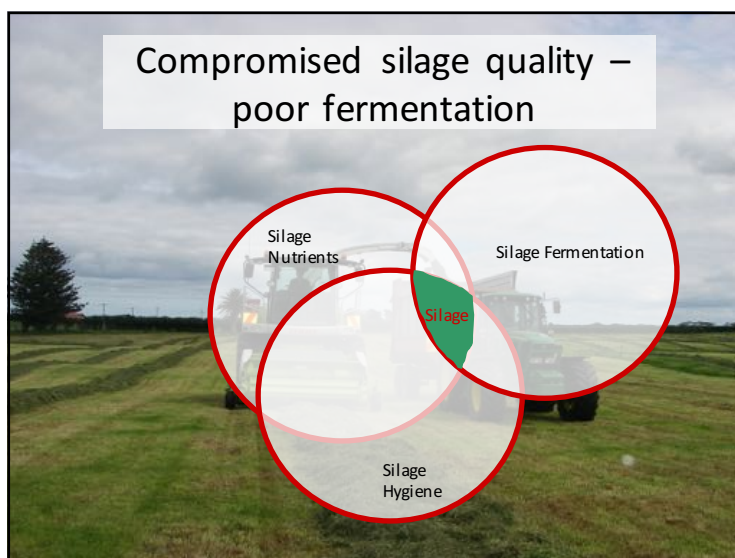
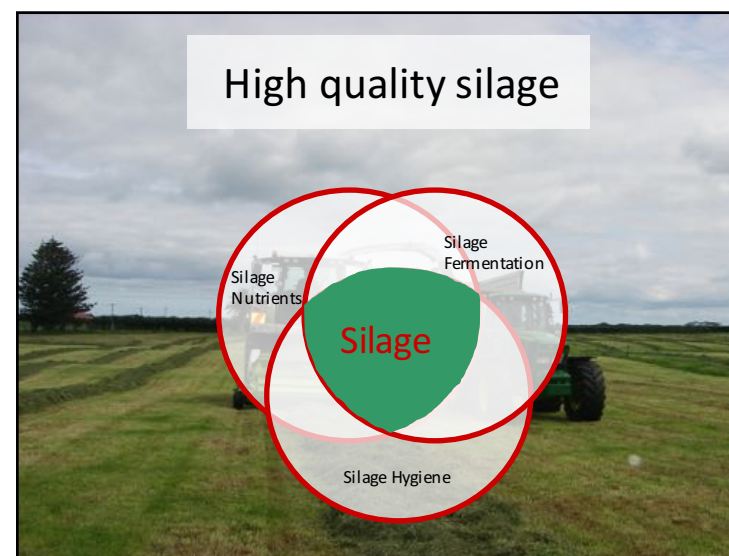
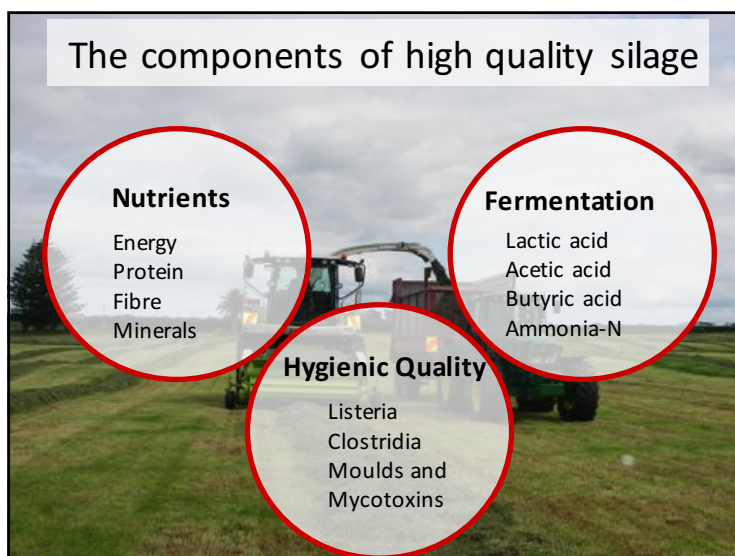




