



Use of beef steers for profitable management of biologically valuable semi-natural pastures in Sweden

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ABSTRACT

Cessation of grazing is an increasing threat to the biodiversity rich semi-natural pastures in Sweden due to a decreased number of grazing livestock despite environmental payments for management of these pastures. The aim of this study is to compare the profitability of raising beef breed calves as intact bulls kept indoors after weaning and slaughtered at 15 months to raising them as steers grazing semi-natural pastures and slaughtered at 20, 25 or 30 months of age. The 20 and 25 month steers graze one summer and the 30 month steers two summers post-weaning. Profitability is calculated as gross margin to cover fixed costs of the farm and background data is obtained from an animal experiment and official Swedish standard budgets. The comparisons include alternatives with holdings situated in one out of two districts (plain or forest) and with one out of six types of semi-natural pasture (low- or high-yielding pasture, pasture with payment on a base level only or with extra payment for special values, 100% semi-natural pasture or 50% semi-natural pasture with 50% complementary ley pasture). The result suggests that the 30 month steer is the most profitable production system in most of the studied alternatives provided that the present environmental payments, single farm payment and support for less favoured areas are maintained. Bulls are more profitable than 30 month steers only if the semi-natural pasture is both high-yielding and entitled payment on a base level only. The 20 and 25 month steers have no economical competitiveness in any of the alternatives studied. Steers with two post-weaning grazing seasons seem to be a cost-efficient way to preserve the grazing dependent biodiversity in Sweden and other parts of Europe with increasing shortage of calves.

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Introduction

In Europe traditional grazing is seen as having positive effects on biodiversity in pastures whereas overgrazing and afforestation are severe grazing related problems in many other parts of the world (Steinfeld et al. 2006). Undergrazing and abandonment are the predominant problems associated with pastures in Sweden today (Persson 2005). At present only 1% of Sweden's land area consists of permanent pasture and meadows whereas the corresponding figures for the European Union (EU) and the World are 17% and 26%, respectively (FAO 2010).

Grazed semi-natural pastures are of great importance for preserving a varied agricultural landscape with high biodiversity and cultural values (Ihse & Norderhaug 1995; Luoto et al. 2003; Smart et al. 2000). Therefore, action is taken to stimulate management of this land on EU and national levels. On an EU level the network European Forum on Nature Conservation and Pastoralism works on stimulating so called high value nature farming

which now is regarded as a compulsory measure within the EU agri-environment payment system (European Forum on Nature Conservation and Pastoralism 2010). In Sweden, the governmental Swedish Environmental Objectives Council (2008) has established the target that "by 2010 all pasture land (existing at the turn of millennia) will be preserved and managed in such a way as to preserve its value ... and the area of managed pasture land of the most endangered types will increase by at least 13 000 hectares by 2010". The Council also suggests that the area of semi-natural pastures should increase to 520 000 hectares (ha) by 2020.

Semi-natural pastures were widespread and of great importance for food supply in Sweden up to the 19th century (Ekstam & Forshed 2000). In the 1920s there were still 1 300 000 ha of such pastures (Mattson 1985) plus large areas of grazed forests (Sveriges skogsvårdsstyrelser 1945). Since then the area of semi-natural pastures has decreased rapidly and reached a lowest point in the mid-1990s of some 400 000 ha (Official Statistics of Sweden 2010). Later the area increased as a result of environmental payments within the EU agri-environment scheme and peaked in 2005 with 508 000 ha including grazed forests. However, during the last few years the area has decreased to 431 000 ha in 2009 (Official Statistics of Sweden 2010) despite continued environmen-

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tal payments and introduction of single farm payment to grazed semi-natural pastures. Today there are two levels of environmental payment; payment on a base level for pastures with general values (1250 Swedish crowns (SEK)/ha; 9.50 SEK = 1.00 €) and payment for semi-natural pastures with special values rendering a higher payment (2650 SEK/ha). A single farm payment (1100 SEK/ha) is added. In spite of these payments, interviews with farmers who managed particularly valuable semi-natural pastures in 2001 suggested that there was a large risk that many such pastures would not be grazed by 2010. This would be especially true in forest-dominated regions with mostly old farmers and small herds whereas the future seemed to be somewhat brighter in agricultural regions where expanding livestock operations can take over grazing when others give up (Kumm 2003).

