

## **Diffusion and Adoption of Livestock Deworming Technology in Different Agro-climatic Regions of India**

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### **ABSTRACT**

Livestock technologies are generated in various research institutions with the notion to explore the possibilities of uplifting the livelihoods of farming communities. It is generally perceived that the extent of absorption of these technologies in field conditions has always been a researchable issue in India. In this situation, an effort was made to study the diffusion and adoption status of deworming technology in different agro-climatic zones of India using primary and secondary data collected from various accessible resources. Group discussion and personal communication with veterinary officers and other experts was also conducted to gain insight and evolve action plans for effective adoption and diffusion of deworming. The study concluded that there was lack of awareness and poor adoption of deworming due to various constraints faced by farmers in deworming. The study suggests that there is a better scope for improving the diffusion and adoption of livestock deworming by means of addressing these constraints and creating favourability of livestock farmers towards livestock deworming technology.

**Key words:** Livestock technologies, diffusion, deworming, agro-climatic zones

### **INTRODUCTION**

Livestock technologies are generated and promoted by research institutions on regular basis but only few of them are diffused and adopted in the field conditions. According to Government of India report (GOI, 2005), only 5.1 per cent of farmers had access to modern livestock technologies against 40 per cent in agriculture. There exists, thus, a big gap between livestock technologies developed and available at research institutions and technologies actually being adopted by the farmers. This poor adoption is one of the major causes for the low productivity of livestock in India. For instance, the average annual milk yield of Indian cattle is 1172 kg which is only about 50 per cent of the global average (FAOSTAT, 2014). There are many contributing factors for animal productivity and one amongst them is preventive medicinal management. Among several technologies, livestock “DEWORMING” is one of the oldest preventive management practices and regularly recommended by the experts to livestock farmers. Livestock deworming as such, has potential to boost animal productivity and health. This paper is an attempt to assess the extent of diffusion and adoption of this particular technology in various agro-climatic zones of India. Further, the study has suggested action plans and strategies for effective adoption and diffusion of livestock deworming in India.

### **METHODOLOGY**

India is divided into fifteen agro-climatic zones *viz.* Western Himalayan region, Eastern Himalayan region, Lower Gangetic plains region, Middle Gangetic plains region, Upper Gangetic plains region, Trans Gangetic plains region, Eastern plateau & Hills region, Central plateau & Hills region, Western plateau & Hills region, Southern plateau & Hills region, East coast plains & Hills region, West coast plains & Ghats region, Gujarat plains & Hills region, Western dry region and the islands region. The present study included both primary and secondary data of different agro-climatic zones of India. The primary data was collected by using pre-tested semi-structured interview schedule using personal interview of 300 and 60 livestock farmers in Shimla (Himachal Pradesh) and Bareilly (Uttar Pradesh) districts, respectively. The adoption and diffusion status of deworming technology was studied by knowing the awareness about deworming, reasons for adoption and discontinuation of deworming and constraints faced by dairy farmers in adoption of deworming. Further, the secondary data was collected from various sources like annual reports, occasional publications of the government, appraisal reports of Planning Commission, Theses and websites etc. The information was collected from 36 organized farms across 8 states to know about

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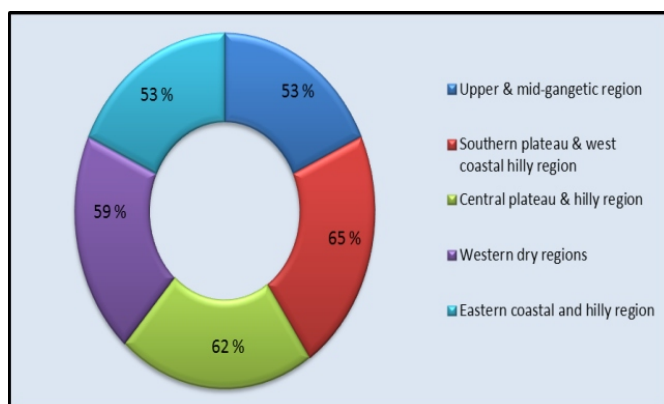
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deworming practices in different organized farms. The study also included group discussion and personal communication with veterinary officers and other subject matter experts to evolve action plans and strategies for effective adoption and diffusion of deworming technology.

## RESULTS AND DISCUSSION

### Agro-climatic regional variation in adoption of deworming technology

The secondary data revealed that in the upper and middle Gangetic zone comprising parts of Himachal Pradesh, Haryana, UP and Bihar, deworming was practiced by 53 per cent of livestock owners. In the southern plateau and west coastal hilly regions comprising the states like Karnataka, Andhra Pradesh, Tamil Nadu and Kerala, 65 per cent of them dewormed their animals regularly. In the central plateau (Madhya Pradesh, Chattisgarh) and hilly region, 62 per cent of the livestock owners followed deworming. In the Gujarat plains and western dry regions of Rajasthan, only 59 per cent of livestock owners deworm their livestock while, in eastern coastal and hilly region zone comprising of coastal Andhra and Tamil Nadu, only 53 per cent of livestock owners found to deworm their animals. The agro-climatic zone wise adoption of livestock deworming is depicted in fig 1.



**Fig 1. Adoption of deworming technology across various agro-climatic zones of India**

Further, Table 1 depicts the awareness, information sources and different practices followed by livestock farmers in the study area. It was found that about 82 per cent of the farmers were aware about deworming, and responded that veterinarians and para-veterinarians were the major source of information for the farmers. The study also revealed that, among the aware farmers, about 56 per cent farmers practiced deworming and mainly contacted veterinarian for carrying out deworming. About 66 per

cent of the farmers were satisfied with the practice of deworming for their livestock. In a similar study, Rathod *et al* (2014) also reported poor adoption of deworming in Karnataka state.

