Research Application Summary

Production performance and contribution of dairy goats to income of small scale farmers: A case of Babati and Kongwa districts in Tanzania

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Abstract

This study was carried out in Babati and Kongwa districts in Tanzania to determine the lactation performance, reproduction performance, profitability and contribution of dairy goats to household income of small scale farmers. The data were collected from a total of 40 small-scale dairy goat farmers and 40 non-dairy goat farmers from four villages using semi structured questionnaire. Gross margin analysis was used to assess the profitability of the dairy goat enterprises. The study revealed that the major income generating activities were both crop and livestock production. The first three reasons for keeping dairy goats in both districts were production of milk for domestic use (99%), generation of income (94%) and provision of manure (77%). Dairy goat production parameters from the study areas indicated that average daily milk yield, total lactation yield, lactation length and dry period were 1.71 ± 0.08, 276.22 ± 24.49 litres, 5.41 ± 0.36 and 1.8 ± 0.11 months, respectively. Age at first kidding was 14.57± 0.28 months and kidding interval was 9.29 ± 0.37 months for Babati district. In Kongwa, average daily milk, total lactation milk yield, lactation length and dry period were 1.37 ± 0.13, 241.35 ± 38.63 litres, 5.44 ± 0.49 and 2.0 ± 0.11 months, respectively. Age at first kidding was 13.04±0.38 months and kidding interval was 9.19 ± 0.50 months. Among the parameters described above only daily milk yield and age at first kidding differed significantly between the two districts ($P \leq 0.05$). Average annual profit per household from dairy goat enterprise in Babati and Kongwa were US$ 455.73 and US$ 215.18, respectively. Dairy goats contribute 32% in Babati and 25 % in Kongwa districts of the total household income. Average incomes for dairy goat farmers were higher than that of non-dairy goat farmers (US$ 1,417.9 vs US$ 504.56 in Babati and US$ 8,37.31 vs US$ 545.19 in Kongwa). The study showed that, dairy goat enterprises are profitable and significantly contribute to household income. Promotion of dairy goats to other areas of the country is thus recommended.

Key words: Annual income, gross margin, lactation performance, reproduction performance

Résumé

Cette étude a été réalisée dans les districts de Babati et de Kongwa en Tanzanie pour déterminer la performance de lactation, la performance de la reproduction, la rentabilité et la contribution de chèvres laitières au revenu des ménages de petits agriculteurs. Les données ont été recueillies sur un total de 40 petits éleveurs de chèvres laitières et 40 éleveurs de chèvres non laitières en provenance de quatre villages à l'aide d'un questionnaire semi-structuré. L'analyse de la marge brute a été utilisée pour évaluer la rentabilité des entreprises de chèvres laitières. L'étude a révélé que les principales activités génératrices de revenus étaient à la fois la production végétale et animale. Les trois premières raisons pour garder les chèvres laitières dans les deux districts étaient la production de lait pour l'usage domestique (99%), la génération de revenus (94%) et la fourniture de fumier (77%). Les paramètres de production des chèvres laitières dans les milieux d'étude ont indiqué que le rendement moyen du lait par jour, le rendement de lactation totale, durée de la lactation et la période sèche étaient 1,71 ± 0,08, 276,22±24,49 litres, 5.41 ± 0.36 et 1,8± 0.11 mois, respectivement. L'âge à la première blague était 14,57 ± 0,28 mois et l'intervalle de plaisanterie était de 9,29 ± 0,37 mois pour le district de Babati. Dans le district de Kongwa, moyenne quotidienne de lait, le rendement total de lactation, la durée de la lactation et la période sèche étaient de 1,37 ± 0,13 ; 241,35±38,63 litres, 5,44 ± 0,49 et 2,0 ± 0,11 mois, respectivement. L'âge à la première blague était 13,04 ± 0,38 mois et l'intervalle de plaisanterie était 9,19 ± 0,50 mois. Parmi les paramètres décrits ci-dessus seulement le rendement en lait par jour et l'âge à la première blague étaient significativement différents pour les deux districts ($P \leq 0,05$). Le bénéfice annuel moyen par ménage à partir de l'entreprise des chèvres laitières à Babati et à Kongwa étaient aux États-Unis et 455.73 $ US et 215.18 $ US, respectivement. Les chèvres laitières contribuent 32% dans le district de Babati et 25% dans celui de Kongwa du revenu total du ménage. Le revenu moyen des éleveurs de chèvres laitières a été plus élevé que celui des éleveurs de chèvres non- laitières (US $ 1,417.9 vs US $ 504.56) à Babati et US $ 8,37.31 vs US $545.19 à Kongwa). L'étude a montré que, les entreprises de chèvre laitières sont rentables et contribuent de manière significative au revenu du ménage. La promotion de chèvres laitières à d'autres régions du pays est donc recommandée.

