Making Great Pasture Silage

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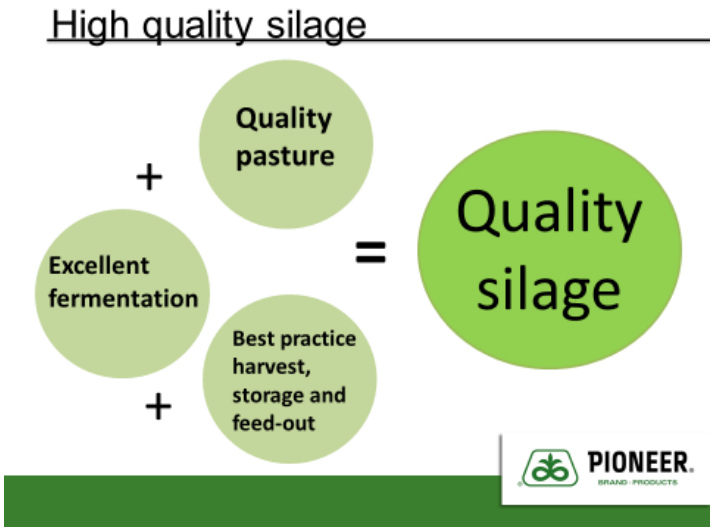
What is good silage?

Producing high quality pasture silage requires the combination of a quality pasture or crop; an excellent fermentation; excellent harvest, storage and feed-out management.



Your ultimate goal for your stack or bales is to completely eliminate oxygen and keep it out, creating an environment where a good fermentation can take place.

During good fermentation plant sugars are converted into lactic acid by the **right strains** of lactic acid producing bacteria working in **oxygen-free conditions**.

Yeasts and moulds grow in the presence of air. They make silage heat and decrease the quality and the quantity of the silage available for feeding. Oxygen-free conditions are achieved by compacting air out of the silage and keeping it out.

Why is silage quality important?

1. **Time of feeding.** High energy, high protein pasture silage can be fed year-round and is an excellent feed for milkers. If you make poor quality silage it is at best a filler for dry cows.
2. **Milk response rate**. Research conducted by Kevin MacDonald at DairyNZ showed that high quality pasture silage fed in the spring, summer or autumn produced an average of 0.22 kg MS/cow/day more than poor quality pasture silage.
3. **Palatability/wastage**. Wastage is a big cost associated with supplementary feeds. Feed-out wastage is the most costly form of wastage because you have already paid for the feed, paid to store it and paid to feed it out. Silage that is badly fermented (e.g. butyric and smells like vomit) will have higher wastage rates.
4. **Animal health concerns**. Some silage moulds can produce toxins and cause ill thrift, fungal abortions, pneumonia and reduced production. A little bit of some moulds can cause a big problem and large animal health bills.

5. **Cost per MJME**. High quality pasture silage costs about as much to make as poor quality pasture silage. High quality silage has a lower cost per MJME and gives a much better return.

Key steps to making high quality pasture silage

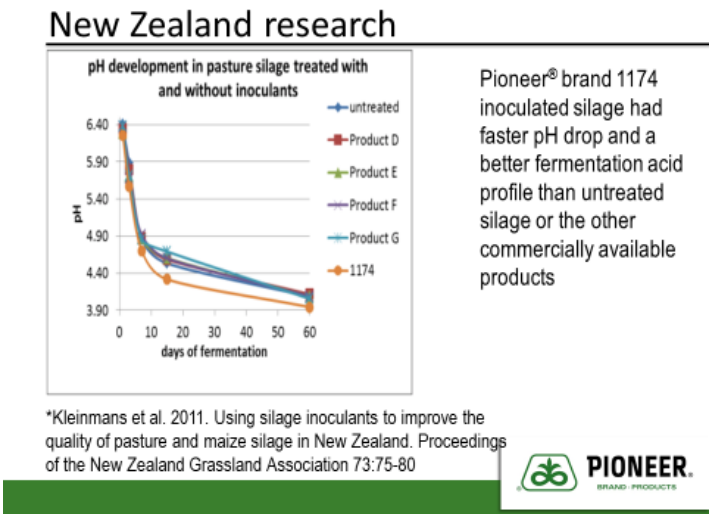
1. **Harvest at the correct time.** Harvest no later than 35-40 days after the last grazing, or when a maximum of 10% of the ryegrass seed heads have emerged.
2. **Wilt to at least 25% dry matter for stacked silage or 30% dry matter for bales**[1]. Wilting concentrates the sugar and increases the chance of a good fermentation. It also decreases the risk of silage effluent losses. Silage effluent contains valuable nutrients and is also a powerful agricultural pollutant. Where possible wilt within 24 hours.
3. **Avoid getting dirt in the silage**. Avoid effluent application to paddocks that have been closed for silage. Make sure the cutter bar does not scalp the paddock.
4. **Use a quality silage inoculant.** Research has shown inoculants can give good returns because they reduce fermentation losses and produce higher quality silage.
5. **Compaction and sealing.** For stacked silage, spread into 100-150 mm layers and compact until the surface is firm. Use a high quality plastic cover and weigh it down with tyres that are touching. Seal the edges with sand or lime. For baled silage use quality plastic and the recommended number of wraps.
6. **Careful storage and feed-out management.** Handle bales carefully to avoid puncturing the wrap. Mend holes that develop in the silage cover or bale wrap immediately. Feed out stacked silage carefully – do not loosen the silage face more than you need.

