

Cumulative effects of fodder beet – SFF Making fodder beet Sustainable

Background

Following the rapid increase in fodder beet use in the mid 2010's, farmers and veterinarians became increasingly concerned about potential negative carryover effects on animal performance. Increased body condition score at calving in cows wintered on FB has resulted in more metabolic disease, e.g. milk fever and liver dysfunction at parturition which may affect colostrum quality. Differences in nutrient intake between kale and fodder beet diets in late gestation, as detected by blood mineral status, has the potential to affect calf size at birth, growth of replacement heifers and their subsequent performance

A series of studies have been undertaken at SDH to investigate wider implications of fodder beet feeding to those being investigated in the farm systems study. These include:

1. A comparison of BCS gain, nutrient intake and early lactation milk production of cows offered two feeding levels (ad libitum or targeted for 0.7 BCS gain) of winter diets differing in crop type (FB and kale).
2. Measurement of the health and wellbeing status of cows feed fodder beet or kale at two allocations by testing blood parameters and activity measures during winter
3. Determining if winter crop type and dry matter allocation affected colostrum quality, as measured with Brix, in mixed age cows at their first milking post calving
4. A comparison of the growth of rising one-year-old dairy heifers grazing either kale or fodder beet from May until August and determine if crop type affected grazing behaviour and rumination
5. Investigating any cumulative effects of dam (through en utero effects), on offspring winter diet at 1 and 2 years old (kale or fodder beet) on performance of heifer replacements from birth until the end of their first lactation

Key messages

- Crop type had a greater impact on cow performance than allocation rate
- Cows wintered on fodder beet had better reproductive performance (3-wk pregnancy rate) and greater average milk solids yield than cows wintered on kale.
- Later calving cows are less likely to be pregnant at the end of mating
- Body condition score loss in the first six weeks was not affected by crop type or allocation level
- Feeding fodder beet increased blood magnesium but decreased blood phosphorus (if not supplemented with P), total protein and urea levels compared with cows fed kale.
- Crop type had a bigger effect on blood metabolite concentrations than did the daily allocation of crop (kg DM/cow).
- Achieving recommended dietary protein intake is difficult with fodder beet diets especially in the last 4 weeks of pregnancy and for rising-1-year-olds
- Colostrum quality was not affected by crop type or allocation level but there is significant variation between individual animals and between quarters within an animal most likely linked to colostrum intake by the calf
- Cows wintering on fodder beet walked more and had fewer, longer lying bouts. However, lying time will be affected by the soil conditions in individual paddocks
- Consideration should be given to the diets of heifer replacements in winter to ensure they achieve minimum dietary requirements, particularly of protein and phosphorus
- Dam and heifer diet did not affect milk production for the first lactation, however differences in liveweight, reproduction and blood metabolites indicate possible negative impacts of feeding heifers fodder beet during winter, particularly if the dam is also wintered on fodder beet

Dalley DE, Edwards JP, Woods RR. 2020. Impact of winter fodder beet or kale allocation on body condition score gain and early lactation performance of dairy cows. Journal of New Zealand Grassland 82: 73-81

Dalley DE, Edwards JP, Masterson E, Woods RR. 2021. The effect of winter fodder beet or kale allocation on behaviour and blood metabolite status of non-lactating dairy cows. Journal of New Zealand Grassland 83: 153-162

Dalley DE, Edwards JP, Kay J, Ritchie W, Hammond N. 2018. Effect of winter crop and dry matter allocation on colostrum quality of dairy cattle. Australasian Dairy Science Symposium, Palmerston North, 2018.

Harris P, Dalley DE, Bryant RH. 2021. The effect of feeding fodder beet or kale during winter on growth and behaviour of rising-one-year-old dairy heifers. New Zealand Journal of Animal Science and Production 81: 81-86

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