

Review of the Performance of the Konso Goat under Different Management Systems

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Abstract

The aim of the current study was to review the performance of Konso goat reared under different management systems in Konso zone. Different research papers for Konso goat reared under on-station (semi-intensive) and on-farm (traditional and community-based breeding program) level reported by the different authors were used for the review. Article reviews have showed that the highest birth weight (BW), weaning weight (WW), six month weight (SW), nine month weight (NW) and yearling weight (YW) were reported for Boar*Konso crossbred (BKC) under semi-intensive on-station level than Pure Konso goats reared under both on-station and on-farm (traditional and community-based breeding program (CBBP)) levels. Konso goats managed at on-station level have performed better at BW and WW vis-a-vis goats managed under traditional and CBBP whereas in contrary for SW, NW and YW. Pre-weaning average daily weight gain (gm) was higher than post-weaning average body weight gain under all management systems. Both pre-weaning and post-weaning mortality were higher for BKC than the rests. Prolificacy was not obtained for pure Konso goat reared under on-station level.

Keywords: Goat, Konso, Performance

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1. Introduction

The total number of goats (*Capra hircus*) in Ethiopia is estimated to be nearly 52.46 million (CSA, 2021). Due to their small body size, they require lower feed, easily integrate into different farming systems, adapt to different climates and have short reproductive cycles (ESGPIP, 2009). However, Ethiopian indigenous goats are genetically less productive as compared to temperate breeds (Mohammed *et al.* 2012; Zeleke *et al.*, 2017) constrained by many biological, environmental and socio-economic factors. Among them, lack of systematic breeding programs is an important constraint (Solomon, 2014; Mezgebu *et al.*, 2022).

Reproductive and productive performances are important indicators of adaptability and management suitability (Getahun and Girma, 2008). Evaluations of the performances of economically important traits of the livestock are very useful inputs for planning a breeding program (Aynalem *et al.*, 2011; Solomon, 2014). Productivity performance can be evaluated either at on-farm or at on-station level (Mueller *et al.*, 2021). Evaluating the goat performance at different management systems helps to exploit the potential of a given animal which guides the directions for the end users (Netsanet *et al.*, 2016).

Konso goat is one of the 12 identified in Ethiopia (Tesfaye, 2004). The performance of the Konso goat at on-station and on-farm level: traditionally managed as baseline (Dereje and Ermias, 2018) and under community-based breeding level (Ermias, 2022) were evaluated different periods. There are previous and current research outputs for Konso goat reported by different scholars. Compiling the research outputs is vital for the end users and policy makers. Therefore, this review paper was prepared to collect and forward the Konso goat research findings to conclude their impacts.

2. Methodology

The research outputs of Konso goat reported by different authors were collected to review articles. Simple comparison methods were used to analyze the findings.

3. Findings

3.1 Growth Performance

Birth weight, weaning weight, six month weight, nine month weight and yearling weight of Konso goat under different management systems were depicted in Figure 1 (Dereje and Ermias, 2018; Ermias, 2022 and Dereje *et al.*, 2023_unpublished). Boar with Konso 50% crossbred goat breed managed under on-station semi-intensive system have showed superior performance for all growth categories than pure Konso goats reared under on-station and on-farm levels. The lower crossbred growth performances were reported for Boar crossbred with central highland goats managed under similar environments (Belay *et al.*, 2015) for all growth categories. This could be due to goats may perform better in lowland areas than mid to highland areas. The expectations from crossing two breeds is that the performance of their progeny will be half-way between the average performances

of the two parent breeds and heterosis or hybrid vigor (ESGPIP, 2009).

3.1.1 Birth weight

The birth weight (kg) for pure Konso goat reared under on-station (semi-intensive), on-farm (traditional), on-farm (CBBP) and Boar with Konso 50% crossbred goat at on-station (semi-intensive) level were 2.63, 2.15, 2.56 and 2.82, respectively. Crossbred followed by pure Konso goat reared under on-station (semi-intensive) management system were superior. Traditionally managed pure Konso goats were inferior to others. However, birth weight for goats managing under CBBP have progressive improvement than the on-farm baseline pure Konso goats. Almost similar birth weight was reported for the goats managed under agro-pastoral areas (Mekete et al., 2022). Whereas, birth weight for Bati goat reared traditionally was higher than for Konso goat managed similarly and Borana, and in contrary, Short-eared Somali goat were lower reported by Hulunim (2019).