Key Nutritional Principles for Profitable Dairy Farming

Ensuring your silage is fit for purpose
Trish Lewis

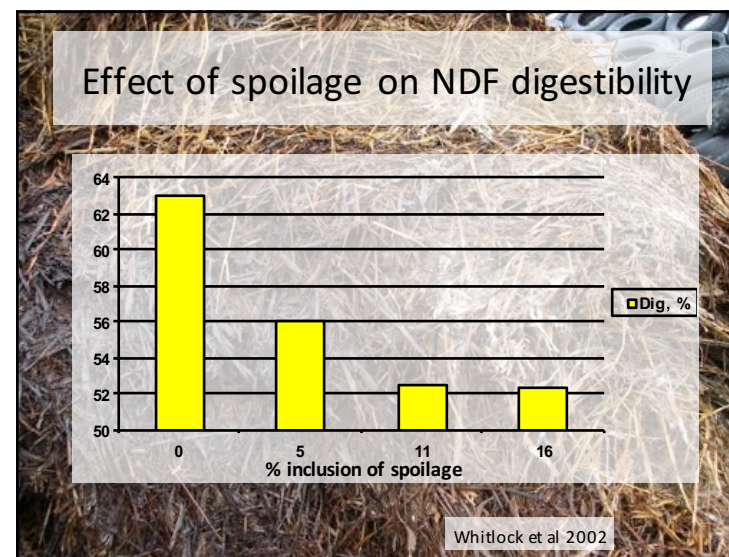
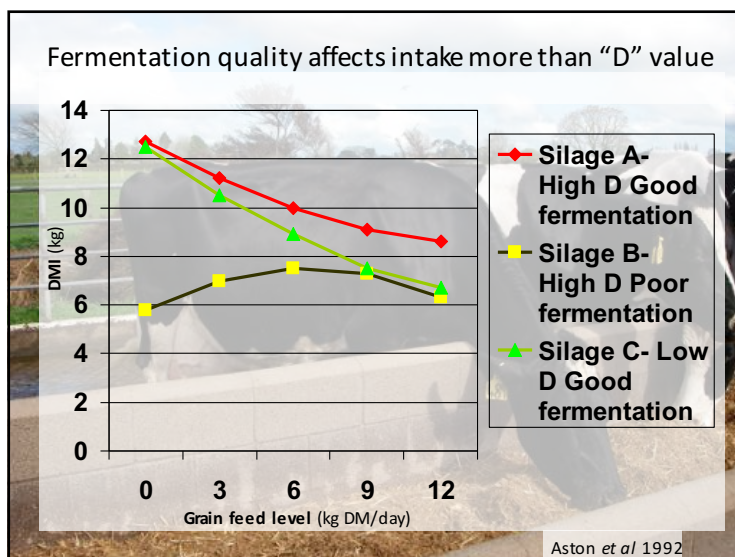




Effect of silage management on silage performance

	A High D Good F	B High D Bad F	C Low D Good F
DM %	24.3	22.6	24.8
D Value	75.6	77.4	64.5
Crude Protein (% DM)	19.0	19.6	13.5
pH	3.9	3.9	4.1
Lactic acid (g/kg DM)	109	112	71
Acetic acid (g/kg DM)	25	40	14
Ammonia-N (g/kg Total-N)	118	132	115

Aston *et al* 1992



Dry matter losses

Potential losses during ensiling	%
Wilting	2-5
Respiration	1-2
Fermentation	3-8
Effluent	0-7
Surface wastage	1-10
Aerobic deterioration	1-10
Total Losses	8-30+

The physical difference

Grass silage	Good silage	Poor silage
% losses	10	25
Dry matter %	30	28
ME (MJ/kgDM)	11	9
True protein %	70	30
pH	4	5
Ammonia N	2	14
Lactic acid %	8	3

The financial difference

For a stack of 500 tonnes DM of grass ensiled and fed to milking cows :-

Good silage	Poor silage
70,000 kg MS worth \$280,000*	48,000 kg MS worth \$192,000*

\$88,000 more milk

* At \$4/kg milk solid

Silage making critical control points

- Cutting
 - Timing
 - Mower height
 - Chop length
- Additive application
- Wilting
- Compaction
- Sealing
- Pest control
- Feed out management



