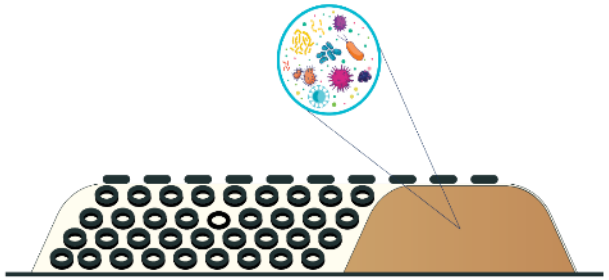
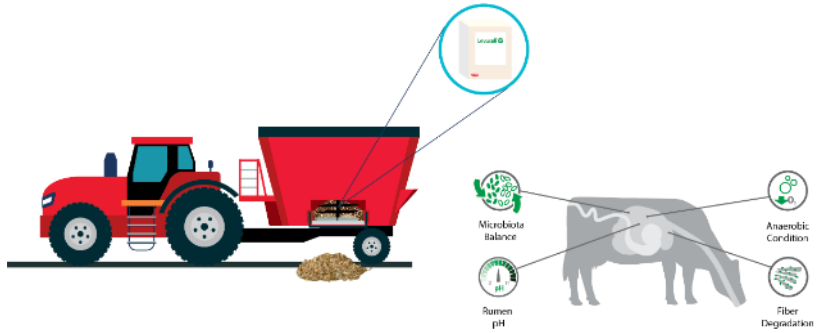
Silage produced with more efficient and sustainable methods can deliver high quality fodder for livestock.

David Lewis





Topics

- Silage management – creating efficiencies and feeding more
- Silage product technology creating better forage outcomes
- Silage machinery technology how we can it benefit from it
- Fodder packaging and plastic use reduction
- Feed hygiene

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What is peoples memory of silage as first impressions count

SMELL

LOOK

TOO MANY TYRES (WILDLIFE)

WASTE

EXPENSIVE

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Too many people still picture this as the image of silage!

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Baled silage shouldn’t be this sad!

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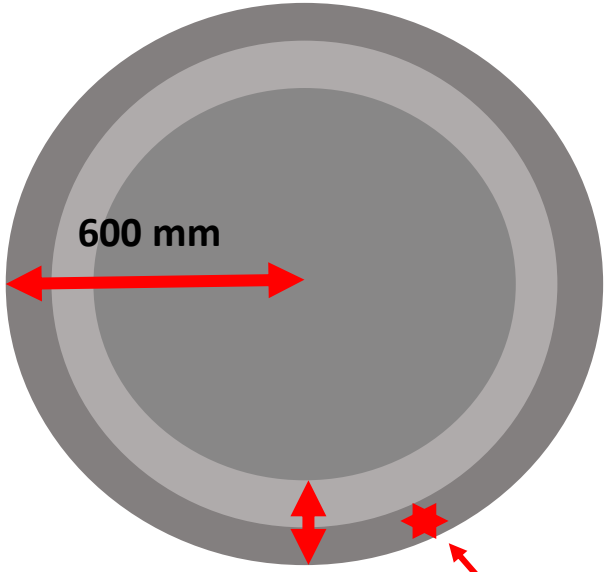

50% of the silage in a bale is in outer 125 mm

25% of the silage in a 1.2m bale is in outer 57

Bale looks okay however 9 litres less milk calculated from the bale on the left

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Dairy cow nutrition is only as good as the forages you make

88% of dairy farmers use silage
Over 10% less grass grazed over the last decade that's been replaced with conserved forages

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Magnitude of DM losses from different levels of silage management

Losses From	Excellent	Average	Poor
Respiration	< 1%	< 2%	> 5-10%
Fermentation	< 3%	3-5%	10-15%
Seepage	0%	< 1%	>5
Storage (aerobic)	3-5%	5-6%	>10-30%
Total	**8-10%**	**11-15%**	**20-40%**

You must start excellent to finish excellent!

