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A Collating Study for Health and Management Practices Followed by Stall Fed and Extensive Rearing Goat Farmers of Punjab

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ABSTRACT

The present study was conducted in all the six different agro-climatic zones of Punjab state during February 2019 to April 2020 to study the awareness of goat farmers rearing goats on Stall fed (Group I) and Extensive/Grazing (Group II) system regarding health and management practices. A total of 120 goat farmers were randomly selected in such a way that 10 goat farmers belong to Group I and Group II each from all the six different agro-climatic zones, thereby making sample size of 60 goat farmers for Group I and Group II each. Personal interview schedule as tool of data collection was used to gather information. In Punjab, most of the goat farmers were between age group 31-60 years, male, with education level up to high school, had main occupation as goat farming, had joint families and were landless. The mean knowledge percentage at Punjab level was reported to be 33.20%. The health and management knowledge score of Group I and Group II goat farmers in different agro-climatic zones of Punjab differ significantly at $p<0.05$. The knowledge score of Group I (in medium category) is significantly higher (at $p<0.05$) than Group II (in Low category). The present study gives light on the facts that there is dire need to enrich knowledge of goat farmers about health and management practices by conducting demonstrations and training programmes at field level. The knowledge level of goat farmers should be assessed before organizing any extension programme, as it varies from zone (area) to zone (area) and between different farming system. Also, the goat farmers should be educated about advantages of stall rearing system, so as to give momentum to goat farming in the state.

KEYWORDS: Farmer, grazing, goat, health, management, stall fed

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1. INTRODUCTION

In India, Goats are among the main meat-producing animals and goat meat (chevon) is one of the choicest meats and has huge domestic demand. Besides meat, goats provide other products like milk, skin, fiber and manure. Goat provides food and nutritional security to the millions of marginal and small farmers and agricultural labourers.

Goat is projected as future food animal as there are availability of a wide variety of goat breeds and there is high market demand for goat meat and milk. The goat population in Punjab state and India is 0.348 million and 148.88 million respectively (Anonymous, 2019). Goats are hardy and prolific animals and can be cheaply reared (Banerjee, 2004). Traditionally, goats were reared after following the extensive/grazing system, in which the goat farmers move from one location to another along with their goats, which survive on grazing in field, road side or canal side. Very little or no feeding cost involved in this system. But, now a days, due to low initial investment and easy management of small sized animal, many livestock farmers are venturing in to stall fed goat farming and many new goat farms are mushrooming up in the state. In stall fed rearing system, there is close supervision as goats are fed on manger. There are frequent questions/queries among new farmers, (which want to venture in to goat farming) about the rearing system in which the goats are healthier. The extension machinery related with goat farming is striving hard to inculcate the latest scientific practice to the goat farmers. The earlier studies conducted at different locations (Mohan et al., 2009, George et al., 2010, Satyanarayan and Jagadeeswary, 2010, Debele et al., 2013; Roy and Tiwari, 2017), indicated that the poor productivity and lack of scientific knowledge about goat farming proves to be the lacunae behind goat production. There is no doubt that goat farming is providing livelihood to many farmers and for getting maximum benefit from goat farming, the goats should be healthy. The Goat farmers (Rearing goats by stall fed or extensive rearing system) must have adequate knowledge about the health management of goats, which can play an important role in getting maximum production from goat farm. The improvement in health and management practices leads to a reduction in mortality (Ochan and Makosa, 2020). The economic losses at goat farm due to bad health management can be in terms of decreased production, cost of treatment and even death of infected animals. Also, the products obtained from goats that are to be used by consumer, must be from healthy goats. The health management knowledge level of farmers rearing goats by stall fed rearing system and extensive rearing system must be compared to know about the fact that in which rearing system, goats are healthy and consequently there is higher production and profitability. So, the present study is planned with the aim to collate and to conduct comprehensive study regarding awareness of goat farmers regarding health and management practices in both- stall fed and extensive rearing system in Punjab state. This study can help the extension worker to know about the missing link in better health management of goats under both rearing system (stall fed as well as extensive) and to formulate suitable strategy for educating goat farmer and for keeping healthy goats.

