

## Awareness Regarding Zoonotic Diseases among the Butchers of Proddatur, Kadapa Dist., A.P., India

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### ABSTRACT

Zoonotic diseases present an ongoing public health concern. Most human infections with zoonoses come from livestock, including pigs, chickens, cattle, goats, sheep and camels. Butchers constitute the high risk group in the transmission of zoonotic diseases. The educational status and awareness regarding the information, identification and transmission of zoonotic diseases among this high risk group, is critical in controlling the spread of zoonotic diseases. Hence, a study has been designed to evaluate the educational status, awareness among the butchers regarding the various zoonotic diseases and their modes of transmission and the effluent treatment methods followed by the butchers in and around Proddatur, Andhra Pradesh. The survey revealed that 86 percent of the butchers had high school education and most of them acquired this profession from their ancestors. 60 percent of the butchers were having awareness regarding the commonly occurring zoonotic diseases, 81 percent of butchers identified the disease by observing the lesions and were familiar with their control. Some of the butchers follow the hygienic practices and majority of them (81.4 %) were interested in attending training programmes pertaining to zoonotic diseases.

**Key words:** Zoonoses, Butchers, Rabies, Hygienic Practices, Lesions, Disease Transmission

### INTRODUCTION

Meat is a vital source of protein and a precious commodity to resource poor communities. This is very pertinent as more and more people in India are turning into non-vegetarians as evident in the Hindu-CNN-IBN national survey [1].

The relationship among humans, animal populations and the adjoining environment is in very proximity in many developing countries, where animals offer transportation, draught power, fuel, clothing, and sources of protein in the form of meat, eggs, and milk. In the dearth of proper care, this relationship can lead to a serious risk to public health with enormous economic consequences [2]. Zoonoses are defined as those diseases and infections naturally transmitted between people and vertebrate animals [3]. Zoonoses comprise of an assorted group of viral, bacterial, rickettsia, fungal, parasitic, and prion disease with a diversity of animal reservoirs, including wild life, livestock, pet animals, and birds [4]. The transmission may occur through direct contact with the animal, through vectors such as fleas or ticks, or through food or water

contamination [5]. Globally, zoonoses said to account for 60% of all human infectious disease pathogens and 75% of all emerging pathogens [6].

In both developing and developed countries, emergence of new zoonoses might be the result of either newly identified pathogens or agents that are already known, usually appearing in animal species in which the disease had not formerly been detected [7]. Zoonotic diseases cause mortality and morbidity in people, while also imposing significant economic losses in the livestock sector. Their burden tends to fall most heavily on poor societies (WHO, 2005). Researchers found that zoonoses are responsible for 2.2 million human deaths world-wide, every year [8, 9].

Butchers constitute the high risk group in the transmission of zoonotic diseases. The educational status and awareness regarding the information, identification and transmission of zoonotic diseases among this high risk group, is critical in controlling the spread of zoonotic diseases. Butchers are critical linkage in the meat production and processing chain at slaughterhouses. Two types of slaughterhouses are operating in the country, organized and unorganized. There are 3600 registered slaughterhouses

functioning under local bodies in India, yet the greater part of them is highly ill-managed, unhygienic and congested [10]. The state of the butchers is miserable and populace who consume meat from these slaughterhouses, have superior probability of being infected. The awareness of the butchers towards Zoonotic diseases plays an imperative role for the maintenance of life cycle and transmission of these diseases to the different arrays of their hosts. Studying the awareness of the butchers on the risk factors, routes of transmission and life cycle of zoonotic diseases is a decisive step towards the development and implementation of appropriate disease prevention and control strategies.

In developing countries, zoonotic diseases have become a vital threat to human health [11]. Most of the times, meat is supplied by slab slaughterers, the unauthorized ones, having scarce facilities which are typically located on the sides of roads and streets. These shops might be a source of meat-borne diseases and food poisoning among the population as they hardly adhere to any hygienic practices. Ideally, butchers should have a good insight on meat hygiene and fundamental infrastructural facilities should be made available to them. Then only practicing hygienic ways of slaughtering can be anticipated from the butchers.

Improving consciousness among the livestock owners and proper disease diagnostic techniques could abet prevention and control of zoonotic diseases. Consequently, an understanding about awareness and practices of butchers have gained much attention now a days, could be a useful device in developing and improving existing control measures [12,13].

Hence, a study has been designed to evaluate the educational status of butchers, awareness among the butchers regarding the various zoonotic diseases and their modes of transmission, the effluent treatment methods followed by the butchers in and around Proddatur, YSR Kadapa District, and Andhra Pradesh, India.

