VELD MANAGEMENT
missing link hampering optimal beef production

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1. INTRODUCTION

South Africa beef producers are confronted by many socio-economic and management challenges that have a negative effect on beef production. Furthermore the production information of the different sectors in South Africa is well documented by Prof Michiel Scholtz of the ARC and his colleagues from the University of the Free State. Although, with many research and articles (popular and scientific) that try to address the issue, the average calving rate for the commercial farmers is estimate at 62%, the emerging sector at 48% and the communal sector at 35%. Livestock scientists concentrate on issues such as breeding, selection, supplementary feeding and livestock management to address this problem while rangeland management is not always mentioned or take note of. South Africa is still a net importer of beef due to the low levels of production. According to livestock scientist we will be able to move to self-sufficiency if the average calving rate increases with 10%. In this paper we are going to look at the effect of sustainable veld management on calving rate. Sustainable agriculture practices, especially rangeland management as well as livestock management, which are not of immediate financial benefit to the farmers are difficult to market under conditions where long-term advantages are uncertain. If one look at the different beef production sectors in South Africa, grazing management could be summarized as follows.

Communal grazing

Communal farming is usually found near urban areas where farmers do not own the land individually and the land belongs to the different municipalities. Due to lack of land ownership the execution and maintenance of farm planning (fences, windmills and water supply) is not up to standard. It is therefore difficult to fence off camps to apply a rotational grazing system. Continuous grazing is therefore commonly applied in a communal grazing system. The application of veld management principles meets little success and in terms of conventional grazing capacity, veld is overstocked. However a management system that uses strategic herding could be seen as a solution. Insufficient stock water supply usually leads to overgrazed areas near water points, closer to homesteads and under grazed areas further away. Condition of animals is usually very poor during winter and spring due to forage shortages. Pre-weaning mortalities are usually high (31%) with low reproduction rates (calving 35%). Most of these areas are severely degraded, resulting in decreased animal production which contributes to poverty. Some sustainable communal areas still exist and these can be used as reference for future interventions.

Emerging sector grazing

Degradation of natural resources severely threatens the livelihoods of South African societies and their economy. This phenomenon prevails mostly on small holdings of emerging farmers, where resources in terms of available land and farm infrastructure are a major challenge. Natural resource degradation is usually unavoidable in

these situations. Grazing management vary from continuous grazing to two, three and four camp systems. The fact that, many developing small holding farmers comes from communal livestock farming background whereby veld management and beef production practises are seldom practiced, poor livestock performance (calving 48%) and natural resource degradation are most evident.

The application of a management system that complies with the potential of rangeland is one of the most important factors for sustainable livestock production and will reduce the effect of poverty on small holding farmers.

There is little doubt that a strategy to promote sustainable agricultural principles among emerging small holding farmers in southern Africa will have to ensure an increase in productivity and profitability of the farming system. There is proof that if conservation practices are actually built into a utilization system, their long-term economic advantages usually exceed those of systems without the application of conservation principles. The acceptance of conservation practices by grazers is often accompanied by the following condition, namely, that the net revenue under conservation management must exceed his immediate welfare requirements. Unfortunately most of the net revenue of emerging farmers on small holdings varies from a very low profit to financial losses.

This group of farmers is also the focus point for Departmental projects and initiatives such as CASP, Livestock improvement schemes and Landcare projects focus to increase the productivity, profitability and sustainability of these farmers. The focus point for these projects should be to recommend environmental friendly grazing and livestock management practices that will increase grazing capacity, livestock production and empower the farmers to become sustainable in producing good quality animals, thereby positively competing in the red meat industry over the long-term.

Commercial grazing

The grazing area is subdivided into more camps than there are groups of animals. At any given time the animals only stay on part of the farming unit and this part is determined by the number of camps per herd. The other camps get a chance to rest for shorter or longer periods. Depending on the specific rotational grazing system and the stocking rate applied, rotational grazing can have many advantages:

- Efficient rest periods can be provided for different reasons,
- Selective grazing can be limited and results in more efficient utilization,
- Better botanical composition and veld condition than in the case of continuous grazing,
- Less bare patches and less soil erosion,
- Less trampling around watering-points and pathways,
- Provision for droughts can be made through reserve camps,
- The farming system is more flexible and stable,
- Is easier to give preferential treatment to certain camps or stock herds and
- Production per hectare is usually higher than that with continuous grazing.

Depending on the number of camps per herd and the rate of rotation, rotational grazing can be divided into slow (conventional) and fast (multicamp) systems. It is not possible to have a precise borderline, but normally a system where six or more camps per herd are available, is seen as a multicamp system. If the grazing periods are on average shorter than one month, such a system can be described as a fast rotational grazing system. Conventional and multicamp systems must not be seen as contrasting approaches, but multicamp systems must be seen as a development of, or an intensification of conventional systems.

Commercial farms is however not excluded from veld degradation and unsustainable practises such as overgrazing, uneconomic small farm units, poor grazing management, insufficient execution of farm planning and injudicious application of licks contributing to degradation. It is estimated that less than 30 % of commercial farmers apply sustainable veld management practises which contribute to the average calving rate of 62%. It is however estimated that the calving rate of animal recording schemes is about 85%.

2. GLEN BEEF RESEARCH RESULTS

The calving rate of a Bonsmara herd increased drastically after the implementation of a multi camp grazing system. The calving rate increases from 32% with no veld management inputs to 82% four years after implementing a multicamp grazing system (Table 1). With no veld management inputs the calving rate of 195 Bonsmara females was 32% and compared with the findings of Prof Scholtz for the communal sector. Pre weaning mortalities was also high (15%) and compared with the average mortalities between the communal and emerging sector. Animals were then divided into 5 herds and a multi camp grazing system was implemented. Vegetation is classified as a sweet grasveld vegetation type and animals did not receive any production or protein licks. The stocking rate of 6 ha/LSU was adhered for four of the herds, while a variable stocking rate as determined by seasonal veld analyzed was followed for the fifth herd. Veld analyses included veld condition assessments as well as the effect of rainfall variation on grazing capacity.