Mots clés: Revenu annuel, marge brute, performances de lactation, performances de reproduction

Background

Smallholder dairy production is an important source of nutrition and income to millions of households in Tanzania (World Bank, 2001). Dairy goats are kept by small scale farmers in rural areas specifically for meat, milk, skins and manure. Milk from goat is reported to have higher medicinal value, high vitamin B content and high digestibility making it helpful in relieving stress and constipation. It is also a good source of protein which is important food for children, patients and nursing mothers. Goats also serve as saving and living banks for the resource poor rural people, since they can easily be converted to cash (Dossa *et al*., 2008; Gurmesa *et al*., 2011).

Goats have faster reproductive rate, shorter generation interval, are cheaper to buy and require fewer facilities for up keep and maintenance than cattle. Goat enterprises make quick returns on invested capital. Due to the importance of goat as source of food and in reducing poverty to small scale farmers, most of development agencies have been engaged in improving dairy goat production in the rural areas. This has been done through introduction of exotic dairy goats and their crosses. The common dairy goat breeds introduced in rural Tanzania are Toggenburg, Saanen, Anglo-Nubian, Alpine and Norwegian (Das and Sendalo, 1991).

Unfoetunately, the introduction of exotic dairy goats and their crosses was done without considering whether the prevailing environmental conditions suits the breeds. Information on performance of dairy goats in rural areas is scarce. This study was carried out to determine production performance, profitability and contribution of dairy goats enterprises to incomes of small scale farmers in Tanzania.

Literature Summary

Dairy goat production has been found to be a promising enterprise for increasing consumption of animal protein as well as raising income of rural people (Ahuya *et al*., 2009). This is because the initial and maintenance costs for goats are low and can be afforded by smallholder farmers compared to dairy cattle.

In the 1980s, on-farm dairy goat keeping at community level was promoted by development agents and did well as opposed to the station-based approaches. Introduction of dairy goat breeds in rural areas were aimed at upgrading the local breeds and increasing their growth rates, milk yield and hence improve food security as well as household income. This has led to

increased interest in using dairy goat enterprises in poverty reduction by government and non-governmental organisations (Ogola *et al*., 2009). As a result dairy goats have been introduced in many different parts of the country. In most parts of Tanzania, dairy goats have gained popularity as source of milk and income (Shirima, 2005; Tadele, 2007). Dairy goat enterprises have been shown to contribute significantly to household incomes in comparison to most other enterprises. Manure from dairy goats improvesoil fertility, increase crop yield, and hence food security and household income (Peacock, 2005; Safari *et al*., 2008). Performance of dairy goats in developing countries however, are influenced by the production environment, climatic conditions, breed, season of the year and level of nutrition (Ndlovu, 1990; Dadi *et al*., 2008). In most cases, production efficiency is reduced.

Study Description

This study was carried out in Babati and Kongwa districts located in a semi-arid environment of Tanzania. In each district four villages with pure exotic breeds or their crosses were selected for the study. The basis for selection was that dairy goats have been into the respective village for more than five years. A purposive sampling procedure was adopted to ensure that the sampled households represent the dairy goat farmers. From each village ten dairy ten non-dairy goat farmers were involved. The tool for data collection was a structured questionnaire and visual observations. Farmers were visited individually, and asked information about their dairy goat enterprise, crops, and other livestock and off-farm activities. The same data were collected from non-dairy goat farmers. Information on cost of production for crops, other livestock, off-farm activities and sales of yield/outputs was also obtained. Data on age at first kidding, kidding interval, kid mortality, daily milk yield, total lactation yield, lactation length and dry period were also collected. The data on enterprises performance were analysed using SAS (2004). Information on profitability of the dairy goat enterprise was computed using gross margin analysis. Finally, the contribution of dairy goat enterprise to household income in comparison to other enterprise was determined.