## MATERIALS AND METHODS

- *Study Design:* A questionnaire and interview based cross sectional study design was employed to look at the perception levels regarding the awareness of Zoonotic diseases among the butchers. The principle intention of this study was to assess the awareness among the butchers regarding the Zoonotic diseases.
- *Study Area and Subjects:* The present study was conducted at the slaughter houses in Proddatur (YSR Kadapa District, Andhra Pradesh, India) and in villages in the vicinity of Proddatur (Kotha Viswanadapuram, Kethavaram, Badripalli,

Korrapadu, Rajupalem, Vellaala, Pedda Settipalli, Devagudi, Sankarapuram). The target populations consist of butchers of different ages, educational levels and varied experience. The cross sectional study among the butchers was conducted during February 2015 to March 2015.

- *Sampling Method:* Simple Random Sampling was employed to select the respondents. Respondents were chosen based on educational levels and experience in the profession during questionnaire administration in different regions of Proddatur and its surrounding villages. During questionnaire administration, any respondents, who voluntarily willing to participate in the interview was taken into consideration. Before administration of the questionnaire the principle of the study, as well as the methodology was explained to each butcher and their oral consent was obtained.
- *Study Methodology:* The appraisal method included a well-designed interview and a questionnaire. A fourteen item interviewer administered semi-structured questionnaire was prepared by authors and was used for face-to-face interview to evaluate the perception levels of awareness among the butchers. Interview was conducted in local vernacular language i.e., Telugu. The questionnaire included a full range of response options, designed to identify the butchers knowledge, attitude, educational status, perception of the butchers about the importance of Zoonotic diseases, their transmission cycles, major clinical symptoms in humans and animals. The initial part of the questionnaire consisted demographic information which include respondents location, age gender, educational level and years of experience in the occupation. The remaining part of questionnaire comprised of questions which can evaluate the knowledge, attitude and perception of respondents about Zoonotic diseases. This part also evaluates safety procedures knowledge about effluent treatment etc.
- *Data Collection and Analysis:* Data from the questionnaires were coded and analyzed by SPSS® ver 19.0 for windows ®. The findings were presented as percentage. Hierarchical Cluster Analysis was conducted for Familiarity of Zoonotic Diseases among the Butchers and depicted in a Dendrogram. The findings about the awareness regarding the zoonotic diseases have been depicted in a pie chart and the findings pertaining to acquaintance of diseases based on lesions has been portrayed as doughnut graph.

## RESULTS AND DISCUSSION

Zoonotic diseases present an ongoing public health concern. Most human infections with zoonoses come from livestock, including pigs, chickens, cattle, goats, sheep and camels. Enhanced contact between animals and humans, environmental changes due to natural and manmade calamity, customs and traditions followed by diverse people in various countries, increase in human population, migration of people from one place to another place especially from rural to urban areas and increased movement of animals towards human habitations due to deforestation are some of the factors for spreading of the zoonotic diseases. In most of the under developed and developing countries farming practices, low education level, culture and eating habits, presence of reservoir population, inadequate disease control programmes and lack of information about disease burden have been reported to be associated with persistence of Zoonotic diseases [14,15].

#### a) *Opinion about Educational Status of Butchers*

In the present study butchers from different educational strata were selected as respondents. The educational qualifications of the respondents are presented in Table 1. All the respondents were in a position to understand their mother language i.e., Telugu. Analyses of data procured from the survey indicate that most of the butchers (86.05%) had school education; a few of them (12.79%) are illiterates. Only one respondent among the 86 butchers (1.16%) interviewed has finished higher education.

**Table 1:** Educational status of butchers

No	Description	Male (%)	Female (%)	Total (%)
1	Illiterate	9 (10.47)	2 (2.33)	11 (12.79)
2	School Education	69(80.23)	5 (5.81)	74 (86.05)
3	Higher Education	1 (1.16)	0 (0.00)	1 (1.16)
<b>Total</b>		<b>79(91.86)</b>	<b>7 (8.14)</b>	<b>86(100.00)</b>

Education level of the respondents predicts the perception of the respondents about the diseases, risk factors, routes of transmission, life cycle of Zoonotic diseases. Educational standard of the respondents is the critical point in educating the respondents about the Zoonotic diseases, as well as developing and implementation of appropriate disease prevention and control measures.