According to this data the calving rate of producers, especially in the emerging and communal sector can increased drastically with the implementation of efficient grazing management. The increasing in calving rate of the variable stocking rate group was most striking in comparison with the other herds. After four years the calving rate of this group increased to 92%. What makes this calving rate of 92 % more outstanding was the fact that it was reached within an early mating treatment (14 -16 months), while animals were only supplemented with stock salt. The calving rate of this herd for the third and fourth year is compared with the other herds in Tabel 2. Due to variable seasonal rainfall conditions the grazing capacity of veld varied accordingly to these conditions. Especially during the starting period of the mating season (December to January) when mid season droughts can hamper consumption rate.

3. Economic implications

The economic implications for the Glen beef trail are calculated in Table 3. The difference in weaner calf income per cow increased ± four times within only one year after implementation of veld management. Drastic changes in calving rate (27%), weaning weight (35 kg) as well as pre weaning mortalities (14%) were experienced after the first year of efficient veld management practises were implemented. This data implicated that the profitability of especially the communal and emerging sectors can increase drastically whereby these sectors can therefore start contributing successfully in the red meat industry.

Due to the time frame of rangeland management on livestock production as well as the adaptability of herds, the weaner calf income for year 3 and 4 is combined for both the fixed and variable stocking rate treatments. For these calculations an average weaner calf price of R 36/kg was used with the variable stocking rate outscore the fixed stocking rate with more than R1 000 per cow. The practical implementation of the variable stocking rate should however be further investigated. Due to increasing climate variability and the threads of global warming as well as the effect on the environment in terms of rangeland condition, variable stocking rate according to veld potential will ply a major role in sustainable beef production in the future.

Table 1 Mean (± standard deviation) calving rate of cows after implementing a multi camp grazing system (%)

Years after implementation	Calving % ± SD
No veld management inputs	32^{a} ± 10
Year 1	59^{b} ± 19
Year 2	60^{b} ± 12
Year 3	62^{b} ± 15
Year 4	82^{c} ± 7

a, b, c – Values with different superscript different significantly

4. CONCLUSIONS

Findings of the Glen Bonsmara beef trail proof that with scientific based veld management practices drastic improvement of beef production will be achieved. Because data was collected over a four year period with the same group of animals, with the same genetic potential, it is clear that management was playing a dominant role in the results. Especially for the communal and emerging sectors efficient veld management can contribute enormously to poverty alleviation.

This will also reduce natural resource degradation and ensure sustained profits over the long time.

Even in the commercial sector it often happens that farmers obtain very good livestock production and sometimes even seeing as top beef cattle farmers. These farmers are usually pleased with their veld management system and can also motivate higher stocking rates. However, when their veld is evaluated, it is clear that the veld ecosystem is under severe pressure, as indicated by the appearance of pioneer plants, such as *Aristida* species, or with less-palatable grasses, such as tough lovegrass (*Eragrostis plana*), turpentine grass (*Cymbopogon pospischilii*) and wire grass *(Elionurus muticus*), totally dominating the palatable grasses, such as red grass (*Themeda triandra*), finger grass (*Digitaria eriantha*) and bottle brush grass (*Anthephora pubescens*). In this scenario, the farmer's lick intakes are also dramatically higher than what is good for the environment, while animal performance is entirely dependent on his lick program, and the factory of the farm (his/her veld) is being destroyed. Unfortunately these medium term profitable practises are also used as examples for successful farming practises. It is therefore very important to distinguish between sustainable management practises and medium term more profitable but unsustainable practises.

Years after implementation of veld management	Fixed stocking rate	Variable stocking rate
Year 3	58	76
Year 4	80	92

Table 2. Comparison of calving rate between fixed and variable stocking rate (%)

The long-term economic viability of extensive animal production systems, mainly rely on the veld, and sustainable animal production will only be possible when the veld and soil conditions are in a productive and stable state. Livestock producers should focus on sustainable veld management including stocking rate rather than applying too many licks and nutritional supplements to the veld, as these have a negative influence on veld condition, grazing capacity and sustainability. The selection of veld adapted livestock which are able to satisfy the bulk of their nutritional requirements from the veld, will minimize the need for supplementary feed and will limit long-term degradation.

Sustainable livestock production is however only possible with scientific sound veld and livestock management over the long-term that ensures that veld condition increased or is in an ecological optimum. As such, a management system that neither increase production cost nor negatively affect production as well as the environment should be developed to optimize animal productivity and hence, livestock profitability.

Table 3 Comparison of weaner calf income per cow

Veld management inputs	No veld management	First year after implementation of veld management	Veld management: Fixed stocking rate (Year 3 & 4)	Veld management: Variable stocking rate (year 3 & 4)
Stocking rate	Not recorded*	6 ha/LSU	6 ha/LSU	3.8 – 9.8 ha/LSU
Calving %	32	59	69	84
Weaning weight	175 kg	210 kg	210 kg	216 kg
Weaner calf income	R 6 300	R 7 560	R 7 560	R 7 776
Pre weaning mortalities	15%	4%	1 %	0 %
Income per cow mated	R 1 071	R 4 158	R 5 202	R 6 532

* Although not recorded it is estimated that it did not exceeded 6ha/LSU