



A STUDY ON POULTRY SLAUGHTER HOUSE WASTE MANAGEMENT IN MALAPPURAM AND KOZHIKODE DISTRICTS OF KERALA

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Abstract

This study investigated poultry slaughter house waste management in Malappuram and Kozhikode districts of Kerala. Data were collected using a structured questionnaire that was administered to 30 randomly selected slaughter house owners of Kozhikode and Malappuram districts. Data were analysed using standard deviation, frequency and percentage methodologies. Results showed that average amount of waste produced per bird was 721.67 gram and the average total waste produced per day per slaughter house was 21.83 kilogram. The owners were sold the waste at the rate of Rupees seven per kilogram to agents. They were utilizing the waste as fertilizer, pig feed, fish feed, dog feed and for biogas production. This study showed that the poultry slaughter house owners were bothered about proper waste management techniques.

Introduction

Poultry is the most systemised sector in animal husbandry in India. Broiler meat production has increased to 4.5 million tonnes per annum (GOI, 2013). Total chicken meat consumption in India is about

4.49 million metric tonnes and increased by approximately seven percent over this year (GOI, 2013). Per capita consumption of poultry meat is around 3.6 kg per year (Jayathilakan *et al.*, 2012).

Broiler slaughter house waste has become a major source of pollution in all states of India. The demand for broiler chicken had enormously increased in the last decade. Consumer preference is more for the white chicken meat than the red meat of pork and beef due to increasing health consciousness. Broiler chicken has considered as cheapest source of animal protein in almost all parts of the world.

In Kerala, it is estimated that about 5.3 lakh broilers are slaughtered daily (N.Ali *et al.*, 2013). This leads to the production of 350 tonnes of broiler waste per day (Abraham *et al.*, 2015). The annual production of broiler waste is a intimidating task. These wastes are collected by the agents from the poultry slaughter house at a rate of 4/kg. They are now dispose off in uninhabited areas and in water bodies leading to water pollution (both surface and ground water), unbearable odour, health hazards, posed by haphazard breeding of microorganisms, parasites, houseflies and stray dogs (Abraham *et al.*, 2015). This act as a catastrophic threat to the environment and may result in major health hazards. Therefore, this study was carried out to find out the poultry waste production from poultry slaughter house and what are the measures they have taken off for the waste management.

Objective

- To determine poultry slaughter house waste production.
- To ascertain efficacy of waste management in the respective areas.

Methodology

Description of study areas: The study covered 30 poultry slaughter houses in Kozhikode (12) and Malappuram (18) districts of Kerala.

Sample design: Thirty poultry slaughter houses were randomly selected and done a brief informal inquiry with each individual slaughter house owners. Through this preliminary discussion, we concluded that majority of the poultry wastes were utilized beneficially and the owners spend money for the effective waste management.

Survey instrument and design: A structured questionnaire was developed with the help of the data collected during preliminary inquiry. The questionnaire was divided into two parts to address the stated objective. Part A comprised information on the demographic

characteristics (age, income) of the respondents and poultry slaughter house descriptions while part B covered management of poultry waste on slaughter houses.

Data collection: Questions were asked to slaughter house owners and responses recorded in the questionnaire. Owners were also asked certain specific questions, both of open ended and closed ended type so as to guide and encourage them to share their views and concepts regarding efficient poultry waste management.

Data analysis: The information thus generated was compiled and subjected to statistical analysis. Standard deviation, frequency and percentage methodologies were used for the study. Tables were used to summarise statistical information such as means, standard deviations and percentages.

Result and Discussion

The result consist of demographic characteristics and poultry slaughter house and poultry slaughter house waste management in the study area and that's been given in two tables i.e., in table 1 and table 2.

