

# A Study on the Level of Awareness and Knowledge on Carcasses and Animal Waste Disposal among Farmers in Puducherry Region

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

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

\*Corresponding author: rajvet10@gmail.com (ORCID ID: 0000-0003-3211-1189)

Paper No. 663

Received: 21-09-2017

Accepted: 03-01-2018

## ABSTRACT

Carcass and animal waste disposal are a vital part of livestock and poultry rearing and its improper disposal can cause the spread of diseases among animals and from animals to humans. A structured, pre-tested and peer-reviewed questionnaire containing both open and close ended questions on various aspects of zoonotic diseases, i.e., awareness, knowledge, risks, animal waste disposal, personal hygiene etc., were used to interview 250 respondents from Puducherry. The attitude towards disposal of aborted foetus and retained placenta was 60.8% of the farmers tie to tree, which they consider as a belief followed from generation to generation implicating that tying the retained placenta to the branches of the milk secreting tree, will indirectly increase the milk secretion of the lactating cow or does. Although 31.3% of the farmers buried their aborted foetus and retained placenta, it indirectly indicated the awareness towards zoonosis in them. And the rest 10% of the people were disposing the placenta improperly. In diarrhoeic animals' cases, about 40.9% of the livestock owners used water as a cleaning agent to clean their shed. With respect to dead animal carcass disposal, 67.6% of the farmers were burying their animals due to the knowledge toward zoonosis among livestock owners. About 28.4% sell their dead animal carcass for slaughtering for meat which is an offence and 4% were improperly disposing the carcass. From our present study it is concluded that the farmers need proper education towards the importance of waste disposal and its impact, both on their health and their animal health. The government requires better enforcement of existing policies aimed at environmental preservation and a lookout on the zoonotic diseases as a one health aspect.

## Highlights

- ① 10 per cent of the farmers were improperly disposing the placenta and 28.4 per cent sell their dead animal carcass for slaughtering for meat
- ① Farmers need proper education towards the importance of waste disposal

**Keywords:** carcasses, animal waste, awareness, waste disposal, livestock

Carcass and animal waste disposal are a vital part of livestock and poultry rearing. Improper carcass disposal and animal waste disposal can cause the spread of diseases among animals and from animals to humans. Dung and urine are the major waste materials from animals apart from other secretions like oestrus secretion, nasal secretion, etc (Ajayi

2008). Urine and dung have high concentration of nitrogen, which if improperly disposed into environment that will pollute it. It pollutes soil and water as nitrate and air as ammonia. Apart from nitrogen; phosphorus, potassium, lead, cadmium are also excreted into environment, which is a very big public health concern (FAO 2006). These

substances may change water and soil pH. Elements like lead and cadmium are heavy metals and are highly toxic to both humans and animals. When their concentration in soil and water increases, the animals which graze on those lands and drink such water will be affected (NRC 2001). Dumping of large amount of these animal wastes into water bodies will also produce bad odour, undesirable taste and act as a breeding place for microbes (Barth 1995). Since animal waste has very high amount of nitrogen, phosphorus and other organic materials, it may lead to excessive growth of algae in water bodies further leading to eutrophication which destabilizes the water ecosystem of that area. Excessive release of greenhouse gases like methane from animals (Adewumi *et al.* 2005) also cause global warming which increases vector population and in turn increases the incidence of diseases.

Apart from these dead animals, aborted foetus, and placenta should also be disposed properly (Alhaji 2011; Addas *et al.* 2010)). Animal died of any infectious disease if not disposed properly will be a source of spread of infection. Placenta and aborted foetus if not properly disposed will be taken by some carnivores and these carnivores will take those materials from one place to another and the spread of infection is over a wide range of area. Such kind of improper and diffused disposal of animal waste is referred to as non-point source (NPS) pollution (Downing and Gibson 1984 and Oreyemi 1988). Non-point source pollution is the largest remaining water quality problem in many developed and developing countries (John and Steven 1999).

