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Research Article

Genetic Variation on Body Weight and Daily Body Weight Gain of Boer Crosses and Khari Goats Kids at Mid-Hills of Nepal

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ABSTRACT

Research was done at the National Goat Research Program, NARC, Bandipur, Tanahun, Nepal with the objective to identify the pattern of live weight changes (kg) and daily weight gain (g/day) of different genetic groups of Boer crosses (Boer 75% and Boer 50% genotypes) and Khari goats from birth to yearling. The live weight of goats at different stages of growth were taken and recorded properly. Five hundred sixty-nine kids for birth weight, 534 kids for weaning weight (3 months), 467 for six-month weight, 320 for nine-month weight, and 279 for twelve-month weight were used in this study. Findings revealed that the body weight of different genetic groups (Boer 75%, Boer 50% and Khari) at birth to nine months, except 3 months was statistically similar ($p>0.05$) for Boer 50% and Boer 75% blood level, but Boer 75% blood level was significantly ($p<0.05$) higher body weight at 3 months. In contrast, at twelve months, Boer 50% had significantly ($p<0.05$) higher body weight than Boer 75%. Khari goat had significantly lower body weight from birth to twelve months in comparison to Boer genetics. Likewise, the mean daily weight gain (MDWG) of different genetics of goats from birth to 3 month was significant ($p<0.05$) with Boer 75%, having better results of Boer crosses, but it didn't continue for 3 to 6 months whereas Boer 50% had better performance that tend to continue for 6 to 9 months. Considering MDWG from birth to 12 month, Boer 50% had better results than Boer 75% and Khari genetics. There was no significance difference ($p>0.05$) in MDWG for birth type and sex of the kids in the three months intervals, but the overall MDWG from birth to 12 months was significant ($p<0.05$) for sex with male having higher daily weight gain. The interaction of birth type and sex on MDWG of different genetics groups had the significant ($p<0.05$) effects with Boer 50% having better results. Thus, it can be concluded that while looking at the pattern of live weight change and mean daily weight gain of different genetic groups of Boer crosses and Khari during birth to yearling, Boer 50% proved to be having relatively higher superior performing genetics suggesting need to consider these scientific inferences to develop different nutritional based management plan focusing to Boer 50% cross in achieving higher profit from crossbred goats.

Introduction

The livestock sector is highly valued among the agricultural activities of rural communities in Nepal with goat holding significant importance due to their adaptability to diverse climatic conditions, ease of management, and ability to thrive on marginal lands (Kunwar, 2000; Kolachhapati, 2006; Bhattarai *et al.*, 2019; Khadka *et al.* 2024). Goat farming act as a vital source of income, food, milk and fibre for many smallholders' farmers. Nepal boasts a diverse range of indigenous goat breeds, each with unique genetic potential that have adapted to the country's varied climatic and geographical conditions, showcasing resilience and productivity. Among them, Khari goat is most prevalent breeds, known for its adaptability, prolificacy and good meat quality dominating the mid hills of Nepal (Bhattarai *et al.,* 2019; Kadel *et al.* 2023). However, goat productivity and efficiency in goat farming in Nepal are relatively low compare to other countries, which may be due to several factors including genetic potential, nutritional management and disease control.

Different genetic groups exhibit varying growth rates, which are critical for understanding weight gain

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dynamics (Kadel *et al.*, 2023). For instance, Boer goats are known for their superior growth and meat production traits compared to local breeds such as Khari (Lu, 2001; Shrestha and Fahmy, 2005; Gawat *et al.*, 2023). Crossbreeding these two groups aims to combine the hardiness of Khari goats with the rapid growth characteristics of Boer goats (Parajuli, 2020; Poudel and Karki, 2020; Kadel *et al.*, 2023). This genetic interaction can lead to enhanced mean daily weight gain in crossbred offspring, particularly when managed with appropriate nutrition. Under these contexts, research was done with the main objective to analyse the pattern of live weight change also by considering daily weight gain of different genetic groups of Boer crosses and Khari goats yearlings to understand their variation and genetic performance so that findings could be useful in formulating genetic based nutritional plan and to develop suitable management plan in achieving higher profits from crossbred goats rearing.