#### b) *Opinion about Experience in Butcher Occupation*

Interpretation of results from the survey among the butchers of Proddatur reveal that majority of the butchers (70.93 %) are into this profession for more than 5 years (Table 2). Some of the butchers (16.28 %) are into this profession as their hierarchical descendance from their ancestors. 6.98 % of the

respondents are into this profession since 5 years and a few respondents (5.81 %) are into this profession for less than 5 years.

**Table 2:** Experience in butcher profession

No	Description	Male (%)	Female (%)	Total (%)
1	Below 5 years	3(3.49)	2 (2.33)	5 (5.81)
2	5 years	5 (5.81)	1 (1.16)	6 (6.98)
3	Above 5years	57(66.28)	4 (4.65)	61(70.93)
4	Ancestral occupation	14(16.28)	0 (0.00)	14 (16.28)
<b>Total</b>		<b>79(91.86)</b>	<b>7 (8.14)</b>	<b>86(100.00)</b>

Butchers who are into the profession for considerably long period can easily identify the diseased carcass and act as a control point for the spread of Zoonotic diseases. Due to lack of experience of the butchers regarding the identification of zoonotic diseases of livestock, the economy will be impaired through barriers to trade, increased cost of marketing the product, to ensure it is safe for human consumption and the loss of market because of decreased consumer confidence [16, 17].

#### c) *Opinion about Awareness of Zoonotic Diseases*

Zoonotic diseases constitute unique group of infectious diseases that affect human being as well as animals. The Joint Expert Committee of WHO and FAO (1959) [18] have defined zoonoses as those diseases and infections which are naturally transmitted between vertebrate animals and man. Lack of awareness about the zoonotic diseases is one of the most important reasons for the outbreak of zoonotic diseases in people. When it comes to the veracity, people living in villages are often exposed to zoonotic diseases than the people residing in towns or cities. As agriculture and Animal Husbandry are the two important occupations of people in villages, make them to succumb to a number of dangerous zoonotic diseases.

The respondents were asked about the Zoonotic diseases that they know after explaining about the disease and their significant effect on human health. The results reveal that Most of the butchers (60%) were aware of the zoonotic diseases as depicted in the pie-diagram shown in Fig. 1.

#### c. 1.) *If Yes, opinion about Most familiar zoonotic Diseases*

The most familiar zoonotic disease among the butchers is **Rabies** (59.62%) and the butchers gained the awareness of the disease from their own experience. The results regarding most familiar diseases were presented in Table: 3. these findings corroborate observations of [19].

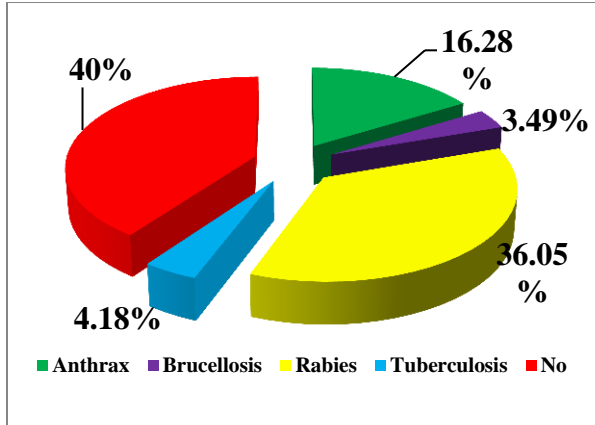


Fig. 1: Awareness regarding zoonotic diseases

Table 3: Awareness about zoonotic diseases

No	Description	Male (%)	Female	Total
1	Anthrax	13 (25.00)	1 (1.92)	14 (26.92)
2	Brucellosis	3 (5.77)	0 (0.00)	3 (5.77)
3	Rabies	29 (55.77)	2 (3.85)	31 (59.62)
4	Tuberculosis	3 (5.77)	1 (1.92)	4 (7.69)
<b>Total</b>		48 (92.31)	4 (7.69)	52 (100.00)

*Hierarchical Cluster Analysis (Dendrogram) for Familiarity of Zoonotic Diseases*

The cluster analysis representing the Familiarity of Zoonotic Diseases among the Butchers is depicted in a Dendrogram [20] and is shown in Fig.2.

