

Dry matter intake and feeding behaviour of grazing dairy cows offered a partial mixed ration with or without canola meal

*M.M. Wright, M.J. Auldist, E. Kennedy,
N. Galvin, F.R. Dunshea, & W.J. Wales*



PMR feeding systems



Partial mixed ration (PMR)
‘incorporating mixed rations into grazing systems’

- **Increased feed intakes**
- **Optimised rumen function**
- **Increased milk production responses**

(Auld et al. 2013, 2014 & 2016; Golder et al. 2014; Wales et al. 2014; Wright et al. 2014)

Background - Canola meal in PMR research

- **Increased milk production**
- **Increased pasture intakes**
- **Less supplement refused**

Auld et al. 2014 and Golder et al. 2014



Background - Canola meal

- **Increased crude protein (CP)**
- **Increased & more balanced supply of limiting AA**
- **Pull effect**
- **Physiological changes**
- **Potentially other mechanisms (pH, fat, VFAs etc....?)**



Main objective

To determine if replacing some wheat grain with canola meal in a ration would increase eating times and dry matter intake (DMI)



Materials & Methods - Dietary treatments

32 cows

PMR-C

PMR+C

Low
8 kg DM/cow.day

High
14 kg DM/cow.day

Low
8 kg DM/cow.day

High
14 kg DM/cow.day

Materials & Methods - Dietary treatments

PMR-C

CP 14.1%

Wheat
grain
60%

Lucerne
hay
22%

Maize
grain
18%

PMR+C

CP 16.2%

Wheat
grain
38%

Lucerne
hay
22%

Maize
grain
18%

Canola
+ meal
22%



Isoenergetic

Materials & Methods - Estimating individual intake

The n-alkane technique



- Dosed cows with a known amount of alkane (C_{32}) for 10 days
- Commenced sample collections on day 6-10 (feed and faeces)

Materials & Methods - Feeding behaviour



- Automated devices for ~23 hrs
- To quantify:
 - Eating times
 - Eating bouts
 - Bites (prehensions & mastications) & bite rate
 - Ruminating time
 - Ruminating mastications & boli
 - Ruminating bouts
 - Idling time

Key findings

Pasture eating time:

PMR-C
329 mins

PMR+C
362 mins



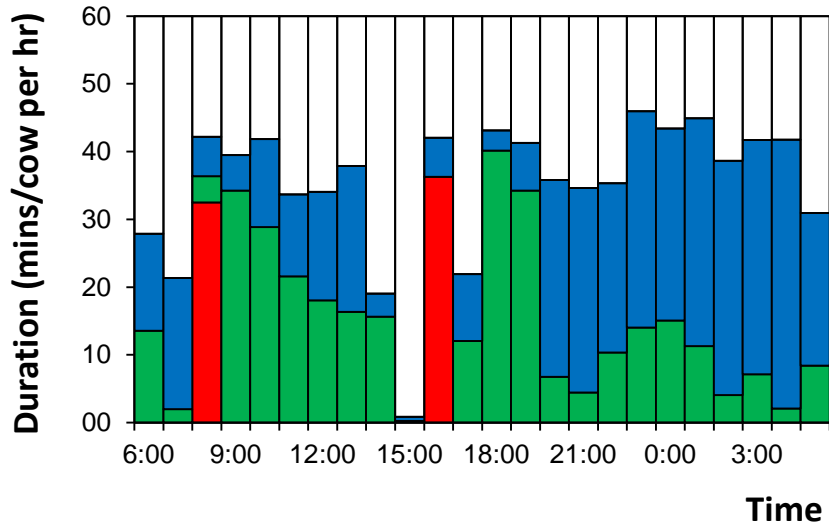
But no difference in pasture DMI or total DMI



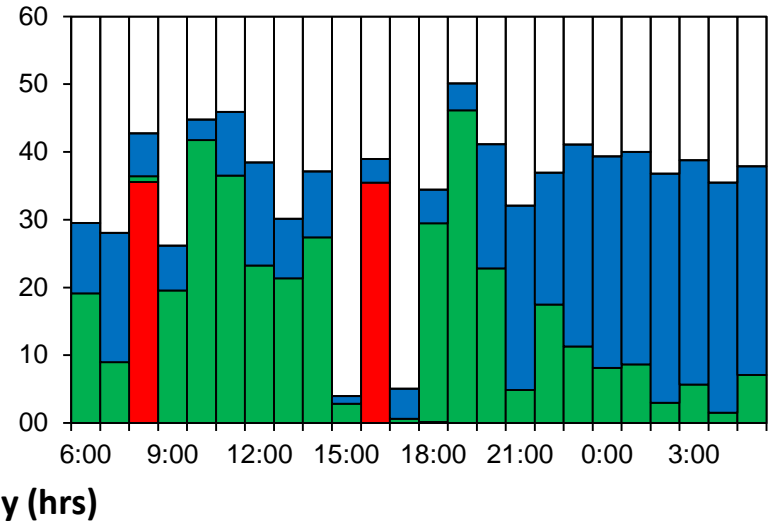
Explanation for no increase in pasture DMI

- **Main experiment found an increase in pasture DMI of 0.6 kg DM/cow per day**
- **Low pasture allowances offered**
- **Potential inability to detect small differences**

PMR-C



PMR+C



■ Eating Ration
 ■ Eating pasture
 ■ Ruminating
 □ Idle

Key findings



PMR+C:

- **Increased pasture eating time by 33 mins/cow.day**
- **Total eating time by 36 mins/cow.day**
- **No measureable increase in DMI at the low pasture allowance provided**
- **Further research is required when pasture is not limited**