One reason for the decreasing pasture area is a decreasing number of cattle in Sweden. The number of dairy cows and young cattle of dairy breed has been decreasing for a long time but this has partly been compensated by an increasing number of suckler cows and thus young cattle of beef breeds (Official Statistics of Sweden 2010). However, the trend of increasing number of suckler cows was broken in 2007 and the number of suckler cows decreased by 2% from 2007 to 2009 (Official Statistics of Sweden 2010). The decrease is probably a consequence of an impaired profitability mainly caused by the decoupling of animal premiums in 2005 and later the decreased carcass prices and changed definitions of whether pastureland is entitled to environmental and single farm payments (Larsson et al. 2010). The gross margin per suckler cow for covering cost of land and overall farm management decreased by 2000 SEK from 2004 to 2009 (Agriwise 2004, 2010). At present, 28% of Swedish beef farmers intend to cease or reduce their beef production during the next three years, whereas only 21% intend to increase their enterprises (Larsson et al. 2010). Despite the fact that some herds are increasing the total number of suckler cows in Sweden is forecast to decrease up to year 2020 especially if the world trade of agricultural products will become deregulated (Norell 2007). Concentration of remaining cattle to fewer and larger herds (Official Statistics of Sweden 2010) means that many farms with valuable pastures have no grazing cattle left on the farm. Similar trends of long-term decrease in dairy cow numbers, increasing number of suckler cows up to the turn of the millennium followed by decreasing number of both dairy and suckler cows and concentration of the remaining cattle to fewer and larger herds, have occurred also in the rest of the EU 15 (Sarzeaud et al. 2008). Consequently, shortage of grazing cattle for landscape management may arise also in other European countries with valuable pastures.

One way of increasing the grazing capacity in Sweden, and other countries with existing or approaching shortage of cattle for nature management, is to raise the bull calves of beef breed as steers instead of as intact bulls. Steers normally graze two or three summers before slaughter whereas bulls graze only the first summer together with their dams. After weaning the intact bulls are finished in intensive indoor systems fed silage and grain and are slaughtered before or in the beginning of the next summer. To turn almost slaughter mature bulls out to grass implies loss of weight, handling problems and issues of public safety. Raising them as intact bulls is the most common system for male beef cattle progeny in Europe except in Ireland and the United Kingdom, whereas steers predominate in North and South America and Australia. In a majority of the steer raising countries the cattle spend all year, or most of the year, outdoors on large pastures (Deblitz 2009). In Sweden the proportion of male calves, across breeds, raised as steers increased from 3.5% in 1995 to more than 20% ten years later (Official Statistics of Sweden 2010). The increase was as a consequence of Sweden entering into the EU and the following direct payments for steers and environmental payments for management of semi-natural pastures. In 2009 the proportion of steers, across all breeds, was 22% of

male calves born, but a major part of the steers was of dairy breed whereas only 9% of the male calves of beef breed were raised as steers (Taurus 2010).

There are several reasons for not raising male calves as steers but as intact bulls, for example the longer time spent before slaughter for the steers resulting in higher costs of maintenance feed, labour, buildings and interest for steers than for bulls. These disadvantages of the steers are very pronounced in Sweden having a high cost of forage and high agricultural wage levels. In addition the climate, traditions and animal welfare legislation in effect preclude cheap outdoor wintering in Sweden which increases the cost of rearing the steers during two winters before slaughter (Kumm 2005).

The aim of this case study is to compare the profitability of raising beef breed calves traditionally as bulls kept indoors and slaughtered at 15 months of age or as steers grazing semi-natural pastures in summers and slaughtered at 20, 25 or 30 months of age. The results will suggest if and on which type of land it is profitable to increase the grazing capacity of the decreasing number of calves born by castrating beef breed bull calves to create extended grazing periods. If this is possible it will be easier to fulfill the aim of the Swedish Environmental Objectives Council to preserve, and hopefully, increase the area of grazed semi-natural pastures (Swedish Environmental Objectives Council 2008).