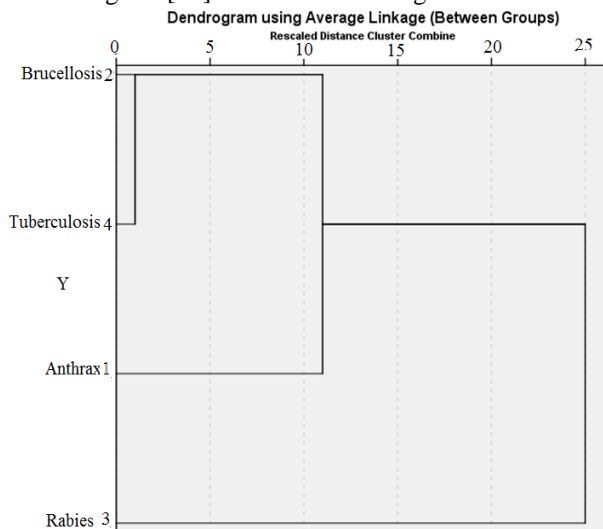


Fig.2: Dendrogram for familiarity of zoonotic diseases among the Butchers

Table 4: Cluster1- Least familiarity of zoonotic diseases among the butchers (N=52)

No	Variable Name	Agree (%)	Disagree (%)
1	Brucellosis	3 (5.76)	49 (94.23)
2	Tuberculosis	4 (7.69)	48 (92.30)
3	Anthrax	14 (26.92)	38 (73.07)
<b>Total</b>		21	135

Agree Ratio: 21/52 = 0.40 Disagree Ratio: 135/52 = 2.59  
 Agree to Disagree Ratio (0.40:2.59) = 0.15:1

In cluster 1, three variables are grouped as shown in the Table 4. The Agree to disagree ratio is 0.15:1,

which can be interpreted that these three variables are Least Familiar Zoonotic Diseases for the Butchers.

Table 5: Cluster2 - Highest Familiarity of zoonotic diseases by the butchers (N=52)

No	Variable Name	Agree (%)	Disagree (%)
1	Rabies	31(59.61)	21(40.39)
<b>Total</b>		31	21

Agree Ratio: 31/52 = 0.59 Disagree Ratio: 21/52 = 0.40  
 Agree to Disagree Ratio (0.59:0.40) = 1.47:1

In cluster 2, one variable is recorded as shown in Table 5. The agree and disagree ratio has been arrived at 1.47:1, which can be interpreted that the one variable (Rabies) has got Highest Familiarity among the Zoonotic Diseases by the Butchers

Enhanced consciousness about the disease rabies among the respondents was due to the information provided by the newspapers, due to the extension activities conducted by the staff of the Departments of Veterinary and Animal Husbandry and Medical and Health services of the state government in the form of pamphlets and posters, through the elders in the family and further they also intimated that the disease was present in their area because of that, they came to know much about rabies. This study has shown inconsistency about the awareness of Zoonotic diseases among the butchers and livestock keepers. This low level of awareness will probably expose them to an enhanced threat of contracting Zoonotic diseases. This risk is more for butchers, as they are unlikely to take proper precautions or use protective clothing when dealing with abortions or calves with diarrhea in the animal shed or during the slaughtering of animals. The study further revealed that the butchers had a very poor knowledge about the other Zoonotic diseases except rabies, anthrax and tuberculosis. This shows that the emergency vigilance for an outbreak of Zoonotic diseases is diminutive.

With regarding the restricted knowledge and awareness about Zoonotic diseases among the butchers, much can be done by education and training, to increase the knowledge and proficiency of the health professionals and for raising awareness among butchers by facilitating communication and inter-disciplinary partnership in sharing information between veterinary, public health, agricultural personnel and policy makers [21].

These findings are congruent with the work of [22] who stated that a high number of respondents had no comprehensive and precise knowledge about zoonotic tuberculosis. There was a diversity in the level of awareness with regard to Zoonotic tuberculosis in the study groups where-in, employees of animal and human health care departments have the highest awareness and the traditional livestock keepers and other categories of people have considerably less awareness. This might pose them as



the most vulnerable group as far as zoonotic tuberculosis is concerned. Ashford *et al* (2001) [23] reported that in countries where bovine tuberculosis is frequent and pasteurization of milk has not been practiced extensively, an estimated 10-15 percent of human tuberculosis cases are caused by *Mycobacterium bovis*.