Research Application

The results showed that overall mean daily milk yield per goat was 1.71 ± 0.08 litres in Babati and 1.37± 0.13 litres Kongwa. The results revealed that daily milk yield differed significantly ($P<0.05$) between the districts. Total milk yield was 276.22 ± 24.49 litres in Babati and 241.35±38.63 litres in Kongwa. However, the district effect in this case not was significant

(P>0.05). Lactation length, dry period, age at first kidding, and kidding interval were 5.41 ± 0.36, 1.86 ± 0.11, 14.57 ± 0.28, 9.29 ± 0.37 months in Babati and 5.44 ± 0.49, 2.0± 0.11, 13.04 ± 0.38, 9.19 ± 0.50 months in Kongwa. The difference in age at first kidding was significantly different (P<0.05) in the two districts. However, lactation length, dry period and kidding were not significantly (P > 0.05) different between the districts. Overall kid mortality was 13.4% and 7.89% in Babati and Kongwa districts, respectively. The difference in kid mortality between the districts was significant (P<0.05).

Table 1 shows profitability of dairy goat enterprise and their contribution to household income in the two districts. There were significant difference (P<0.05) in labour cost, buck price, sales of young and adult females, sales of milk and gross margin between Babati and Kongwa districts. Gross margins were

Table 1. Annual cost, sales and Gross margin for dairy goat enterprises and other enterprises and their contribution.

Variable	Babati	Kongwa
Input costs		
Drug	73,073.75 ± 11,842.96 [a]	61,648.75 ± 11,842.96 [a]
Labour	112,510 ± 21,618.07 [a]	181,880.0 ± 21,618.07 [b]
Feeds	167,262.5 ± 24,139.57 [a]	194,263.0 ± 24,139.57 [a]
Buck	4,700.0 ± 1,021.99 [a]	1,792.50 ± 1,021.99 [b]
Construction cost	186,827.50 ± 23,528.62 [a]	98,050.00 ± 23,528.62 [b]
Veterinary services	10,445.00 ± 1,837.02 [a]	11,892.50 ±1,837.02 [a]
Total cost (x)	549,411.25 ± 50,237.27 [a]	549,526.75± 50,237.27 [a]
Revenues		
Sale of young Male	149,825.0 ± 34,492.56 [a]	140,750.0 ± 34,492.56 [a]
Sale of young Female	341,025.0 ± 46,784.69 [a]	213,750.0 ± 46,784.69 [b]
Sale of Adult Male	49,850.00 ± 18,377.89 [a]	92,000.0 ±18,377.89 [a]
Sale of Adult Female	52,625.00 ± 21,878.28 [a]	159,000.0 ± 21,878.28 [b]
Sale of Milk	203,937.50 ± 55,286.634 [a]	19,600.0 ± 55,286.63 [b]
Milk consumed home	438,240.0 ± 96,264.03 [a]	337,955.0 ± 96,264.03 [a]
Total sale(y)	1,233,002.50 ± 136,964.83 [a]	872,305.00 ± 136,964.83 [a]
Gross margin (y-x)	683,591.25 ± 119,738.51 [a]	322,778.25 ± 119,738.51 [b]
Income from various enterprises		
Dairy goat	683,591.3(32.07%) [a]	322,778.3 (25.70%)[b]
Crops	988,496.25 (46.38%)	628,225 (50.02%)
Other livestock	307,753.8 (14.44%)	169,943.8 (13.53%)
Small business	151,450 (7.11%)	135,012.5 (10.75%)
Total income	2,131,291.35[a]	1,255,960[b]

[a,b]Means with different superscript letters are significantly different (P<0.05).

TShs 683,591.25 ± 119,738.51 and 322,778.25 ± 119 738.51 in Babati and Kongwa districts, respectively (1 TShs = US$ 0.0006). From Table 1 dairy goats contributed 32% in Babati and 25% in Kongwa to the total household income. The study showed that, dairy goat enterprise is profitable and significantly contributes to household income in the study area. Introduction and promotion of dairy goat enterprises to other areas of the country is thus recommended.

Acknowledgement

This study was financed by the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) for which the authors are thankful.

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