

Original Research Article

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## Awareness and Socio-Economic Loss Due to Dog Bite among Goat Owners in Puducherry Region

K. Rajkumar\*, A. Bhattacharya, M. Jayakumar, N. Balaji, S. Hari Balaji,  
S. David and R. Hariharan

Department of Veterinary Public Health and Epidemiology, Rajiv Gandhi Institute of  
Veterinary Education and Research, Puducherry - 605 009, India

\*Corresponding author

### ABSTRACT

#### Keywords

Awareness, Socio economic loss, Goat farmers, Dog bite, Rabies

#### Article Info

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The present study was undertaken to study the awareness and socio economic loss due to dog bite among goat owners in Puducherry region. Forty-seven goat farmers were selected randomly and interviewed with a scheduled questionnaire. The respondents were interviewed with a questionnaire containing both open and close ended questions on different aspects of dog bite in goats, i.e., awareness, knowledge, risks, economic loss etc. The questionnaire had 22 questions to assess knowledge of the goat farmers on dog bite and to test their awareness level. Based on the study conducted in Puducherry, it is evident that majority of the goat farmers are primarily educated. Goat farmers have poor knowledge on the transmission of rabies between humans and animals. This study reveals that there is higher proportion of people aware about spread of rabies through dog bite, on the other hand it also shows that lack of awareness about vaccination and handling of dog bitten goat in terms of rabies vaccination and tetanus toxoid. This study also shows there is huge economic loss among poor farmers in terms of treatment, vaccination and mortality.

### Introduction

Goat rearing plays a significant role in the national economy. Among the rural people of India, goat rearing provides gainful employment and good income.

Goats are reared mainly for meat, hide, milk, manure and hair fiber. In India, Goat are called as POOR MAN's cow because of its versatile characteristic and utilization.

In India, chevon is preferred over mutton, resulting in increasing goat rearing with

potential of good economic returns among livestock farmers.

Goat and Sheep in India are generally reared on free range system, making it susceptible for dog bite. Goat and sheep are attacked by stray dogs roaming the city streets giving sleepless nights to animal owners.

According to livestock census of India 2012, 135.17 million goats are reared in India. In India, around 1 to 1.5 million people receiving post bite treatment and 30,000 deaths have been reported by national health authorities,

that accounts for 81% of total global death (Trivedi and Patel, 2009). Even in developed countries like United Kingdom incidence of dog bite increased to 550% from 1989 to 2013 (Mannion Christopher *et al.*, 2016).

In Puducherry 54,950 goats are reared, of this 43,817 are reared in rural areas and 11,133 are reared in urban areas.

One of the most common traumatic injuries in livestock is caused by dog bite. Most cases are commonly occurring in domestic animals like cattle, sheep and goats, even in dogs and cats. Female and younger animals are the frequent victims of dog bite.

Types of dog bite wound can be classified as

Category I - licks on the skin by rabid dog.

Category II - minor scratches or abrasions without bleeding, licks on broken skin.

Category III - single or multiple bites or scratches.

According to WHO survey conducted during 1991-2001 in India in five IVRI Institute and 18 veterinary institutes, dog bitten cases 75,345 were reported in livestock. Among this, 40 percentage was reported in goats.

Dog bitten goats should at least receive three doses of post bite anti rabies vaccine at 0, 3<sup>th</sup>, 7<sup>th</sup> day of bite, Dog bite usually followed by tetanus/locked jaw (Angeline Radjou *et al.*, 2012) in advanced cases no treatment is available (Ashok Singh, 2014) which is fatal if not treated properly. Therefore, animal has to receive a tetanus toxoid injection as post bite therapy (Vikram Sabhaney and Ran Goldman, 2012). The present study was undertaken to study the awareness and socio economic loss due to dog bite among goat owners in Puducherry region.

## **Materials and Methods**

### **Ethical approval**

No ethical approval was required as it is a survey-based study; however, after obtaining consent from all the participants involved in the study, the data were collected.

### **Sampling size**

Forty-seven goat farmers were selected randomly and interviewed with a scheduled questionnaire.

### **Data collection**

The respondents were interviewed with a questionnaire containing both open and close ended questions on different aspects of dog bite in goats, i.e., awareness, knowledge, risks, economic loss etc.

The questionnaire had 22 questions to assess knowledge of the goat farmers on dog bite and to test their awareness level.

The questionnaire was pre-tested on a few selected farmers, and the easiness of completion of the questionnaire and ambiguity of questions were noted and subsequently revised before a large-scale interview of the farmers. The information about independent variables *viz.*, age, education, and herd size were collected with the help of structured schedule and scales.

