas weather-tight?						
Is the milling / mixing and feed ingredient storage areas weather-tight?						
Does the grain storage area enable aeration/ cooling of grain on arrival?						



Other Ingredient Assessment	Yes	No	Comment	Action list	Date to Check Progress	Completion Date
Suitable storage of ingredients (cool, dry, out of sun)?						
<ul style="list-style-type: none"> <li>• Grains</li> </ul>						
<ul style="list-style-type: none"> <li>• Protein</li> </ul>						
<ul style="list-style-type: none"> <li>• Fats</li> </ul>						
<ul style="list-style-type: none"> <li>• Micronutrients</li> </ul>						
<ul style="list-style-type: none"> <li>• Commercial food by-products</li> </ul>						
Does the facility provide a well-lit working environment for staff?						
Is the facility well-ventilated?						
Does the facility have dust extractors?						

Does the facility have a documented facility inspection and cleaning plan?						
Does the facility have a documented system for inventory turnover?						

<b>Feed Processing Assessment</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Does the mill and mixing equipment have a programmed maintenance system?						
Is weighing equipment routinely checked for accuracy and recalibrated at least annually?						
Are the wet-feeding system tank and pipes routinely cleaned and flushed?						
Is the water used in wet-feeding to a potable standard and tested?						
Are the diet formulations available and easy to read?						
Are the ingredients to be mixed clearly labelled?						
Is there a standard procedure for visual/physical/inspection of feed- particle size, colour and smell?						
Is the storage for mixed feed clearly labelled?						
Is there a documented cleaning programme for:						

Feed Processing Assessment	Yes	No	Comment	Action list	Date to Check Progress	Completion Date
<ul style="list-style-type: none"> <li>Sweeping</li> </ul>						
<ul style="list-style-type: none"> <li>Dusting</li> </ul>						
<ul style="list-style-type: none"> <li>Removal of plastic bags</li> </ul>						
<ul style="list-style-type: none"> <li>Removal of cardboard packaging</li> </ul>						
<ul style="list-style-type: none"> <li>Incinerating rubbish</li> </ul>						
Are feed ingredient weights reconciled?						
Are feed ingredient specifications documented and measured?						
Are feed mix formulations adhered to?						
Are ingredients correctly identified, weighed, and mixed to correct formulation?						

<b>Feed Processing Assessment</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Are diets formulated to ensure no residues above allowable limits in mixed feed?						
Are premixes and other micro-supplements added to a carrier prior to being added to the bulk mixer?						
Are staff informed of the requirement for accuracy when mixing feed?						
Are staff aware of safety aspects when handling premixes?						
Are opened bags resealed to prevent insect damage and rodent contamination?						
Are hygroscopic products managed to minimise moisture infusion? (e.g. resealing premix bags)						
Are premix bags stored out of direct sunlight?						
Are all bags labelled and feed bins and silos clearly marked making them easy to identify?						
Are incoming ingredients checked for damage?						

<b>Feed Processing Assessment</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Is there a documented inventory and stock turnover system?						
Is there clear separation of stored ingredients?						
Are records of incoming feed stocks – weights and dates maintained?						
Are records of mixed feed going out – weights and dates maintained?						
Are they reconciled?						
Is appropriate equipment available to accurately weigh and handle:						
<ul style="list-style-type: none"> <li>• Batches of grain</li> </ul>						
<ul style="list-style-type: none"> <li>• Bulk ingredients</li> </ul>						
<ul style="list-style-type: none"> <li>• Macro ingredients</li> </ul>						
<ul style="list-style-type: none"> <li>• Kilogram and part kilogram micro ingredients and supplements</li> </ul>						

<b>Feed Processing Assessment</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Are there standard operating procedures for time of mixing (i.e. time feed in mixer) mixing sequence and storage of mixed feeds?						
Is there a standard operating procedure for cleaning between batches of different feeds to ensure no inappropriate carry-over between batches?						
Are staff aware of hazards such as mould/mycotoxins, moisture damage, and rancidity of products containing fat?						
Are staff aware of procedures for traceability of ingredients?						

<b>Assessment for Mixed Feed</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Are the mixed feed storage bins clearly labelled to ensure feed goes to the right class of pig?						
Are the mixed feed conveyance systems clean?						
Are the mixed feed storage containers clean and dry?						