Table 1: Demographic characteristics and poultry slaughter house descriptions

<i>Sl. No.</i>	<i>Variables studied</i>	<i>Categories</i>	<i>F</i>	<i>%</i>
1.	Age	Old (50 and above years)	3	10.00
		Middle (between 35 to 50 years)	19	63.33
		Young (below 35 years)	8	26.67
2.	Income from poultry slaughter Mean -43,433, S.D.- 28,958	Rs. 73000 or above	6	20.00
		between Rs.15000-73000	21	70.00
		less than Rs. 15000	3	10.00
3.	Is your poultry stall registered or not?	Yes	10	33.33
		No.	20	66.67
4.	From where the stocks are coming?	from local poultry farms of Kerala	15	50.00
		from outside Kerala	5	16.67
		Both	10	33.33
5.	Mode of chicken sale	After cutting	18	60.00
		as live weight	0	0.00
		Both	12	40.00
6.	No. of birds slaughtered per day (least value 17, highest value 125)	17-53 birds	26	86.67
		54 - 89 birds	1	3.33
		90 - 125 birds	3	10.00

Demographic Characteristics and Poultry Slaughter House Descriptions

From Table 1 it was evident that 63.33 percent of respondents were middle aged (between 35-50 years), 26.67 percent were young (below 35 years) and meagre (10.00%) were old (above 50 years). From this survey, we found that middle aged people were more interested in poultry slaughter field. Moreover, 70.00 percent of the respondents got income between Rs. 15,000 – 73,000, 20.00 percent got income Rs. 73,000 or above and meagre (10%) got income less than Rs. 15,000. Most of the owners considered this as a small scale business, rather than making poultry into a large scale business to get more income.

Majority (66.67%) of poultry slaughter houses were not registered. According to the report on “Survey of slaughter houses in Kerala” 2013, “the total number of poultry slaughter houses functioning in the state were 6489, out of which 2124 ie, 32.00 percent were registered”. So it was evident that our survey coincides with this report. Furthermore, 50.00 percent of stocks from local poultry farms of Kerala, 33.33 percent from both and meagre (16.67%) from outside Kerala.

According to the report on “Survey of slaughter houses in Kerala” 2013, “32.88 percent broilers were procured locally for slaughter purpose”. As per our study, more birds were procured from the local poultry farms of Kerala. Hence it was evident that the poultry farming sector in Kerala was in a developing mode. Besides, 60.00 percent of the chicken were sold after cutting, 40.00 percent of the chicken were sold after cutting and as live weight. Consumer preference was very much clear as they were demanding chicken after cutting than live weight. Moreover, 86.67 percent of respondents were slaughtered 17-53 birds per day, 10.00 percent were slaughtered 90-125 birds per day and meagre (3.33%) were slaughtered 54-89 birds per day. According to the report on “Survey of slaughter houses in Kerala” 2013, “the number of broiler chicken slaughtered per year was 51.04 crores”.

From Table 2 it was evident that on an average, 342.50 g of chicken waste were produced by 1 kg chicken and the average amount of waste produced per bird was 721.67 g. According to the report on “Survey of slaughter houses in Kerala” 2013, “average amount of waste produced per bird was 600.00g.” So our result approximately coincides with this report. Feather, intestine, head and shank were considered as waste in poultry slaughter houses slaughter house persons were bothered about all waste organs, but not blood. They were not aware about blood meal also.