### **Statistical analysis**

Knowledge scorecard was developed, and each correct answer was awarded one mark, and each incorrect answer was given zero mark. Respondents were categorized into three groups based on the mean and standard deviation, as measured by software Graphpad prism.

## **Results and Discussion**

### **Education and socioeconomic status of the goat farmers**

Based on the study conducted in Puducherry, it is evident that majority of the goat farmers are primarily educated.

Moreover, the majority of them are able to read and write in their mother tongue.

The above survey reflects that most of the respondents belong to the age category of 35-45 years and most of the respondents have livestock rearing and agriculture as their occupation (Table 1-2 and Fig. 1).

### **Awareness and knowledge of goat farmers on risk factors and management of dog bitten Goats**

Due to the fact that rabies is a dreadful disease and due to various awareness programs implemented towards rabies by Puducherry Government, most of the respondents are aware that dog bite is the main source of rabies to humans (85.10%) and majority of them also knew that dog bite is the main source of rabies to goats (82.97%).

About half of the farmers (51.06%) answered that dog bitten goats can recover if treatment is given and most of the farmers (51.06%) even replied that rabid goats are treatable, if diagnosed early (Table 3).

### **Socio-economic losses among goat farmers due to dog bitten goats**

As for the socio-economic losses due to rabies, about 82.97% farmers responded that they will treat a dog bitten goat. Still 36.17% of the farmers replied that they will sell a dog bitten goat either without treating or immediately after treatment (Table 3).

In this study, all the respondents replied that a dog bitten animal has a lower market value compared with a healthy goat of same weight.

Based on the market prices of healthy goat and dog bitten goat replied by the farmers, it has been estimated that there is about 57% reduction in price of the dog bitten goats compared with that of healthy goats (Fig. 2).

### **Zoonotic awareness on rabies by goat farmers**

In this study, the facts were revealed that 53.19% of farmers believe that humans can get rabies by consumption of rabid goat meat and about 38.19% of them replied that rabies can be transmitted to humans by contact with rabid goats.

The above information indicates that goat farmers have poor knowledge on the transmission of rabies between humans and animals (Fig. 3).

### **Management of dog bitten goats by the farmers**

About 51.06% of the respondents replied that they are afraid of handling rabid goats due to their belief that they may contract rabies by contact with a rabid goat. 31.9% of the farmers responded that they will isolate rabid goats from other animals in the herd.

A small fraction of respondents said that they won't vaccinate a dog bitten goat against rabies since it is costly.

### **Relationship between different variables analyzed by Chi-square test**

Different independent variables were analyzed by chi-square test and Fisher's exact test and data was analyzed for statistical significance (Table 4).

**Table.1** Education level of respondent

Sl. no	Age group	Frequency (%)	95% confidence interval
1	No education and primary education	35	77.34702 - 70.65298
2	SSLC	8	23.98312- 10.01688
3	HSS	0	-
4	UG	4	18.59738 -0.597375
5	PG	0	

**Table.2** Age group of the respondent

Sl.no	Age group	Frequency (%)	95%confidence interval
1	25-35 years	7 (15%)	13.6327 -16.3673
2	36 -45 years	14 (30%)	29.03317 -30.96683
3	46 -55 years	9 (19%)	17.78512 – 20.21488
4	56-65 years	8 (17%)	15.71565 -18.28435
5	>65 years	9(19%)	17.78512 – 20.21488

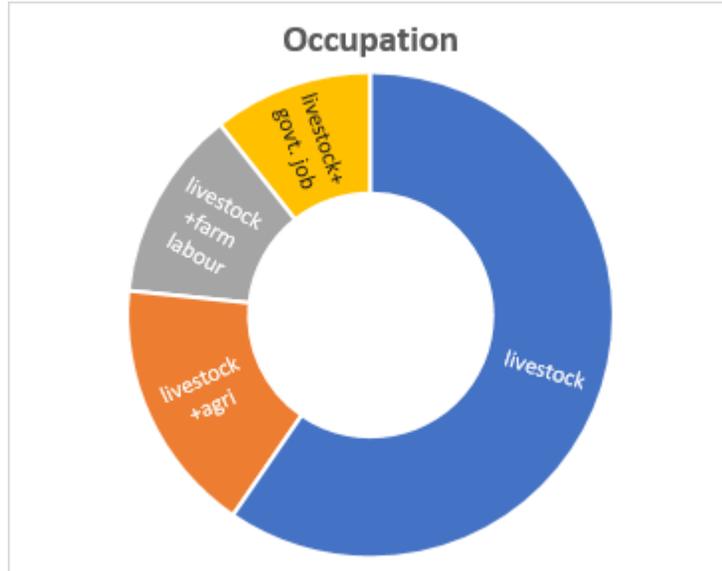
**Table.3** Awareness and knowledge of goat farmers on risk factors of dog bitten goats

