

Performance evaluation of Abergelle cross Boer goat under farmer management system in case of Tanqua Abergelle wereda

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ARTICLE INFO

Article history:

Received: 19 September 2015;

Received in revised form:

22 April 2016;

Accepted: 28 April 2016;

Keywords

Crossbreeding,
Crossbred kids,
Local breed,
Kids growth performance,
Survival rate.

ABSTRACT

41 (31 females and 10 males) 50% Boer and 50% Abergelle crossbred goats were distributed to evaluate and compare their kids growth performance, farmers' perception and their survivable rate under farm management system. Housing, feeding and health care were thoroughly attended. The average BW, WW, SMW and NMW of the crossbred (25% Boer and 75% Abergelle) male and female kids were (2.68 kg, 2.62 kg), (12.17 kg, 11.95 kg) and (18.25 kg, 17.38 kg) respectively. While, the local kids average BW, WW, and SMW were (2.30kg, 2.23kg), (10.5kg, 10.5kg) and (14.17kg, 13.38kg) for male and female respectively. The result indicated that crossbred body weight increment at different growth stage was better than the local breed. Farmers were also perceive the crossbred goat have docile behavior which easily adopt for zero grazing, non selective and voracious in feeding and high growth rate, even though they criticize as short in body length and lowest disease resistant. The survivable rate of the crossbred kids at pre weaning and post weaning were 90.7% and 97.4% respectively which more related to low disease resistance. So that with applying of good management practice scaling up activities has to be strengthened to make farmers better benefited from Abergelle cross Boer goat breed.

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List of abbreviation

ESGPIP -----Ethiopian sheep and goat
productivity improvement program
BW-----Birth weight
WW-----Weaning weight
SMW-----Six months weight
NMW-----Nine months weight
WWG-----Weaning weight gain
SMWG-----Six month weight gain
NMWG-----Nine month weight gain
CSA-----Central statics authority
Kg-----kilo gram
Km -----kilo meter
Masl -----meter above sea level
Mm -----mill meter
OoARD-----office of Agriculture and
Rural Development

Introduction

Goat production is an integral component of agriculture in Ethiopia. Ethiopia is endowed with a large number of goats estimated to be 21.7 million heads (CSA, 2011) which are found distributed in all agro-ecology zones of the country. Goats in Ethiopia are maintained under farmers management system used as source of food (meat and milk), skin, manure and direct cash income (Zelege, 2007). Profitability in meat goat farming depends to large extent on the reproductive performance and health of animals. Meat goat breeds may differ in reproductive performance and health. Thus, it is important to identify breeds with optimum reproductive performance and health for the respect climates.

There is a wide range of breed choices for meat goat producers around the world. Introduction of livestock breed into production system should be done after scrutiny of the breed to ascertain its ability to compute with the indigenous breeds

adapted to the local production environment. This has not been the case especially in developed countries where exotic breeds perceived to be more productive have replaced well adapted local breeds perceived to be inferior in production (Okeyo and Barker, 2005).

Abergelle goat are among the major indigenous goat breed in Ethiopia, They are found along Tekeze river. It is relative to Afar and Worre goats. (ESGPIP, 2008). The growth performance of Abergelle goat breed is medium as compare to other goat breed in Ethiopia. (Belay Deribe and Mengistu Taye, 2013).

Boer goats originated from the semi arid regions of South Africa and they were developed through selection for high growth rate within the existing local populations (Casey and Nieker, 1988; Erasmus, 2000; Malan, 2000).

The selected technologies like Abergelle cross Boer goat breed which are disseminating in Abergelle agricultural research center mandate areas are favorable with the climatic condition and mostly they are major commodities of the area so that they are contributing more in poverty reduction in the region and country as whole. For the demonstrating and evaluation performance of the Abergelle cross Boer goat breed technologies farmers were selected according to their interest, have willingness to accept the new technology, most of them are poor or disadvantaged people and 80% of the beneficiaries are female headed household and the remaining 20% are male headed house hold.

The demand of Abergelle cross Boer goat breed is still increasing throughout the region in particular in Abergelle agricultural research center mandate areas. Given the considerable potential for the female household head income and employment generation from the Abergelle cross Boer goat breed and the development of small ruminant sector can

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significantly contribute to poverty alleviation (wereda agricultural office, 2014).

Objectives

General objective

The purpose is enhancing indigenous goat meat production through practicing crossbreeding with Boer goat under smallholder farmers.