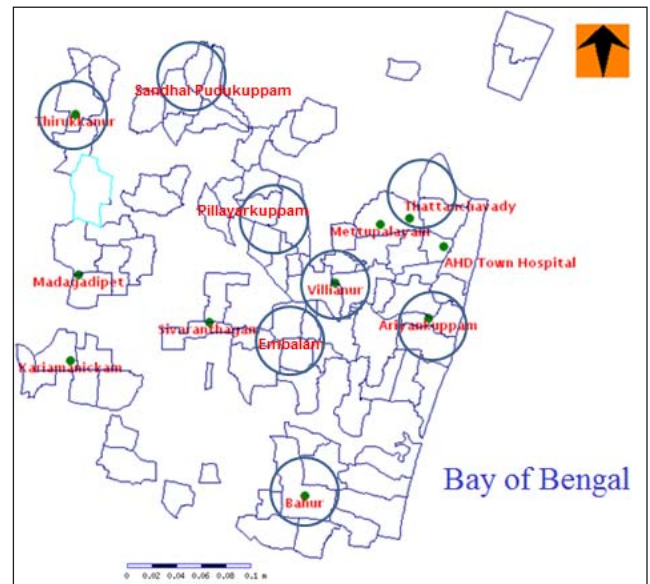
So, it is very important that the farmers should have a sound knowledge about the proper disposal of dead animals and animal waste products. The main objective of this study is to know the awareness and knowledge of farmers on dead animal and animal waste disposal.

## MATERIALS AND METHODS

### Sampling area and size

Puducherry union territory has a total of 81 revenue villages from which a total of 250 livestock farmers were selected randomly from eight revenue villages. And each farmer was interviewed with a questionnaire. Geographical Information System

map showing 81 revenue villages and area selected for the study was shown in Fig. 1.



**Fig. 1:** GIS map of Puducherry showing 81 revenue villages and sampling area represented by a circle

### Data collection

A structured, pre-tested and peer-reviewed questionnaire containing both open and close ended questions on various aspects of zoonotic diseases, i.e., awareness, knowledge, risks, animal waste disposal, personal hygiene etc., was used to interview the respondents. The information about independent variables *viz.*, education, income, age, animal waste disposal and herd size were collected with the help of structured schedule and scales.

### Statistical analysis

The relationship between education level and zoonotic disease awareness; and risk of zoonotic diseases and its relation with independent variables were analyzed by chi square test using software Graph pad prism.

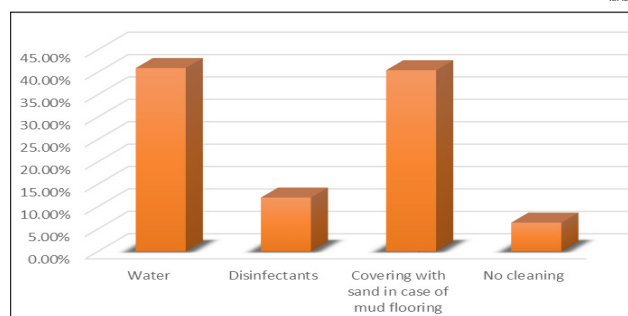
## RESULTS AND DISCUSSION

From the total respondent of 250 individuals, the attitude towards disposal of aborted foetus and retained placenta was 60.8% of the farmers tie to tree (Fig. 2) which they consider as a belief followed from generation to generation implicating that tying the retained placenta to the branches of the milk secreting tree will indirectly increase the milk secretion of the lactating cow or does. Although

31.3% of the farmers buried their aborted foetus and retained placenta, it indirectly indicated the awareness towards zoonosis in them. And the rest 10% of the people were disposing the placenta improperly (Fig. 3).



**Fig. 2:** Placenta tied to the tree



**Fig. 4:** Cleaning of diarrhoeic animals' shed

**Table 1:** Action taken by Respondents if their livestock is diagnosed positive for TB

Sl. No.	Action Taken	Frequency	Percentage
1	Slaughter the animal for meat	18	7.2%
2	Sell the animal	47	18.8%
3	Send to koshala	1	0.4%
4	Treat the animal	129	51.6%

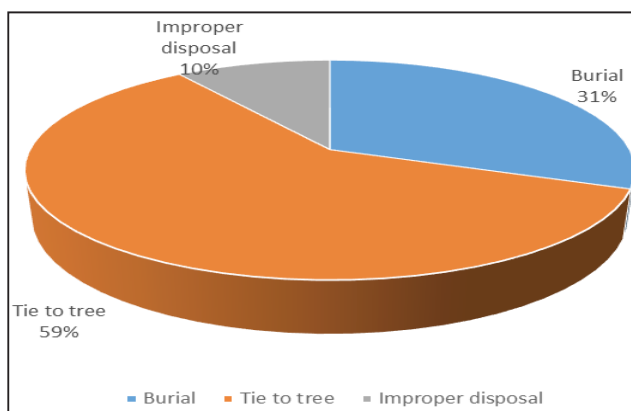
With respect to dead animal carcass disposal, 67.6% of the farmers were burying their animals due to the knowledge toward zoonosis among livestock owners. About 28.4% sell their dead animal carcass for slaughtering for meat which is an offence and 4% were improperly disposing the carcass for e.g. throwing the carcass in rivers, pools, drainages etc (Table 2).