#### d) Opinion about mode of gaining awareness about Zoonotic diseases, identification of diseases by lesions

The results of this contemporary study revealed that very little percentage (9.30 %) of respondents gained awareness about the cause, modes of transmission, factors influencing spread of Zoonotic diseases after consulting a Veterinary Assistant Surgeon. The findings were presented in Table: 6. interestingly, majority of the butchers (90.70 %) were aware about some of the Zoonotic diseases with their own experience and based on the symptomatic guidance from their ancestors. Al-Majali *et al*, (2009) [24] referred that; Veterinarians are a critical link in informing wholly, to the butchers about the ways to

minimize the risk of transmission of zoonotic diseases. In addition to proper disposal of contaminated or infected meat, aborted material and use of hygienic procedures during slaughtering of animals, handling of meat is also an exceedingly important step in successful control of zoonotic diseases.

When asked about the number of animals slaughtered per day, among all the respondents, 36.05 % of butchers were slaughtering at least 2 animals per day, 27.91 % of them slaughtered at least 3 animals per day, while 24.42 % of the butchers slaughtered at least 4 animals per day. Only 11.63 % of the butchers were slaughtering to a scale of more than 4 animals per day.

When enquired about whether the butcher respondents can identify any disease based on Post-Mortem lesions, nearly all the butchers (94.19 %) responded that they can identify certain diseases based on lesions observed in the carcass. However, a few of the butchers (5.81 %) expressed their inability to identify diseases based on post-mortem lesions.

**Table 6:** Gaining awareness about Zoonotic diseases, Identification of diseases by lesions

No	Description	Male (%)	Female (%)	Total (%)
<b>1</b>	<b>How do you got Awareness about Zoonotic Diseases</b>			
	Veterinary Assistant Surgeon	8 (9.30)	0 (0.00)	8 (9.30)
	Own Experience	71 (82.56)	7 (8.14)	78 (90.70)
<b>2</b>	<b>No of animals Slaughtered per Day</b>			
	2	28 (32.56)	3 (3.49)	31 (36.05)
	3	23 (26.74)	1 (1.16)	24 (27.91)
	4	20 (23.26)	1 (1.16)	21 (24.42)
	above 4	8 (9.30)	2 (2.33)	10 (11.63)
<b>3</b>	<b>Can you Identify any disease based on lesions</b>			
	Yes	75 (87.21)	6 (6.98)	81 (94.19)
	No	4 (4.65)	1 (1.16)	5 (5.81)
<b>3.1</b>	<b>If yes, how many can you Identify</b>			
	1	24 (27.91)	1 (1.16)	25 (29.07)
	2	35 (40.70)	3 (3.49)	38 (44.19)
	3	16 (18.60)	2 (2.33)	18 (20.93)
	4	0 (0.00)	0 (0.00)	0(0.00)

Further, the results presented in Table 6, demonstrate that 44.19 % of the butchers can identify at least two diseases based on Post-Mortem examination findings, 29.07 % of butchers can identify only one disease whereas 20.93 % of respondents identified at least three diseases based on Post-Mortem lesions.

The overall impression from the study implies that, Most of butchers can correlate the Post-Mortem lesions with the specific disease (Fig.3). The awareness was high with at least two diseases (44.19 %).

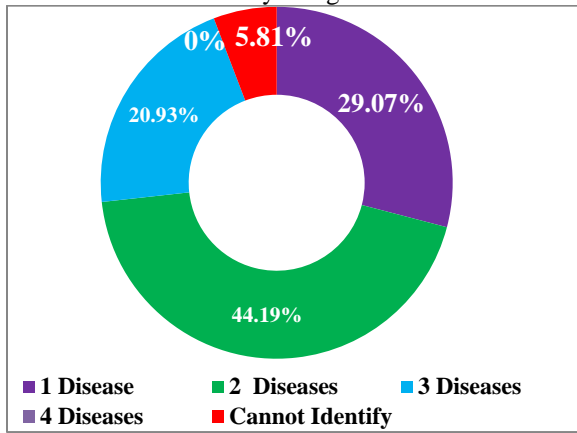
#### a) Opinion about knowledge pertaining to disease transmission

Communicable diseases can spread through various modes and knowledge of such modes is a pre-requisite to contain the spread of such diseases. Meat handlers comprise a distinctive set of individuals with enormous public health implications because they not

only contract the disease from animals or meat, but also convey it through faulty handling of meat. The transmission cycle of these diseases involves interaction between one or more animal hosts, a conducive environment for its survival, and human beings. Butchers and their associates are exposed occupationally to these diseases and may have clinical or sub-clinical manifestations that are not being detected and treated. The disease can be spread both recreationally and occupationally in man [25, 26.]