Methods

The profitability of four production systems for male cattle of Charolais cross-breeds from weaning to slaughter is compared. There is one system with intensively fed bulls raised indoors and three systems with steers grazing semi-natural pastures during the summers but kept indoors during the winters. The steer systems differ by involving different feed intensities during the indoor periods. A high feed intensity (mixture of 45% grass-clover silage and 55% rolled barley at *ad libitum* intake) is used for bulls and for steers slaughtered at 20 months of age, a medium feed intensity (grass-clover silage *ad libitum*) is used for steers slaughtered at 25 months of age and low feed intensity (grass-clover silage at a restricted intake corresponding to 80 and 90% of *ad libitum* during indoor period 1 and 2, respectively) is used for steers slaughtered at 30 months of age. The 20 and 25 month steers have one grazing period after weaning and the 30 month steers two grazing periods after weaning (Table 1). All four systems are planned to deliver marketable carcasses with regards to weight, conformation and fatness. A prerequisite is for the pasture sward to be grazed short enough for entitlement to environmental payment. The sward is kept short to prevent, for the flora, deleterious litter being accumulated.

The profitability is compared by long run gross margin (=incomes less long run incremental costs including calf, feed, bedding, labour, building and interest = contribution to fixed costs such as basic machinery, pastureland and overall farm management). Fixed costs are the same in all the four production systems which make the alternative with the highest gross margin the most profitable one. Data on feed consumption and carcass characteristics and prices are taken from an animal experiment (Hessele et al. in press). Most other calculation-data are taken from standard budgets for beef production and feed production made by the Swedish University of Agricultural Sciences (Agriwise 2010).

The basic animal experiment was carried out in a district in the temperate/humid continental climate zone with 210 days vegetative period. The steers grazed biodiverse semi-natural pasture, mainly consisting of open *Deschampsia cespitosa*/*Agrostis capillaris*/*Festuca ovina* meadows where they utilised 1600 kg herbage dry matter (DM) per ha. The concentration of metabolisable energy in the grass was 10.1 and 9.5 MJ per kg of DM during the first and second grazing period, respectively. The first grazing period lasted

Table 1
Feed types and average carcass weights in four production systems with Charolais male progeny.

System	Indoor period 1	Grazing period 1	Indoor period 2	Grazing period 2	Carcass weight, kg
Bull 15 months	Mixture, <i>ad libitum</i>	–	–	–	394
Steer 20 months	Mixture, <i>ad libitum</i>	Semi-natural pastures	Mixture, <i>ad libitum</i>	–	344
Steer 25 months	Silage, <i>ad libitum</i>	Semi-natural pastures	Silage, <i>ad libitum</i>	–	356
Steer 30 months	Silage, restrictive amounts	Semi-natural pastures	Silage, restrictive amounts	Semi-natural pastures	386

119 days for the 20 month steers and 189 days for the 25 and 30 month steers, whereas the second grazing period lasted 161 days for the 30 month steers. From experimental data other pasture types were constructed in this desk study to be used in the calculations. Two levels of utilised herbage from semi-natural pastures are investigated: low (L) and high (H) yield, implying 1000 and 1600 kg of DM per ha. Calculations are done both for semi-natural pasture with base level of environmental payment (B; 1250 SEK/ha) and for pastures with special values rendering a higher payment (S; 2650 SEK/ha). Pasture consumption derives to 50 (50) or 100 (100)% from semi-natural pasture and 0 or 50% from pasture on leys. In total six different pasture types are investigated in the calculations, LS100, LB100, HS100, HB100, LS50 and HB50. The calculations are done for a plains district in central Sweden having comparative advantages in grain production and, thus, grain-based animal production and for a forest district in southern Sweden having comparative advantages in grass production and grass-based animal production. Both the districts are situated in the same climate zone as the experiment and have biologically, cultural historically and aesthetically valuable semi-natural pastures.

In the standard budgets intensively managed leys for silage and pasture suited for dairy cows are supposed. For steers having lower nutrient requirements less intensively managed leys are more cost-effective especially in forest districts with low opportunity cost for land and high environmental payment and support for less favoured areas. Therefore the data for cost of silage and pasture leys are taken from Kumm (2009).