Specific objectives

- To evaluate and compare the growth performance of crossbred and local kids
- To evaluate farmers perception on the introduced F₁ crossbred goat

Materials and Methods

Description of the study area

The study was conducted in Tanqa-Abergelle wereda, located in central zone of Tigray 120 km away from Mekelle. It is found 13° 14' 06"N Latitude & 38°58'50" E longitudes. It has area coverage of 122,500 ha and the average land holding per house hold is estimated to be 1.0 ha (CSA, 2000). Agro ecologically the study area is characterized as hot warm sub-moist low land (SMI-4b) below 1500m.a.s.l. The mean annual rainfall & temperature is 350 – 700mm & 24-41°C respectively (Legesse, 1999 .In: Gebreyesus Berhane, 2012). The wereda has 20 kebeles out of which the 19 kebeles are rural kebeles.

Shekatekli, which this study was conducted is, one of the rural peasant associations. It is categorized as hot to warm sub moist low land. It is classified as lowland (kola). The total cultivated area coverage is estimated to be about 1013 hectares; of which 868 ha (22 %) is covered by majored crops, and the remaining land is covered by teff and cow pea. It has a total human population of 3884; of which 1848 (47.58 %) are male and 2036 (52.42 %) female. (WTAoFED, 2013). The total number of farm households is estimated to be 844; of which 535 (63.39 %) are male households and the rest 309 (36.61 %) are female households. The average household size is calculated as 4.61 persons per household.

Mixed crop-livestock farming system being practiced in the area. Crops like sorghum, maize, teff (*Eragrostis tef*), and pulses are the major growing crops in the area. The area is well noted for its enormous livestock resources especially small ruminants. Shekatekli has the livestock resources that include goats (12100), cattle (2706), sheep (1184), equines (774), and chickens (5020) (WTAoARD, 2013). The small ruminant breed of this area is known by name of Abegelle breed which are considered as meat type. Livestock are made to graze in the extensive rangelands which are largely dominated by *Acacia* species.

Beneficiaries and selection procedures

The study was conducted on 80% of female headed and 20% male headed household participants based on operational research project criteria that includes productive safety net beneficiaries and willing to use the technology. Training was given for the selected beneficiaries on goat breeding, feeding and housing managements.

Abergele cross Boer goat production

Abergele Agriculture Research Center has been undertaking genetic improvement to enhance meat production of Abergele goat using crossbreeding with Boer and Begait goat breeds. Pure male Boer breed was introduced by Ethiopian Sheep and Goat Productivity (ESGPIP). The source of goat for this demonstration had undertaken a crossbreeding between Abergele does with Boer bucks on the research center goat breed evaluation and distribution station. The target of this project was distributing a 1/2 Boer; 1/2 Abergele genotype crossbred for goat

producer to produce a 1/4 Boer; 3/4 Abergele genotype crossbred goat with better body weight and meat quality. Shekatekli is one of the areas which had used Abergele and Boer crossbred goat technology with collaboration of operational research project.

Data collection

- Birth weight of crossbred kids
- Weaning weight
- Six months weight
- Health management
- Advice and training (record keeping, feeding and health care)
- Farmers' perception
- subjective standard set for general management practice

Result and Discussion

Body weight of crossbred and pure Abergele kids

The average birth weight, weaning weight and six months weight of (25% Boer and 75% Abergele) crossbred kid and Abergele kids had shown in the figure below. The average birth weight, three months weight and six months weight and neigh months weight of male and female were crossbred kid were (2.85kg, 2.68kg), (9.11kg, 8.85kg) and (16.4kg, 15.39kg) and (22.3kg, 21.1kg) respectively. While the Abergele kid were (2.21kg, 2.12kg), (7.4kg, 7.3kg) and (11.8kg, 11.8kg). (14kg, 13.95kg)

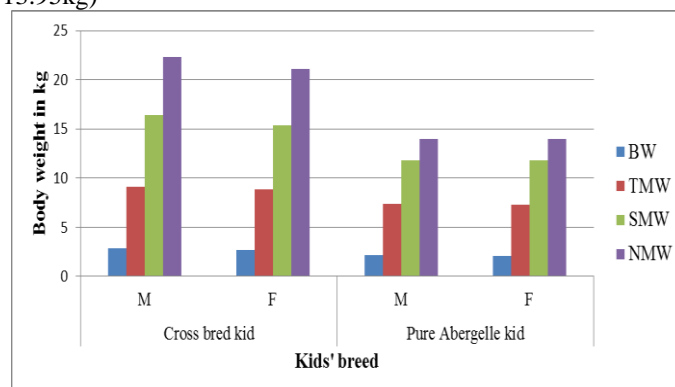


Figure 1. Body weight changes of crossbred and pure breed kids



Goat management practices

The results of the interview of male and female household participants was indicated 33.3% and 20.83% were categorized as good management practices respectively. While the medium management practices respond were 26.7% and 33.3 % and the poor management practices were 40 % and 45.83 % respectively. A well constructed shelter, with supplement feeding of legume plants and concentrates fed per requirement and on time animal health care is good management practices and the reverse is for poor management practices. Whereas the medium one is practicing some supplementation and animal health care rarely.

