

Seasonal perennial ryegrass nutritive characteristics: northern Victoria

Understanding seasonal supply of nutrients from perennial ryegrass can aid in the formulation of optimal diets for grazing dairy cows.

The nutritive characteristics of perennial ryegrass (PRG) vary between seasons and influence the choice of supplementary concentrates farmers feed to their dairy herd. Farmers are already well aware of changes in key components such as dry matter, crude protein and metabolisable energy content across the four seasons. However, a better understanding of the seasonal changes in pasture nutrients can allow farmers to formulate tailored rations for grazing dairy cows to optimise milk production.

SEASONAL CHANGES IN PASTURE QUALITY

Pasture quality and quantity are affected by environmental conditions and on farm management practices. While average annual rainfall in northern Victoria is lower than the two southern regions, many farmers can combat a lack of rain through the use of irrigation. While this can encourage growth of PRG, it can also allow other species commonly found in northern Victoria, such as sedge and paspalum, to flourish.

PERENNIAL RYEGRASS CULTIVARS

There were 18 cultivars of PRG analysed for their nutritive characteristics over five growth periods in northern Victoria, including trial cultivars. Cultivars included: Abermagic AR1, Alto AR37, Arrow AR1, Avalon AR1, Banquet II Endo5, Base AR37, Bealey NEA2, Bronsyn AR1, Endure AR1, Extreme AR1, Halo AR37, Impact AR1, One50 AR37, Trojan NEA2, Victoria SE and three trial cultivars. These cultivars differed in ploidy, maturity date, and the endophyte that they contained.

PRG NUTRITIVE CHARACTERISTICS

The table on the following page gives a brief overview of the difference in nutritive characteristics between season.

Early spring

Vegetative growth of PRG in early spring in northern Victoria is characterised by high protein and fat concentrations, as well as high concentrations of phosphorus and potassium.

Late spring

Late spring pasture had declining protein concentrations, but had higher ADF, NDF and lignin concentrations, indicating its increase in maturity. Concentrations of most minerals declined in comparison with early spring pasture, excluding calcium, magnesium and sodium.

Summer

Pasture in summer had the lowest CP content compared with the other seasons, but had the highest fibre content, and had a low fat concentration. Sulphur concentrations continued to decline, and all other minerals were lower in concentration compared with late spring pasture.

Autumn

The CP content of autumn pasture, harvested after the autumn break, increased compared with the summer pasture. Fibre levels decreased, due to the vegetative state of the pasture. Fat levels increased, as did phosphorus and potassium levels in the pasture.

Winter

Winter pasture had lower protein and fibre levels compared with autumn pasture, however metabolisable energy was greatest in this season. Carbohydrate concentrations increased compared with autumn pasture, however fat levels decreased. Concentrations of all minerals declined compared with autumn pasture.

IMPLICATIONS FOR FARMERS

A greater understanding of the nutritive characteristics of PRG cultivars during each season can allow farmers in northern Victoria to optimise the diet of their cows to match the supply of nutrients from supplementary concentrates with that from the pasture.

The table below describes the nutritive characteristics of all cultivars averaged for each season, as it is more practical to formulate rations this way, and not for individual paddocks where the PRG cultivar is different. Therefore, farmers can focus on seasonal changes, however considerations need to be made for paddocks containing species other than PRG.

FURTHER INFORMATION

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ACCESSIBILITY

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Table 1. Summary of the nutritive characteristics of perennial ryegrass pasture in northern Victoria during each season

Season	ME	CP%	ADF%	NDF%	Lignin	NSC	Fat	Ca	P	Mg	K	S	Na	Cl
Early spring	11.2	23.5	24.1	42.0	2.0	9.9	4.8	0.37	0.44	0.27	4.04	0.48	0.51	1.96
Late spring	10.5	18.4	29.8	50.3	2.9	10.2	4.0	0.44	0.34	0.29	2.74	0.40	0.64	1.59
Summer	9.5	14.5	34.4	55.0	4.6	6.8	3.6	0.35	0.30	0.26	2.09	0.32	0.37	1.21
Autumn	11.1	20.5	24.6	41.1	2.4	11.6	4.3	0.32	0.43	0.22	2.85	0.27	0.37	1.31
Winter	11.7	16.8	22.8	38.8	1.8	13.8	3.6	0.30	0.37	0.18	2.70	0.23	0.28	1.10

CP = crude protein, RDP = rumen degradable protein, AD F= acid detergent fibre, NDF = neutral detergent fibre, and NSC = non-structural carbohydrates.



Figure 1. Trial site at the Mooroopna dairy farm in northern Victoria