Sl. no	Parameters	Frequency (%)
<b>Knowledge of farmer</b>		
1	Dog bite is main source of rabies to humans	40(85.10)
2	Dog bite is main source of rabies to goats	39(82.97)
3	Rabid goats can recover from rabies	24(51.06)
4	Rabid goats are treatable	24(51.06)
5	Don't know ARV is available	30(63.82)
<b>Socio economic losses</b>		
1	Will treat dog bitten goat	39(82.97)
2	Will sell the rabid goats for slaughter	17(36.17)
<b>Management of a rabid goat</b>		
1	Afraid of handling rabid goats	24(51.06)
2	Not go for vaccination due to cost	13(27.65)
<b>Zoonotic awareness of rabies</b>		
1	Rabies → Humans by consuming rabid goat's meat	25(53.19)
2	Rabies → Humans by handling rabid goat	18(38.29)

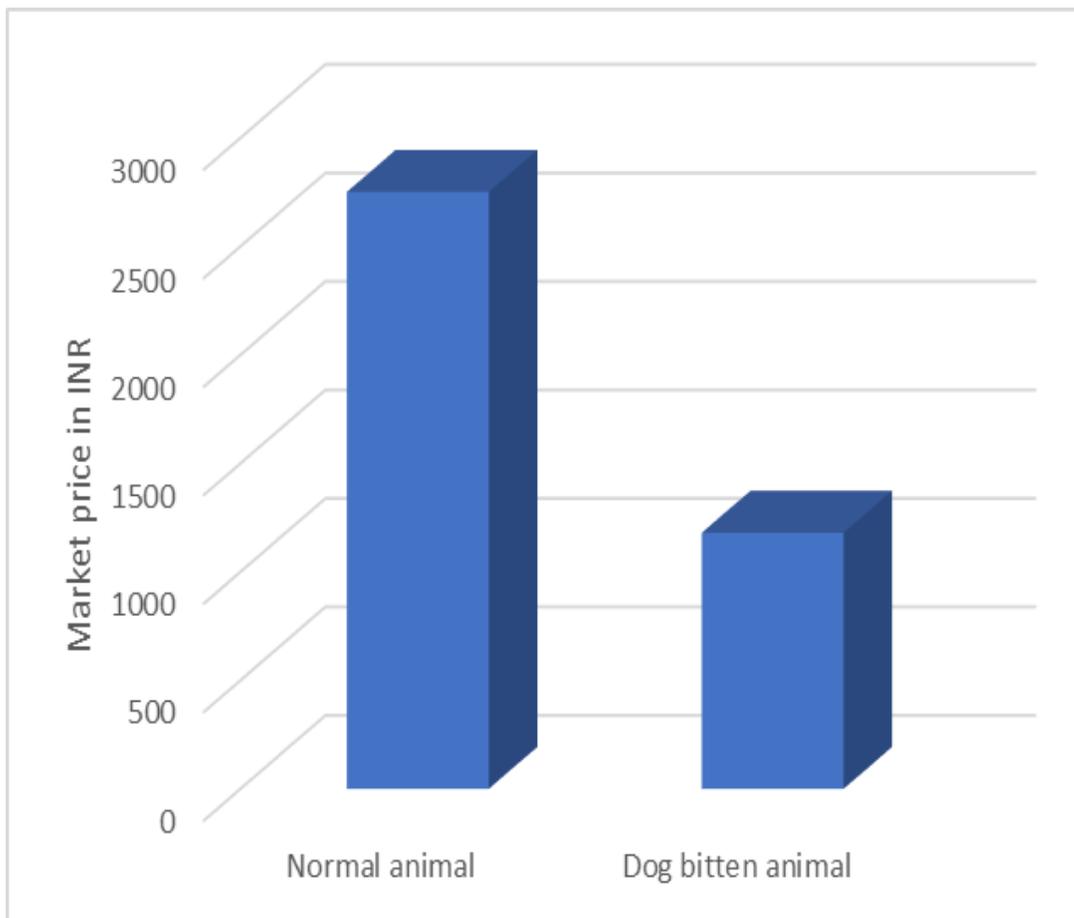
**Table.4** Statistical analysis of relationship between different variables analyzed by Chi-square test