**Table 1: Awareness and deworming practice followed by dairy farmers**

		n=360	
Awareness & Deworming practice	Option categories	Frequency	Percentage
Awareness about deworming	Aware	294	81.66
	Not aware	66	18.34
Source of information about deworming	Veterinarians	165	56.12
	Para-veterinarians	119	40.48
	Neighbours	5	1.70
	Others	5	1.70
Whether deworming practiced by the farmer	Yes	169	56.12
	No	125	44.88
Person contacted for deworming	Veterinarian	108	63.90
	Para-veterinarian	37	21.89
	Home made	06	3.56
	Ethno-veterinary	10	5.91
Time to start deworming in livestock as perceived by farmers	No response	08	4.74
	More than 5 years	37	21.89
	3-5 years	63	37.28
	1-5 years	08	4.73
Satisfaction level towards deworming practice	Less than one year	61	36.10
	Satisfied	112	66.27
	Partly Satisfied	24	14.20
	Not Satisfied	03	1.77
	No response	30	17.76

Table 2 highlighted the reasons for adoption and discontinuation of deworming at field conditions. It was interesting to note that, deworming was followed by farmers since it was delivered free of cost (34.91%) and was also prescribed by the doctors (40.23%). However, the realization about importance of deworming was less from the farmers' side. Further, majority of the farmers complained that practice was discontinued since it was perceived that deworming reduced milk production of the dairy animals (13.01%).

**Table 2: Reasons for adoption and discontinuation of deworming n=169**

Reasons for adoption & discontinuation of deworming	Frequency	Percentage
<b>Reasons for deworming</b>		
To reduce the parasitic load of the animal	38	22.48
It is prescribed by doctor	68	40.23
Medicines are available free of cost	59	34.91
No idea	04	2.36
<b>Reasons for discontinuation of deworming</b>		
Reduces milk production of animals	22	13.01
Consumes more feed and fodder after deworming	20	11.83
Recurrence of worms despite deworming	15	8.86
Cost of deworming outweighs benefits	05	2.95
Low mortality from worms	06	3.55

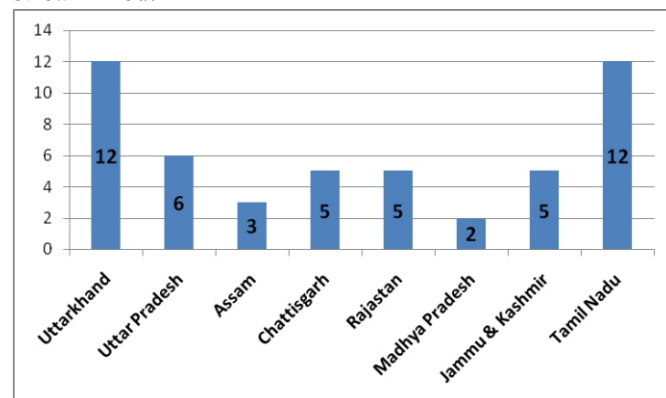
Among various constraints faced by the respondents in adoption of deworming, it was found that lack of awareness about its importance (86 %) and difficulty to remember correct deworming schedule (84 %) were considered as the most serious constraints, while difficulty in gathering herd or flock during deworming (76 %) was considered as serious constraint faced by the farmers resulting in poor adoption and diffusion of livestock deworming in the study area. This indicates the fact that there is a better scope of improving the diffusion and adoption of livestock deworming by means of addressing these constraints and responding through solutions.

**Table 3: Constraints in adoption of deworming**  
N=294

Constraints in adoption of deworming	Seriousness of the constraints (%)		
	Most Serious	Serious	Less Serious
Remotely situated veterinary hospital	09	53	41
Non-availability of veterinary services	21	41	38
Lack of awareness about its importance	86	09	05
Difficult to bring the animal to the hospital	21	75	04
Unsatisfactory results	16	35	49
Unable to afford dewormer cost	02	09	89
Difficulty in gathering the flocks for deworming in particular place	06	76	18
Difficult to remember deworming schedule	84	12	04
Yield gets decreased	03	39	58

#### Deworming frequency in organized farms

The annual frequency of deworming in the state-run organized farms of eight states varied from 2 to 5 and in states like Tamil Nadu and Uttarakhand, deworming was followed upto 12 times per annum. In organized farms, mostly Benzimidazole group of dewormers were used with minimal drug rotation. This type of indiscriminate use of dewormers may lead to anthelmintic resistance which in turn results in poor utility of the drugs and cause harm to animals. Thus, the livestock deworming scenario in both organized and unorganized farms needs to be streamlined.



**Fig 2. Frequency of deworming per annum in organized farms**

#### CONCLUSION

The study concluded that, awareness and adoption of deworming practice was poor in the study area. Among various constraints faced by the respondents in adoption of deworming, it was found that lack of knowledge and difficulty to remember correct deworming schedule were considered as the most serious constraints faced by the farmers. Further, the study also revealed that organized farms in Uttarakhand and Tamil Nadu states followed indiscriminate deworming which might lead to anthelmintic resistance in future. Hence, there is a need to assess the technological gaps, actual adoption of technologies and factors affecting adoption and diffusion at field conditions for all the states and regions of India. There is also an urgent need to study the beliefs and social issues of farmers for better adoption of the deworming technology. Various research and extension agencies have to collaborate and create effective region based strategies to create better impact and popularize livestock technologies in general and deworming in particular in India.

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