Herd sizes are supposed to be 100 cattle produced for slaughter per year. This implies that there are more cattle on the farm in the cases of raising steers where the age at slaughter is higher. Labour demand up to slaughter is supposed to be 6 h for bulls, 8 h for 20 month steers, 10 h for 25 month steers and 12 h for 30 month steers. The cost of labour is 190 SEK/h which is a farm worker wage including benefits and payroll taxes (Agriwise 2010). It is also a good estimate of the opportunity cost of the farmers labour on the farm (e.g. in forestry) or outside the farm in a country district (e.g. working on other farms). The single farm payment for semi-natural pasture is included in the calculations because it presupposes grazing, but single farm payment for arable land is excluded because it is received independent of type of production. The data used are summarised in Table 2.

Results

Base calculation

Thirty month steers grazing two summers post-weaning have the highest profitability in a majority of combinations of the pasture types and districts studied (Fig. 1). A superior profitability is achieved with 30 month steers solely grazing low-yielding semi-natural pasture entitled to environmental payment for special values (LS100). In all combinations the 30 month steers reaches a higher profitability than the 20 and 25 month steers grazing one summer post-weaning. The 30 month steers are also more profitable than the indoor raised bulls when solely semi-natural pasture is used for grazing and the pasture is low-yielding and/or entitled to payment for special values (LS100, LB100, and HS100). If the

semi-natural pasture is both low-yielding and entitled to payment for special values (LS50), half of the steers' pasturage intakes could originate from leys and the 30 month steers are still more profitable than the bulls. In general, the superiority of the 30 month steers is slightly higher in the forest district compared to the plains district (Fig. 1). However, in enterprises where the only available semi-natural pasture is high-yielding with payment on a base level and not big enough to feed all animals but having to be complemented with 50% ley for grazing (HB50), bulls are more profitable irrespective of district (Fig. 1). The reasons are low environmental payment per ha and a small grazed area per steer. In enterprises without semi-natural pastures, and thus 100% ley grazing, the steers have still poorer ability to compete with bulls.

Sensitivity analyses

The relationship between the price of grass-clover silage and barley influences the economical competitiveness for the 30 month steers compared to the bulls. With pasture types HB100 and LS50 the 30 month steers are more profitable than the bulls until the price of the silage increases by more than 15% or the price of the grain decreases by more than 15%. When using LB100 and HS100 it is not until the price of silage is increased by more than 100% that the profitability for the bulls is higher than for the 30 month steers. For LS100, the price of the silage has to increase 200% to make the bulls more profitable than the 30 month steers. A higher labour cost is primarily a disadvantage for the labour intense steers. Although, the 30 month steers are more profitable than the bulls until the wage cost has increased with 400, 100 and 150% for LS100, LB100 and HS100, respectively. Both building costs and carcass revenues influence the profitability in beef production. In this study, however, the difference in building costs among the production systems is not big enough to influence the relative positions in profitability. Likewise, at an altered carcass price per unit of weight, the relative economical competitiveness for 30 month steers compared to bulls is unchanged as the two groups have similar carcass weights.

If single farm payment for semi-natural pastures is phased out, the profitability for the steer systems is reduced, whereas the profitability for the bulls remains unchanged. Still, even without single farm payment the profitability of the 30 month steers is higher than of the bulls when grazing LS100. On HS100 the profitability of the 30 month steers is still somewhat higher than that of the bulls in the forest district but similar to that of the bulls in the plains district. However, with environmental payment on a base level only (LB100 and HB100) or if combined with ley pasture (LS50 and HB50) the profitability of the 30 month steers is lower than that of the bulls. If the environmental payment for grazing semi-natural pastures would be phased out the profitability of all the steer systems drastically decreases. A system with 30 month steers on LS100 loses as much as 9000 SEK per steer. Consequently, if environmental payment is phased out the bulls are economically superior irrespective of pasture type.

