

Off-take and production statistics in the different South African cattle sectors: Results of a structured survey

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Abstract

This article demonstrates the value of a survey based on a sample framework where urban/rural/deep rural enumerator areas of the South African population census are fused onto the input variables of the different biomes. The results of the survey can be used as guidelines for productivity measures in cattle. Pre-weaning calf mortalities in the commercial and emerging sectors was found to be just over 3%, whereas it is 31% in the communal sector. The off-take in the commercial sector is 32%, which is higher than the previous estimate of 25%, whereas it is 25% in the emerging sector and a low 6% in the communal sector. The calving percentage for the commercial and emerging sectors were found to be 61% and 48% respectively and in the communal sector as low as 27%, or 35% if adjusted for herd composition. Aspects such as pre-weaning mortality, herd composition and calving percentage in the communal sector should be urgently addressed to improve production from this sector. There is also scope for increased production in the commercial and emerging sectors by improving calving percentage.

Keywords: Cattle, mortalities, off-take, communal sector, emerging sector, commercial sector

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Introduction

Total cattle numbers in South Africa ranged from 13.6 to 13.8 million head over the past 5 years (RMRDT, 2008). Cognisance should also be taken that the cattle sector is highly dualistic with communal and commercial farmers all co-existing. The current estimate is that there are 6.7 million beef cattle and 1.5 million dairy cattle in the commercial sector, giving a total of 8.2 million cattle in the commercial sector; with 35 to 40 percent of the total herd owned by communal farmers, i.e. approximately 5.5 million animals (RMRDT, 2008). Research on several aspects of the communal and emerging sectors has shown that these sectors have not reached their full potential (Paterson, 1997; Ainslie, *et al.*, 2002; Clark, *et al.*, 2005; Montshwe, 2006). For example it is estimated that off-take in the non-commercial sector (communal and emerging) varies between 7.5 percent and 10 percent, which is significantly lower than the estimated 25 percent in the commercial sector (Montshwe, 2006; RMRDT, 2008). Jooste (1996) estimated that the national off-take varies between 15 and 20 percent. The estimates referred to above are based on localized samples or are outdated and new information on a national level is necessary for long term planning.

The information gathered through a survey conducted under FAO/UNDP/SADC Project RAF/97/032 (Scholtz, *et al.*, 2008), can be used to as guidelines for productivity measures in cattle. The aim of the survey was to identify, characterize, conserve and improve farm animal resources in order to maintain biological diversity. Socio-cultural information, population demographics, production and animal health data were also collected to create a holistic approach to the design of sustainable livestock systems with the potential to improve food security, rural livelihoods and incomes (Bester & Ramsay, 2005).

This article aims at comparing the dualistic cattle sectors in South Africa, to quantify the off-take from the different sectors, and to supply some baseline information.

Materials and method

The field work of the survey was completed by the end of 2003. Following a number of delays, sufficient analysis was completed to contribute towards the South African Country Report on Farm Animal Genetic Resources, finalized in 2006. However a lot of secondary information is still available from the survey. This article summarizes results of the survey in respect of the off-take of cattle in the different sectors. More information on the survey can be obtained from Scholtz, *et al.* (2008). The design of the sample framework was based on the input variables of the different biomes and urban/rural/deep rural enumerator areas to ensure that the survey was representative. Areas chosen were the enumerator areas used in the South African population census of 1996 and were identified by fusing the census information onto the biomes.

The sample size for cattle was 1097, 94 and 90 farmers for the communal, emerging and commercial sectors respectively from throughout South Africa. This sample size included both the primary and secondary keepers of cattle, secondary keepers being those that keep another species than cattle as their main interest. This group was excluded from the analyses since they were not required to respond to all the questions related to cattle in the questionnaire. The final sample sizes for primary cattle keepers were 938 communal, 81 emerging (in the survey described as small scale) and 76 commercial farmers. In contrast to previous studies this one separates the communal from the emerging sector.