2. MATERIALS AND METHODS

The present study was conducted during February 2019 to April 2020 on goat farmers of Punjab state, India. Punjab state has six zones with different agro climatic conditions. These zones are Zone I (Sub-mountain undulating zone), Zone II (Undulating plain zone), Zone III (Central plain zone), Zone IV (Western plain zone), Zone V (Western zone), and Zone VI (Flood plain zone). From each zone, 10 goat farmers rearing goat by Stall fed (Group I) and Extensive rearing (Group II) system were randomly selected, making the sample size equal to 120 goat farmers. Goat farmers were categorized in to different categories for different demographic profile parameters (Table 1). Personal interview schedule was the tool for data collection. While preparing interview schedule, the relevant literature/ concerned research articles were seen, discussion with field extension personnel /consulting subject matter specialists /progressive goat farmers were made. A total of 26 questions/items related to health & management practices were included in the interview schedule. If the goat farmer give correct answer to a question, it means that he has knowledge about that question and was assigned one score and those which do not answer correctly were assigned zero score. Then, the goat farmers were categorized into low, medium and high knowledge level with scores of 0-8, > 8-16 and > 16 respectively. Before tabulation, the collected data was carefully examined for completeness and correctness. The gathered data was analyzed statistically with the help of SPSS version 20.0 software.

3. RESULTS AND DISCUSSION

3.1. Demographic profile of goat farmers

A perusal of Table 1 indicates that most of goat farmers of Group I and Group II were in age group of 31–60 years, followed by ≤30 years and then >60 years. Tanwar et al., (2008) reported that in the tribal area of Udaipur district of Rajasthan, majority of the goat farmers belonged to 31–50 years of age group. Also in Nathdwara, Vallabhnagar, Railmagra and Devgarh areas of Rajasthan the majority of goat rearers were reported to be belonging to middle age group (Sharma et al., 2007). However, Roy and Tiwari

Table 1: Distribution of goat farmers according to demographic profile in Punjab

Attributes	Parameter	System of rearing		
		Group I (n=60)	Group II (n=60)	Overall (n=120)
Age (years)	≤ 30 years	12 (20.00)	16 (26.67)	28 (23.33)
	31-60	42 (70.00)	32 (53.33)	74 (61.67)
	> 60	6 (10.00)	12 (20.00)	18 (15.00)
Sex	Male	60 (100)	60 (100)	120 (100)
	Female	0 (0)	0 (0)	0 (0)
Education	Illiterate	12 (20.00)	34 (56.67)	46 (38.33)
	Up to middle	24 (40.00)	20 (33.33)	44 (36.67)
	High school	24 (40.00)	6 (10.00)	30 (25.00)
	Higher secondary	0 (0)	0 (0)	0 (0)
	Graduate and Postgraduate	0 (0)	0 (0)	0 (0)
Main occupation	Agriculture	7 (11.67)	3 (5.00)	10 (8.34)
	Goat farming	42 (70.00)	41 (68.33)	83 (69.16)
	Labour/Service/ Business	11 (18.33)	16 (26.67)	27 (22.50)
Family size	Small (≤ 4)	12 (20.00)	20 (33.33)	32 (26.67)
	Medium (5-8)	23 (38.33)	19 (31.67)	42 (35.00)
	Large (>8)	25 (41.67)	21 (35.00)	46 (38.33)
Family type	Single	17 (28.33)	27 (45.00)	44 (36.67)
	Joint	43 (71.67)	33 (55.00)	76 (63.33)
Land holdings (Acres)	Landless	37 (61.67)	54 (90.00)	91 (75.83)
	(<5)	23 (38.33)	6 (10.00)	29 (24.17)
	5-10	0 (0)	0 (0)	0 (0)
	>10	0 (0)	0 (0)	0 (0)