S. No	Variable 1	Variable 2			P value
1.	<b>Education level</b> SSLC, HSS, UG, PG No education and primary education Total	<b>Source of rabies</b>			0.1756
		Dog bite	Other source	Total	
		8	4	12	
		31	4	35	
		39	8	47	
2.	<b>Education level</b> SSLC, HSS, UG, PG No education and primary education Total	<b>Knowledge on vaccine</b>			0.7334
		Available	Not available	Total	
		7	5	12	
		23	12	35	
		30	17	47	
3.	<b>Education level</b> SSLC, HSS, UG, PG No education and primary education Total	<b>Knowledge on handling</b>			0.7438
		Proper	improper	total	
		6	6	12	
		20	15	35	
		26	21	47	
4.	<b>Occupation</b> Livestock and other Livestock alone Total	<b>Disposal of animal died of dog bite</b>			1.000
		Proper	improper	total	
		15	4	19	
		23	5	28	
		38	9	47	
5.	<b>Occupation</b> Livestock and other Livestock alone Total	<b>Decision after dog bite</b>			0.1364
		Sell for slaughter	Give treatment	total	
		14	5	19	
		14	14	28	
		28	19	47	
6.	<b>Transmission via meat</b> Transmit Do not transmit Total	<b>Selling for slaughter</b>			1.000
		Sell for slaughter	Do not sell	total	
		10	15	25	
		9	13	22	
		19	28	47	
7.	<b>Recovery</b> Possible Not possible Total	<b>Selling for slaughter</b>			0.4793
		Sell the animal	Do not sell	total	
		7	17	24	
		5	7	12	
		12	24	36	

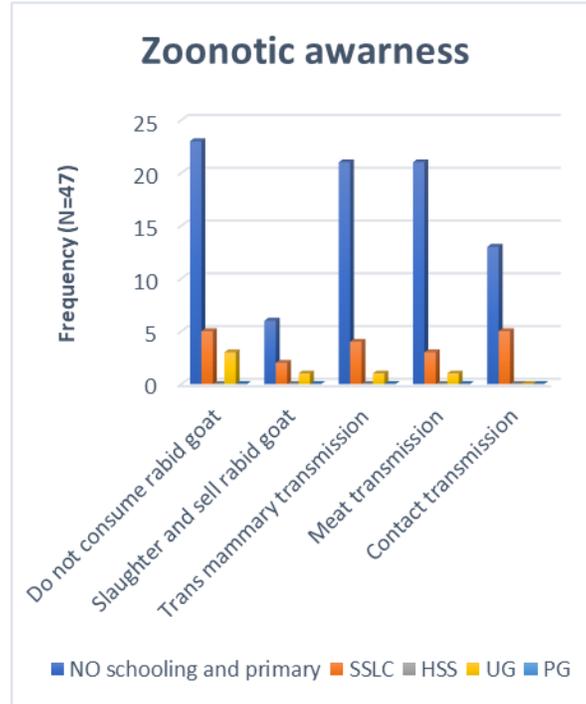
**Fig.1** Occupational status of the respondent



**Fig.2** Market value of Healthy goat vs. dog bitten goat



**Fig.3** Zoonotic awareness on rabies by goat farmers



The data revealed that there was no significance in the Education level and the source of Rabies, knowledge on vaccine, knowledge on handling; occupation and the disposal of animal died of dog bite, decision after dog bite; Transmission via meat and selling for slaughter; recovery and selling for slaughter

In India goats are reared for meat, fur, skin and manure purpose. Feeding of offal's (slaughter house) to the stray dog is the main reason to develop biting behavior. Dog bite mainly occurs in different livestock because of many reasons such as: they are being furious while threatened during feeding and as a defensive behavior towards their territory dogs tends to bite the invading animals (Hart and Hart, 1985; Appleby *et al.*, 2002). They are aggressive and over excited during their estrous period.

According to National multi-centric survey 2003 sponsored by WHO, among production

animal's cattle shows higher degree of susceptibility to rabies and dog bite compared to sheep and goats. But recent study done in Bangladesh and India (Islam *et al.*, 2016) revealed that incidence of dog bite is more in goats than cattle

Around 82% of respondents in the present study reported that they will treat their dog bitten goats, and goat farmers were aware about rabies. Rajkumar *et al.*, (2016) reported that higher proportion of Puducherry farmers were aware about rabies infection through dog bite.

The present study was undertaken to study the awareness and socio economic loss due to dog bite among goat owners in Puducherry region. Forty-seven goat farmers were selected randomly and interviewed with a scheduled questionnaire. This study reveals that there is higher proportion of people aware about spread of rabies through dog bite, on the other hand it also shows that lack of awareness

about vaccination and handling of dog bitten goat in terms of rabies vaccination and tetanus toxoid. This study also shows there is huge economic loss among poor farmers in terms of treatment, vaccination and mortality.

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