

# Seasonal nutritive characteristics of perennial ryegrass

*Understanding the 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 fed to dairy cows. A better understanding of the seasonal changes in pasture quality can take the guesswork out of formulating tailored rations to optimise milk production.

## SEASONAL CHANGES IN PASTURE QUALITY

Climatic conditions differ in the three dairying regions of Victoria, influencing pasture supply and quality. Gippsland is generally a high rainfall, dryland farming region, as is south-west Victoria. Northern Victoria has a low annual rainfall with many farmers having access to irrigation. Along with seasonal changes, the nutritive characteristics of PRG cultivars vary in each region. Changes in pasture nutritive characteristics were tracked throughout the year in these three regions.

## PERENNIAL RYEGRASS CULTIVARS

Perennial ryegrass cultivars are either diploid or tetraploid influencing their leaf size, digestibility and palatability, which are generally improved in tetraploid cultivars. Cultivars also differ in flowering date, influencing its seasonal growth where early flowering cultivars have better growth in winter and early spring, and late flowering cultivars maintain growth into summer if managed properly. Each cultivar contains one of a number of endophytes influencing their persistence.

## NUTRITIVE CHARACTERISTICS

Nutritive characteristics of perennial ryegrass cultivars vary between season, but minimal differences between cultivar within a season or region exist. The tables on the following page give a brief overview of the differences in nutritive characteristics between seasons within each region, of PRG harvested to grazing height.



**Figure 1.** Perennial ryegrass harvested in Gippsland

## IMPLICATIONS FOR FARMERS

Better understanding of the nutritive characteristics of PRG cultivars during each season can allow farmers to match the supply of nutrients from supplementary concentrates with nutrients from the pasture, optimizing milk production.

The following tables describe the nutritive characteristics of all cultivars averaged for each season in each region, 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.

**Table 1.** Average nutritive characteristics of PRG cultivars during each season in Gippsland

Season	ME	CP	RDP	ADF	NDF	ESC	Starch	Fat	Ca	P	K	S	Na	Cl
Early spring	11.4	20.0	14.5	24.2	41.5	11.6	0.7	3.6	0.61	0.44	3.27	0.35	0.22	1.27
Late spring	10.3	11.9	8.5	29.1	50.5	8.5	0.5	2.6	0.60	0.21	1.88	0.28	0.21	1.22
Summer	10.7	15.0	10.9	25.9	45.7	9.4	0.7	4.4	0.71	0.16	2.25	0.34	0.20	1.49
Autumn	11.2	29.9	22.0	23.1	40.3	6.9	0.6	5.3	0.53	0.44	4.08	0.41	0.42	1.20
Winter	11.7	23.8	16.1	23.2	38.0	8.8	1.8	4.8	0.54	0.47	4.07	0.44	0.40	1.27

Values for ME are MJ/kg DM, all other values are %DM

**Table 2.** Average nutritive characteristics of PRG cultivars during each season in northern Victoria

Season	ME	CP	RDP	ADF	NDF	ESC	Starch	Fat	Ca	P	K	S	Na	Cl
Early spring	11.2	23.5	16.1	24.1	42.0	9.3	0.6	4.8	0.37	0.44	4.04	0.48	0.51	1.96
Late spring	10.5	18.4	13.1	29.8	50.3	9.7	0.5	4.0	0.44	0.34	2.74	0.40	0.64	1.59
Summer	9.5	14.5	10.5	34.4	55.0	6.2	0.6	3.6	0.35	0.30	2.09	0.32	0.37	1.21
Autumn	11.1	20.5	14.7	24.6	41.1	10.5	1.2	4.3	0.32	0.43	2.85	0.27	0.37	1.31
Winter	11.7	16.8	12.2	22.8	38.8	11.7	2.2	3.6	0.30	0.37	2.70	0.23	0.28	1.10

Values for ME are MJ/kg DM, all other values are %DM

**Table 3.** Average nutritive characteristics of PRG cultivars during each season in south-west Victoria

Season	ME	CP	RDP	ADF	NDF	ESC	Starch	Fat	Ca	P	K	S	Na	Cl
Early spring	11.1	18.3	12.1	25.3	44.3	9.8	0.7	4.7	0.45	0.39	3.34	0.34	0.48	1.95
Late spring	10.4	12.8	9.1	28.6	53.4	10.5	1.1	3.0	0.38	0.19	1.46	0.23	0.51	1.38
Summer	9.9	14.9	11.0	30.6	55.6	7.1	0.9	3.6	0.45	0.17	1.79	0.27	0.39	1.32
Autumn	10.7	24.1	17.3	24.0	41.6	7.9	1.0	3.8	0.36	0.32	3.26	0.40	0.62	1.75
Winter	11.5	30.9	22.8	21.6	37.2	8.7	1.8	5.0	0.33	0.48	4.20	0.52	0.48	1.42

Values for ME are MJ/kg DM, all other values are %DM

CP= crude protein, RDP= rumen degradable protein, ADF= acid detergent fibre, NDF= neutral detergent fibre, and ESC= ethanol-structural carbohydrates (sugars).

## FURTHER INFORMATION

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## ACCESSIBILITY

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