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BEEF CATTLE PRODUCTION IN A PERI-URBAN AREA OF ZIMBABWE

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Abstract
A total of 102 questionnaires were administered to determine the production practices and identify constraints faced by peri-urban beef cattle farmers in Bulawayo, Zimbabwe. The majority of the farmers reared commercial chickens (57% of the respondents) and cattle (20%). Cattle were ranked as the most important livestock species and were chiefly kept for breeding purposes, draught power and cash. Brahman and its crosses were the most common beef breeds. The majority of the farmers (77%) practiced extensive cattle production. Most respondents (80%) supplemented their cattle with crop residues and mineral salts during the dry season. Tick-borne diseases (48% of the respondents), stock-theft (45%) and shortage of feed (42%) were ranked as the major constraints cattle production. It was concluded that peri-urban beef farming can be a feasible and sustainable option, where locally available medicinal and drought tolerant feed resources are utilized.

Introduction

There is an ever increasing demand for livestock products in Zimbabwe due to the prevailing harsh economic and climatic conditions. Beef industry is one of the Zimbabwe's foremost economic activities (Sibanda, 1999). However, it is collapsing, for instance, beef production declined by 9%, from 99 000 tons in 2003 to 90 000 tons in 2004 (CSO, 2006). The majority of the national cattle population (3.5 million) is found in the smallholder areas, however, off-take (currently 3-5 %) from this sector is low (Sibanda, 1999). Thus, there is need to improve production and off-take of the cattle from the smallholder areas. In Zimbabwe, peri-urban beef cattle production is not prominent. Development of the peri-urban cattle

production in cities that are located in semi-arid agro-ecological zones can increase cattle offtake and meet the high beef demands offered by urban dwellers.

What distinguishes peri-urban cattle production from the rural production is proximity to a large number of human settlements (Schiere *et al*., 2000). This proximity implies opportunities in terms of providing fresh and high value beef and the efficiency in marketing and transport of inputs and produce (IFPRI 2000). It also means more employment and increased income for the peri-urban farmers and urban dwellers. Thus, peri-urban agriculture offers great potential for reducing unemployment, food insecurity and poverty for urban dwellers (Maxwell, 1994; Schiere *et al*., 2000). Despite the importance of peri-urban beef production in Zimbabwe, research, extension, development and policy systems have largely ignored this area of food production. Currently, there is little, if any systematic information about its importance for addressing food and livelihood sustainability. To improve productivity and sustainability in a particular agricultural sector, there is need to assess the prevailing production systems and identify objectives, constraints and opportunities of the farmers (Ashley *et al.,* 1999). The objective of this paper was, therefore, to determine the production practices and identify constraints faced by peri-urban beef cattle farmers in Bulawayo, Zimbabwe.

Materials and Methods

Study area

The study was conducted in peri-urban areas situated within a radius of 40km from Bulawayo city, Zimbabwe. The areas include Glenkara, Hyde Park, Trenance, Sigola, Crocodile Resettlement, Umguza, Hopefountain, Woodville, Woodlands, Rangemore, Gumtree, Worringham, Kensington and Matsheumhlope. Bulawayo district is located at an altitude of 1200 m above sea level. Its' mean annual rainfall and temperature ranges between 450-650 mm and 25-30^{o}C, respectively. The district is dominated by livestock production with minor crop production. Rangelands are chiefly composed of *Heteropogon*, *Andropogon*

and *Hyparrhenia* grass species. The dominant trees are *Acacia spp, Terminalia sericca, Dichrostachys cinera, Ziziphus mucronata, Colophospermum mopane* and *Combretum apiculatum.*

Data collection

A total of 102 beef cattle producers were randomly interviewed at their homesteads using a structured questionnaire (pretested) between April and August 2004. Data captured included sex of household head, level of education, livestock species owned, objectives of keeping cattle, production systems, cattle management practices and constraints faced by peri-urban beef cattle producers.