Materials and Methods

Experimental site

This research was done at the National Goat Research Program, (NGRP) which is one of the key commodity research programs under Nepal Agricultural Research Council (NARC) and is located at Bandipur Rural Municipality, Tanahun district in Gandaki Province of Nepal (Figure 1) at 27.94 N and 84.38 E with an elevation of 850 altitude, which receives an average annual rainfall of 2000 mm with 85% relative humidity and maximum and minimum temperatures of 32ºC and 8ºC, respectively (NGRP 2022).

Figure 1. GIS map showing the experimental site

Genetic grouping of the experimental animals

The goats used in this study were indigenous Khari breeds, Boer bucks crossed with Khari does to produce 50% crossbred Boer, and Boer bucks crossed with 50% Boer does (50% Khari) to produce 75% crossbred Boer.

Feeds, feeding, housing and health management of kids

Boer crossbreds (both 50% and 75%) were kept under complete stall feeding whereas indigenous Khari goats were reared under semi-intensive system as stall feeding as well as grazing for six hours each day. The goats were offered with seasonal fodder with commercial concentrate feed with 18% crude protein @ 1% of their body weight according to feeding thumb rule. All the kids were housed in clean, well-ventilated sheds with appropriate bedding and infrared light ensuring warmth with easy access to feed and water. All animals were regularly dewormed with broad spectrum anthelmintic (Albendazole) in every three months, dipped in 0.1% solution of Cypermethrin twice a year and vaccinated against Pest Des Petits Ruminants (PPR), Foot and Mouth disease (FMD), and Enterotoxemia once a year.

Data collection and sample size

Data recorded for four years during 2018 to 2021 were used to study and analyze production performances and litter traits. Thus, weights of goats at different stages of growth were recorded and incorporated in the analysis. A total of 569 kids were recorded for birth weight, 534 kids for weaning weight (3 months), 467 for six-month weight, 320 for nine-month weight and 279 for twelve-month weight. All the variations were entirely based on the available population and sample size to meet the objective of this research.

Statistical analysis

All the relevant and collected data of different genetic groups of goats and their kids described in the data collection section were entered into the computer in Microsoft Excel package programs. The data were analyzed by using a Mixed Model Least-square and

Maximum Likelihood Computer Program PC-2statistical package (Harvey 1990) developed by Walter R. Harvey based on the C.R. Henderson model (Henderson, 1953), and the means were compared by Duncans' Multiple Range Test (DMRT) (Duncan, 1955). Line and bar graphs were prepared using Ms-Excel.

Body weight and mean daily weight gain (MDWG) at different stages of growth (at birth, 3, 6, 9 and 12 months) were analyzed by using the following fixed effect model:

$$Y_{ijk} = \mu + a_i + b_j + c_k + e_{ijkl}$$

where,
Y_{ijk} is the adjusted body weight and mean daily weight gain (MDWG) at different stages of growth (at birth, 3, 6, 9 and 12 months)
μ is the overall mean
a_i is the effect of i^{th} genetic group (i=1, 2 and 3)
b_j is the effect of j^{th} type of birth (j=1, 2 and 3)
c_k is the effect of k^{th} sex (k=1 and 2)
e_{ijkl} is the random element (error mean) assumed to be normally and independently distributed among the sampled population.

Details of the research site, goats' population and statistical analyses are also described by Kadel *et al.* (2023).

