Productivity Measures in Small-Holder Livestock Production Systems and Social Development in Southern Africa

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ABSTRACT: Animal husbandry is an essential economic activity in most African farming systems. A significant proportion, approximately 70\% of ruminant livestock species (cattle, sheep and goats) in southern Africa, is kept under small-holder farming conditions, based on communal grazing systems. The objective of this paper is two-fold: i) to report on the productivity and dynamics of cattle herds of small-holder owners under communal tenure in the northern part of South Africa; ii) to review the notion of "social status" when simultaneously addressing small-holder and commercial farmers’ perceptions. The survey area comprised a rural village where 50 small-scale cattle owners were randomly selected. Interviews, questionnaires and the studying of veterinary services inspection records for the village were used to obtain a situation analysis of the productivity of these cattle herds. The survey conducted showed that 52\% of the respondents own less than eight head of cattle. Cows constituted 51\% of the herd composition, bulls 17.9\%, heifers 19.5\%, calves 7.7\% and oxen 3.4\%. Although there is a high bull and cow ratio, no correlation ($r=0.082$) between the number of bulls and calving percentage could be obtained. Herd management, particularly milking strategies may play a role in contributing towards the low reproduction rate. Herd mortality in this study is extremely high (45.1\%). This high mortality rate could have been aggravated by the severe drought experienced during the year of the study in this area. Mortality rates were highest in cows which had calves (44\%). There was a significant difference ($p<0.01$) in mortality rate between cows with calves and dry cows, oxen and bulls. The word “production" is relative, especially so when comparing two systems which from the outset have different objectives, as is obviously the case between small-holder communal farmers, where livestock ownership is associated with social status, and commercial livestock farmers in southern Africa.

Key Words: Productivity, Small-Holder, Livestock, Social Development, Southern Africa

INTRODUCTION

Animal husbandry is an essential economic activity in most African farming systems. A significant proportion, approximately 70\% of ruminant livestock species (cattle, sheep and goats) in southern Africa, is kept under small-holder farming conditions, based on communal grazing systems. Because livestock have both multiple productive functions and jointly produce a range of social, environmental, economical and cultural benefits, goods and services that can contribute directly to food security, rural development and enhanced environmental sustainability, they are particularly important to small-holder, resource-poor farmers (Barnes, 1978; Steyn, 1988; Ndlovu, 1990; Swanepoel, 1999).

A summary of benefits and products derived from livestock are presented in Table 1.

This diversity is erroneously viewed by many animal scientists as a negative factor in itself, responsible for low livestock productivity in communal systems. However, the multiplicity of purposes in keeping livestock can be viewed more positively as the small-holder farmer making maximum utilisation from his animals. This viewpoint is valid as long as a direct comparison in “productivity” between small-holder farmers and commercial enterprise is not made.

The objective of this paper is two-fold: i) to report on the productivity and dynamics of cattle herds of small-holder owners under communal tenure in the northern part of South Africa; ii) to review the notion of “social status” when simultaneously addressing small-holder and commercial farmers’ perceptions.

Table 1: A summary of benefits and products derived from livestock

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Product</th>
</tr>
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<tbody>
<tr>
<td>Food</td>
<td>Milk; meat; eggs; blood; fish; honey; processed products.</td>
</tr>
<tr>
<td>Clothing</td>
<td>Wool; hides; skins; leather.</td>
</tr>
<tr>
<td>Work</td>
<td>Draught power – cultivation; transport of goods and people; threshing; milling; pumping water.</td>
</tr>
<tr>
<td>Monetary</td>
<td>Capital wealth; investment; income from: hiring working animals; sale of products; sale of animals.</td>
</tr>
<tr>
<td>Social</td>
<td>Lobola (bride price); ceremonial; companionship; recreational; status.</td>
</tr>
<tr>
<td>Manure</td>
<td>Fertilizer; fuel; flooring.</td>
</tr>
<tr>
<td>Other</td>
<td>Feathers; bone meal; soap production.</td>
</tr>
</tbody>
</table>

MATERIALS AND METHODS

The survey area comprised a rural village where 50 small-scale cattle owners were randomly selected. Interviews, the completion of questionnaires and the studying of veterinary services inspection records for the village were used to obtain a feasible and accurate situation analysis of the productivity of these cattle herds in the study area. Data was analyzed using SAS (1985).

RESULTS

The results obtained from this case study are presented in Table 2 to 5.
The survey conducted showed that 52% of the respondents own less than eight head of cattle. It is widely reported and accepted that the herd size is regarded as one of the major constraints, which has an adverse influence on increased cattle productivity. Cows constituted 51% of the herd composition, bulls 17.9%, heifers 19.5%, calves 7.7% and oxen 3.4%. Although all the respondents would prefer more cows and heifers than oxen or bulls, the ratio of bulls to that of cows is 1:3. Although there is a high bull and cow ratio, no correlation \((r=0.082)\) between the number of bulls and calving percentage could be obtained. The reproduction of the cattle in this area is poor (14.9%). There is no distinct calving and breeding season, which is evident from calves being born throughout the year with the peak being during the summer months. The peak calving season during the summer period is associated with the uni-modal rains, highly concentrated during December to February in this area. Consequently, two-thirds of cows calve from December-February.