Chop length – to achieve good compaction

DM of silage	Ideal chop length
>32%	2.5cm
28-32%	2.5-5cm
22-28%	8cm
<22%	8-10cm

Source: Dave Davies, Silage Solutions



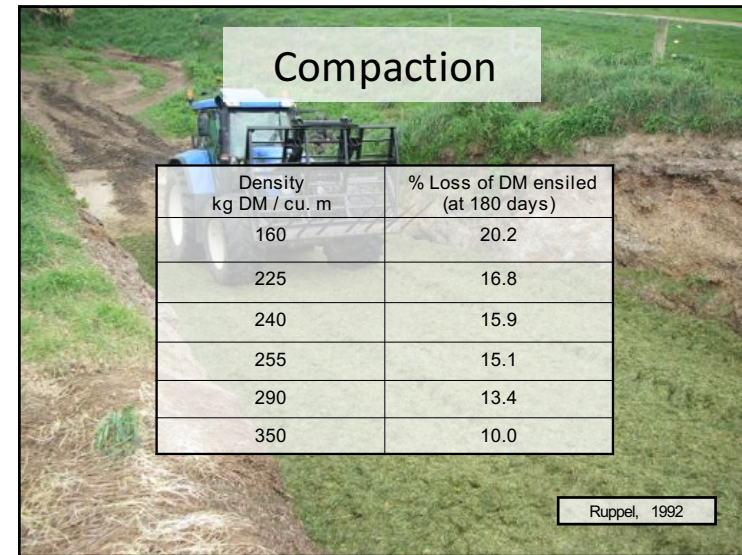
Additives

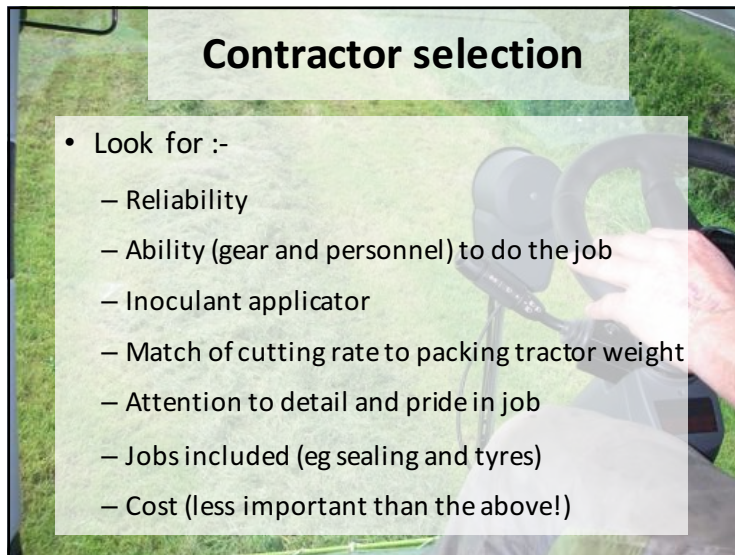
- Fermentation enhancing inoculants
 - Contain lactic acid producing bacteria
 - Speed up fermentation and reduce DM losses
 - Reduce risk when ensiling in challenging conditions
- Preservation inoculants
 - Contain *L. Buchneri* bacteria
 - Reduce mould growth and heating at feed out
- Chemical preservatives
- Salt

Additive selection

- Type of additive
- Supplier
 - Research work
 - Local support
 - Reliability and evenness of application
 - Cost









Nets

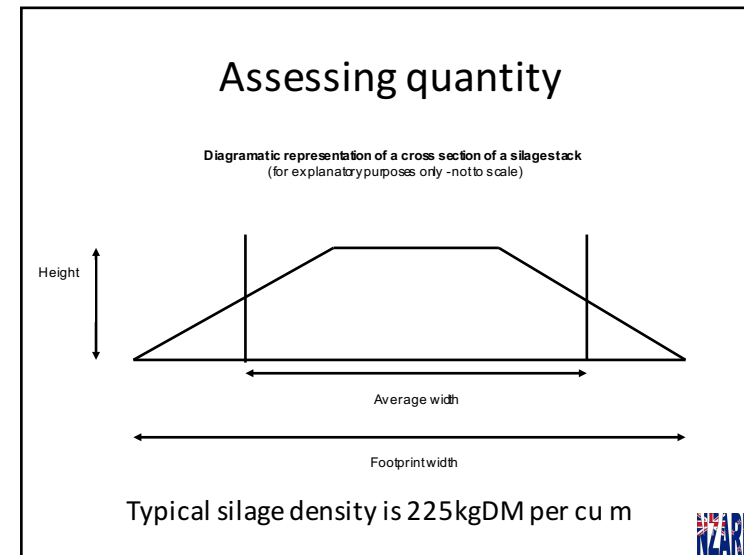




Silage assessment

Why?

