

## Performance and parasitosis in heifers grazing mixed with sows

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### Summary

The aim of the study was to investigate the effect of mixed grazing with first season heifers and pregnant sows on animal performance, gastro-intestinal helminths, pasture quality and sward structure during three grazing seasons. This presentation will focus on results from 1999, primarily regarding performance and parasitosis in heifers. There have been no earlier reports on such mixed grazing systems. Three grazing systems were studied in replicate: 1) Heifers grazing alone; 2) sows grazing alone; 3) heifers grazing together with sows. The heifers were inoculated with low doses of infective *O.ostertagi* larvae at turn-out. Continuous grazing was practised in paddocks regulated in size according to herbage allowance. Individual weight gain, faecal egg output and serum pepsinogen concentrations - as indicator of *O.ostertagi* infection - were measured fortnightly. The sward structure and quality were greatly influenced by the applied grazing system. The average daily gain of the heifers was significantly higher ( $P=0.0006$ ) when grazing together with sows ( $1,121\pm 45$  g/day,  $n=16$ ) than when grazing alone ( $869\pm 48$  g/day,  $n=14$ ). The mean pepsinogen concentrations were elevated in the heifers grazing alone. It is concluded, that weight gains were significantly better and infection levels with *O.ostertagi* were significantly reduced in heifers grazing together with sows.

### Introduction

Outdoor pig production is increasing, especially in connection with organic farming. When sows with nose-ring graze alone, experience shows that the sward gets dirty and stemmy, and the sows destroy the sward in spots. It is well known that mixed grazing with sheep and cattle usually improves the utilization of the pasture and reduces parasite infection (Nolan and Connolly, 1988) and therefore, our hypothesis was that mixed grazing with sows and cattle could be a usable alternative. This type of mixed grazing has not been reported in the literature and was therefore tested in 1997-98. The two animal species grazed in harmony and the sward in the mixed paddocks seemed to have a better quality than swards with sows grazing alone (Sehested *et al.*, 1999). On that background, mixed grazing was compared to mono grazing with these animal species in separate paddocks in 1999. The aim of the study was to investigate the effect of mixed grazing with first season heifers and pregnant sows on pasture quality and sward characteristics, animal performance and gastro-intestinal helminths. Part of these data has been presented earlier by Sjøgaard *et al.* (2000).

### Materials and methods

The sward which was not previously grazed consisted of perennial ryegrass (*Lolium perenne*), timothy (*Phleum pratense*), white clover (*Trifolium repens*) and red clover (*Trifolium pratense*). In 1999, three grazing systems with heifers grazing alone, sows grazing alone and sows grazing mixed with heifers, respectively, were compared - each in two replicates. Thirtytwo first-year Holstein-Friesian heifers were allocated into the four groups of 8 heifers according to sire and weight. The number of animals in the four groups of sows was dynamic. Initially, 9-12 pregnant sows were allocated in each group, but sows close to farrowing were continuously replaced by sows in mid-gestation throughout the season. The weight gain was measured at turn-out and fortnightly until

turn-in. The sows were nose-ringed and were fed with concentrates corresponding to half of the recommended daily requirement, approximately 1 kg dry matter (DM) sow<sup>-1</sup> day<sup>-1</sup>. The heifers were not fed any supplements. The animals grazed continuously from 3 May until 5 October. The stocking rates are shown in table 1. To introduce parasites the heifers were inoculated with 20,000 infective *O.ostertagi* larvae per individual at turn-out and with 10,000 and 5,000 after two and three weeks, respectively. The sows were naturally inoculated with *Oesophagostomum dentatum*. Heifers and sows in the different grazing systems were followed parasitologically by fortnightly evaluation of fecal egg counts, serum pepsinogen (heifers only).

Table 1: Stocking rates for heifers and sows grazing one species alone or mixed.

