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Outreach Research on Livestock Improvement, Nutrition and Health in the Command Districts of Rars, Parwanipur

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Abstract

Regional Agricultural Research Station Parwanipur have four outreach research sites in four different districts viz Bara, Parsa, Rautahat and Makwanpur of Mid Development Region of the country. Where different livestock research activities are being tested in farmers managed condition with the objective of verification and some sort of dissemination of promising technologies. A number of technologies in livestock sector were accomplished in last couple of years. An attempt was made to improve Terai goat (Capra Hircus) through introduction of Jamunapari buck within three goat rearing farmers group in Bara district. The result revealed that third generation (F3) achieved the highest weight gain followed by second generation (F2) comparing at birth, after 4 months, 6 months, 9 months and 12 months of birth. Twining was observed highest in 3rd generation followed by first generation. Interestingly, triplet kidding was found to be highest in first generation followed by third generation but no triplets were observed in second generation. The highest number of kids' production were observed in first generation and the lowest in second generation. However, kids' mortality was also observed higher in first generation. Major health problems were diarrhea, bloat, mucus discharge from nose, and parasites such as flukes, worms, ticks, mites and flea were observed in all the growth period and generations. The most vulnerable period for disease incidence in the kids were observed up to 4 months of age. A comparative study was conducted in forage crop with four oat varieties to select the best one in farmers' field condition. The result showed interaction between varieties and harvesting days were highly significant. Mean yield of green biomass of Bundel variety performed well (3092 g/m2) followed by NZA 30003 (2735 g/m2) and Kent (2322 g/m2). First harvesting at 60 days produced the highest green forage ((3445 g/m2) followed by 90 days (2415 g/m2) and 120 days (1401 g/m2) of harvesting.

Keywords

Outreach sites, Kids, Twining, Triplet, Jamunapari Buck, Mortality, Forage

1. Introduction

Nepal is enriched with more than 10.25 million heads of goats (MOAD, 2015) and endowed with four prominent indigenous breeds viz. Chyangra (in mountains), Sinhal (in high hills), Khari (hills and mid hills), and Terai (in Terai) as reported by Kharel and Neopane (1998). The rate of increment in goat population during last 13 years (2000/01 to 2013/14) was reported to be 3.67 percent per year contributing about 19.8% to the total meat production in the country (MOAD, 2014).Meat production and consumption from goats' ranks second to that of buffaloes in the country. Goats are very important livestock species in the eastern hills of Nepal. Eighty five per cent of the farming households own goats in the Koshi hill districts (part of the eastern hills) where they are reared mainly for meat (Gurung et al., 1989). Terai

goats constitute about 9% of the total goat population of Nepal and are found in the southern most plains (Terai). This breed appears to be recently developed from the population originating from Jamunapari and native breeds. The average adult body weight of male Terai goat is 30 – 35 kg and that of female is 18 – 32 kg. The average age at first kidding (15 – 16 months) and kidding interval (7 – 8 months) are similar to Khari goats of the hills (Joshi and Shrestha, 2003). Oats are grown for use as grain as well as forage and fodder, straw for bedding, hay, haylage, silage and chaff. Oats are best grown in temperate regions and hence suitable for winter season. Winter oats may be grown as fodder crop. They also can be used for pasture; they can be grazed a while, then allowed to head out for grain production.

Oats are generally considered healthy due to their rich content of several essential nutrients. This is an excellent fodder especially during winter seasons. The farmers face fodder deficiency in winter when they have only dry stalks of cereal fodder or dry summer grasses. Under such conditions adoption of oat production technology can be beneficial for providing fodder for winter seasons. There is a direct need to maximize fodder production per unit area which could be increased 2-3 fold by adopting improved varieties and agronomic practices (Kumar, 2014).

2. Materials and Methods

The study was conducted at Fattepur VDC of Bara district from September, 2013 to March, 2016. Three farmers group were formed in the village after baseline survey with goat rearing farmers. Jamunapari bucks having better pedigree records were purchased and distributed to each group. The bucks were replaced in each generation with new one to control inbreeding. Training to control inbreeding and feeding regime were conducted accordingly time to time. Technical support and health management were regularly provided to the farmers by RARS, Parwanipur. Data for birth type, number of kids, and weight at birth, after 4, 6, 9 and 12 months kids and mortality were recorded in excel spreadsheet and were analyzed. Similarly, four promising oat varieties (Kent, Bundale, Netra and NZA 30003) were distributed to farmers of Maheshpur, VDC of Bara district to identify best oat variety for forage production. The experiment was designed in RCBD with four replications. The plot size were kept 9 m2 and 12 gm/ m2 seed rate was used. The fertilizer was applied @ 120: 120: 60 N, P2O5, K2O kg/ha. Sowing was done on 2072/8/23. The first cutting was done at 60 days after sowing and then 2nd and 3rd cutting was done at 30 days interval. Data were recorded for green forage yield and yield attributes of different oat cultivars at different cutting stages. Data were maintained separately in excel spreadsheet and were analyzed using Genstat 5 Release 3.2.