3.1.2 Weaning weight

Almost similar weaning body weight was documented for goats reared under on-station level for both pure Konso and crossbred goats although crossbreds slightly performed better. Likewise, pure Konso goats reared on-farm (traditional and CBBP) have showed almost equal weaning weight. Pre-weaning weight for goats reared at on-station were better performed than those of no-farm ones (Dereje and Ermias, 2018; Ermias, 2022 and Dereje et al., 2023_unpublished). This might be due to until pre-weaning, kids may have repeated access for sufficient milk suckling per day.

3.1.3 Six month weight

Crossbred goats raised under on-station level performed better than others. However, pure Konso goats managed at on-station level performing inferior after weaning age than the rest of the management systems. Weaning shock might be one of the factors (ESGPIP, 2009). Goats reared under CBBP were slightly higher in six month weight than traditional managed ones. Selective breeding may indicate the improvement in general (Aynale et al., 2011).

3.1.4 Nine months weight

Pure Konso goats reared under both on-station and on-farm traditionally have showed almost similar body weight at six month. This might indicate that goats reared under nucleus level getting worse due to high management inputs. However, both nucleus managed crossbreds and CBBP goats were performing higher. Consistent results revealed for the yearling body weight too.

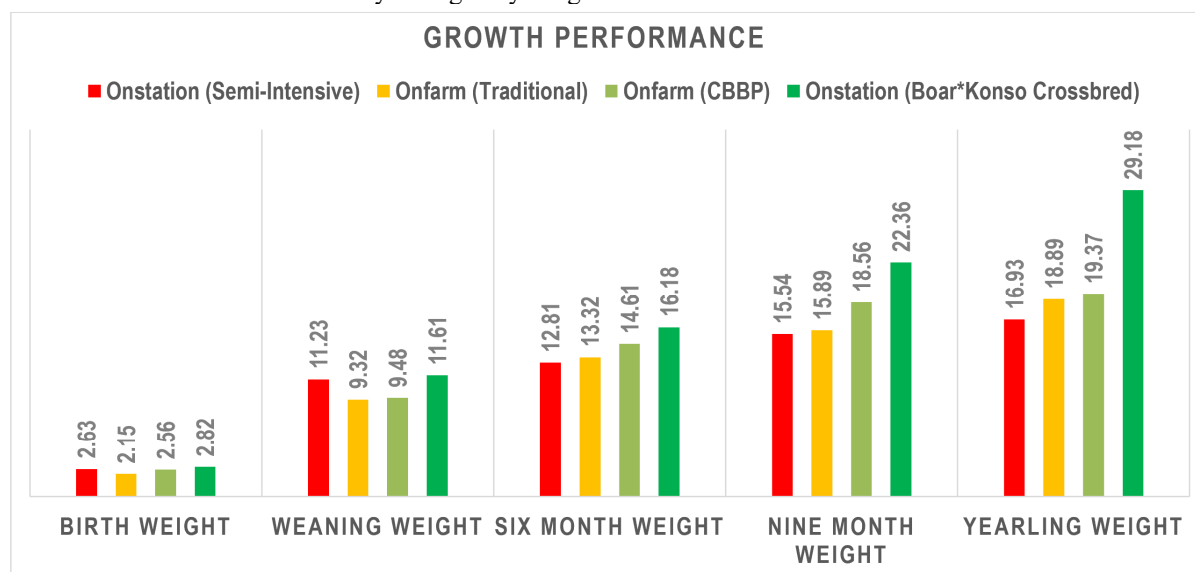


Figure 1. Growth Performance of Konso under different management systems

3.2 Average Daily Body Weight Gain

Pre and post-weaning average daily body weight gain (gm) for goats reared under on-station (semi-intensive), on-farm (traditional), on-farm (CBBP) and Boar with Konso 50% crossbred goat at on-station (semi-intensive) level were presented in Figure 2. The highest ADBWG gm^{-1} during pre and post-weaning reported was for Boar with Konso crossbred.

3.2.1 Pre-weaning average body weight gain

On-station managed crossbred kids followed by pure Konso kids at on-station level have gained fast average daily body weight. In contradiction, traditionally managed pure Konso goats have attained poor weight gain.

3.2.2 Post-weaning average body weight gain

On-station reared crossbred kids followed by pure Konso goats raised at community-based breeding program

have showed fast post-weaning weight gain. Pure Konso goat reared under on-station level followed by traditionally managed were inferior in post-weaning weight gain.