In previous studies off-take was identified as the percentage animals marketed. In this study off-take was defined as all the voluntary exits (e.g. sold, slaughtered, donated, exchanged, used for cultural purposes) as the percentage of total cattle.

Results and discussion

The number of calves born and bought as well as the number that died or were stolen, that was sampled in the survey is presented in Table 1. Table 1 indicates that the pre-weaning calf mortalities in the commercial and emerging sectors are just over 3%, whereas it is 31% in the communal sector. This is somewhat lower than the pre-weaning mortality of 50% that is sometimes quoted for the communal sector (Clark, *et al.*, 2005). However, a pre-weaning mortality of 31% is still regarded as too high. For the commercial sector pre-weaning mortalities are accepted to be 4%, which is close to the 3% calculated from the survey data. Stock theft under the calves is low in all the sectors.

Table 1 Number of calves borne, that died or were stolen in the different cattle sectors

Item	Commercial sector		Emerging sector		Communal sector	
	Number	%	Number	%	Number	%
Calves born, bought	8276		1770		940	
Died	256	3.1	59	3.3	289	30.7
Stolen	12	0.14	0	0	14	1.49

The total number of cattle sampled, excluding the calves, and the voluntary exits, as well as the involuntary exits (died, stolen) for the different cattle sectors are presented in Table 2. From Table 2 the off-take in the commercial sector is 32.3%, which is higher than the 25% off-take that has been estimated for this sector (RMRDT, 2008). It should be noted that the off-take in the emerging sector is high at 24.7%. Since this is a relatively “new” sector, the cattle population dynamics may not be stable, resulting in such high off-take figure. Alternatively, the fact that the survey indicates that more animals (1779) are sold than what is born (1770) in this sector, may be an indicator that this sector will struggle to sustain itself. The high off-take may be the result of breeding stock being sold. In the case of the communal sector it is a low 6.07%, which is lower than the estimated off-take of 7.5% to 10% for the non-commercial sector. An explanation may be that the previous estimates did not distinguish between the emerging and communal sectors.

Table 2 Total number of cattle (excluding calves), and reasons for exits expressed as the percentage of the total herd size (excluding calves) (% given in 2nd row of table)

Item	Commercial sector		Emerging sector		Communal sector	
	Number	%	Number	%	Number	%
Total number of cattle	28 726		7 749		11 426	
Sold	6 959	24.2	1 779	23.0	470	4.11
Slaughtered	2 384	8.30	128	1.70	210	1.84
Donated	9	0	6	0.08	3	0.03
Exchanged	4	0	1	0.0	10	0.09
Total: Voluntary exits	9 356	32.3	1 914	24.7	693	6.07
Died	764	2.66	151	1.95	537	4.70
Stolen	46	0.16	13	0.17	197	1.72%
Total: Involuntary exits	810	2.82	164	2.12	734	6.42%

The off-take of cattle in South Africa as calculated in this study is compared to those of other countries and regions (FAOSTAT, 2002) in Table 3. From Table 3 it is clear that the production efficiency of the commercial beef cattle sector in South Africa is at a high level and exceeds that of Australia whereas it is close to that of the European Union.

Table 3 Off-take percentages of cattle in South Africa compared to other countries and regions

Country / region	% Off-take
South Africa (commercial)	32
South Africa (emerging)	25
South Africa (communal)	6
Australia	28
New Zealand	37
European Union	34
United States of America	38
South America (Argentina, Brazil, Paraguay, Uruguay)	20

The post weaning mortality of 2.66% in the commercial sector is close to the 2 % that has been accepted as the norm for this sector. The post weaning mortality in the communal sectors of 4.7% is extremely low, compared to the accepted level of 15% (Tapson, 1990). It is also significant that the involuntary exits in the communal sector are higher than the voluntary exits, which is alarming (Table 2). In the case of both the commercial and the emerging sectors the voluntary exits are 12 times higher than the involuntary exits.