Discussion

Traditional grazing has positive biodiversity effects in many European countries (Steinfeld et al. 2006) and in Sweden there is

Table 2
Price and cost data used for calculating incomes and incremental costs for four production systems with Charolais male progeny in two districts (2010 price level, 9.50 SEK = 1.00 €).

	Plains district in Central Sweden	Forest district in Southern Sweden
Incomes		
Beef, young bull, SEK/kg ^a	29.00	29.00
Steer 20 month, SEK/kg ^a	30.00	30.00
Steer 25 month, SEK/kg ^a	32.00	32.00
Steer 30 month, SEK/kg ^a	31.00	31.00
Base payment for semi-natural pastures, SEK/ha	1250	1250
Additional payment for semi-natural pastures with special values, SEK/ha	1400	1400
Single farm payment to grazed semi-natural pastures, SEK/ha	1100	1100
Support for less favoured areas, SEK/ha	0	675
Incremental costs		
Weaned bull calf, SEK/kg ^a	17.00	17.00
Weaned steer calf, SEK/kg ^a	17.30	17.30
Grass-clover silage, SEK/kg DM ^a	1.40	1.00
Barley, SEK/kg ^a	1.20	1.30
Ley pasture, SEK/kg DM ^a	0.80	0.30
Minerals, SEK/kg	9.00	9.00
Bedding straw, SEK/head/day	1.80	1.80
Labour, SEK/h	190	190
Building		
SEK/bull	1300	1300
SEK/steer	2000	2000
Management of semi-natural pastures, SEK/ha	600	1220
Interest, %	5	5
Other costs, SEK/head	580	580

^a 2008 price level.

an environmental goal of preserving all present pastures and even increase the area of managed semi-natural pastures in the long run (Swedish Environmental Objectives Council 2008). Decreasing numbers of cattle in Sweden (Official Statistics of Sweden 2010) as well as in some other Western European countries (Sarzeaud et al. 2008) is hence a threat to biodiversity.

By raising 30 month steers instead of traditional intact bulls it is possible to combine more grazing on biologically valuable semi-natural pastures with better profitability, provided that the present environmental payments, single farm payment and support for less favoured areas are maintained (Fig. 1). A change-over from the now predominant system of finishing beef breed male progeny as bulls to steer-raising where appropriate, creates more grazing power despite the fact that the number of born calves is decreasing. This is true particularly in Europe, where steer-raising occurs on pasture. If half of the beef breed bull calves born in Sweden were raised as steers and grazing semi-natural pastures for two summers post-weaning, they could manage 60 000–100 000 ha of grasslands depending on herbage yield. This figure is comparable with the decrease in area of grazed semi-natural pasture in Sweden from 2005 to 2009, namely 77 000 ha (Official Statistics of Sweden 2010).

According to this study the 30 month steers are the most profitable production system in enterprises with a possibility to receive high levels of environmental payment for the management of semi-natural pasture. Larger amounts of environmental payment per animal can be achieved by a high level of payment per unit area, due to specific values of the pasture, or by an extended area grazed per animal, due to low yield of utilised herbage per unit area. The bulls are, however, the most economically competitive system when available semi-natural pastures are high-yielding, less valuable and, hence, entitled to payment at a base level only and/or not big enough so having to be complemented by ley grazing to supply the herds grazing demand. In enterprises without semi-natural pastures, and thus 100% ley grazing, the steers have still poorer ability to compete with bulls.

The system with environmental payment per unit area makes dry or wooded, low-yielding, semi-natural pastures more attrac-

tive for farmers than wetter, high-yielding, semi natural pastures. In this study, a pasture with high yield implies utilised herbage corresponding to 160% of a pasture with low yield. But, the herbaceous biomass from semi-natural pastures can differ as much as sixfold (Heinsoo et al. 2010). This fact may give incitement to the abandonment of a disproportionate high percentage of the wet plant communities, such as coastal meadows and floodplain meadows which are valuable biotopes for example for birds.