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Forage without air = Silage

High Oxygen Barrier film **

Forage plus air = Compost

Conventional PE film

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Specific strain technology for Forage inoculant

Specific strain bacteria for silage

- Latest strain technology has less DM loss with faster fermentation than previous strains
- More efficient fermentations, less heat, more feed value retained
- Rapidly inhibit spoilage organisms – feed silage safer sooner
- Increased aerobic stability at 15 days of fermentation above previous strains at 30 to 45 days
- Increased storage life in the bunker or bale

Specific enzymes combined with bacteria to treat silage

- Improve the supply of plant sugars for acidifying bacteria
- Ideal for low DM and low sugar forages
- Significant improvement in NDF digestibility when applied to grass silage.

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Machinery technology

- Preparation machinery – controls quality in wilted silages
- Density – balers and bulk silage
- Processing of grain and plant material to benefit rumen and digestion
- Moisture testing live onboard in machines
- NIR analysis onboard in machines
- Tools to measure and manage more available and easy to use in the field
- Telematics live from silage harvesting machinery to your phone
  - DM, starch and yield mapping and more
- Feed and silage analysis more available and uniform
- Feed and ration software continues to improve

Some of the above technology has been around for years yet is still not used to its full potential to make proactive silage decisions at harvest time that can impact next years milk production

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Sealing and protecting

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Silage plastic film evolution

- Silage films have a range of different ingredients and construction
  - Film construction can be 3, 5, 7, 9, 11-layer extrusion
  - Different ingredients in plastic films - PE, Metallocene Poly Amide, EVOH

- What's the difference?

- Strength

- Lifespan

- Oxygen Transfer Rate

- Less use of resources

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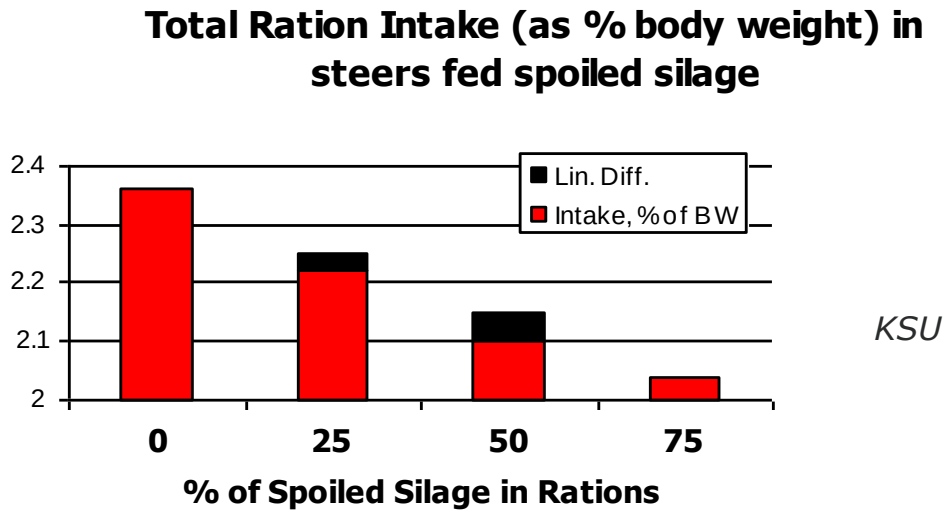
High Oxygen Barrier (HOB) sealing systems preserve and store silage for longer, maintaining the nutritive value

- 100 times less oxygen transfer than regular PE films
- Reduce DM losses in top 1m of silage by 10%
- Feeding spoiled silage reduces DM Intake
- A very small amount of spoiled feed has a major impact on feed intake

  The first little bit has the most impact on performance



KSU 2001, Professor Keith Bolsen and Dr Lance Whitlock

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Feed Hygiene - Remove spoilage before feeding