Per ha		Mono grazing		Mixed grazing
		Heifers	Sows	Heifers + Sows
May	No	15	29	10 + 13
	Ton	2.5	7.1	1.7 + 3.1
July	No	11	20	6 + 7
	Ton	2.5	4.9	1.4 + 1.7
Sept.	No	5	14	3 + 4
	Ton	1.5	3.4	0.9 + 1.0

The grazing areas were increased during the season by regulation according to the measured compressed sward heights at approximately 5 cm, measured with a plate raising meter. The sow-paddocks were topped on 28 June. The other paddocks were not topped. The grazing height was measured monthly in 50 random plots in each paddock and herbage samples were cut at grazing height. Botanical composition was determined in sub-samples by hand separation. Digestibility for cattle was determined as *in vitro* organic matter digestibility (IVOMD) by method of Tilley and Terry. *In vitro* digestibility for sows was determined as enzyme digestible organic matter (EDOM) as described by Boisen and Fernández (1997). Crude protein was determined by the Kjeldahl method.

## Results and discussion

The sward structure and quality were greatly influenced by the applied grazing system. Data regarding sward structure and pasture quality was reported by Søgaard et al. (2000). Some general findings was that mixed grazing with pregnant sows and heifers: improved the herbage quality compared with sows grazing alone; eliminated rejected areas around dung pat compared with grazing heifers alone; and reduced the proportion of stems in the sward as compared to grazing sows alone.

### Animal performance

The average daily weight gain for animals in the mixed grazing system was significantly higher for heifers and tended to be higher for the sows compared to animals grazing alone (Table 2). For the sows, this could be an effect of the higher herbage quality, whereas for the heifers it could be an effect of a lower infection with *O.ostertagi*.

Table 2. Daily weight gain and start weight of heifers and pregnant sows grazing either one species alone (mono) or mixed.

Grazing system	Heifers		Sows	
	Weight gain g day <sup>-1</sup>	Start weight kg	Weight gain g day <sup>-1</sup>	Start weight kg
Mono	869	169	489	242
Mixed	1121	166	566	238
Sign. level	0.0006		0.10	

### Parasitosis

The faecal egg output (EPG) of heifers increased steeply after turn-out due to the initial inoculations, but after the decrease in July the egg excretion of the mixed-grazing heifers remained low, while the mono-grazing heifers had a new peak in egg excretion in August (Fig. 1). The serum pepsinogen level (SPL) was low during the first part of the grazing season and increased in the late summer (Fig. 1). While this increase was moderate and subclinical in mixed-grazing heifers, the SPL was very high in the mono-grazing heifers, reflecting severe clinical *ostertagi* infections. This was the reason for the anthelmintic treatment of all heifers in late August. Removal of bovine nematode larvae from the tufts by sows were grazing close to the cow pads is speculated to be the main cause to this difference, although stocking rates differed in the two systems.

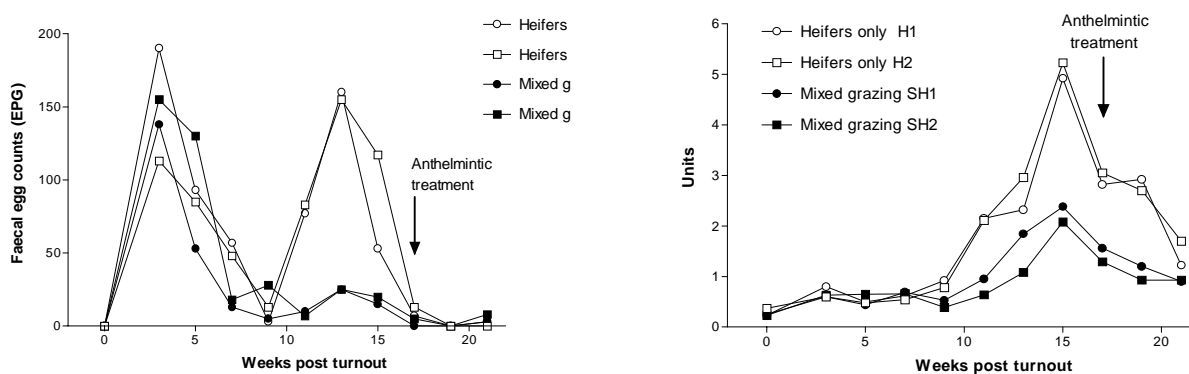


Figure 1: Faecal egg counts and serum pepsinogen levels in heifers grazing alone or mixed with sows.

### Conclusion

Mixed grazing with pregnant sows and heifers improved the herbage quality compared with sows grazing alone. Weight gain was higher and infection levels with *O.ostertagi* were lower for heifers grazing mixed with sows. Mixed grazing with sows and heifers seems therefore to be a usable grazing method.

### References

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