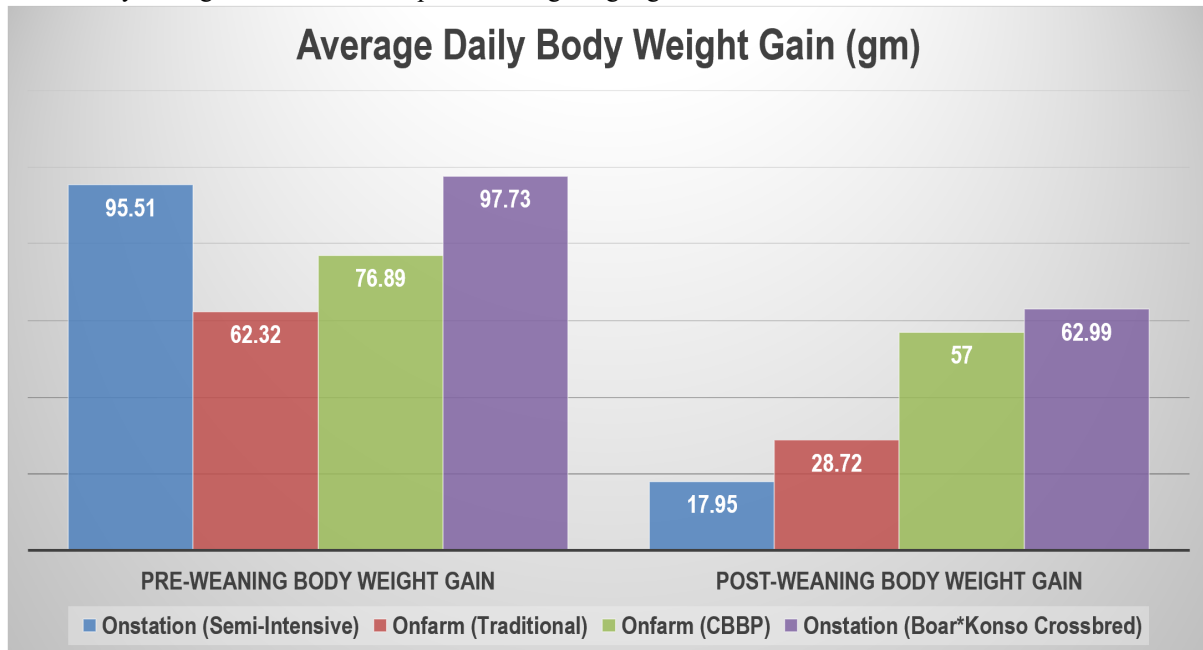


Figure 2. Average daily weight gain of Konso goat under different management systems

3.3 Konso Goat Prolificacy

The litter size of goats reared under different management systems were presented in Figure 4. Crossbred goats reared under on-station followed by community-based breeding program goats have showed better prolificacy. The lowest prolificacy was reported for pure Konso goats reared under on-station level. Some triplets were reporting under community-based breeding program.

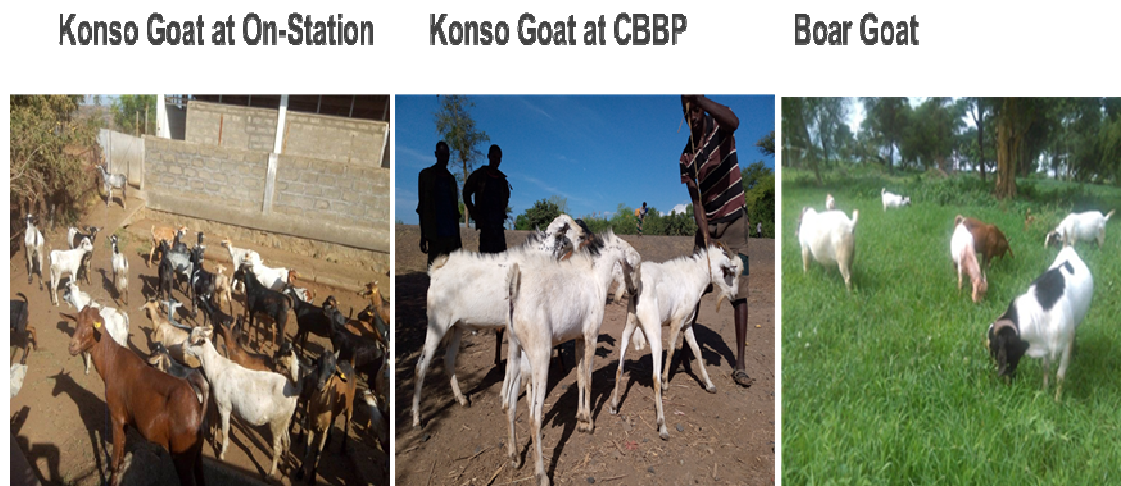


Figure 3. Pictorial representation of pure Konso goats under on-station, on-farm (CBBP) and Boar X Konso crossbred (left to right).

