Management of grassland by Jersey male calves nursed by ex-milking cows

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Abstract
There is a lack of grazing animals to manage semi-natural grasslands in Denmark. At the same time Jersey male calves are usually killed just after birth, because the economy in feeding them to slaughter is very bad. The handling of Jersey mail calves is therefore an ethical problem. Jersey for grassland management may be an option for calves born in the period November to April to be with their 'nursing aunt' on summer grazing and be slaughtered just after the grazing season. The Jersey system combines a cow, which is about to finish her duty as a milking cow, with two newly born male calves from other Jersey cows.

It was found that the calves had a good growth, about 750 g per day, having enough milk available. The cows lost weight in general but not critically (and not in the period middle of April to middle of August). Cows and calves which were coupled kept the connection to each other. The calves were slaughtered at around 10 months of age together with their 'nursing aunts'. The meat of the calves has been a prize winner in a Danish evaluation. Slaughtering costs are relatively high, and it is necessary to sell the product as a special quality product.

The Jersey cattle system is expected to be best suited at unfertilized grasslands without very coarse species as their forage. The system has been tested at dry as well as moist semi-natural grassland. One of the sites was close to a recently established lake with a substantial amount of *Cirsium arvense* (L.) Scop. The effect of grazing was therefore compared to the effect of different cutting strategies as alternatives to continuous grazing. Continuous grazing combined with trimming gave the best results concerning reduction of *C. arvense*.

Introduction
It is a problem to get enough grazing animals to manage semi-natural grasslands in Denmark. The number of beef cattle is too low and many farmers do not wish to use heifers and steers at more natural sites. The reasons may be that the growths of young cattle of milking cow breeds are too low at these sites, or concerns about heifers getting bites from insects and may subsequently lose their full milking capacity. At the same time Jersey male calves are usually killed just after birth, and therefore it has been tried to use these calves together with ex-milking cows for grassland management. It is estimated that there is a potential on around 30.000 male calves' of which a substantial part may be used in management of semi-natural grassland in Denmark

Method of the grazing system with Jersey calves together with ex-milking cows

Two male calves are coupled to one cow. The cows have to be healthy and selected so that there is 0.5-1 year since last calving, and the milk production is 10-15 litres. The cow can be an excellent aunt although old, infertile, low milk production or other problems which usually means that it has to stop as a milking cow. The calves have to finish getting colostrums, and can be up to three months old when included in this system. Older calves do not appeal to the maternal instinct of the cow. Before they are grouped with others, cow and calves need to have been alone in at least a week without it has been necessary to fixate the cow.

Often it is a dairy farmer producing the groups of aunts with two calves, and another farmer is taking over, when the calves are about two months old and are sent to the semi natural grassland. To make sure the coupling is still working after the group is moved, the cattle should spend the first time in a small paddock, where control of the group is easier.

Calves getting milk from the cow is more resistant to parasitic infections than calves grazing on their own. It is still an advantage to combine grazing with cutting to get clean swards at the beginning of July. It is necessary to increase the area from spring to autumn, and also to supply with minerals. In general the two calves sticks to their own aunt, but they may get some milk from other cows as well. The calves get milk until slaughter, but they eat more and more grass with age. The calves in general behave calmly when grazing with an aunt.

Effect of grazing with Jersey at semi-natural grassland

Different types of swards were used. One group of cattle grazed the swards around a newly established lake and the grazing area was a combination of fields with different history of management, and in the previous years it had been fallow. It was not an easy area to manage seeing that there was a substantial amount of *C. arvense* in some of the dryer parts and a substantial amount of *Epilobium hirsutum* (L.) in some of the more wet parts of the grassland. These species were not popular among the cattle. Among the species, these two were most often found left over (ungrazed), when recording such species at the end of the season.

Six different types of grassland management were compared in a part of the sward with a lot of *C. arvense* (26 % on DM-basis): 1) Unused; 2) One cut, not removed; 3) one cut, removed; 4) One cut, removed, and grazing; 5) Continuous summer grazing with trimming; 6) Continuous summer grazing, no trimming. Trimming was done 10. June, 15. July and 5. September. The treatments were established in three blocks and shoots were counted in 5x1 m^2 in each plot. No significant difference was found between numbers of shoots of *C. arvense* in the different treatments 2008 and 2009, but in 2010 significantly more shoots were found in treatment 4 and 6 than treatment 5 (Figure 1). It seemed that the Jersey cattle could not alone mange the *C. arvense* problem, but in combination with trimmings the best result was obtained concerning shoots. The coverage of the *C. arvense* was also examined, but no significant change was found over year in the three years of measurements, only that in general the cover was highest in

2009, lowest in 2010 and in 2008 an intermediate level was found. The percentage of *C. arvense* on DM-basis was only measured in 2008 and 2009 and the treatments did not differ significantly, but the highest increase from 2008-2009 was found in continuous summer grazing without trimming.