If single farm payment for semi-natural pastures is phased out, the 30 month steers in both the investigated districts are more profitable than the bulls only when grazing the very best paid pastures, which are entirely low-yielding semi-natural pastures entitled to payment for specific values. Also in the forest district a high-yielding semi-natural pasture with special values renders a higher profitability for the 30 month steers than for the bulls. Assuming all other parameters unaltered and farmers expected to act as “the economic man”, for enterprises with male progeny of beef breeds phasing out the single farm payment for semi-natural pastures will very likely result in continued management only of the very best paid pastures. Phasing out also the environmental payment for semi-natural pastures would be an economical disaster for grazing based rearing systems and probably result in no maintained semi-natural pastures at all. In such a scenario, habitats for many endangered species of several organism groups are lost (Luoto et al. 2003; Smart et al. 2000). Traces of cultural heritage values, recreation possibilities and amenity values also disappear (Ihse & Norderhaug 1995).

The advantage of the 30 month steers compared to bulls is greater in forest districts with high levels of environmental support to ley and high support to less favoured areas compared to plains districts with only a minimal aid to ley and no regional support, both factors reducing the net cost of silage and pasture production. However, operations producing many steers in order to achieve economies of scale require large areas of pasture and ley. An operation producing 100 heads of 30 month steers per year, which is supposed in these calculations, needs 140 ha of semi-natural pastures producing 1600 kg DM/ha and 60 ha of arable land for producing silage. If the pasture production is only 1000 kg DM/ha,