Statistical analysis

The data were analyzed using SPSS (2002) to give descriptive statistics. Chi-square tests were used to determine association among socio-demographic characteristics, herd size and production systems.

Results and discussion

Farmer socioeconomic profiles

Seventy-eight percent of the households in the peri-urban areas were male-headed. These findings are similar to the national average of 76% (CSO 1992). Chawatama *et al.* (2005) in Matobo and Ndebele *et al*. (2007) in the Gwayi smallholder areas reported that 74 and 84% of the households, respectively, were male-headed. Sex of the household head influences the type of livestock held, cattle management practices, decision making and household access to food (Chambers, 1983; Devendra and Chantalakhana, 2002). The majority of the respondents (60 %) were aged over 50 years while 38% were aged between 31 and 50 and 2% were less than 30 years old. These findings are comparable Ndebele *et al.* (2007) who reported that more than 65 % of the farmers were aged over 50 years. About 76 % of the interviews were married, 16% widowed, 5% divorced and 3% single. Mean household size

for all the communities was 11 ± 9 members and composed of 4 ± 2 males, 3 ± 1 females, 4 ± 2 children. About 23 % of the interviewed farmers in peri-urban areas had primary, 74% secondary 3 % no educational qualifications, respectively. The comparably high standards of education in this sector can be exploited in the introduction of improved cattle production technologies. Respondents ranked livestock as the main source of livelihood.

Landholdings and crops grown

About 60 and 58% of the respondents owned less than 5 acres of arable and grazing land, respectively, 20 and 15% owned between 5-10 acres and 20 and 27% greater than 10 acres. Table 1 shows crops grown by peri-urban beef producers. Maize was the most commonly grown crop and was mainly used for home consumption.

Table 1: Crops grown by peri-urban beef producers in Bulawayo

Crop	Proportion of farmers %
Maize	96
Groundnuts	36
Roundnuts	11
Sunflower	19
Sorghum	26
Millet	9
Sugar beans	36
Cowpeas	7
Wheat	7
Soya beans	3
Vegetables	31

Livestock species kept

The majority of the farmers reared commercial chickens (57% of the respondents) and cattle (20%). About 6% kept indigenous chickens, goats (3%), sheep (2%), pigs (2%) and Donkeys (1%). These findings concur with earlier reports by IFPRI (2000) and Schiere *at al.* (2000) that raising of small livestock, especially chickens, is the main business developed by peri-urban farmers. Cattle were ranked as the most important livestock species. About 34 % of the interviewees ranked breeding as the most important reason of keeping cattle, 25 % draught power, 22 % cash and 15 % milk. Other uses of cattle were meat, manure, wealth,

dowry and socio-cultural functions. Chimonyo *et al.* (1999) and Chawatama *et al.* (2005) reported similar results in Sanyati and Matobo smallholder areas, respectively.

Cattle ownership and gender roles

As indicated in Table 2, most of the animals were jointly owned by males and females. Generally, males were dominant in all cattle production activities (Table 2). Corresponding to the outcome of this research, Chawatama *et al*. (2005) reported that cattle ownership and husbandry in the smallholder areas still follow a largely gendered division of labour dominated by men.

Table 2: Ownership and participation (%) of different gender groups in cattle production

Gender	Ownership	Purchasing	Selling	Herding	Breeding	Feeding	Milking
Males	31	82	68	48	56	56	48
Females	19	43	50	15	16	24	19
Parents	46	-	-	-	-	-	-
Boys	6	2	3	44	8	17	43
Girls	2	-	-	-	-	-	-