Table 1. The beneficiaries goat management practices

Gender	Housing system	Feeding system	Health care
	40%G	40% G	20% G
Male	40% M	20 % M	20%M
	20% P	40% P	60 % P
	12.5% G	25% G	25 % G
Female	37.5% M	37.5% M	25% M
	50% P	37.5 % P	50 % P
Good management (G), Medium management (M), Poor management (P).			

Survival rate of the crossbred goats

Table 2. Survival rate of the 50% crossbred goat and their kids in farmer management

50% Boer and 50% Abergelle crossbred goats			25% Boer and 75% Abergelle crossbred kid		
Sex	Survived	Survival rate	Survived		Survival rate
Bucks	10(9)	90%	At pre weaning	43(39)	90.70%
Does	31(28)	90.30%	At post weaning	39(38)	97.40%
Total	41(37)	90.20%	Total	43(38)	88.40%

Survival rate of the cross-bred goats were lowest than local breeds, they need high management such as more feed and health care. Their survival rate were decreased after weaned because of poor management and made to graze in the grazing land which can cause of diseases.

Farmer's perception

These cross-bred were evaluated from farmers point of view by comparing with Abergelle goat. Farmers were perceive the Abergelle cross Boer goat have docile behavior which easily adopt for zero grazing feeding system, non selective browser and grazer, voracious eater, the cross born kid early gets to puberty and early mature but short in body length and weak in disease resistant. Mean while the evolution of the cross breed as

listed above farmers prefer to have the crossbred and multiply it in large amount.

Conclusion and Recommendation

Abergelle cross Boer goat breeds are adaptable and best perform in low land of central zone of Tigray, Tanqua Abergelle wereda. The result of this study indicated that the growth and reproductive performance of the Abergelle cross Boer goat breed increased through effective management practices, besides to this also these breeds need more care as compare to the local goat breeds and farmers perceive that the breeds as Early mature, Docile in behavior, Non selective and voracious eater, Good grazer and browser even though the participant farmers criticize the Abergelle cross Boer goat breed are weak in disease resistance and short in body length, due to its better body performance, early maturing, ability and economic profitability they show high demand of the crossbred. Hence in scaling out of this crossbred farmer should train how to manage their animal in general and the crossbred goats in particular.

Reference

- Casey N.H and Van Niekerk W.A 1988. The Boer goat. Origin and adaptability performance testing, reproduction and milk production. Small Ruminant Research. 1,291-302.
- CSA, 2011. Livestock sample survey 2010-2011 Central Statistical Agency, Minister of Finance and Economic Development, Ethiopia. ETH-CSA-AgSSLV-2011-v1.0.
- Erasmus J.A.2000. Adaptation to various environments and resistance to disease of the improved Boer goat. Small Ruminant Research. 36,179-187.
- Ethiopia sheep and goat productivity improvement program,, 2008: sheep and goat production hand book for Ethiopian
- H. Yonghong1, et al... Yangzhou University, China, Nantong Agricultural Scientific Institute, China and Rugao Country Animal and veterinary Science Institute, China
- Malan S.W.2000. The improved Boer goat. Small Ruminant Research .36, 165-170.
- Okey A.M and Baker R.L. 2005. Methodological illustration of genotype x environment interaction (GXE) phenomenon and its implications: a comparative productivity performance study on red Maasai and dropper sheep breeds under contrasting environments in Kenya. [http://mahider.ilri.org/bitstream/handle/10568/3597/okeyo GXE.pdf;jsessionid=1](http://mahider.ilri.org/bitstream/handle/10568/3597/okeyo%20GXE.pdf;jsessionid=1).
- Zeleke, Z.M., 2007. Environmental influence on pre weaning growth performance and mortality rates of extensively managed Somali goats in eastern Ethiopia. Livestock Res. Rural Dev., vol.19.
- Wereda of Tanqa Abergelle Agricultural Offices, 2013. annual report
- Wereda of tanqua Abergellefinance and economy development office, 2013,annual report