(2016) reported that in West Bengal and Uttar Pradesh, the mean age of the goat owners was around 41 years. All the goat farmers of Group I and Group II were male. This suggests that goat farming in Punjab is predominantly done by male goat farmers. However, Raghavan and Raja, (2012) reported that in Malabar region of Kerala, females are mainly engaged in goat rearing. Sharma and Kandpal, 2021 also reported that in Uttarakhand, majority of goat farmers were middle age group, literate and were female. Kumar and Deoghare (2002) reported that in semi-arid parts of India, Goat rearing helps in the empowerment of poor rural women by providing them employment and to some extent financial autonomy. Although, goat is a small animal and it can be easily handled by women and children. But, in Punjab, women are not predominantly involved in goat farming due to social or other reason. The goat farming can play a pivotal role in women empowerment. So, there is dire need to conduct extension campaign to educate and encourage women farmer to adopt goat farming as it will empower them.

The education level of Group I goat farmers is more than that of Group II. It means that stall feeding is practiced by goat farmers having more educational level. The education level of 40% Group I, 10% Group II and 25% goat farmers in overall Punjab was reported to be High School level. Raghavan and Raja, (2012) also reported that in Malabar region of Kerala, 92% of the heads of the families were educated and 15% of them had high school level education and above. The main occupation in Group I, Group II and for overall Punjab Goat farmer is Goat farming, followed by labour/service/ business and then agriculture. This indicates that farmers in both type of rearing system are primarily surviving on goat farming. This highlights the importance of adopting goat farming as main occupation instead of subsidiary occupation or side business. A large number of goat farmers in Group I, II and in overall Punjab were having medium and large families. In Group I, Group II and in overall Punjab, predominant family type is Joint family. It indicates the possibility of participation of other family members in effective operation of goat rearing.

So, all the family members along with head of the family (which is predominantly involved in goat farming) should be made part of extension programme for upliftment of goat farmer. Majority of goat farmers belonging to Group I, II and overall Punjab were landless. In earlier studies conducted in various parts of India, it was also reported that the majority of goat farmers belonged to landless and marginal categories (Raghavan and Raja, 2012; Mohan et al., 2012; Rawat et al., 2015, Singh et al., 2021). Birthal and Taneja, (2006) also reported that smallholders and landless farmers together control more than 75 percent of the country's livestock capital. However, Kumar et al., (2010) stated that only the landless, farm wage earners and marginal and small farmers were involved in goat rearing in Uttar Pradesh. Goat rearing was, however, adopted by all groups of farmers in Rajasthan, where drought is frequent. For their livelihood, most farmers practiced goat rearing and thus seldom measured the cost of production.

3.2. Knowledge percentage of goat farmers

3.2.1. In different agro-climatic zones

Table 2 shows that the mean knowledge percentage regarding health and management practices was 31.54%, 27.50%, 43.08%, 35.19%, 38.27% and 23.65% in Zone I, II, III, IV, V and VI respectively. Zone II has lowest knowledge, while Zone III had maximum knowledge. The knowledge

Table 2: Knowledge percentage of goat farmers about health and management practices in Punjab