3. Result and Discussion

3.1. A. Improvement of *terai* goat (*Capra Hircus*) through Jamunapari buck distribution at Bara

3.1.1. Weight Gain

Table 1. Average weight in kg recorded for different age of kids at different generations

Generation	F1 (N=77)	F2 (N=19)	F3 (N=60)
birth wt	2.28	2.63	2.67
4 month	11.52	14.27	14.88
6 month	12.6	16.25	17.8
9 month	14.35	18.92	20.52

Data shows that F3 have highest weight gain of kids for all the age group having marked differences with F1 (Table: 1 & fig: 1). The kids of F3 were found heavier (20.52 kg) than F2 (18.92 kg) and F1 (14.35) at 9 months of age (Table: 1). Similar finding was also reported by Shrestha, 2007 when terai goat was crossed with barberi buck. This finding clearly indicates that higher weight gain can be achieved generation after generation if Terai goat is crossed with Jamunapari buck. This also indicates that farmers‘ economic benefit and the social status could be raised by upgrading local terai goat with strategic breeding program. During the research period it was also observed that even some farmers rear improved buck for breeding their goats but the desired weight could not achieved due to inbreeding.

Farmers of the research site showed great enthusiasm to this program as they registered their group with DLSO, Bara which was initially formed for research purpose only. The number of goat rearing farmers is increasing as adopted

by many farmers with the support of line agencies such as DLSO and NGO's. Technology has been popular in the testing site as it has already gone in the adoption pathways. However, scaling up of this technology in similar areas and environment is required.

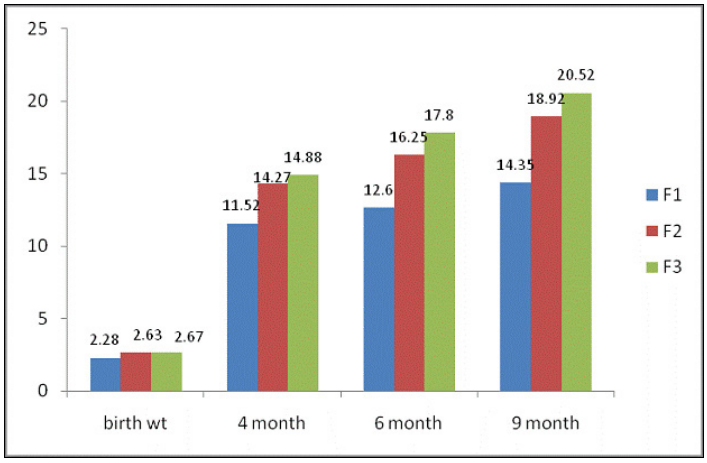

Figure 1. Comparative trend of Weight (Kg) and generation of kids

3.1.2. Kidding Pattern

Table 2. Number and type of kidding

Generation	Single kidding (%)	Twining (%)	Triplet (%)
F1 (N=40)	50	35	15
F2 (N=13)	56	31	13
F3 (N=41)	64	36	0

Kidding performance at different generations were also evaluated and found that most of the goats produced single kids in F3 (64 %) followed by F2 (56 %). Similarly twining percentage was also highest in F3 (36) having no distinct differences with F1 (35). Whereas triplet kidding was observed highest in F1 (15 %) followed by F2 (13 %) but no triplet was recorded in F3 generation (Table. 2).

It is learned that even improved buck such as Jamunapari is better for meat production and economic benefit but the character for production of twins and triplet kids is lower than local terai goat which is obviously increases raising and caring cost of the kids but not the total meat production and final benefit as compared to Jamunapari cross. Although, more kids production from Terai local has some other enefits for marginal farmers but may not be appropriate for commercial production.

3.1.3. Health records

All the goat and buck of farmers group were vaccinated with PPR once in year. Deworming was done done every six months but still the Major problems regarding health issues were diarrhea, bloat, mucus discharge from nose, parasites such as flukes, worms, ticks, mites and flea were observed in all the generations. Kids‘ mortality was observed higher in first generation and least in F3. This may be due to regular training on health management to farmers.

3.2. B. Comparative study of different Oat cultivars for forage production

Table 3. Green mass forage yield (g) of different oat varieties at different DAS

	Green mass yield (g)/ sq m				
DAS	**Kent**	**Bundel**	**NZA 30003**	**Netra**	**Mean**
60	3350	4225	3779	2426	3445
90	2160	3075	2900	1525	2415

Table 3. ***cont.***

	Green mass yield (g)/ sq m				
DAS	**Kent**	**Bundel**	**NZA 30003**	**Netra**	**Mean**
120	1455	1975	1525	650	1401
Mean	2322	3092	2735	1534	
F test					**
LSD					1168.3
CV(%)					33.6

All four varieties and harvesting days interaction were highly significant to each other. Bundel variety of oat produced highest (3092 g/m2) yield of green forage followed by NZA 30003 (2735 g/m2) and Kent (2322 g/m2). Least forage was produced by Netra (1534 g/m2). First harvesting at 60 days produced the highest green forage ((3445 g/m2) followed by 90 days (2415 g/m2) and 120 days (1401 g/m2) of harvesting (Table 3). Other parameters such as Leaf length, leaf width and plant height were found nonsignificant however number of tillers per plant and number of leafs found to be significant which seems to be positively correlated with the higher forage production.

4. Conclusion

The improvement program of local *terai* goat with jamunapari buck found to be successful in terms of meat (chevon) production and economic benefit. It can be replicated in other areas having similar environment. This technology can be recommended for small scale commercialization. Technology has been popular in the testing site as it has already gone in the adoption pathways. Similarly, Bundale variety of oat was found to be best in terms of green forage production among tested four varieties. Many farmers of the site started to grow oat for forage and its seed production for own purpose and also sell to others. This technology enhance the total livestock production.

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