Increasing pasture intake in Partial Mixed Ration (PMR) systems using grazing management

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The three factors that drive pasture intake in PMR systems are Pre-grazing height, Pasture allocation and PMR intake.

The C4Milk team ran two trials during May and September 2018 at the Gatton Research Dairy. The trials investigated how each of the three factors influenced dry matter intake (DMI). In each experiment, cows were offered two levels of partial mixed ration (PMR), either 14 kg DM or 7 kg DM. The remaining diet was made up of lucerne pasture aiming to reach a total daily DMI of 21 kg/cow.

Typically pasture intake increases as pasture height increases, and eventually intake will decline as the pasture height becomes too extreme. The first experiment aimed to establish whether a similar pattern occurred when grazing lucerne pasture. Figure 1 (pg 7) illustrates that total DMI increased by 1.5 kg for every 5 cm increase in pre-grazing pasture height.

During this trial the lucerne did not reach pre-grazing heights beyond 40 cm and intake did not begin to decline. However, grazing lucerne that is at least 40 cm high will increase total DMI compared to lower pre-grazing pasture heights.

In the second experiment, cattle grazed lucerne at a constant pre-grazing height of approximately 40 cm. The cows were offered decreasing levels of daily pasture allocation from 50 kg DM/cow down to 5 kgDM/cow. The lower allocations were aiming to achieve very high levels of utilisation to leave a residual pasture height of 5 cm. In Figure 2 (pg 7), the post-grazing height is expressed as a percentage of the initial pasture height. It illustrates that the lowest residual the cows grazed to was 35% of the initial height, or approximately 15 cm. This indicates that cows would not graze into the stemmy material at the bottom of the plant, and consequently intake declined.

Residual pasture heights above 60% of the initial height were only achieved when an area of pasture remained ungrazed. Therefore, allocating pastures to leave some un-grazed areas will maximise total DMI and also improve diet quality as cows are not forced to graze the stemmy material.

Unlike pasture height or allocation, there was no difference in total intake between the two levels of PMR (Figure 3, pg 7), which suggests that if pasture allocation is set to a point where there is ungrazed areas, then Lucerne pasture can make up in excess of 60% of the diet without limiting DMI.

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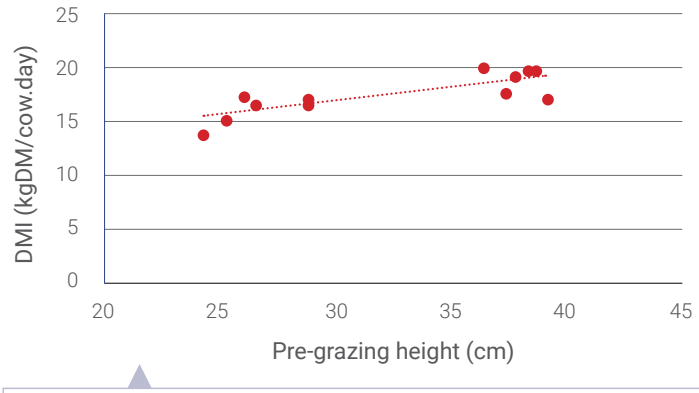

Figure 1. *The relationship between Pre-grazing pasture height and Total dry matter intake.*

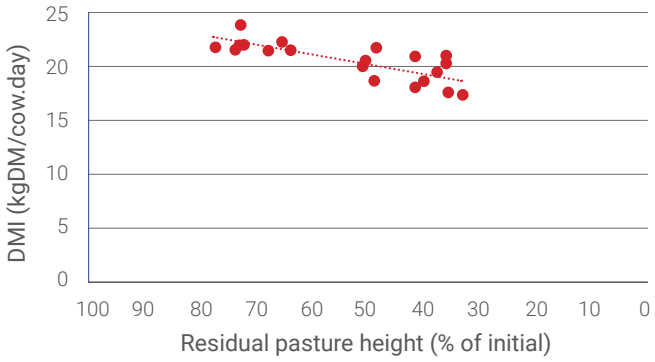

Figure 2. *The relationship between the Residual pasture height (% of the initial) and Total dry matter intake.*

The results from these experiments show:

1. Grazing lucerne pasture at a minimum of 40 cm pre-grazing height increases DMI.
2. Allocating pasture to ensure some of the paddock remains ungrazed maximises DMI and diet quality.
3. PMR level can be reduced to 7 kgDM without compromising total DMI.

Ongoing studies will aim to define how manipulating the PMR can influence pasture intake, and to investigate how these management strategies impact on the long term growth rates and persistence of lucerne pastures.

The next article published from these trials will highlight how milk production is influenced by grazing management within PMR systems.

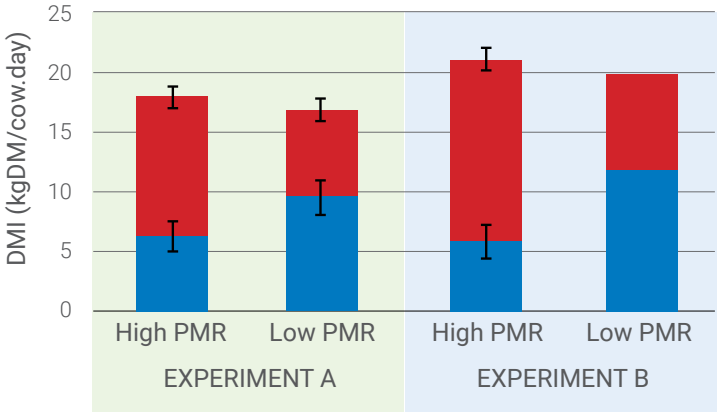

Figure 3. *Combined PMR and Pasture Intake for High and Low PMR groups from Experiments A and B.*