Knowledge about	Agro-climatic zone						
	I (n=20)	II (n=20)	III (n=20)	IV (n=20)	V (n=20)	VI (n=20)	Over all (n=120)
Disbudding	65.00	60.00	75.00	65.00	70.00	60.00	65.83
Castration	40.00	35.00	70.00	55.00	60.00	30.00	48.33
Tagging	45.00	45.00	60.00	45.00	50.00	40.00	47.50
Hoof trimming	75.00	70.00	75.00	70.00	70.00	60.00	70.00
Hair clipping	30.00	20.00	50.00	35.00	40.00	10.00	30.83
Ligation & disinfection of naval cord	10.00	5.00	30.00	20.00	25.00	0.00	15.00
Kid deworming	20.00	20.00	25.00	25.00	20.00	20.00	21.67
Weaning of kid	20.00	15.00	20.00	15.00	15.00	5.00	15.00
Vaccination schedule	60.00	60.00	85.00	70.00	80.00	55.00	68.33
Vaccine	20.00	15.00	20.00	15.00	15.00	10.00	15.83
Deworming schedule	80.00	75.00	90.00	90.00	90.00	55.00	80.00
Deworming medicine	15.00	10.00	20.00	10.00	15.00	5.00	12.50
Ecto-parasite control	35.00	35.00	40.00	40.00	45.00	35.00	38.33
Ectoparasite medicine	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Record keeping	30.00	20.00	35.00	25.00	30.00	10.00	25.00
Age estimation by dentition	15.00	10.00	30.00	25.00	30.00	10.00	20.00
Common diseases	0.0	0.0	10.00	5.00	5.00	0.0	3.33
Zoonotic disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mastitis	35.00	25.00	55.00	40.00	45.00	20.00	36.67
Cleaning of udder	75.00	80.00	75.00	80.00	80.00	90.00	80.00
Teat dipping	15.00	10.00	35.00	25.00	30.00	10.00	20.83
Method of milking	15.00	10.00	35.00	25.00	30.00	10.00	20.83
Cleaning of milking utensil	60.00	50.00	85.00	65.00	75.00	40.00	62.50
Colostrum feeding	30.00	25.00	60.00	35.00	45.00	25.00	36.67
Quarantine	25.00	15.00	25.00	20.00	20.00	5.00	18.33
Proper disposal of dead goat	5.00	5.00	15.00	15.00	10.00	10.00	10.00
Mean percentage	31.54	27.50	43.08	35.19	38.27	23.65	33.20

about disbudding, castration, tagging, hoof trimming and hair clipping was reported to be 65.83%, 48.33%, 47.50%, 70.00% and 30.83% respectively. Knowledge about ligation & disinfection of naval cord, kid deworming and weaning of kids was with 15.00%, 21.67% and 15.00% goat farmers. Knowledge about vaccination schedule, vaccine, deworming schedule and deworming medicine was with 68.33%, 15.83%, 80.00% and 12.50% goat farmers respectively. Sivachandiran et al., 2020, Singh et al., 2021 reported that the vaccination and deworming turnout were low due to the lack of awareness among the goat farmers about the importance of vaccination and deworming. Knowledge about ecto- parasite control, record keeping and age estimation by dentition and about common diseases was with 38.33%, 25.00%, 20.00% and 3.33% goat farmers respectively. None of the goat farmer had knowledge about ecto- parasite medicine and zoonotic disease. Knowledge about mastitis, cleaning of udder, teat dipping and method of milking was with 36.67%, 80.00%, 20.83% and 20.83% goat farmers respectively. Very less number of goat farmers was aware about quarantine (18.33%) and proper disposal of dead goat (10.00%). Meena et al., 2022 also reported that goat farmers belonging to Raika pastoralists of Rajasthan never followed proper method of disposal of dead animal. This indicates that goat farmers did not know much about health and management practices. So, they should be educated by discussing advantages of following these practices. However, in south Gujarat, most of goat keepers preferred the castration of male kids (73.21%) and were doing vaccination of goats prior to monsoon (69.19%). But, only 22.04% and 9.49% goat keepers adopted deworming practice and measures to control ecto-parasitic infestations respectively (Deshpande et al., 2009). In East Shawa Zone, Ethopia, 51.7% of goat farmers were deworming their goats whereas 48.3% do not practiced deworming. 21.7% deworm their animal whenever the goats have got health problem. About 91.7% of the farmers did not practice treating of their goats against external parasites (Debele et al., 2013). However, Mordia et al., 2018 reported that in Chittorgarh district of Rajasthan, majority of goat owner practiced vaccination (55.68%) and deworming (60.97%) two times annually. Kumar et al., 2021 reported that in Karur district of Tamil Nadu, high proportion of farmers under study were not practicing prophylactic measures for minimizing morbidity and mortality of the animals due to infectious and contagious diseases.