Silage inoculants – do they work?

Silage inoculants contain specially selected strains of lactic-acid producing bacteria. When applied to the crop at harvest time these bacteria outcompete the naturally-occurring bacteria improving the speed and quality of fermentation. There are a number of things you must consider when purchasing an inoculant:

- Always look for a product that provides 100,000 colony forming units (cfu) per gram of forage.
- The bacteria must be live – so look for a company which has a good quality control programme in place.
- Ask for product-specific trial data – not all products work.
- Choose a company that understands silage making and can provide comprehensive technical back-up.

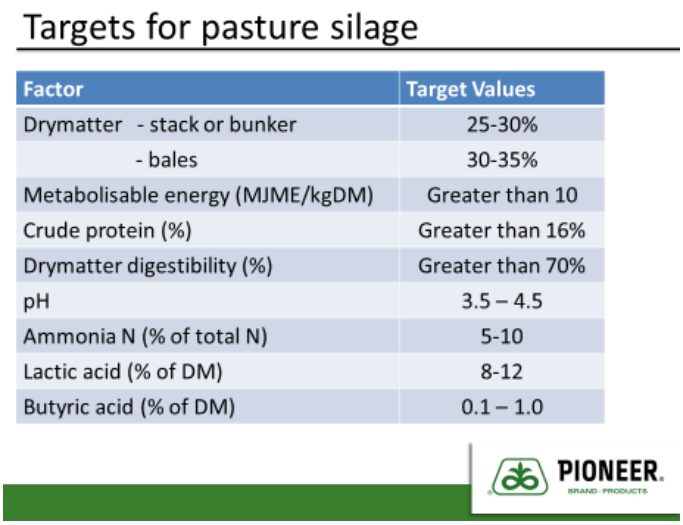
[1] Some balers may require higher dry matter levels for baling.



Products like Pioneer® brand 1127 give a return on investment of about $2.50 per dollar invested at the current milksolids payout.

Goals for pasture silage

Always test your pasture silage. It will help you determine when you should feed it and how much to feed. It will also help you to determine what you have done right or wrong, so you can modify your management next spring. Goals for pasture silage are shown in the table below:



Factor	Target Values
Drymatter - stack or bunker	25-30%
- bales	30-35%
Metabolisable energy (MJME/kgDM)	Greater than 10
Crude protein (%)	Greater than 16%
Drymatter digestibility (%)	Greater than 70%
pH	3.5 – 4.5
Ammonia N (% of total N)	5-10
Lactic acid (% of DM)	8-12
Butyric acid (% of DM)	0.1 – 1.0

pH is a measure of the silage's acidity. Silage that has a low pH will be more stable and less prone to the growth of undesireable microorganisms.

Ammonia nitrogen is a measure of how much protein has broken down during the fermentation. Lower levels are better because you want to keep nitrogen in the form of amino acids which your herd can use for milk production or body condition score gain.

Lactic acid is the most desirable fermentation acid. The smell of your silage can tell you a lot about the fermentation pathway. Lactic silages have a molasses or slight tobacco odour. Silages which smell like vinegar (acetic), vomit (butyric), alcohol or yeast have not gone down a desireable fermentation pathway.