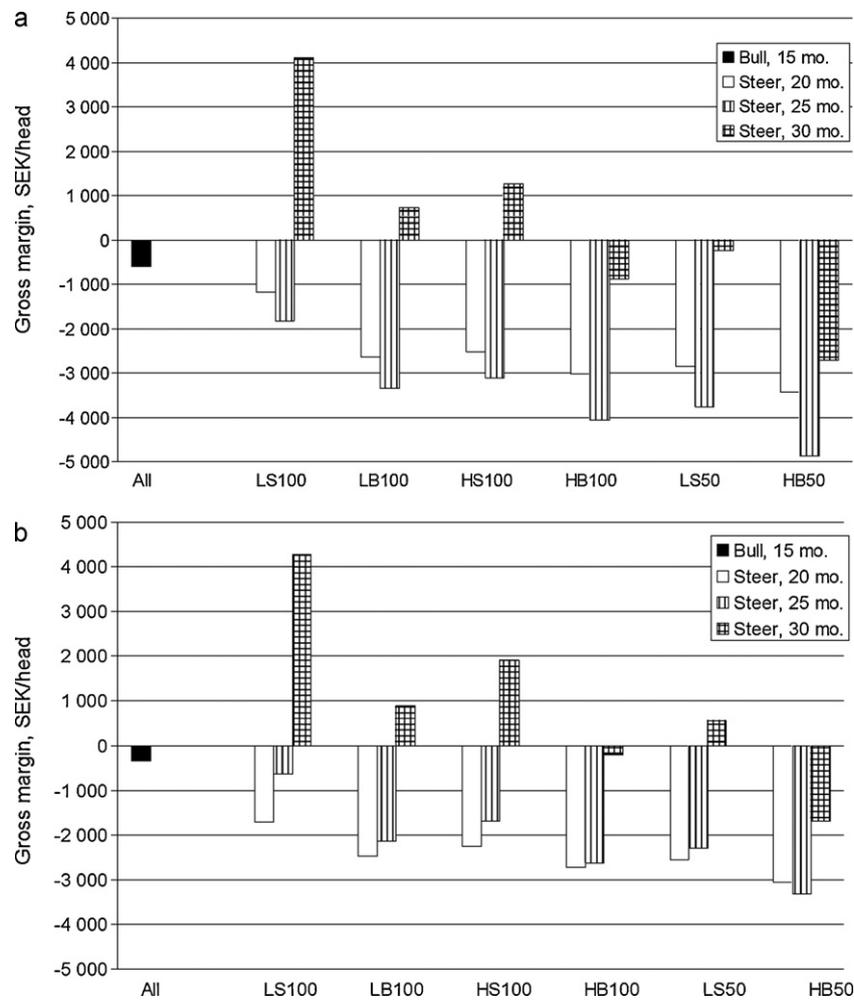


Fig. 1. Gross margin for production systems with Charolais male progeny in (a) plains district in central Sweden and (b) forest district in southern Sweden; indoor-fed bulls slaughtered at 15 months of age and steers slaughtered at 20, 25 and 30 months of age and grazing different types of semi-natural pasture. LS100: 100% semi-natural pastures, low-yielding and with payment for special values. LB100: 100% semi-natural pastures, low-yielding and with payment on a base level. HS100: 100% semi-natural pastures, high-yielding and with payment for special values. HB100: 100% semi-natural pastures, high-yielding and with payment on a base level. LS50: 50% semi-natural pastures, low-yielding and with payment for special values, and 50% ley pasture. HB50: 50% semi-natural pastures, high-yielding and with payment on a base level, and 50% ley pasture.

230 ha of semi-natural pasture are needed. These large areas can be compared to the average area per farm of 22 ha arable land and 8 ha of semi-natural pasture in a typical forest district in southern Sweden. In a forested district the average arable field and average pasture size is only 1.5 ha scattered in a forest dominated landscape (Norell 2007). If the operations produce less than 100 heads per year the cost of labour and buildings per head of cattle will be higher and the gross margin accordingly lower than calculated. Increasing wage level for employed farm workers and increasing opportunity cost of farm family labour make large herds and, thus, need of large pastures increasingly important to achieve economically viable steer-rearing operations. Bull-raising requires less arable land per produced head for forage production than steer-raising and no pasture.

The problem of finding pastures large enough for economies of scale in a steer production system might in some cases be solved by creating large pasture and forest mosaics from the existing small scattered pastures. In these areas existing semi-natural pastures can be grazed together with restored, previously abandoned, pastures, marginal arable land with no opportunity cost in many forest dominated regions, and actual forest. Many of these forests used to be pastures or grazed forests before reforestation (Kumm 2004). Forestland can, entirely or partly, also be converted to pasture after

clear-cutting. Not replanting after clear-cutting but relying on natural regeneration often results in glades suitable for grazing in a pasture-forest concept. At a rate of interest normal in other industries, natural regeneration is probably more profitable than conifer plantation on ordinary Swedish forest land (Kumm 2004).

There is an evolution, both in the Swedish and the whole European beef sector, of the disappearance of small, less competitive farms and increasing size of the remaining operations in order to facilitate competitiveness towards foreign countries who are exporting more and more beef to Europe (Sarzeaud et al. 2008). In Sweden the number of farms with cattle decreased by 29% from 2000 to 2008 (Official Statistics of Sweden 2010). Interviews with farmers with livestock on semi-natural pastures indicate that grazing with the farmer's own cattle is decreasing very rapidly, especially on small farms having grazing with high species diversity (Kumm 2003). To secure economically sustainable management of many pastures with high biodiversity and cultural values, it requires nature conservancy entrepreneurs who move their grazing animals around on to otherwise ungrazed pastures on other farmers land (Kumm 2003). Steers are better suited for being moved around on different pastures than herds of suckler cows with calves and breeding bulls. Young bulls as well as dairy cows are in most cases completely unsuitable for this kind of ambulatory grazing.

The results suggest that 30 month steers are cost-efficient nature conservationists. However, a change-over from intensive indoor bull-raising to extensive steer production with higher slaughter age and slaughter mainly in autumn in order to utilise pasture as much as possible, will also result in increased methane emissions per kg of beef produced (Steinfeld et al. 2006) and increased seasonality of beef production (Sarzeaud et al. 2008). There are, thus, conflicts of interest between on one hand increased capacity to graze semi-natural pastures with high biodiversity and cultural values and on the other hand market adjustment and reduced climate impact.

Conclusion

This study suggests that raising 30 month steers with two grazing summers after weaning instead of raising intact bulls finished completely indoors after weaning in many cases is a profitable way to increase the grazing capacity of the decreasing number of calves born. The steers are especially competitive in forest districts and on low-yielding semi-natural pastures whereas bulls are more profitable when pastures are high-yielding and have to be complemented with ley grazing. For the 30 month steers to be profitable under Swedish conditions, the present environmental payments, single farm payment and support for less favoured areas, must be maintained and most of the grazing be done on semi-natural pasture.

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