3.2.2. In different rearing systems

Table 3 shows that Group I (36.15%) had more knowledge about different health and management practices than Group II (30.26%). However, the mean health and management practices knowledge percentage at overall Punjab level was reported to be 33.20%.

Table 3: Knowledge percentage of goat farmers (on rearing system basis) about health and management practices in Punjab

Knowledge about	Rearing practice		Over all (n=120)
	Group I (n=60)	Group II (n=60)	
Disbudding	98.33	33.33	65.83
Castration	56.67	40.00	48.33
Tagging	91.67	3.33	47.50
Hoof trimming	46.67	93.33	70.00
Hair clipping	10.00	51.67	30.83
Ligation & disinfection of naval cord	8.33	21.67	15.00
Kid deworming	31.67	11.67	21.67
Weaning of kid	30.00	0.00	15.00
Vaccination schedule	83.33	53.33	68.33
Vaccine	31.67	0.00	15.83
Deworming schedule	65.00	95.00	80.00
Deworming medicine	25.00	0.00	12.50
Ecto parasite control	53.33	23.33	38.33
Ecto parasite medicine	0.0	0.0	0.0
Record keeping	48.33	1.67	25.00
Age estimation by dentition	8.33	31.67	20.00
Common diseases	5.00	1.67	3.33
Zoonotic disease	0.0	0.0	0.0
Mastitis	40.00	33.33	36.67
Cleaning of udder	60.00	100.00	80.00
Teat dipping	8.33	33.33	20.83
Method of milking	8.33	33.33	20.83
Cleaning of milking utensil	48.33	76.67	62.50
Colostrum feeding	33.33	40.00	36.67
Quarantine	30.00	6.67	18.33
Proper disposal of dead goat	18.33	1.67	10.00
Mean percentage	36.15	30.26	33.20

3.3. Knowledge level of farmers

3.3.1. In different agro-climatic zones

The health and management knowledge score of Group I goat farmers in different agro-climatic zones of Punjab differ significantly at $p<0.05$ level (Table 4). In Zone I, III, IV, V and in overall Punjab, the health and management knowledge score falls under medium category, while for zone II and VI, knowledge score is low. Satyanarayan and

Table 4: Health and management knowledge score of Group I goat farmers

Agro-climatic zone	Health and management Knowledge score (Mean±S.E.)	Health and management Knowledge level
Zone I (n=10)	9.10±1.60^{ab}	Medium
Zone II (n=10)	7.80±1.57^{ab}	Low
Zone III (n=10)	12.20±1.57^{b}	Medium
Zone IV (n=10)	9.80±1.65^{ab}	Medium
Zone V (n=10)	11.30±1.71^{b}	Medium
Zone VI (n=10)	6.20±1.31^{a}	Low
Over all (n=60)	9.40±0.67	Medium

(Different superscripts mean that values differ significantly at p<0.05)

Jagadeeswary (2010) also recorded that three fourths (80%) of sheep and goat farmers in Bangalore North taluka had low awareness, followed by medium (18%) and strong (2%) knowledge levels of prescribed sheep and goat rearing management practices.

It is clear from Table 5 that health and management knowledge score of Group II goat farmers differ significantly at p<0.05 level in different agro-climatic zones of Punjab. The health and management knowledge level of Group II farmers in zone III, IV and V falls in medium knowledge category, while for zone I, II, VI and overall Punjab, there was low knowledge. Roy et al., (2017) also reported that mean knowledge score of goat owners in kid health management was medium.