Results

Mean body weight changes of different genetic group of goats

Mean body weight changes in different genetic groups of goat kids at various stage of growth at NGRP, Bandipur, Tanahun are presented in Table 1. Accordingly, the overall weight at birth was 2.93 ± 0.02 kg, weaning weight was 13.12 ± 0.13 kg whereas, nine-month weight was 23.97 ± 0.26 kg, and yearling weight was 26.68 ± 0.32 kg, respectively (Table 1). The mean live weight changes were significant ($p<0.05$) among the genetic groups, however mean body weight of Boer 75% and Boer 50% did not significantly differ ($p>0.05$) at birth, six months, and nine months old. The birth weight and weaning weight at three months, and six-month old were found the highest in Boer 75% (Table 1) that was also overtaken by Boer 50% in nine month and also for yearling weight (Table 1). Meanwhile, the mean body weight of Khari was found lowest from birth to twelve months in comparison to Boer crossbreds (Table 1).

Table 1. Pattern of live weight (kg) change in different genetic group of goat kids at various stage of growth at NGRP, Bandipur, Tanahun, Nepal

	Body weight (kg) (Mean ± SEM)				
	At Birth	3 month Wt.	6 Month Wt.	9 Month Wt.	12 Month Wt.
Overall	2.93±0.02 (569)	13.12±0.13 (534)	18.87±0.17 (467)	23.97±0.26 (320)	26.68±0.32 (279)
Genetic Group					
Boer 50%	2.45±0.05^{a} (185)	13.18±0.22^{b} (179)	19.71±0.27^{a} (156)	26.37±0.49^{a} (81)	32.86±0.59^{a} (73)
Boer 75%	2.51±0.04^{a} (211)	14.61±0.21^{a} (195)	20.05±0.28^{a} (159)	25.50±0.39^{a} (103)	31.06±0.50^{b} (94)
Khari	1.85±0.02^{b} (173)	11.47±0.21^{c} (160)	16.77±0.29^{b} (152)	21.38±0.36^{b} (136)	26.45±0.4^{c} (112)
CV	29.50	23.74	20.25	19.95	18.42
p–value	<0.001	<0.001	<0.001	<0.001	<0.001

SEM: Standard Error of the Mean, CV: Coefficient of Variation
Number in parenthesis indicates number of observations

Mean daily weight gain (MDWG) of goats

The mean daily weight gain (MDWG) of different genetic group of goat breeds at NGRP, Bandipur has been presented in table (2). Accordingly, the overall MDWG (g/day) from birth to three month was, 120.71 ± 1.44 g/day where as it was, 64.12 ± 1.46 g/day for three to six months. The overall MDWG (g/day) for twelve month was 76.23 ± 0.89 (Table 2). The MDWG was found highest from birth to weaning in all three genetic groups and it was declined as the age increased. The highest MDWG was found in Boer 75% from birth to three month ($p<0.001$) which was 133.44 ± 2.39 g/day, but in the later stages, the MDWG was found highest in Boer 50% genetic group (72.44 ± 2.84 g/day) from three to six month ($p<0.001$), 79.01 ± 3.75 g/day from six to nine month, and 70.62 ± 4.76 g/day ($p<0.001$) from nine to twelve month (Table 2). The overall MDWG from birth to twelve month was found highest in Boer 50%, followed by Boer 75% and was lowest in Khari breed (Table 2) the lowest MDWG was recorded in Khari breeds amongst all three genetic group (Table 2).

The result also revealed that there was no significance difference in MDWG of the goat kids from birth to twelve months, with no variations on three months intervals for the birth type. The highest MDWG was recorded in single birth from birth to weaning weight (126.23 ± 4.05 g/day) while the lowest MDWG was recorded in twins from nine to twelve months (59.84 ± 2.40 g/day). The overall MDWG from birth to yearling was highest for twins (76.65 ± 1.05 g/day) and lowest was recorded in triplets (75.34 ± 2.54 g/day) (Table 2).