Your livestock will thank you

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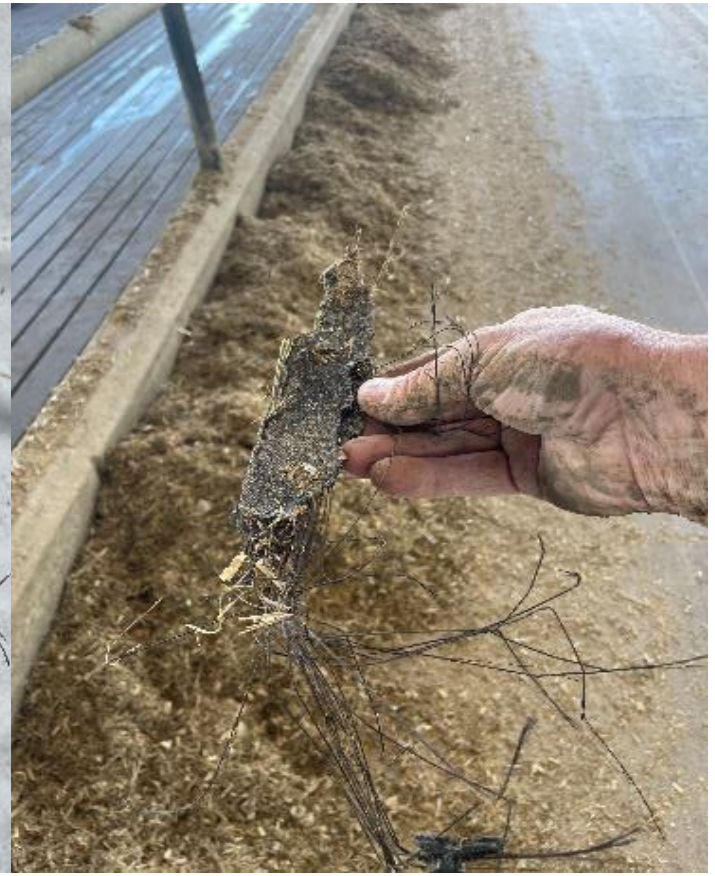
Feed hygiene - Tyres wear out and are a risk to feed and animals



Segregate damaged tyres to a not to be used pile or recycle

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Fodder packaging – where does it go?

- 8,800 tonnes of plastic for fodder used per annum
  - 6,700 tonne bale film
  - 2,100 tonne pit covers
  - 477 tonne net wrap
  - 163 tonne twine

- Very little is currently recycled
  - 40% to 60% is burnt or buried on farm
  - 25% to 40% is landfilled

Dairy Australia

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Plastic use - Baled silage

- Baled silage can consume up to 1 kg to1.5 kg plastic per bale
  - Depending on crop type, moisture, density, % stretch and the number of layers applied

- Options we can use to reduce plastic use
  - Increase bale density and/or bale size
  - Moving wrappers from 55% stretch to 70% stretch with quality film
  - Inline wrapping to reduce film use
  - Net wrap replacement film

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Plastic use - Bulk silage

- Single and 2 layers of conventional PE plastic on silage piles can use - 500g to 1 kg of plastic per DMt

- Reusable woven 100% UV protection covers*, can reduce plastic use by swapping out the single-use PE film and combining with high oxygen barrier film to protect silage.
- High Oxygen Barrier film** – 200g to 250g per DMt

*SilageKeeper UV covers
** SILOSTOP Orange

Transitioning from baled to bulk silage made possible

Improved conservation, storage and face management technologies allow

- Less losses from the open silage face with low feed out rates than previous
- Provides pre processed and ready to feed silage for a mixer or wagon
- Reduce plastic use, cost and disposal
- Deliver more homogenous silage to the herd

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Summary

- Quality hygienic and efficient silage production is very achievable
- Quality silage drives production and efficiency from crop to the cow
  - Aim for ZERO visible waste – utilise the latest technology in inoculants and high oxygen barrier film
  - Aim to minimise invisible losses with challenge specific forage Inoculant accurately to control the fermentation
- Focus on all steps to measure and manage the silage process
  - Arm your silage team with:
    - Right information, skills and suitable tools

Optimize and use technology available to drive efficiency and sustainability in your forage system

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