There is currently no agreement on the calving percentages of cows in the different sectors. The perception is that the national calving percentage in the commercial herd varies between 55% and 65%, whereas others will argue that it is as low as 45%. In the communal sector the calving percentage is generally accepted to be in the region of 40% (Clark, et al., 2005). The results of a case study on the South African Beef Profit Partnerships project (Madzivhandila, 2007), gives calving percentages that range from 43% to 64%. The results in Table 4 are an attempt to quantify the calving percentage of cows in South Africa using information from the survey.

Table 4 Information from the survey used to estimate the calving percentage and the estimated calving percentage in the different sectors

Description	Commercial sector	Emerging sector	Communal sector	Communal Sector*
Total number (excluding calves)	28 726	7 749	11 426	11 426
% Adult females	51.6%	48.7%	32.7%	25.0%
Number of adult females	14 822	3 774	3 736	2 857
Number of active adult females	13 607	3 693	3 496	2 694
Number of calves borne	8 276	1 770	940	940
Calculated calving %	60.8%	47.9%	26.9%	34.9%

* Scenario where % Adult females was adjusted to 25%

An assumption made in respect of the information in Table 4 is that “adult females” as recorded in the survey is the equivalent of females at the age of reproductive capability. The inactive adult females (those that were stolen or died) were then subtracted from the total adult number to give the number of active adult females that could have produced a calf. The first point to note from Table 4 is that the number of adult females in the commercial herd is 51.6%, which is close to the norm of 50% set for the commercial sector. In the communal sector the adult females are estimated at 32.7%, which is higher than some observations that put it at between 20% and 25%.

The calculated calving percentage (number of calves borne/ number of active adult females) for the commercial sector (Table 4) is 60.8% which corresponds to the estimated calving percentage of 55% to 65%. In the emerging sector it is calculated to be 47.9%. The calving percentage in the communal sector is calculated to be only 26.9%, which is lower than the accepted norm of 40%. The estimation of 26.9% in this study may be too low and should not be used as a reference point. In a scenario where the percentage adult females in the communal sector is adjusted to 25%, then the calving percentage increases to 34.9% (Table 4), which may be a more accurate reflection of the actual calving percentage.

The mean and median herd sizes for both the primary and secondary cattle keepers combined have also been calculated from the information of the survey and are presented in Table 5. The median for herd size was included because it is generally accepted that there are many farmers, especially in the communal sector, with very small herds of less than 10 and a few very large herds. For the same reason the mean herd size of the largest 5% of herds in each sector as well as the maximum herd size is also presented in Table 5.

In the case of the commercial sector there is a big difference between the mean and median and to a lesser extent in the emerging sector, indicating that herd sizes are not normally distributed. Although the mean and median herd sizes in the communal sector are small, there are a few relatively large herds in this sector, which can be targeted for proper commercialization. The information on herd sizes in the different sectors may be useful for decision makers at different levels.

Table 5 The mean and median cattle herd sizes for the different sectors

Sector	Mean	Median	Mean (largest 5%)	Maximum
Commercial	293 (413*)	184	708	2 000
Emerging	59	41	307	900
Communal	13	9	61	300

* This value reflects the mean herd size of the primary cattle producers

Conclusion

A survey that is based on a sample framework where urban/rural/deep rural enumerator areas of the South African population census are fused onto the input variables of the different biomes can render very valuable results regarding livestock production. The major discrepancies in production and throughput between the commercial, emerging and communal sectors are highlighted by the results of the survey, and clearly indicate that aspects such as pre-weaning mortality, herd composition and calving percentage in the communal sector should be urgently addressed to improve production from this sector. There is also scope for increased production in the commercial and emerging sectors by improving calving percentage.

A number of different stakeholders such as scientists, development practitioners, policy makers and cattle farmers can all benefit from the availability of the information presented in this article.

Acknowledgements

The authors are grateful to the FAO for the funding of the survey through project RAF/97/032. The enumerators and supervisors of the different Provincial Departments of Agriculture and the ARC are recognized for their hard and dedicated work in carrying out the survey. The University of Pretoria is acknowledged for designing the sample framework and guidance during the survey.

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