<b>Assessment of Hazards</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Are staff aware of hazards and safe operating procedures?						
Is there a documented hazards list in place that include:						
<ul style="list-style-type: none"> <li>• Grain receiving pits (covered)?</li> </ul>						
<ul style="list-style-type: none"> <li>• Augers?</li> </ul>						
<ul style="list-style-type: none"> <li>• Access to bulk bins (grain collapse)?</li> </ul>						
<ul style="list-style-type: none"> <li>• Ladders and overhead gantries?</li> </ul>						
<ul style="list-style-type: none"> <li>• Dust from micro-nutrients?</li> </ul>						
<ul style="list-style-type: none"> <li>• Correct storage/stacking of bagged ingredients?</li> </ul>						
<ul style="list-style-type: none"> <li>• Fork lift and other vehicle safety?</li> </ul>						

Assessment of Hazards	Yes	No	Comment	Action list	Date to Check Progress	Completion Date
<ul style="list-style-type: none"> <li>Are staff aware of hazards with dust and the risk of dust explosions?</li> </ul>						
Is there a documented hazards list in place covering:						
<ul style="list-style-type: none"> <li>Is there a 'no smoking' policy around the feed mill to minimise risks of dust explosion?</li> </ul>						
<ul style="list-style-type: none"> <li>Are staff aware of the risk of gas in wet-feeding tanks during cleaning or repair activities?</li> </ul>						
<ul style="list-style-type: none"> <li>Is there a system for flushing wet-feeding tanks prior to cleaning or repairing?</li> </ul>						
Is an Injuries Register maintained and regularly assessed?						

GIS Assessment	Yes	No	Comment	Action list	Date to Check Progress	Completion Date
Does the facility operate a Grain Importation System (GIS)?						
Are standards adhered to?						

<b>Facilities Assessment</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>Action list</b>	<b>Date to Check Progress</b>	<b>Completion Date</b>
Does the farm ensure that all feed, feed delivery vehicles, and persons meet the Farm's biosecurity standard?						
Does the farm meet the Piggery Presentation Guidelines in all respects?						

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*Date of Assessment*

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*Date of Progress Check*

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*Date of Re-assessment*

## Appendix 1: Relevant Legislation

Home millers / mixers need to be aware of their responsibilities under the following New Zealand regulations and industry standards:

- The Biosecurity (Meat and Food Waste for Pigs) Regulations 2005: Meat, meat products and any food that has come into contact with meat, must NOT be fed to pigs unless 'treated' (defined in the Regulations as heated to a temperature of 100°C for 1 hour, or other approved treatment). This is in order to prevent the spread of diseases to pigs via pig feed.
- In addition, NZPork has an Industry Policy that all porcine material is excluded from pig feed. This is to minimise risks associated with disease transfer and to retain consumer confidence.
- The Biosecurity (Ruminant Protein) Regulations 2010: These regulations prohibit the feeding of ruminant protein (except dairy produce) in any form to ruminant animals. Very careful management of any potential contamination of feed intended for ruminants is required, including in feed mills that utilise ruminant protein for feeding pigs. At an absolute minimum, there must be full line separation, with dedicated equipment used. The purpose is to preserve New Zealand's BSE-free status and manage the risk of a BSE outbreak.
- The Animal Products Act 1999: This Act requires that measures are in place to ensure so far as is practicable that all traded animal products are fit for their intended purpose, and in the case of food products, safe and suitable for human food consumption.
- Agricultural Compounds and Veterinary Medicines Act 1997: This Act requires the management of risks associated with the use of agricultural compounds primarily as risks to animal health (including welfare) and public health (including ensuring that domestic food residue standards are not breached). The Act covers any substance or mixture of substances or biological compound used or intended for use in the direct management of animals or applied in an area where animals are managed; and any veterinary medicine, substance mixture of substances or biological compound used for post-harvest treatment of raw primary produce, or anything used or intending to be used as feed for animals. Also, home-millers should refer to NZPork's 'Responsible Use of Antibiotics' guidelines at [hyperlink](#)
- Health and Safety at Work Act 2015 (HSWA): Under HSWA, person conducting a business or an undertaking (PCBU) must look after the health and safety of its workers and any other workers it influences or directs. The business or undertaking including company Directors and managers, are also responsible for the health and safety of other people at risk from its work including customers, visitors, or the general public.

