Replacing wheat with canola meal and maize grain in the diet of lactating dairy cows: feed intake, milk production and cow condition responses

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Short Title: Milk responses to canola meal and maize grain

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Summary

This research paper describes the effect of partially replacing wheat with maize grain and canola meal on milk production and body condition changes in early lactation dairy cows consuming a grass silage-based diet over an 83 d period. Two groups of 39 cows (Holstein Friesian) were stratified for age, parity, historical milk yield and days in milk (DIM), and offered either (i) a control diet (CON), formulated to reflect a typical summer ration in Western Australia, comprising on a DM basis (kg/cow per d); 8 kg of annual ryegrass silage, 6 kg of crushed wheat, 3.6 kg of crushed lupins and *ad libitum* lucerne haylage; or (ii) a second diet (FGM) identical to CON except the 6 kg of crushed wheat was replaced by 6 kg of a formulated concentrate mix (27% crushed wheat, 34% maize grain and 37% canola meal). Lupins were provided in equal portions twice daily in the milking parlour, while grass silage and the remaining concentrate was fed as a partial mixed ration (PMR) once daily. Lucerne haylage was provided separately to the PMR in the paddock on an *ad libitum* group basis. The FGM group had a greater mean daily DM intake (DMI; 22.5 v. 20.4 kg/cow) and a higher energy corrected milk (ECM) yield (29.2 v. 27.1 kg/cow; $P = 0.047$) than the CON cows. The difference in DMI was caused by a higher daily intake of lucerne haylage in FGM cows (4.5 v 2.3 kg/cow). The CON group had a higher concentration of milk fat (42.1 vs 39.3 g/kg; $P = 0.029$) and a tendency towards higher milk protein (30.3 vs 29.4 g/kg; $P = 0.057$) than FGM cows. Milk protein yield was greater in FGM cows ($P < 0.021$); however milk fat yield was unaffected by treatment. It is concluded that replacing wheat with canola meal and maize grain in a grass silage-based diet increases voluntary DMI of conserved forage and consequently yields of ECM and milk protein.

Keywords: dairy cows; grass silage; wheat; maize grain; canola meal