In context of sex, there was no significance difference (p>0.05) in MDWG for male and female kids in the tri-monthly interval, but the overall MDWG from birth to yearling was significantly difference (p<0.001) amongst male and female, with male having slightly greater MDWG of 79.65 ± 1.22 g/day comparing to female of 74.64 ± 1.17 g/day. The highest MDWG was found in male kids from birth to weaning (123.18 ± 2.00 g/day) and lowest in female from nine to twelve month (57.42 ± 2.48 g/day) (Table 2).

Table 2. Mean daily weight gain (MDWG) of different genetic group of goat breeds at NGRP, Bandipur, Tanahun, Nepal

	Mean daily weight gain (MDWG) (g/day) (Mean ± SEM)				
	Birth to 3M	3 to 6 M	6 to 9 M	9 to 12 M	Birth to 12 M
Overall	120.71±1.44 (534)	64.12±1.46 (467)	62.19±1.77 (320)	59.14±2.13 (279)	76.23±0.89 (279)
Genetic Group	***	***	***	***	***
Boer 50%	119.24±2.40^{b} (179)	72.44±2.84^{a} (156)	79.01±3.75^{a} (81)	70.62±4.76^{a} (73)	84.53±1.65^{a} (73)
Boer 75%	133.44±2.39^{a} (195)	60.31±2.32^{b} (159)	62.14±3.08^{b} (103)	63.00±3.33^{a} (94)	79.36±1.45^{b} (94)
Khari	106.83±2.26^{c} (160)	59.58±2.28^{b} (152)	52.21±2.26^{c} (136)	48.81±3.01^{b} (112)	68.43±1.13^{c} (112)
Birth Type	NS	NS	NS	NS	NS
Single	126.23±4.05 (90)	61.18±4.45 (83)	63.94±3.96 (57)	55.56±4.70 (49)	75.68±2.27 (49)
Twin	120.28±1.67 (363)	63.64±1.77 (319)	62.11±2.12 (161)	59.84±2.40 (197)	76.65±1.05 (197)
Triplets	116.49±3.79 (81)	70.26±3.97 (65)	59.88±5.64 (36)	60.27±8.59 (33)	75.34±2.54 (33)
Sex	NS	NS	NS	NS	**
Male	123.18±2.00 (267)	66.47±1.98 (224)	64.33±2.85 (144)	62.53±4.02 (94)	79.65±1.22^{a} (94)
Female	118.24±2.07 (267)	61.96±2.14 (243)	61.00±2.26 (206)	57.42±2.48 (185)	74.64±1.17^{b} (185)
CV	27.61	49.37	51.02	60.23	19.48

SEM: Standard Error of the Mean, CV: Coefficient of Variation, ***Significant at 0.1% (p<0.001), **Significant at 1% (p<0.01), M=months
Number in parenthesis indicates number of observations

Effect of interaction between various genetic groups and birth type

The interaction effect of the genetic group and birth type on MDWG during different stages of growth period at NGRP, Bandipur, Tanahun, Nepal has been presented in Figure (2). Likewise, the interaction effect of genetic group and birth type on MDWG during the pre-weaning (birth to 3 month) stage is presented in Figure 2(a). Accordingly, the 75% Boer blood level had higher MDWG followed by 50% Boer blood level for all birth type in decreasing rate for single, twin and triplets, respectively, but MDWG was similar for 50% Boer blood level for triplet (p>0.05). The interaction effect of genetic group and birth type on MDWG during the weaning (weaning to 6 month) stage has been presented in Figure 2(b). Accordingly, it is well revealed that the MDWG significantly differed (p<0.05) for 50% and 75% with birth type (single, twin, and triplet) as compared to Khari (Figure 2).