**Table 2:** Ways of Animal Carcass Disposal undertaken by Respondents

Sl. No.	Method of Disposal	Frequency	Percentage
1	Sell for Slaughtering for Meat	71	28.4%
2	Burying	169	67.6%
3	Burning	0	0%
4	Improper Disposal	10	4.0%
<b>Total</b>		<b>250</b>	

**Relationships between different variables analysed by chi-square test**

Different independent variables regarding waste disposal were analyzed by chi-square test and data and statistical significance were represented in the Table 3. The data revealed that there was no statistical significance in the education level of respondent and the method of disposal of carcass, TB affected animal, retained placenta and aborted materials.



**Fig. 3:** Method of disposal of aborted foetus and retained placenta

In diarrhoeic animals' cases, about 40.9% of the livestock owners used water as a cleaning agent to clean their shed, 12% of the owners were using disinfectants like phenol, Dettol etc. and the farmers who were rearing animals on mud flooring (40.4%) cleaned it by covering the diarrhoeic waste with sand and by sweeping it away (Fig. 4).

Since a cattle cost around 30,000 -40,000, and in case the animals owned by farmers were positive for TB (Tuberculosis), 51.6% of the livestock owners told that first they would go for treating the affected cattle, about 18.8% of the respondent told that they will sell their animals and 7.2% of farmers said that they would slaughter the animals for meat (Table 1).

**Table 3:** Relationships between different variables analysed by chi-square test

Sl. No.	Variable 1	Variable 2			P value	
1	Education level of Respondents	Method of Disposal of Carcass			0.4225	
			sell for slaughter	bury		Total
		HSS, graduates	8	25		33
		Primary, SSLC	67	141		208
	Total	75	166	241		
2	Education level of Respondents	TB affected animal			0.8353	
			Disposal of TB animal	Treating of TB animal		Total
		HSS, graduate	8	25		33
		Primary, SSLC	58	159		217
	Total	66	184	250		
3	Education level of Respondents	Disposal of retained placenta and aborted materials			0.3112	
			proper disposal	improper disposal		Total
		HSS, graduates	13	20		33
		Primary, SSLC	64	153		217
	Total	77	173	250		

\*\* : Significant ( $P \leq 0.01$ ); \* : Significant ( $P \leq 0.05$ ); + significant ( $P \leq 0.10$ ); <sup>ns</sup> : Non-significant.

India is a country of cultural heritage and religious beliefs, which was seen in their day-to-day activities, as seen in livestock rearing and farming practices. Livestock rearing is one of the important livelihoods among small scale farmers in India.

Due to the lack of awareness among the farmers regarding disposal of aborted material and placenta, 70.8% of people are not following proper disposal methods like burial and burning (Table 1). This aborted materials and placenta acts as a source of many bacterial, viral, and parasitic diseases.

Among 250 respondents 52.9% are following proper disposal methods, 40.4% are not going for cement flooring due to their lower socio-economic status and hence they cannot practice proper disposal methods. As a result of this they cannot practice clean milk production. Accumulation of animal waste like dung and urine act as breeding site for many vectors which may increase the vector population and predispose many vector borne diseases (Barth, 1995).

Tuberculosis is an important zoonotic disease caused by *Mycobacterium tuberculosis*. India stands second in tuberculosis and TB is zoonanthroponosis. The organism affecting cattle can also affect humans with increased risk of disease transmission through milk and meat. Handling the infected carcass can

also act as a source of infection. Hence, proper disposal of TB infected carcass and animals reduce the risk of transmission of disease to humans. The present study revealed that if the farmers found their animals positive for TB, 7.2% people are sending their animal to slaughter for meat purpose, which again increases the risk of spread of TB to abattoir workers.