- To assess how much there is to feed
- To assess the nutritional quality
- To assess the likely intake
- To validate analyses, if done
- To aid in decision making
 - Which silage to feed when
 - What is needed to balance the diet



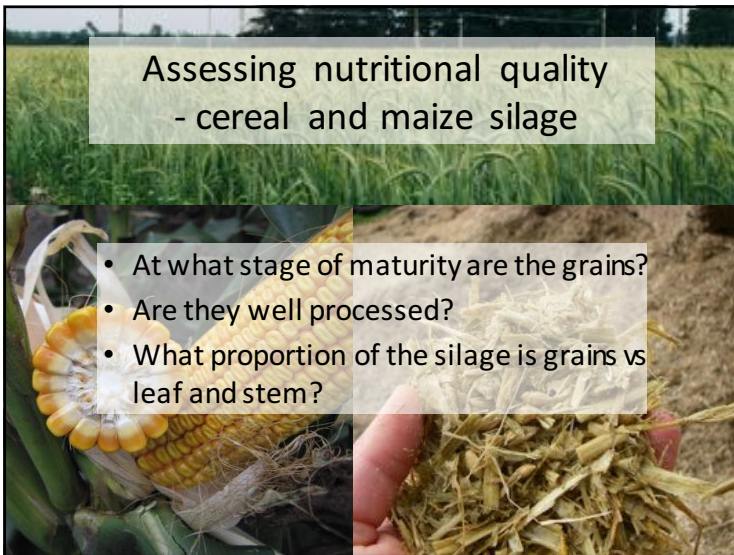
Deduct a % for wastage



Assessing nutritional quality - grass and lucerne silage

- What is the leaf to stem ratio?
- Are seed heads or flower buds/blooms present?
- How much?
- Is there clover in the grass?
- Are there weeds or inferior grasses present?

Assessing nutritional quality - cereal and maize silage



- At what stage of maturity are the grains?
- Are they well processed?
- What proportion of the silage is grains vs leaf and stem?

Assessing dry matter

- Amount of squeezing

– Juice runs easily	<20%
– Juice runs when squeezed hard	20-25%
– Juice drips or hand moist	25-30%
- Ball shape

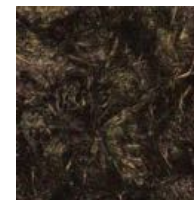
– Ball retains its shape but no juice	30-35%
– Ball slowly falls apart	35-40%
– Ball rapidly falls apart	>40%



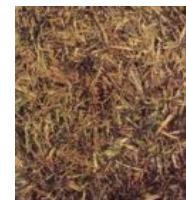
Assessing fermentation quality



Overheated



Butyric



Well fermented

LOOK

FEEL

SMELL



Features of a heated grass silage



- The silage smells like caramel or tobacco
- The colour is brown
- There is considerable shrinkage
- Stock find the silage palatable but do not perform well on it
- There is greater risk of mould growth



Features of a butyric grass silage



- The silage smells putrid
- If you touch the silage, the smell lingers on your hands after washing
- The colour is dark olive green to black
- There is considerable shrinkage
- Stock find the silage very unpalatable and do not perform well on it



Features of a well fermented grass silage

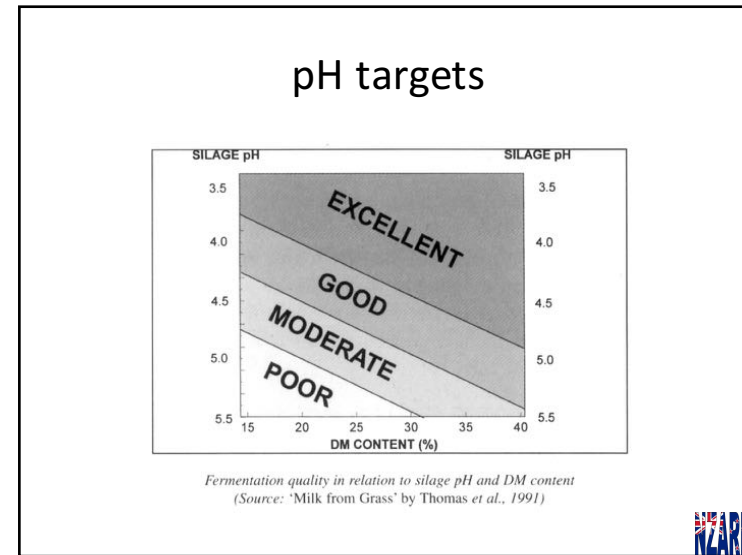


- The silage smells sweet
- There is no sharp acidic or ammonia smell
- The colour is green to golden brown
- Leaves are flat, not shriveled
- There is very little waste on the top and sides of a stack, or outside of a bale
- Stock consume with gusto, leaving little behind



Smells

- Lactic acid smells like natural yoghurt
- Acetic acid smells like vinegar
- Butyric acid smells putrid
- Ammonia smells like bleach