The interaction effect of genetic group and birth type on MDWG during the post-weaning (6 to 9 month and 9 to 12 month) stage has been presented in Figure 2(c) and 2(d) respectively. Accordingly, the 75% Boer blood level had higher MDWG followed by 50% Boer blood level for all birth type in decreasing rate for single, twin and triplets, respectively, with MDWG similar for 50% Boer blood level for twinning (p>0.05) in 6 to 9 month period. The MDWG significantly differed (p<0.05) with various genetic group (50% Boer, 75% Boer, and Khari) and birth types (single, twin, and triplet) in 9 to 12 month period (Figure 2). The 75% Boer blood level had higher MDWG followed by 50% Boer blood level for twin and triplet in decreasing rate, however, it was non-significant for single birth type. MDWG was recorded similar for 50% Boer blood level for triplet (p>0.05). The overall MDWG significantly differed (p<0.01) with birth type (single, twin and triplets) in interactions with genetics groups, with least MDWG recorded for Khari goat in all birth types (Figure 2).

Effect of interaction between various goat genetic groups and sex of kids

The interaction effect of the genetic group and sex of kids on MDWG during different stages of growth period at NGRP, Bandipur, Tanahun, Nepal has been presented in Figure (3). Likewise, the effect of interaction between variousgoat genetic group and sex of kids on MDWG (g/d) during the pre-weaning (birth to weaning) stage has been presented in Figure 3(a). Accordingly, it was revealed that the MDWG remained statistically similar (p>0.05) concerning the genetic group and sex of kids. However, 75% Boer blood level had higher MDWG followed by 50% Boer blood level for both sexes.

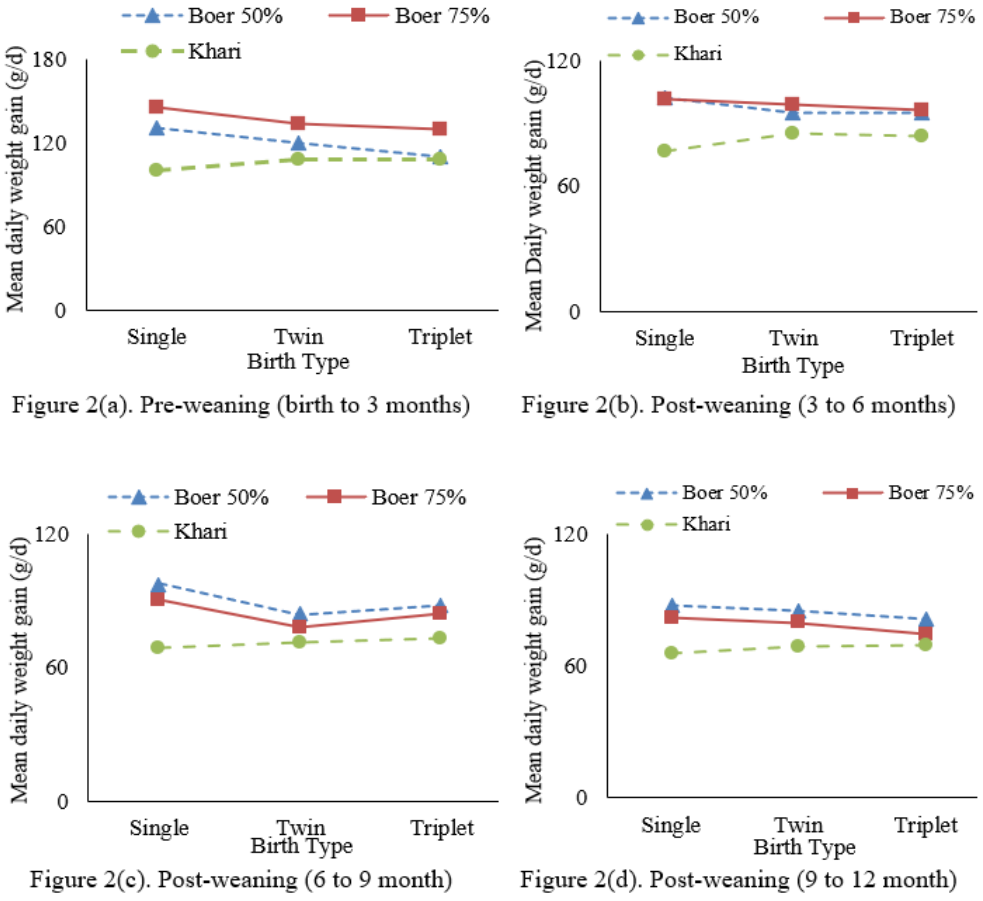

Figure 2(a). Pre-weaning (birth to 3 months)