Cattle production systems

Of those respondents that kept cattle, 77% practiced extensive production system, 14% semi-intensive and 9% intensive. These findings were inconsistent with observations made in other peri-urban areas, where intensification of beef was rampant to meet the consumer demand and space constraints in the big cities (Maxwell, 1994; Schiere *et al.,* 2000). The unexpectedly low numbers of farmers practicing intensive beef production in the Bulawayo peri-urban areas can be ascribed to inconducive climatic conditions for cropping, high prices and unavailability of grains and commercial feed. Cultivation of drought tolerant crops such as sorghum, sunflower and forages [*Lablab purpureus* (Highworth), *Cenchrus ciliaris, Cynodon nlemfuensis* and *Stylosanthes scabra]* can be viable alternatives for intensifying beef production in low rainfall areas (Mapiye *et al.*, 2006a, b; Mapiye *et al.,* 2007). Conserving forage/browse material as hay or foggage for utilization in the dry season can be another coping mechanism to increase feed supply (Mapiye *et al*., 2006b). Semi-intensive

beef farming becomes a feasible option and sustainable, where drought tolerant forages and conserved feeds are used as a supplementary feed on pen finishing.

However, livestock production systems are dynamic and continue to evolve over time in response to market and environmental changes (Sibanda, 1993; Ashely et al 1999). When the demand for beef is high, intensive crop and livestock production is carried out in agro-ecological zones with high rainfall and/or irrigation to meet the market demands (Maxwell, 1994). The less productive and marginal ecological regions are used for livestock production where keeping animals become the most efficient and economic way of utilizing these areas. Thus, land and climate are some of the major determinants of the production systems (Schiere *et al.,* 2000).

About 75% of respondents practiced a combination of breeding and buying-in production methods, 15% breeding and 10% buying-in only. There was a significant association between production system and level of education ($P<0.05$). Farmers who attained at least secondary school qualifications practiced intensive and semi-intensive cattle farming compared to those with/without primary education. Nyangito (1986) reported that the agriculture production and adoption of new technologies in agriculture were positively related to education.

Rangeland and feed management

Most farmers herded (80 %) their cattle throughout the year due to lack or vandalism of fences and kraaled them at night to prevent theft. Most farmers (84%) supplemented their cattle with crop residues and mineral salts (46%) and bought-in feed (25%) during the dry season. Crop residues have low protein content (Sibanda, 1993) and slowly supply/release soluble carbohydrates, this limit microbial activity in the rumen (Smith, 1993). Mixing crop residues with grains and leguminous forages is therefore, important (Mapiye *et al.*, 2007). The main sources of water for the animals were dams (54%), boreholes (24%), taps (12%) and rivers (10%).

Cattle breeds kept

The breed used were Brahman (38% of the respondent), crossbreds (38%), non-descript (13 %) Beefmaster (11%), Afrikaner (9%), Nkone (9%), Tuli (8%), Hereford (6%), Simmental (2%) and Mashona (1%). Respondents preferred to use Brahman and Crossbreds because they considered them to be adaptive (88% of the respondents) and docile (85%), and to have relatively high growth rate (85 %), meat quality (85 %), high fertility (74%), milk yield (36 %) and attractive coat color (29%).

Cattle breeding practices

Most of the farmers did not own bulls. Bulls were mainly kept for breeding (88%) while 12% were used for cultural purposes. Bull infertility problems were common and these were credited to poor nutrition, ageing and overuse. Comparable results were found by Ndebele *et al.* (2007) in the Gwayi farming area. The existence of few bulls over long periods of time can lead to inbreeding. Development of open nucleus group breeding schemes combined with progeny testing and recording schemes can minimize bull fertility and inbreeding problems (Khombe, 1998; Mhlanga, 2000).

Breeding was largely uncontrolled (77% of the interviewees). Men (56%), females (16%) and boys (8%) were responsible for making breeding decisions. Calving interval of 2-3 years were reported. Chimonyo *et al*. (2000), Muchenje *et al.* (2007) and Ndebele *et al.* (2007) also reported calving intervals greater than 2 years in smallholder farming areas. Cows must be managed in such a way that the calving interval should not exceed the optimal calving interval of 12-13 months (Garwe, 2002). The causes of long calving intervals within a breed include poor nutrition after parturition, shortage of bulls and absence of systematic weaning (Hamudikuwanda, 1999; Chimonyo *et al.,* 2000; Garwe, 2002; Muchenje *et al.,* 2007).