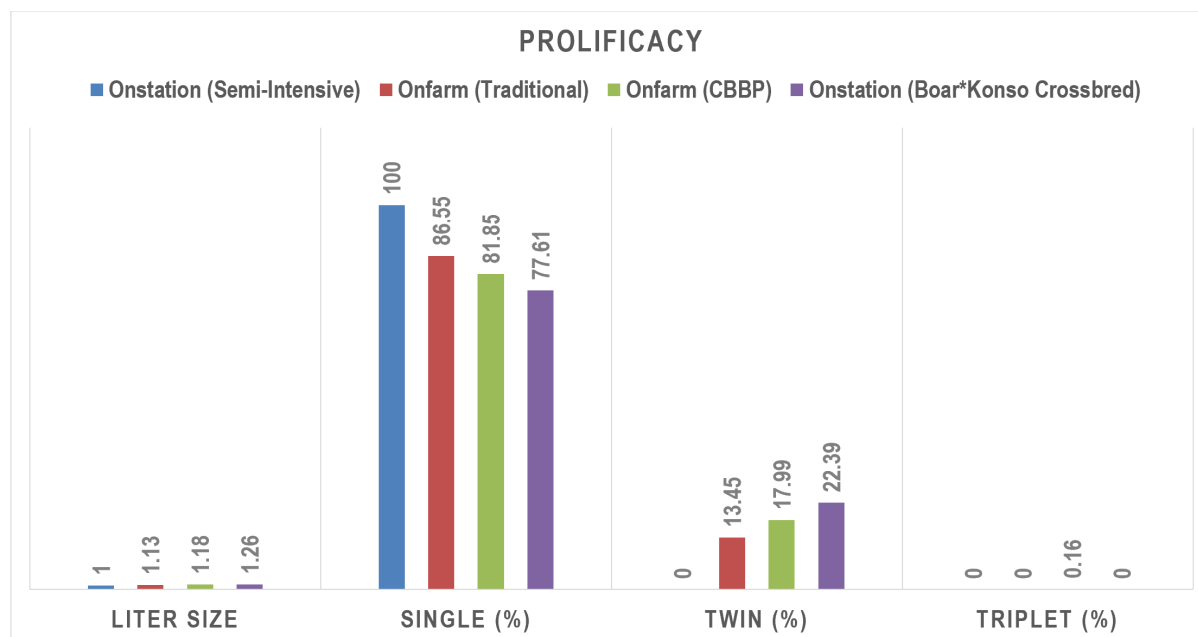


Figure 4. Litter size of Konso goat under different management systems.

3.4 Konso Goat On-station Mortality

Mortality for the kids reared under on-station (semi-intensive) was illustrated in Figure 5. An overall kid mortality for Boar with Konso crossbred kids was higher than pure Konso goats managed under similar management. Pre-weaning mortality for crossbred and pure Konso kids was about 12.58% and 40.81%, respectively. In other side, post-weaning mortality for the corresponding goat types under similar management system was 10% and 5%, respectively. This could indicate that crossbred kids require intensive management than pure indigenous goat breeds.