The reproduction rate of cattle reported in this study is particularly poor, compared to reproduction percentages reported in other studies in the region. About half of recorded calving rates from a representative sample of African production systems, report a calving percentage of approximately 50% (de Leeuw and Thorpe, 1996) which is equivalent to a 24 month calving interval. As cows rarely conceive again in the year of calving, parturition-intervals of 2 years and longer are common. Extended drought periods are common to this area and therefore also contribute towards low reproduction.

Herd management, particularly milking strategies, may play a role in contributing towards the low reproduction rate. Milking strategies of herd owners are guided by a complex set of factors such as herd size, family subsistence needs and whether there is a market for milk. Within the herd, the yield potential of cows and the condition of calves influences milking frequency and daily milk production (Grandin, 1988). Within the study, herd size and cattle wealth (number of cattle per person) influences milk offtake, since milking is primarily focussed on satisfying household food needs. Thus, the number of cows in milk per household is negatively correlated with milk offtake yield. The results of this study is substantiated by Coppock (1994), who reported that households with only 3 cows extracted 213 litres, compared to those with 28 cows who extracted only 70 litres of milk.

### DISCUSSION

#### Herd size, composition and reproduction

The reproduction rate of cattle reported in this study is particularly poor, compared to reproduction
number of their cattle. Others felt that it safeguards against losses during drought. This will not cause a total loss as they will use the meat for consumption purposes. It is clear that there is a need to encourage the communal farmer to increase offtake from his/her herd and to establish an appreciation of improved productivity and quality, instead of animal numbers only.

Socio-Economic Status of Livestock Ownership

The finding by Bembridge & Burger (1977) that the socio-economic status can be regarded as being a very useful predictor of successful and progressive cattle farming is important in this analysis. Whilst Wilkening, et al. (1962) define social status as the ranking given to individuals based upon consensus of members of a community or society as to what they regard as ‘high’ or ‘low’ characteristics, it has been concluded from this study that education, income, size of enterprise, social participation in village and district affairs, standard of living and a linkage to urban cities were identified as important in determining the socio-economic status. This conclusion and the fact that successful cattle farmers had a high socio-economic status in their communities emphasizes the relationship of a rural livestock farmer’s standard of livestock production to his/her level of social development.

Such an analogy is reasonable and understandable, because the production and subsequent significant consumption of animal products is not in the first instance necessary for survival but adds quality to life. The normal sequence of events in developing nations from an agrarian point of view is the production of enough foodstuffs (cereals, potatoes, etc) which, if surplus of the arable crops are being produced, such surplus is then ‘value added’ by being fed to livestock for the production of livestock foodstuffs (milk, meat). Improvements in animal production have often represented one of the best avenues of raising the small-holder producer from the level of subsistence to that of a small commercial entrepreneur (Kadzere, 1996). A further element to the low livestock productivity in small-holder livestock enterprises in southern Africa is the traditional bias of agricultural extension towards crop production. Also, the lack of institutionalization of FSR&E as an accepted means to increase the productivity in small-holder systems.

CONCLUSIONS

The productivity measures of the cattle in this study are generally low with respect to reproduction and offtake percentages and high in terms of mortality. The word “production” is relative, especially so when comparing two systems which from the outset have different objectives, as is obviously the case between small-holder communal and commercial livestock farmers in southern Africa. Improved animal production is normally preceded by self-sufficient and surplus production of grain crops, that is associated with a better social status of the farmers and often represents the transition from small-holder subsistence agriculture to a small-holder commercial entrepreneur.

Veterinarians, animal productionists and extensionists need to complement each other’s efforts in a cohesive team atmosphere for mutual benefit and, most importantly, to develop a competitive animal production industry. Understanding the biology alone is not adequate for providing effective advice to small-holder livestock producers. To be effective, animal scientists working under these circumstances have to be prepared to go beyond natural science principles and incorporate social and cultural elements to address the “real world” problems. A great deal of resilience on the part of the livestock specialist is required, to effectively engage in multi-disciplinary, collaborative problem-focussed approaches, also to understand the socio-economic complexities associated with small-holder communal systems.

Gandhi’s (1959) remark that: “…the greatness of a nation and its moral progress can be judged by the way its animals are treated” is highly appropriate. For the poor whose social status is in most instances low, their primary need is to get the basic food. Quality only becomes an issue after a certain level of satisfaction has been reached.

REFERENCES


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