EFFECT OF AEROBIC DETERIORATION ON CHEMICAL COMPOSITION AND FEEDING VALUE OF SILAGE FOR MILK PRODUCTION

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In addition to losses of silage dry matter during storage, nutrient losses can arise from secondary aerobic fermentation when silage is exposed to air during feeding. The magnitude of these losses from wilted pasture silage and their effects on the feeding value of silage for milk production has not been measured under Australian conditions.

Silage samples were collected from silage bunkers, stacks and pits on 15 commercial dairy farms in Gippsland, Victoria. One half of each sample of fresh silage was immediately oven dried at 65°C while the remaining silage was exposed to air at room temperature for 96 hours to simulate stale silage. Chemical analysis of these samples revealed significant ($P < 0.05$) changes had occurred : dry matter (DM) 32.8, 35.5%; digestible dry matter (DDM) 63.1, 61.9%; water soluble carbohydrate (WSC) 1.94, 1.55%; total nitrogen (TN) 2.40, 2.62% and pH 4.73, 5.32 in fresh and stale silage respectively.

To assess whether a chemical change due to secondary aerobic fermentation affects the feeding value of silage for milk production we carried out the following experiment. Six sets of identical twin Friesian x Jersey cows in late lactation were individually fed in stalls a diet of 25% perennial ryegrass pasture (DDM 70%; N 2.4%) and 75% silage for 2 weeks. One twin of each set was offered "stale" silage which had been removed from the silage stack, placed on a concrete floor, under cover, and exposed to air for 48 hours; the co-twin was offered "fresh" silage which was removed from the same stack and offered immediately. The chemical composition of the "fresh" and "stale" silages were respectively : DM 35.3%, 33.9; DDM % 69.5, 65.6; water soluble carbohydrate % 1.5, 1.0; total nitrogen % 2.8, 2.8 and pH 4.28, 4.32.

Table 1. Feed intake and milk production of cows fed "fresh" and "stale" silage

	Fresh silage	Stale silage	L.S.D. P=0.05
Pasture intake (kg/cow/day)	3.0	3.1	0.3
Silage intake (kg/cow/day)	10.2	10.2	0.9
Milk (L/cow/day)	10.2	9.2	1.5
Milk fat (g/cow/day)	461	435	46
Milk protein (g/cow/day)	357	327	52

Secondary aerobic fermentation caused minor changes in silage nutrient content. Although milk yield was 10% higher with "fresh" silage this was not significant.

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