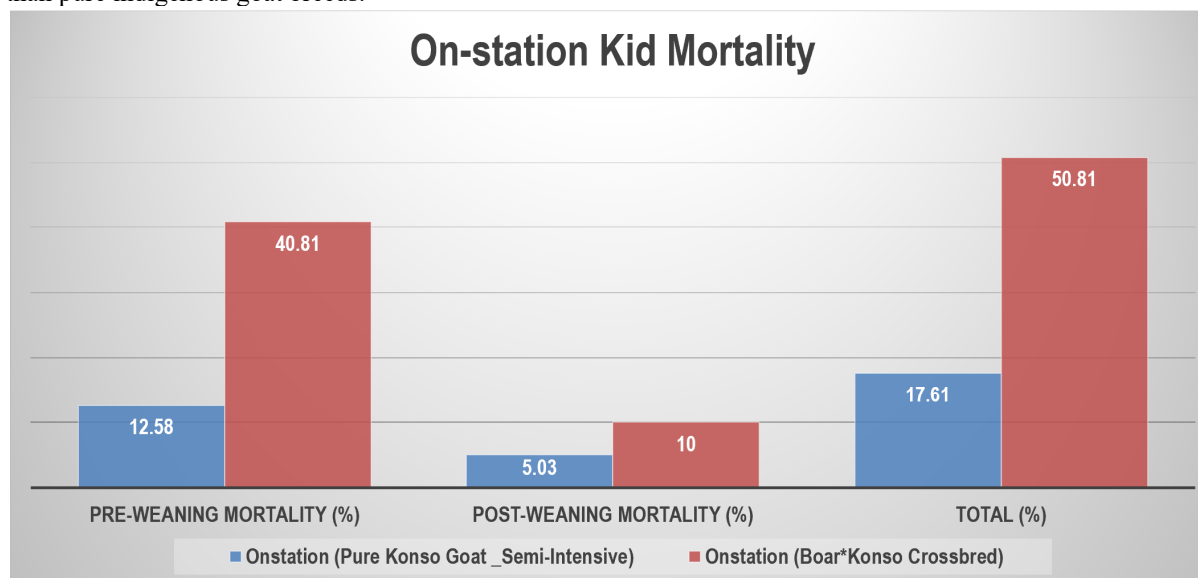


Figure 5. On-station kid mortality of Konso goat under different management systems.

3.5 Gamo and Gofa Goat Linear Body Measurements

Morphometric measurements for goats reared in Gamo and Gofa zones reported by different scholars are explained in Figure 6 (Dereje et al., 2019; Aberra et al., 2021; Dereje et al., 2021). The review indicated that goat population reared in Gamo and Gofa zones are almost similar in basic physical physical appearances.

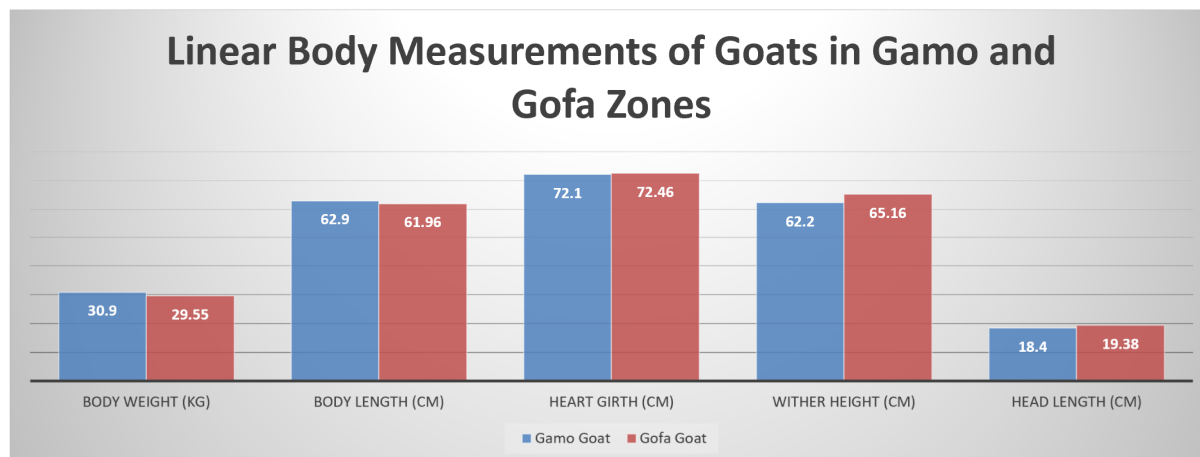


Figure 6. Linear body measurements of Goats in Gamo and Gofa zones (figurative and picture).

4. Conclusion

Pure Konso goats raised under community-based breeding are performed superior than nucleus/station indigenous goats reared under semi-intensive management whereas inferior than Boar*Konso crossbred managed at station under semi-intensive management.

Average daily body weight gain of Boar*Konso crossbred followed by pure Konso goat reflected better pre-weaning weight gain than Konso goats managed under on-farm level (CBBP followed by traditional). On-station crossbred followed by goats reared under CBBP were superior than pure Konso goats managed under station during post-weaning period

The higher prolificacy was observed for crossbred goats followed by CBBP. There is no twinning recorded for pure Konso goats at on-station level.

High kids' mortality was detected for crossbreds than pure Konso goat during pre and post weaning periods at on-station level

Almost similar linear body measurements were identified for goats in Gamo and Gofa areas

Therefore, in line with promising goat CBBPs in rural areas, finisher crossbreeding with Boar goats is better to attain fast meat demand around urban and peri-urban areas to accomplish 'lemat tirufat' government's national policy.

5. Data availability statement

Data will be made available upon request.

6. Declaration of interest's statement

The author declare no competing interests

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