Figure 2(b). Post-weaning (3 to 6 months)

Figure 2(c). Post-weaning (6 to 9 month)

Figure 2(d). Post-weaning (9 to 12 month)

Figure 2. Interaction effect of genetic group and birth type on Mean daily weight gain (MDWG) of the Boer crosses and Khari goats at NGRP, Bandipur, Tanahun, Nepal

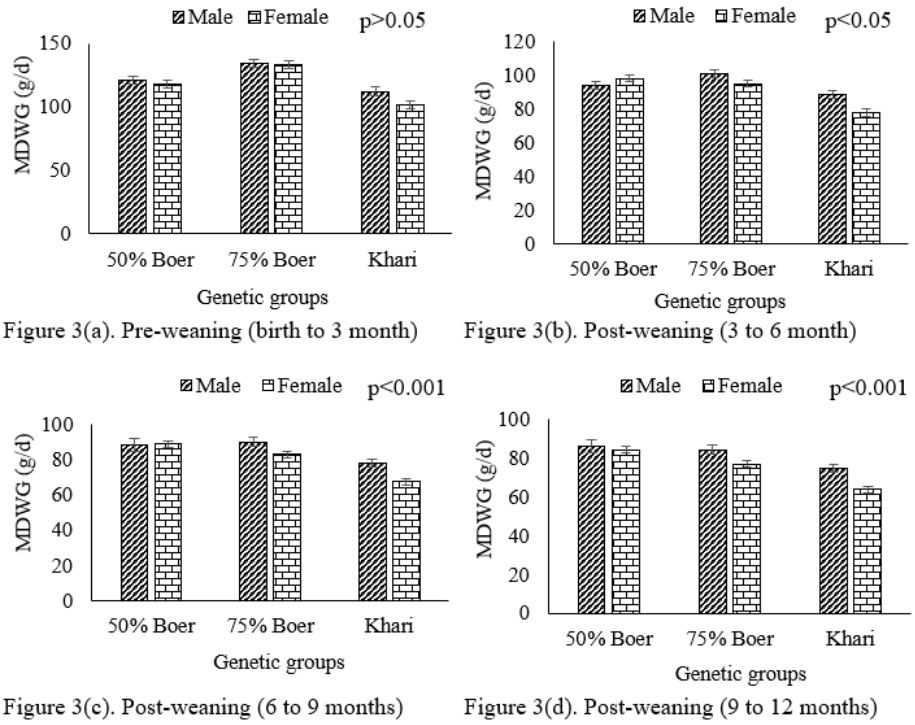

Figure 3(a). Pre-weaning (birth to 3 month)

Figure 3(b). Post-weaning (3 to 6 month)

Figure 3(c). Post-weaning (6 to 9 months)

Figure 3(d). Post-weaning (9 to 12 months)

Figure 3. Interaction effect of genetic group and sex of kids on Mean daily weight gain (MDWG) at NGRP, Bandipur, Tanahun, Nepal

The effect of interaction between various goat genetic group and sex of kids on MDWG during the weaning (weaning to 6 month) stage has been presented in Figure 3(b). It was revealed that the MDWG significantly differed ($p<0.05$) for various genetic group and sex of kids (Figure 3). Higher MDWG was observed for 75% Boer followed by 50% Boer, and these genetic groups did not differ significantly ($p>0.05$), but differ significnatly ($p<0.05$) with Khari. Least MDWG was recorded for Khari for both sexes. Females were heavier than males for 50 % Boer, but males were heavier for 75% Boer and Khari groups.