Cattle diseases and parasites

Tick-borne diseases (83%) were the most causes of mortality in peri-urban areas, followed by bacterial (56%) and viral diseases (16%). Mortality rate was 1% for mature cattle and 2% for calves. The major cattle diseases were heart-water, gall-sickness and blackleg and they mainly occurred in summer. Most farmers (68%) consulted government veterinary on animal health matters, 55% drug dealers, 18% private veterinary doctors and 4% extension officers. The majority (85%) of the farmers dipped their cattle to control ticks and tick-borne diseases. Other control measures used include treating using conventional medicine or traditional medicine (22 %) and vaccinations. Plunge pool dip was the most common type of dip (70%) followed by spray dips (30%). Farmers randomly dosed their cattle to control internal parasites. Chawatama *et al.* (2005) and Ndebele *et al.* (2007) reported occurrence of tick-borne diseases in summer as one of the major constraints and farmers dipped their animal as a control measure in Matobo and Gwayi smallholder areas, respectively.

Cattle marketing

Most farmers sold their cattle to private sales when faced with problems. Cattle off-take in Bulawayo was higher (5 %) than the national off-take of 3-4% and 2-3% in the communal and commercial sectors, respectively (Sibanda, 1999; Cattle Producers' Association, 2002). The high off-take can be attributed to proximity to the market and high demand and prices offered by urban dwellers as earlier stated by IFPRI (2000) and Schiere *et al.* (2000). In areas with poor transport facilities, marketing was a problem. This resulted in unscrupulous buyers who bought beef cattle at a low price.

Constraints faced by peri-urban cattle producers

The major constraints were tick-borne diseases (48% of the respondents) stock-theft (45%) and shortage of feed (42%). High rates of stock-theft can be attributed to a ready and highly

rewarding market offered by urban population, high rate of private cattle sales, which exclude veterinary and police personnel in Bulawayo peri-urban areas. The situation could have been encouraged by inadequate veterinary services, such as lack of inspection of cattle and movement permits. To minimize stock-theft, police or neighborhood watchmen night patrols are essential (Ash, 2003). An establishment of crime prevention agent in the area, such as the farm protection association with the full support and commitment of the farmers and stakeholders in the area can be helpful. Producers were advised to report stock-theft to the police within 24-48 hours. Cattle producers are recommended to resort to lower-cost and locally available forages, multi-purpose tree legumes and agro-industrial by-products to augment the inadequate grazing resources and to meet animal feed requirements (Smith, 1993, Devendra and Chanalakhana, 2002; Mapiye *et al.*, 2007).

Most interviews (34%) claimed that they had difficulties in contacting veterinary officials, whose responses were slow. The veterinary officers did not conduct routine visits, except when requested. Use of locally available and cost-effective medicine and educating farmers on hygienic measures can be a solution. Research on the willingness of the farmers to pay for private veterinary services is crucial. Thus, privatization of veterinary delivery services can be an answer. There were limited contacts between farmers and extension services. Improving farmer-extension linkages was suggested to be the key to this constraint. Farmers had limited access to loans (35%) and credit facilities (30%) and where available high interest rates and lack of collateral. Establishment and funding of local micro-finance credit schemes managed by farmers can be worthwhile. Farmers are challenged to form and use cooperative schemes for sourcing feeds, capital and transport, and when marketing in order to enjoy economies of scale.

Conclusion

Tick-borne diseases, stock-theft and lack of feed, respectively, were ranked as the major constraints of peri-urban cattle production. It was concluded that peri-urban beef farming can

be a feasible and sustainable option, where locally available medicinal and drought tolerant feed resources are utilized. In view of the important contribution of the peri-urban livestock production to meeting the specialized cash and food needs of the urban and peri-urban dwellers, there is need to prioritise its development.

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