

A Comparison of the Nutritive Value of Cavalcade legume pasture and Pangola grass pasture preserved as silage or hay

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Experiment Location

This small study was conducted at Humpty Doo, approximately 40 km South East of Darwin, Northern Territory, Australia (12° 24' S, 131° 15' E). The area receives a mean annual rainfall between 1500-2000mm, 80% of which falls in the four months between December 1st and March 31st.

Description of the Experiment

The nutritive values of Cavalcade legume (*Centrosema pascuorum*) and Pangola grass (*Digitaria eriantha*) pastures were compared with the nutritive values of the same pastures preserved as 7 month old hays and silages. The pastures were harvested (Cavalcade by slashing and Pangola using a disc mower) and wilted under field conditions to obtain forage with dry matter contents ranging from 221 - 865 g kg⁻¹. The wilted pastures were made into small cylindrical bales (800mm long x 450mm wide) which were either wrapped in plastic film for preservation as

silage, or left unwrapped as hay. Each bale was sampled and analysed for nutritive content (DM, DDM, ME, and CP). At harvest the Cavalcade and Pangola pastures were 125 days and 45 days old respectively.

The results are given in Table 1 and Table 2 (This data is the nutritive values of the silages and hays after 7 months storage. This corresponded to a complete Dry Season. Other data is available on request showing the nutritive values of the silages and hays at the time of formation (ie at the beginning of the storage period)

Table 1. A Comparison of the Nutritive Value of Cavalcade legume pasture preserved as wilted silage or hay

Cavalcade legume				
	Pasture	Silage		Hay
		Wilted	Heavily Wilted	
DM (%)	23.3	41.4	61.8	92.2
Digestibility (%DM)	55.1	53.4	50.1	42.5
ME (MJ/kg DM)	8.2	7.8	7.3	6.1
CP (%DM)	20.4	16.1	16.1	13.1
Bale Weight (kg)		25.7	15.9	9.7
pH		4.50	4.60	
Ethanol		2.49	1.44	
Acetic acid		13.99	5.10	
Butyric acid		1.79	0.34	
Lactic acid		16.61	13.44	
Ammonia N (g/kg TN)		52.30	32.20	

Units for ethanol, and Acetic, Butyric, and Lactic acids are g / kg DM

The nutritive values of the Cavalcade forage and the Pangola grass reduced as DM content increased, but nutritive contents during storage were maintained. Silages had better nutritive value than hays. Silage quality was good. The Cavalcade silage had high lactic acid contents, lower acetic and minor butyric acid production being associated with low pH. Spoilage was generally low (11.5 %). In the Pangola grass silage the main fermentation product was ethanol, but the silage quality was still good with lactic acid contents higher than acetic acid content, minor butyric acid production being associated with high pH (4.95). Spoilage was consistently low (2.82%). Ammonia-N production, which was always less than 60 g kg⁻¹ Total N, was highest for low DM content silages for both species.

Table 2. A Comparison of the Nutritive Value of Pangola grass pasture preserved as wilted silage or hay

Pangola grass					
	Pasture	Silage			Hay
		Minimum Wilt	Wilted	Heavily Wilted	
DM (%)	22.1	44.3	55.4	63.7	91.9
Digestibility (%DM)	59.8	60.8	57.0	55.5	48.7
ME (MJ/kg DM)	9.0	9.0	8.4	8.1	7.1
CP (%DM)	13.0	10.7	10.8	11.3	9.8
Bale Weight (kg)		24.8	22.3	18.4	10.7
pH		4.50	4.90	5.40	
Ethanol		16.27	12.52	7.38	
Acetic acid		4.12	1.87	1.30	
Butyric acid		0.45	0.06	0.04	
Lactic acid		11.74	5.05	2.52	
Ammonia N (g/kg TN)		40.00	30.70	28.90	

Units for ethanol, and Acetic, Butyric, and Lactic acids are g / kg DM