

Supplementary grain feeding for dairy cows

Advantages of cereal grains as a supplementary feed

Grains can be readily and successfully integrated into the diet of dairy cows, offering both nutritional and management benefits to a business. Reasons to consider grain feeding will include:

More feed.

Grains provide cows with additional dry matter (DM) when quantity of pasture or other feeds is limiting – e.g. poor pasture growth due to summer drought or cool winter weather, or if access to pasture is limited e.g. due to wet conditions underfoot. Feeding grains causes ‘substitution’, meaning that for every one kilogram of grain fed, the demand for pasture is reduced. This is a valuable way to lift average pasture covers across the farm at critical times including during early and late lactation.

Complementary feeding for pasture fed cows.

Grains complement the nutritional profile of most New Zealand pastures. Pastures often contain high concentrations of crude protein and low concentrations of readily fermentable carbohydrates (starch and water soluble carbohydrates). Grains contain low concentrations of crude protein and high concentrations of starch to nutritionally ‘balance’ a pasture-based diet.

Better cow body condition.

Grains can increase daily intake of energy to better match the energy demands of lactating dairy cows during early to peak lactation. This can reduce the extent and duration of loss of body condition after calving. Cows in late lactation will tend to gain body condition in response to grain feeding, allowing younger and thinner cows to milk on for longer in late lactation.

More milk.

Feeding cereal grains can increase per cow and per hectare milksolids yields by supporting:

- Improved early and peak lactation milk yields.
- Longer lactation lengths (more days in milk) through improved body condition of cows.

Cereal grains do not influence your Fat Evaluation Index (FEI).

Unlike Palm Kernel Expeller Extract (PKE), feeding cereal grains is unlikely to influence your FEI grade, helping make sure you stay with an A grade. Feeding very high rates of cereal grain may however, under some circumstances, increase risk of rumen acidosis and therefore impact on your FEI grade.

Potentially lower levels of milk urea (MU).

Over recent seasons there has been increasing interest in the use of MU information (as supplied to dairy farmers by many dairy companies and co-operatives). If levels are very high (typically greater than 22 mg/dL) nutritionists will sometimes recommend feeding low protein feeds such as cereal grains to dilute dietary protein intake, potentially lowering levels of MU.

Better reproductive performance.

Feeding grains potentially improves reproductive performance of cows by encouraging better body condition score at calving and lessening the extent of body condition loss after calving. *Both outcomes contribute to:*

- **Better 6-week in calf rate.** A higher 6-week in calf rate means more cows getting in calf to artificial insemination and a more condensed calving spread the following season. A faster calving spread improves lactation length, supporting better milksolids yield and helps cows get in calf more quickly as they have more time between calving and mating to restore effective ovarian function and uterine health.
- **Fewer empty (non-pregnant) cows.** Reduced reproductive wastage allows more voluntary culling for non-reproductive reasons such as high somatic cell counts.

Grains fed through in-shed feeding systems can:

- **Deliver feed in a more consistent manner to all cows.** All cows including younger and submissive cows have equal access to supplementary grain, without having to compete for feed with other cows in the paddock. Individual cows compete with one another for new breaks of pasture, silage, forage crops or lifted feeds such as fodder beet bulbs – dry matter intake of these feeds can be highly variable between cows within a herd.
- **Be fed to match production levels by cows.** With modern in-shed feeding systems, levels of grain can be matched with levels of milksolids production, so more grain is offered to the more productive cows, less grain is given to poorer performing cows.
- **Improve body condition score for lighter conditioned cattle.** Preferential feeding of grains to younger, thinner cows supports better gain of body condition score, allowing these cattle to be milked on for longer in late lactation, improving both per cow and per hectare milksolids production.
- **Be consumed more quickly than PKE and PKE blends during milking.** The dry texture of PKE means cows can't quickly consume large quantities of feed during a single milking. Cereal grain (or grain-PKE blends) are typically eaten more quickly, allowing more feed to be consumed at each milking compared with straight PKE alone.
- **Supplement cows in a less wasteful way than silage.** Utilisation of grain through an in-shed feeding system is considerably better than silage fed on the ground.
- **Limit damage to pasture.** Feeding grain through in-shed feeding systems won't damage paddocks in the same way as feeding silage on the ground or PKE in tow-behind troughs.
- **Carry other supplements such as minerals.** Cereal grains can be combined with supplementary minerals such as magnesium, calcium and trace minerals.
- **Improve cow flow and cow comfort during milking.** More content cows are less stressful for staff and risk of cow lameness can be reduced by improved flow of cows into the milking shed. Grain feeding can encourage milk letdown, potentially improving milking times.

Challenges of cereal grain as a supplementary feed

As for any dairy feeds, grains have some practical and nutritional challenges. All can be remedied by understanding the potential issues and by good forward planning.

- **Requirement for processing of whole grains.** Whole grains require processing before feeding to dairy cows. If dairy sheds are not equipped with a roller or hammermill, grain can be purchased as kibbled or crushed products.
- **Free choice feeding of cereal grains.** Grains should not be offered to lactating dairy cows in open troughs or trailers. Individual cows may consume too much grain, increasing risk of ruminal acidosis (“grain overload”). Grain should be blended with other feeds such as silage or PKE to slow the rate of consumption, or be fed to cows in a more controlled manner through an in-shed feeding system.
- **Upper feeding limits of cereal grains.** Like all feeds, grains have upper limits of feeding as a proportion of the diet, typically around 4 kgs of grain per lactating cow per day. Higher rates may increase risk of ruminal acidosis in pasture-fed cows. More than 4 kgs of grain per cow per day can be fed under some management conditions, contact one of the PGG Wrightson Grain nutritionists for more information.
- **Low concentrations of crude protein.** For many parts of New Zealand, this is a key benefit, not a challenge of grains because grain feeding can dilute intake of inappropriately high concentrations of pasture crude protein. In some situations, low protein levels may limit animal performance, e.g. when grains are fed together with other low protein feeds such as summer pastures or maize silage. Diets can be balanced as required by feeding DDG, peas, faba beans or protein meals (e.g. soybean meal, canola meal) combined with cereal grains. Note that whilst PKE contains moderate levels of protein, the digestibility of PKE protein is not particularly high and the amino acid profile of PKE protein may not match the needs of high performing dairy cows if other dietary protein sources are not providing sufficient good quality protein. A qualified Ruminant Nutritionist can offer further advice as required.

- **Low concentrations of calcium and sodium.** For lactating grain-fed cows, supplementation with salt and/or limeflour may be required. A qualified Ruminant Nutritionist can offer further advice as required.
- **Storage of cereal grains.** Like all dry feeds (those with moisture contents of less than 14%), cereal grains must be stored in clean, dry facilities free from moisture and insect pest infestation. Under good conditions, whole grain can be stored successfully for considerable lengths of time.
- **Risk of fungal contamination and mycotoxins.** Under some harvest and/or storage conditions, grains may contain compounds that could be potentially harmful to stock – refer to the section on mycotoxins for more information.

As for most feeds, challenges potentially associated with grain feeding are easily overcome with forward planning and advice from a qualified Ruminant Nutritionist can offer further advice as required.