Table 5: Health and management knowledge score of group II goat farmers

Agro-climatic zone	Health and management knowledge score (Mean±S.E.)	Health and management knowledge level
Zone I (n=10)	7.30±1.39^{ab}	Low
Zone II (n=10)	6.50±1.25^{ab}	Low
Zone III (n=10)	10.20±1.14^{b}	Medium
Zone IV (n=10)	8.50±1.43^{ab}	Medium
Zone V (n=10)	8.60±1.26^{ab}	Medium
Zone VI (n=10)	6.10±1.13^{a}	Low
Over all (n=60)	7.87±0.53	Low

(Different superscripts mean that values differ significantly at p<0.05)

Table 6 represents that health and management knowledge score of goat farmers in different agro-climatic zones differ significantly at p<0.01 level. Zone III has maximum and Zone VI has lowest knowledge about Health & Management practices. The Health and management knowledge level of Zone II and VI falls in low knowledge category, while Health and management knowledge level of zone I, III, IV, V and overall Punjab falls in medium knowledge category.

Table 6: Health and management knowledge score of goat farmers in different agro-climatic zones of Punjab

Agro-climatic zone	Health and management Knowledge score (Mean±S.E.)	Health and management Knowledge level
Zone I (n=20)	8.20±1.05^{abc}	Medium
Zone II (n=20)	7.15±0.99^{ab}	Low
Zone III (n=20)	11.20±0.97^{c}	Medium
Zone IV (n=20)	9.15±1.07^{abc}	Medium
Zone V (n=20)	9.95±1.08^{bc}	Medium
Zone VI (n=20)	6.15±0.84^{a}	Low
Over all (n=120)	8.63±0.43	Medium

(Different superscripts mean that values differ significantly at p<0.05)

3.2.2. In different rearing system

The health and management knowledge score of Group I is significantly higher (at p<0.05) than Group II goat farmers (Table 7 and Figure 1). The health and management knowledge level of Group I goat farmer and overall Punjab falls under medium knowledge category, while for Group II, there is low knowledge level. It is also clear that Group I (Stall fed) goat farmers, having more health and management knowledge, were rearing goats after following more scientific guidelines as compared to Group II (Extensive feeding) goat farmers.

Table 7: Health and management Knowledge score (Mean ± S.E.) of goat farmers (based on rearing system) in Punjab

Rearing system	Health and management Knowledge score (Mean ± S.E.)	Health and management Knowledge level
Group I (n=60)	9.40±0.67^{a}	Medium
Group II (n=60)	7.87±0.53^{b}	Low
Over all (n=120)	8.63±0.43	Medium

(Different superscripts mean that values differ significantly at p<0.05)

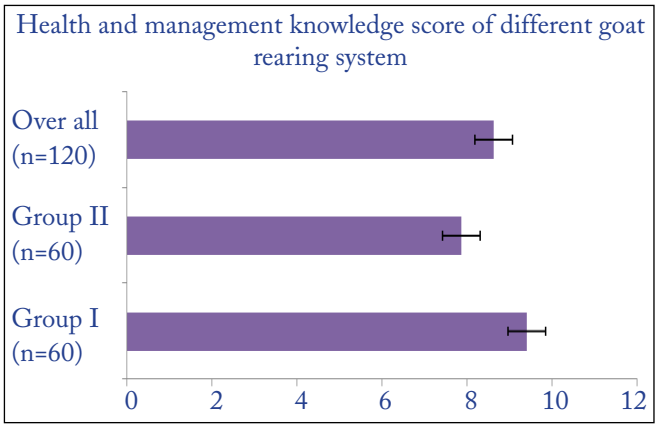

Figure 1 : Health and management Knowledge of goat farmers (based on rearing system) in Punjab

4. CONCLUSION

Before planning any knowledge enrichment extension programmes for goat farmers, the knowledge appraisal should be conducted first as knowledge level varied from zone/place to zone/place and also in different rearing system. The present extension delivery system should be strengthened as the knowledge level of goat farmer fell in low to medium categories. Farmers rearing goats on stall feeding had more knowledge than those rearing goats on extensive rearing system for health and management practices. The stall rearing system should be promoted for rearing goats on scientific guidelines.

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