Supplementing dairy cows in late lactation with high quality silages

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Introduction Agriculture on the Canterbury Plains of New Zealand is a mixture of integrated cropping and pastoral enterprises. Cropping farmers often provide supplementary feed for dairy farmers by growing forages for high quality silage. Such silages can improve milk production by increasing dry matter (DM) intake and/or by alleviating deficiencies of either soluble carbohydrate or protein in pasture (Woodward *et al.,* 2002). Legumes and/or cereals have potential to make large quantities of high quality silage (de Ruiter *et al.,* 2002). This trial aimed to determine milk production and composition differences between three silages fed during late lactation.

Materials and methods In April 2003, three groups of 20 cows (balanced for production, calving date and age) were selected from a 220-cow dairy farm on the Canterbury Plains, New Zealand. The cows consumed 12 kg DM/hd per d of perennial ryegrass/white clover (RGC) pasture. In addition, each group was allocated 5 kg DM/hd per d of silage made from either RGC pasture, whole-crop (WC) triticale (cv. *DoubleTake*) or triticale (cv. *DoubleTake*)/forage pea (cv. *Magnus*). Silages were fed in troughs (with nil wastage) for 34 d. The silages were made as large plastic-wrapped square bales. The triticale silage was cut at the "cheesy dough" stage and the triticale/pea silage was cut when the pods were beginning to fill. Cows were milked twice daily and weighed at the start and end of the trial. Milk yield and composition were measured weekly. Individual cows were treated as replicates. Several forage quality traits were determined for the silages and green pasture (FeedTECH, AgResearch, New Zealand).

Results There were no significant differences in milk yield, composition or live weight gain of cows fed either RGC pasture, WC triticale or triticale/pea silage (Table 1). Triticale/pea silage and green RGC pasture were significantly higher in crude protein (CP) than WC triticale and RGC pasture silage (Table 2). WC triticale silage had higher organic matter digestibility (OMD), soluble sugars/starch (SSS) and metabolisable energy (ME) than the other silages and green RGC pasture.

Table 1 Daily milk production, composition and live weight gain of cows supplemented with three different silages

	Vol. *(l)*	Solids *(kg)*	Fat *(%)*	Prot. *(%)*	LWG *(kg)*
RGC pas.	20.1	1.58	4.40	3.59	0.70
WC Trit.	20.0	1.58	4.48	3.59	0.54
Trit./pea	20.0	1.60	4.55	3.62	0.78
LSD(5%)	1.20	0.09	0.21	0.10	0.36

Table 2 Composition of three silages and fresh green RGC pasture fed to cows in the trial

	CP *(%)*	OMD *(%)*	NDF *(%)*	SSS *(%)*	ME *(MJ/kg)*
RGC pas.	11.3	63.9	59.7	9.1	10.2
WC Trit.	11.8	68.5	48.5	27.1	11.0
Trit./pea	17.2	64.8	54.2	2.3	10.4
Fr. green	18.2	65.7	46.4	8.9	9.9
LSD(5%)	1.7	1.5	3.4	3.0	0.3

NDF: neutral detergent fibre

Conclusions In this trial highly nutritious cereal and cereal/legume silages did not improve milk production during late lactation. The most probable reason for this was that the non-improved forage (RGC pasture and pasture silage) was of high enough quality to meet cow requirements for energy and protein. Greater productivity gains from feeding the alternative silages examined here are more likely to be achieved in situations where pasture quality deteriorates over summer and autumn. In Canterbury this is most likely to occur on farms without irrigation or those that have irrigation restrictions during late summer/autumn.

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References

de Ruiter, J.M., R. Hanson, A.S. Hay, K.W. Armstrong & R.D. Harrison Kirk (2002). Whole-crop cereals for grazing and silage: balancing quality and quantity. *Proceedings of the New Zealand Grassland Association*, 64, 181-189.

Woodward, S.L., A.V. Chaves, G.C. Waghorn & P.G. Laboyrie (2002). Supplementing pasture-fed dairy cows with pasture silage, maize silage, Lotus silage or sulla silage in summer - does it increase production? *Proceedings of the New Zealand Grassland Association*, 64, 85-89.