There have been no problems with enough nutrients in the forage before September, but in the end of the season it may be necessary to give some forage from spring harvest to keep a good growth of the calves. The Jersey cattle managed the swards quite well, but they are not expected to manage very wet areas or swards with very coarse forage.

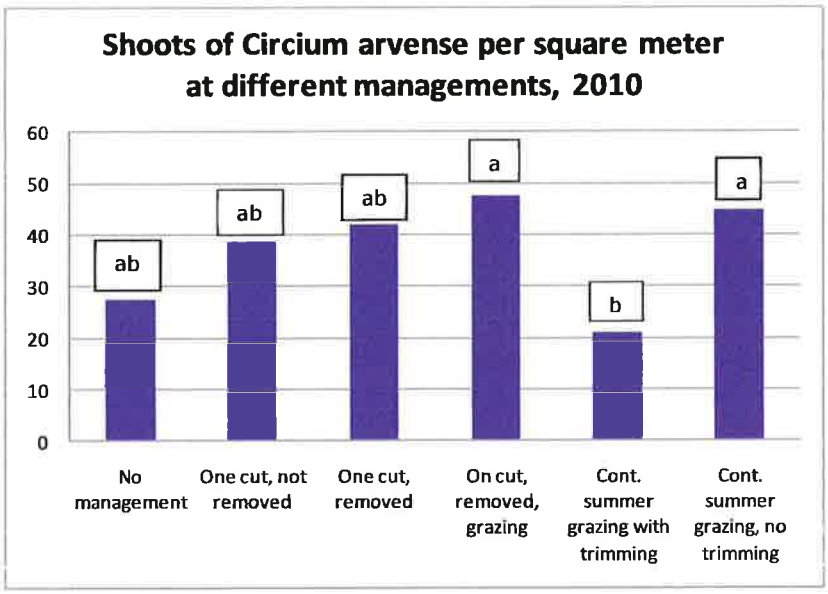

Figure 1. Effect of different types of management on *C. arvense*. No significant difference was found in 2008 and 2009. In 2010 the number of shoots was lowest in grazing combined with trimming.

Economical output when using Jersey male calves and ex milking cows
Gross margin is calculated for both the farmer delivering the calves and for the farmer who manage the semi-natural grassland. It may be the same farmer, but in general farmers specialize in milking or nature management. The data is shown in Table 1 and 2, and it is based on the situation where the farmer can graze a fenced area belonging to the municipality. Different agreements can be involved concerning the aid per hectare, e.g. the farmer may cash this money and pay some rent for the land.

Table 1. The margin for Jersey baby calves, 60 days, 70 kg.

Yield	Kg	Pieces	Price	DKR
Alternative price baby calf*				100
Small calf, 70 kg live weight		1	1042	1042
10 % suckler premium		0,5	360	180
Yield in total				**1322**
Costs:				
Grain	30		2	60
Silage	340		1,4	476
Minerals	3		5	15
Litter	375		0.55	206
Costs in total				**757**
Gross margin per produced calf				**565**

**Saved money for removal of dead animals.*

Table 2. The margin for Jersey grass calves, 750 grams daily gain, 180 days.

Yield	Kg	Pieces	Price	DKR
Small calf, 70 kg live weight		-1,035	1042	-1078
Ex-milking cow, 452 kg lw-> slw	190	-0,5	19	-1803
Jersey grass calf, 205 kg lw-> slw	98	1	28	2755
Cow at slaughter, 420 kg lw-> slw	176	0,5	17	1400
Yield in total				**1273**
Costs:				
Feed and litter				204
Transportation				188
Vet. and miscellaneous				150
Costs in total				**542**
Gross margin per produced calf				**731**

The farmer do not, as for suckler cows, have to pay for forage during the entire winter. Well coupled animals are easy to care for and there are no problems with calving or mating. The advantage for the farmer is that this group of grazing cattle is not as expensive as suckler cows, and money bound to the cattle will be bound in a shorter period. Also the growth of the calves has been quite good (750 g per day) on the semi-natural grassland tried so far. The farmer does however have to obtain a good payment for the calves, and not just sell the cattle to an ordinary slaughterhouse with ordinary prices. Seeing that the meat from the calves was a prize winner in a Danish evaluation in 2010 a good price can be justified.

Conclusions

The Jersey calves with aunts (ex-milking cows) can manage some of the easier semi-natural grassland, and free some hardy suckler cattle to the more difficult swards, e.g. with low digestible forage. A reasonable economy could be obtained both for the farmer producing the couples of one aunt and two calves, and for the farmer who manage the semi-natural grassland, if it is possible to get a good price for the meat. It is possible to use the system for other types of dairy cattle

as well as for Jersey, but in all cases it is important that the coupling is done correctly.

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