Carcass disposal by burial and burning is considered to be the proper methods. By following these methods of disposal of carcass, spread of disease from dead animal can be reduced. Of 250 respondents, 67.6% are following proper disposal yet burning is not practiced because of its high cost involvement. Because of their lower socio-economic status, 28.4% of farmers are selling carcass for meat purpose. 4% of farmers because of no land availability and lack of awareness are following improper methods which include throwing near water bodies like ponds, rivers, etc.

Based on the study conducted, it has been observed that there is no significant relation between level of education of farmers and method of disposal of animal waste like aborted material, carcass, and TB animal disposal. This shows the requirement of awareness programs pointing towards zoonotic diseases among the graduates in the respondent's family.



Awareness programs should focus mainly about zoonotic potential of diseases like brucellosis, TB and other diseases which can be acquired from animal wastes and handling of carcass. Extension programs regarding proper methods of animal waste disposal has to be implemented in order to reduce the risk of zoonotic threats. Alternative method for the utilization of animal waste in the area should be considered (Ayodeji *et al.* 2011).

## CONCLUSION

This study implicates the basic knowledge of the livestock rearers on zoonotic diseases and their ideas towards the importance of animal waste disposal. The disposal methods in case of dead animal carcass followed by majority of the study population is utmost proper, yet some sell the carcasses to knacker slaughter houses, which may pose a threat to the slaughter workers and to the consumers, in case the dead animal was infected with diseases like anthrax, T.B., Brucellosis, etc.

In case of other wastes disposal, majority of the respondents follow improper methods of disposal which poses a direct threat to both environmental and public health aspect of the society. Farmers need proper education on the importance of waste disposal and its impact, both on their health and their animals' health (Onyimonyi *et al.* 2013). The government requires better enforcement of existing policies aimed at environmental preservation and a lookout on the zoonotic diseases as a one health aspect.

## REFERENCES

Addas, P.A., Midaun, A., Milka, M. and Tizhe, M.A. 2010. Assessment of Abattoir Foetal Wastage of cattle, Sheep, and Goat in Mubi Main Abattoir Adamawa State, Nigeria. *World J. Agric. Sci.* 6(2):132-137.

- Adewumi, I.K., Ogedengbe, M.O., Adepetu, J.A. and Aina, P.O. 2005. Aerobic composting of municipal solid wastes and poultry manure 2005. *Journal of Applied Sciences Research*, 1(3): 292-297.
- Ajayi, F.F. 2008. Solid Waste Management Problem and its Implication on Health, *Environmental Management in Nigeria*, 11: 34 – 38.
- Alhaji, N.B. 2011. Prevalence and economic implications of calf foetal wastage in an abattoir in Northcentral Nigeria. *Trop. Anim. Health. Prod.*, 43(3): 587-90.
- Ayodeji O. Olarinmoye., Oluwatoyin G. Tayo and Akintunde O. Akinsoyinu. 2011. An overview of poultry and livestock waste management practices in Ogun State, Nigeria. *Journal of Food, Agriculture & Environment*, 9(3&4): 643-645.
- Barth, C.L. 1995. Livestock Waste Characteristics; a New Approach, Agricultural Waste Utilization and Management. 5<sup>th</sup> International Symposium on agricultural Wastes, pp. 286 – 294.
- Downing, Gibson 1984. How do Chemical Substances affect the Environment? *Archives of Environmental Contamination and Toxicology*, 15: 427 – 434.
- FAO 2006. Livestock Impacts on the Environment. Agriculture and Consumer Protection Department of Food and Agriculture Organization of the United Nations. available at: [www.fao.org/ag/magazine/0612sp1.htm](http://www.fao.org/ag/magazine/0612sp1.htm)
- John, B.N. and Steven, W. 1999. Farm Waste Management. Granid Publishing Ltd. 2<sup>nd</sup> Ed. Great Britain, pp. 291 – 299.
- National Research Council (NRC) 2001. Nutrient Requirements of Dairy Cattle. 7th rev. edn. National Academy Press, Washington D.C.
- Onyimonyi, Anselm Ego, Machebe, Ndubuisi Samuel, Ugwuoke and Jervas. 2013. Statutory regulations of dead animal carcass disposal in Nigeria: A case study of Enugu State. *Afr. J. Agric. Res.*, 8(11): 1093-1099.
- Oreyemi, M.K. 1998. Ecological Sanitation of water and Environmental Conservation Technology Options: the case study of slums in Oyo state, Nigeria. *J. African Environmental Issues*, 3: 12 – 16.