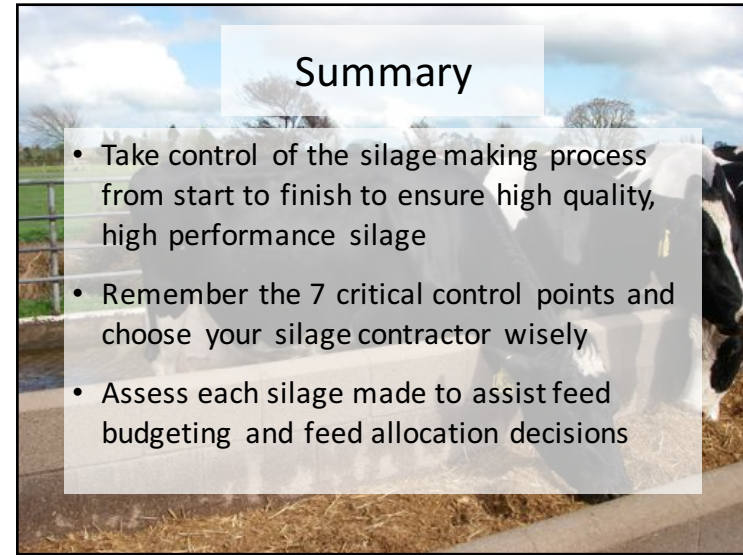


This includes heating



Summary

- Take control of the silage making process from start to finish to ensure high quality, high performance silage
- Remember the 7 critical control points and choose your silage contractor wisely
- Assess each silage made to assist feed budgeting and feed allocation decisions

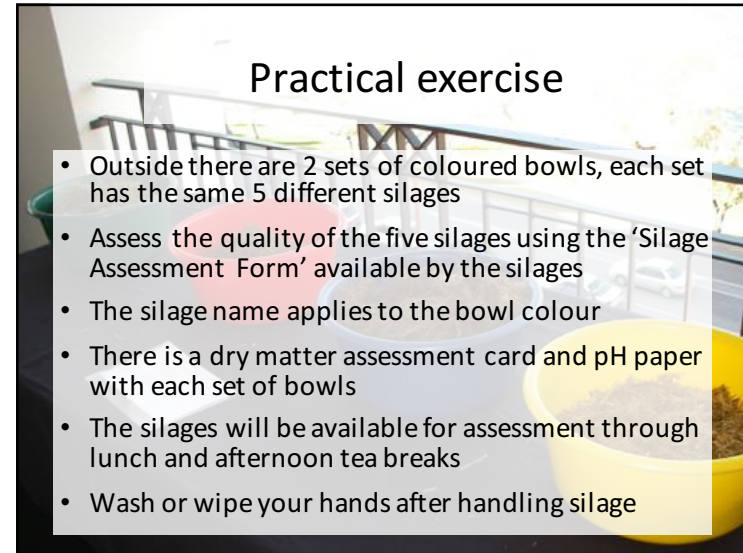


Questions



Practical exercise

- Outside there are 2 sets of coloured bowls, each set has the same 5 different silages
- Assess the quality of the five silages using the 'Silage Assessment Form' available by the silages
- The silage name applies to the bowl colour
- There is a dry matter assessment card and pH paper with each set of bowls
- The silages will be available for assessment through lunch and afternoon tea breaks
- Wash or wipe your hands after handling silage



Assesments

CHARACTERISTIC	SCORING	Dark Green	Light Green	Blue	Yellow	Brown
CROP TYPE	Enter grass, maize etc					
<u>PHYSICAL</u>						
COLOUR	1 (Ideal) to 5 (Poor Fermentation)					
SMELL	1 (Ideal) to 5 (Poor Fermentation)					
DRY MATTER %	Enter dry matter % estimate					
<u>FERMENTATION and INTAKE</u>						
pH	Measure with indicator strip supplied					
AMMONIA LEVEL	1 (Low/Ideal) to 5 (V High/bad smell)					
OVERALL FERMENTATION QUALITY	1 (Ideal) to 5 (Poor)					
LEAF: STALK RATIO	1 (Young/Leafy) to 5 (Old very stemmy)					
GRAIN:LEAF/STEM RATIO	1 (high grain %) to 5 (low grain quantity/%)					
ANIMAL INTAKE POTENTIAL	1 High to 5 Low					
OVERALL POTENTIAL ANIMAL PERFORMANCE RANKING	1 to 5 1 = The highest 5 = The lowest					