The effect of interaction between genetic groups and sex of kids on MDWG during the post-weaning (6 to 9 month and 9 to 12 month) stage has been presented in Figure 3(c) and 3(d), respectively. Accordingly, the 75% Boer blood level had higher MDWG followed by 50% Boer blood level for both sexes from 6 to 9 months, but in contrast, 50% Boer had higher MDWG followed by 75% Boer for both sexes from 9 to 12 month periods. The MDWG significantly differed ($p<0.05$) with various genetic group (50% Boer, 75% Boer, and Khari) and sex (male and female) (Figure 3).

The least MDWG was recorded for Khari for both sexes in all genetic groups regarding all time intervals: pre-weaning, weaning and post-weaning periods. Males were heavier than females for all goat genetic groups.

Discussion

Mean live weight changes

Birth weight (BW), weaning weight (WW), six-month old weight (6MW) and 12 months old kids weight (YW) were 3.05±0.06, 10.9±0.36, 12.5±0.51 and 18.3±0.88 kg, respectively, for pure Boer and 2.62±0.04, 8.80±0.22, 11.2±0.31 and 16.7±0.48 kg, respectively, for 50 % Boer were observed during the study of growth performance of Boer goats and their crosses that matches quite well with the findings of Mustefa *et al*., (2019). However, higher body weight of 50% Boer kids at birth weight, weaning weight, eight-month weight, and twelve-month weight was 2.92±0.66, 16.37±3.50, 29.48±1.32, and 42.32±1.49 kg, respectively was repported by Kadel *et al.,* (2016). Similarly, Adhikari *et al.* (2017) also had reported the live body weight at birth, three months, six months, nine months and one year of Boer crosses as 2.22±0.17, 11.23±2.33, 17.80±3.31, 25.25±4.25 and 33.60±5.29 kg, respectively, whereas 1.70±0.39, 6.33±2.10, 11.12±3.55, 16.45±3.89 and 21.30±5.01 kg was the case for Khari breed, respectively, during the same period which was significantly different ($p<0.001$) among the groups.

The Boer goat breed generally exhibits a higher mean live weight change compared to indigenous goat breeds due to the genetic potential of these breeds for potential growth, higher feed efficiency and larger body frame size (Adhikari, *et al.* 2017; Mustefa, *et al.*, 2019. In addition, selective breeding practices have focused on enhancing desirable traits such as growth rate, meat quality, and overall robustness in Boer goats whereas, indigenous breeds, on the other hand, might have been bred more for survival traits in specific environments rather than maximum growth.Thus our findings also postulated these potential variation among the genetics and ages that further proves the validation and authentication of data analysis and results.

Mean daily weight gain (MDWG) of goats

Four indigenous breeds of Nepal and four improved-breeds such as Jamunapari cross, Barbari cross, Boer cross and Ajmeri/Sirohi crosses have MDWG ranging from 60-120 g per day (Rajwar, 2012). Poudel (2019), Mustefa *et al*. (2019), Gautam *et al.* (2018) and Pandey *et al.* (2009) also reported lower daily gain than the findings of present study. Sapkota *et al.* (2008) reported similar MDWG (92 g/day) at pre-weaning to weaning age. Similarly, average daily weight gain from birth to weaning, weaning to eight month, and eight month to yearling was 109.5, 109.37 and 107.09 g per day, respectively for 50% Boer kids as reported by Kadel *et al.* (2020). Likewise, average daily weight gain for Boer crosses from birth to three months, three to six months, six to nine months and nine to twelve months age was 100.11 g, 73.00 g, 82.78 g, 92.78 g per day, respectively, as reported by Adhikari *et al.*, (2017). Poudel (2019) on the other hand reported higher weight gain (144.58±3.39 g/day) for the pre-weaning age (birth to 2 month).