Table 2: Poultry slaughter house waste management

1.	Grams of chicken waste produced by 1 kg chicken	Average (g)	342.5 g.
2.	Amount of waste produced per bird	Average (g)	721.67g.
3.	Which are the parts that are considered as waste? Feather, intestine, head, shank		
4.	Total amount of chicken waste per day	Average (kg)	21.83kg.
5.	Is there any process of segregation in waste disposal?		
	say yes		2 6.67
	say no		28 93.33
6.	Role of retailers in waste management		
			No
7.	Process of waste management	done by the owner	1 3.33
		sale of waste	25 83.33
		Both	4 13.33
8.	If selling the waste, for what purpose they are buying?	Bio gas	7 23.33
		Fertilizer	20 66.67
		pig feed	5 16.67
		dog feed	1 3.33
		as fish feed	9 30.00
		land filling	1 3.33
9.	How much money is paid for selling 1 kg chicken waste?		Rs. 7/-
10.	if selling the waste, time period of waste disposal (daily/alternate days/weekly)		Daily
11.	If it is done by the owner, Area of waste disposal (near the poultry stall / away)		Away
12.	Any nearby human population around waste disposal area?		
			No
13.	Is there any complaints from the neighbors?		
			No
24.	How one can use poultry waste in a beneficial way?	poultry feed	4 13.33
		Biogas	10 33.33
		Fertilizer	21 70.00
		fish feed	7 23.33
		feed for animal	1 3.33
		pig feed	3 10.00

On an average, total amount of chicken waste produced per day was 21.83 kg. The owners were unable to dispose this much of waste by their own. So they were forced to seek help from other agents for proper waste management. Moreover, 93.33 percent of the respondents were disposing the waste without segregation. So they were not aware of

the quality of each parts. Retailers had no role in waste management. Poultry farming and waste management were not linked with each other's and they were working as different sectors. Furthermore, 83.33 percent were said that they were sold the waste for different purposes, 13.33 percent by both and meagre (3.33%) by owners itself. The amount of waste was huge and the cost and facilities for waste processing was high. Hence most of the owners were not willing to dispose waste by their own. Among the total waste sold, 66.67 percent was utilized as fertilizer, 30.00 percent as fish feed, 23.33 percent as biogas, 16.67 percent as pig feed and 3.33percent as dog feed and also land fill.

Scientific research has documented that nutrients and energy from poultry waste by-products can be safely recycled as a component of livestock and poultry diets when pathogens are neutralized (McCaskey, 2009). Poultry feathers being rich sources of keratin proteins and amino acids, can be converted into valuable products such as feather meal, bio-diesel, biodegradable plastic and fertilizer (Thyagarajan *et al.* 2013). The poultry waste can be effectively used for conversion to useful vermicompost by utilization of different earthworm species (Beohar and Srivastava, 2011). Utilization of broiler slaughter waste by dry rendering process produced rendered chicken oil, a cheap raw material for biodiesel production and carcass meal a feed ingredients for pets and fishes (Abraham *et al.* 2015).

Poultry waste were collected by the agents from the poultry slaughter house at the rate of rupees of Rs. 7 per kg. According to Biodiesel production from broiler chicken waste" (Abraham *et al.* 2015) rate for 1 kg waste were Rs. 4. Within 3 years, the cost for poultry slaughter waste was increased by Rs. 3. Majority of the respondents said that waste disposal was done on a daily basis. They were very much cautious about the public issues. When the waste disposal was done by the owner himself, the waste was disposed away from the poultry stall and human population. Hence there were no complaints from the neighbours. These owners were very much aware about the problems associated with improper waste disposal in human dwellings. According to the slaughter house owners, poultry waste can be beneficially utilized as fertilizer (70%), biogas (33.33%), fish feed (23.33 %), pig feed (10%) and animal feed (3.33%). The slaughter persons were bothered about value of poultry slaughter wastes.

Conclusion

According to the key informants, average amount of waste produced per bird was 721.67 g and the average total waste produced per day per slaughter house was 21.83 kg. The owners were very cautious about waste disposal, so they were sold the waste at a rate of Rs. 7 per kg to agents who were utilizing the waste for biogas, fertilizer, fish feed, dog feed and pig feed. But they were also need to know about other aspects of waste management such as;

- Knowledge and requirements about waste processing at their own house itself.
- Implementation of cost effective waste management methods.
- Awareness about valuable by product from poultry slaughter waste such as blood meal.
- The owners should be aware of public issues like ground and surface water pollution, increased stray dog population, obnoxious odour and health hazards.
- Segregation of waste was important as different parts can be used for different purposes.
- Involvement of retailers in waste management was advisable.

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