

# Milk production benefits of canola in partial mixed rations



## *Increasing dry matter intake and milk yield using canola meal in mixed rations.*

### KEY MESSAGES

- Adding canola meal to mixed rations and grain mixes can increase milk production.
- The increase in milk production is due largely to an increase in voluntary intake of both supplement and pasture.
- The effect appears more consistent in early lactation than late lactation.
- The effect appears only when 12 kg DM or more of total supplement is fed.

### MILK YIELD INCREASES

Experiments at Agriculture Victoria Ellinbank have shown that when solvent extracted canola meal is added to a partial mixed ration (PMR), milk production increases by up to 4 kg of energy corrected milk (ECM)/cow per day when large amounts of ration (concentrates plus forage) are offered (>12 kg DM/cow per day). This has occurred in experiments when Holstein-Friesian cows were in both early and late lactation.



In later experiments that tested the effect of adding canola to mixed rations over a wider range of supplement intake, an increase in milk yield was again seen, but only in early lactation and only when 12 kg DM/cow per day, or more, of total supplement was fed.

### HOW MUCH CANOLA?

The rations in these experiments contained approximately 21% canola meal on a DM basis. So, for 12 kg DM of total supplement, that equates to a canola intake of approximately 2.4 kg DM per cow.

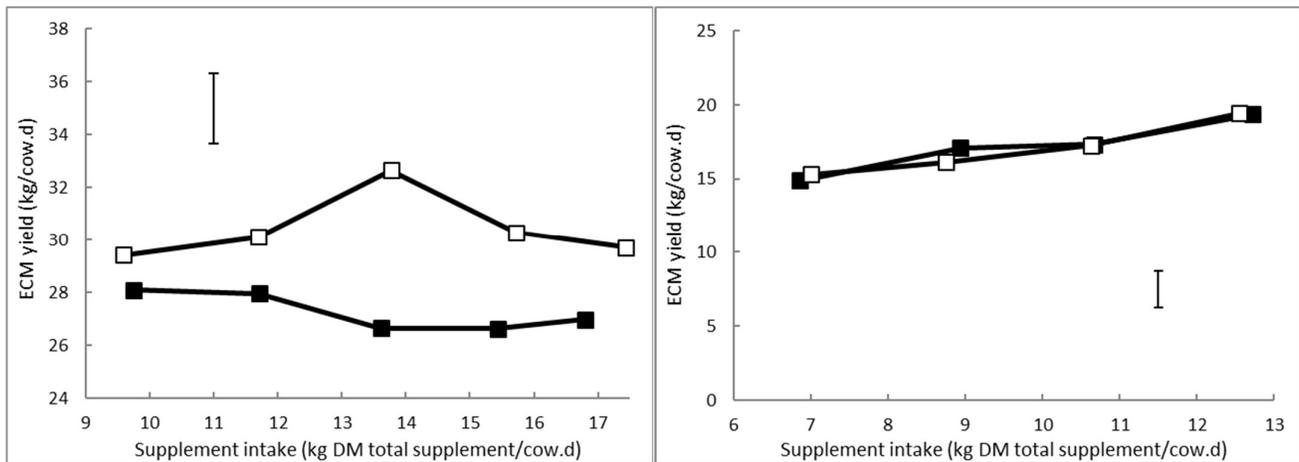
In these experiments, canola meal was generally substituted for crushed wheat grain; other components did not change. Consequently, the overall energy density of the ration was similar in both PMR's, but the protein concentration in the PMR with the canola was clearly higher than that in the PMR without canola.

### COWS EAT MORE

The milk production responses observed when cows consumed the rations containing canola were accompanied by increases in voluntary dry matter intake. Not only did cows consuming the canola consume more ration (less refusals) they were also more inclined to graze when they returned to the paddock.

In one experiment, the addition of canola to the ration resulted in cows grazing for 30 minutes longer each day, as measured using on-cow jaw movement sensors. This resulted in cows consuming 1 kg DM extra pasture each day and, consequently, reducing the substitution of supplement for pasture as is commonly observed in similar situations using cereal grain concentrates.

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**Figure 1.** Mean daily yields of energy-corrected milk (ECM) for grazing cows offered either 8, 10, 12, 14 or 16 kg DM/cow per day of the PMR (closed squares) or PMR+C (open squares) diets in spring (early lactation; left) and autumn (late lactation; right). Data are means from the 14-day measurement period. Vertical brackets represent least significant differences ( $P = 0.05$ ). Supplement intake includes some wheat grain fed in the parlor.

## POSSIBLE MECHANISMS

The mechanisms responsible for the observed increases in intake and milk production are uncertain but could include the following theories:

- Canola meal provides limiting amino acids, which increases milk yield and then the cow eats more (“pull effect”).
- There is an increased buffering capacity in the rumen because of the high protein supplement, with flow on effects of reduced variation in ruminal pH, improved digestion, reduced decline in milk fat concentration and increased intake.
- Less wheat in the diet leads to less starch digestion and a reduced production of propionate in the rumen. This in turn reduces satiety signals, the cow eats more and produces more milk.

## FURTHER INFORMATION

Dr Martin Auldust

Phone: (03) 5624 2222

Email: [martin.auldist@ecodev.vic.gov.au](mailto:martin.auldist@ecodev.vic.gov.au)

## ACCESSIBILITY

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