The growth rate from birth to weaning was higher for all genetic groups but decreased from weaning to 6 months in our study, indicating that the kids were under adjustment stress after weaning. The weaning process can be stressful for goat kids, leading to a temporary reduction in feed intake and growth rate (Vickery *et al.*, 2023). The separation from their mothers and the sudden change in diet can negatively impact their growth. Other factors might be a nutritional transition, digestive system development, rearing environment, genetic etc. The genetic potential for MDWG varies among different breeds as some goats' kid may naturally have slower growth rates due to their genetic makeup. It was observed that the MDWG of various genetic groups of goat were increasing at an increasing rate during 6 months to 9 months of age. Again, the growth trend of MDWG increased, but with a decreasing rate for the kids in all genetic groups. This might be due to the physiological ruminal development of goat kids after some period of weaning and

acclimatization to the grazing and feeding environment (Hafez and Hafez, 2013).

Effect of interaction between various genetic groups and birth type on MDWG

In the present study, Boer crossbred (75% and 50%) showed higher MDWG for single kids than twin and triplet. In contrast, Khari goat had higher MDWG for twin and triplet as compared to single birth type. This could be because of the reason that the indigenous does are better at managing their resources, ensuring all their kids get enough milk and nutrients. Whereas for Boer crossbred goat (50% and 75%), singles show higher MDWG due to less competition. However, twins and triplets might not perform equally due to the does' inability to efficiently support multiple kids, leading to lower individual growth rates (Ssewannyana *et al*., 2004). The observed performance difference can be primarily justified by the indigenous breeds' superior adaptation to local conditions (Peacock, 1996), better maternal care (Mukasa-Mugerwa *et al.*, 1994), efficient nutrient utilization (Morand-Fehr, 1981), and overall resilience (Devendra, 1989). These factors allow indigenous twins and triplets to thrive and achieve higher MDWG compared to their Boer crossbred counterparts under similar conditions.

Effect of interaction between various genetic groups and sex on MDWG

The effect of interaction between various goat genetic groups and the sex of kids on MDWG during pre-weaning, weaning, and post-weaning stage at NGRP, Bandipur, Tanahun, Nepal is in line with the reports of various authors (GRS, 2017; GRS, 2018; GRS, 2019; Parajuli, 2020) working with Khari and Boer crossbred. When designing breeding programs, it's essential to consider the interaction between genetics and sex to optimize growth performance and productivity. For instance, crossbreeding programs might aim to use Boer males to enhance offspring growth rates while preserving the resilience and adaptability of indigenous females (Peacock, 1996). Male Boer crossbreds (50% and 75%) typically exhibit the highest growth rates due to the combined effects of favorable genetics and sex-related growth advantages. However, female Boer crossbreds also show good growth, but generally lag behind males. Indigenous males might outperform indigenous females, but usually have lower growth rates compared to Boer crossbreds of the same sex (Casey and Van Niekerk, 1988). In addition, male Boer crossbreds exhibits rapid growth rates due to higher feed efficiency and genetics they possess whereas indigenous female might be more efficient in converting low value feed into body mass for maintenance and reproduction, particularly in limited resources. Along with these facts, female indigenous goats could reach reproductive maturity earlier and have better reproductive performance under local conditions. However, female Boer crossbreds, while also potentially good breeders, may require better nutrition and management to achieve optimal reproductive performance (Casey and Van Niekerk, 1988).

Conclusion

Findings of our research revealed significant variation in different genetic groups of goats, which was influenced by birth type and sex. Boer crossbreds always had higher growth compared to the indigenous breeds, indicating their better genetic merit. Birth type influenced daily weight gain, as single births mostly had higher growth compared to twins and triplets, with male having higher growth rates compared to females. Boer 50% had superior performance in body weight changes and mean daily weight gain. Thus, these findings reiterate the points of consideretion to opt strategic breeding, nutrition, and adoption of appropriate management practices that can offer full growth potential to improve productivity in goats focussing on Boer 50% crossbreds. Further research is needed on the economy and adaptability of Boer cross goats before introducing in the Nepal Goat Breeding Policy.

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