

Extending the grazing season with turnips

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Introduction A comparison of the actual feeding costs on 86 typical Swiss dairy farms confirmed that the production of hay and grass silage is very expensive with costs from the field to intake in the range of 20-25 Euro cents/kg of dry matter (DM). Options to extend the grazing season for dairy cows in the late autumn and early winter, and hence reduce winter feeding costs, would therefore be welcome (Penrose et al., 1996). The aim of the study was to compare the DM production potential of summer-seeded turnips with other brassicas and Italian ryegrass and to test whether dairy cows can utilize the bulbs of turnips efficiently.

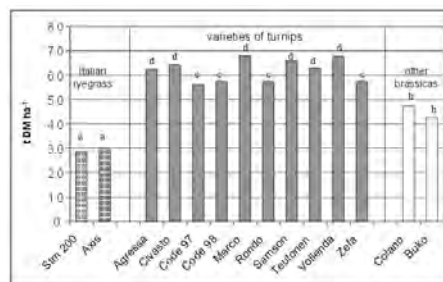
Materials and methods Over three years (1999-2001) the yield potential of ten turnip varieties (*Brassica rapa L. var. rapa (L.) Thell.*) and other autumn crops was studied on three sites in the region of Bern (sowing dates: Aug 4-15; harvest dates: Nov 1-10). A randomized-block design with 3 blocks was used. Plot size was 7.0m x 1.5m. For the statistical analysis of the results the method of linear contrasts according to Clarke and Kempson (1997) was used. Each year farm grazing experiments were conducted on three to six farms (total 14 on farm experiments) to assess the suitability of turnips for grazing. On every field, pre and post grazing DM yield of leaves and bulbs was measured in 6 randomized plots of 1.5m x 1.5m. In the framework of these grazing experiments, blood and milk samples were also analysed to assess potential risks for animal health and milk quality.

Results With an average of 6.5 t DM/ha, the turnip varieties had higher yields than the Italian ryegrass mixtures (2.9 t DM/ha) and were also superior to other *Brassica* spp. like a chinese cabbage (variety BUKO; Figure 1). In the on-farm grazing experiments grazing losses were 33 %, on average, with a net yield of 4.3 t DM/ha (Table 1). In spite of treading damage no indications of long-term impacts on the soil were found. There was no negative influence on animal health, milk quality and taste. Nevertheless, soiling of the cows increased the risk of contamination of the milk with anaerobic spores, which could be a problem for cheese making with raw milk.

Table 1 DM-yields and losses of grazed turnips in 14 farm experiments (1999-2001)

years	1999	2000	2001
No. of farm experiments	6	5	3
Total yield (t DM/ha)	6.17	6.88	6.27
Intake (t DM/ha) ¹	4.49 ¹	4.07 ¹	4.35 ¹
DM losses (%)	27.5	45.5	30.7
- maximum	49.8	57.2	35.4
- minimum	11.9	24.2	26.0

¹ To compare: the DM-intake on Italian ryegrass plots was 2.29 t DM (mean of 3 trials).



The same letters do not differ significantly at $P < 0.05$.

Figure 1 Yields of turnip varieties in comparison with Italian ryegrass mixtures (SM 200 and AXIS) and other brassica species (varieties COLANO and BUKO without bulbs (means of 9 trials, 1999-2001)

Conclusions Based on the results of the study and a survey on 32 farmers having relevant experience, it is concluded that turnips are a suitable crop to extend the grazing period in autumn and early winter. Summer-seeded turnips produced, on average, twice the yield of Italian ryegrass. With strip grazing, dairy cows can make good use of both tops and bulbs.

References

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