All the respondents in the present study were asked, whether they have any awareness regarding the different modes of disease transmission. Majority of the respondents (72.09 %) were unaware of the modes of spread and transmission of Zoonotic diseases (Table: 7). only 7.91 % of the respondents in butcher profession had a knowledge pertaining to

modes of spread and transmission of Zoonotic diseases. This epitomizes that, the awareness of butchers regarding the spread and transmission of Zoonotic diseases is very meager.



**Fig. 3:** Familiarity of number of diseases based on lesions  
The respondents in the current study area were having very low awareness regarding transmission of meat borne Zoonotic diseases, which contradicts the findings of Amenu *et al.*, (2010) [22], who reported that 96.3 % of the respondents knew that contaminated meat and raw meat were vehicles for disease transmission to humans. The disparity could be due to lack of information about the meat borne

zoonotic diseases in the current study area. To uphold the public health an exhaustive awareness creation activities should be undertaken in the area regarding the jeopardy associated with consumption of contaminated and infected meat which predisposes to serious food borne pathogens.

When enquired about the municipality seal required, permitting meat to be sold for public consumption, most of the butchers (69.77 %) were unaware about the municipal clearance seal. Usually a veterinarian or a health inspector at municipality level thoroughly inspects the carcass during post mortem examination, to certify that the carcass is free from any Zoonotic disease and puts a clearance seal on the carcass, indicating that the meat is fit for consumption by the public. Only a few butchers (30.23 %) were getting clearance from the municipal authorities for selling meat to the public. While observing the nature of knowledge, attitude and practice of butchers, who operate at Kumasi slaughterhouse in Ghana, Otupuri *et al.*, (2002) [27] opined that the knowledge, attitudes, practices and beliefs of the butchers in relation to zoonoses are largely inadequate for their profession in view of the public health role played by butchers.

**Table 7:** Awareness about disease transmission

No	Description	Male (%)	Female (%)	Total (%)
1.	<b>Awareness regarding different modes of spreading and transmission of Zoonotic diseases.</b>			
	Yes	21 (24.42)	3 (3.49)	24 (7.91)
	No	58 (67.44)	4 (4.65)	62 (72.09)
<b>Total</b>		79 (91.86)	7 (8.14)	86 (100.00)
2.	<b>Any Awareness regarding municipality clearance Seal</b>			
	Yes	26 (30.23)	0 (0.00)	26 (30.23)
	No	53 (61.63)	7 (8.14)	60 (69.77)
<b>Total</b>		79 (91.86)	7 (8.14)	86 (100.00)

**f) Opinion about hygienic practices to be practiced**

Many studies have shown that unclean animals can be a source of meat contamination [28]. None of the butchers were aware about the history of the flock nor of any diseases might the animals have had. In the present study, butchers were found to have very poor awareness about Hygienic practices related to slaughter house and meat production and potential occupational hazards to them. In spite of having adequate knowledge regarding hazardous diseases and food safety practices, the street vendors' hardly practice. Butchers, in general, do not have any formal training for the job [29]. Thus the lack of hygienic awareness can be attributed to the lack of formal training and poor educational status.

The observations from the survey (Table 8), pertaining to the familiarity of hygienic practices among the butchers revealed that only 6.98 % of the butchers were familiar with the hygienic practices to

be followed for production of wholesome safe meat. Almost all the butchers (93.02 %) were neither aware of hygienic practices nor follow those practices. Investigation of an abattoir at El-Sayeda Zeinab in Cairo, Egypt by Abdel Hameed *et al.*, (2002) [30] revealed that abattoirs can be a source for pathogenic bacteria, signifying the importance of strict hygienic controls and need for a buffer zone between abattoirs and residential area. A study in Kerala [31] also revealed that butchers lack awareness regarding scientific of hygienic aspects of animal slaughter. Lack of hygienic awareness can precipitate outbreaks and catastrophes any time.

Zinsstag *et al.*, 2007 [32] suggested that, General hygienic practices and zoonotic disease control programmes need to be integrated in the meat production course particularly at the small holders' level in order to avert transmission from animals and animal products as most of the zoonotic pathogens are maintained in animal reservoirs.

The respondents were asked whether there was any history of incidence of Zoonotic outbreak in Proddatur, Kadapa district, Andhra Pradesh, India, to their knowledge. All the butchers replied that no such incident happened at Proddatur. This was confirmed with the reports of medical and health department, Kadapa district. Respondents in this study area were having scanty knowledge about Zoonotic outbreaks. Relatively lesser awareness was observed with

regarding the meat borne zoonotic diseases as compared to a study conducted by Amenu *et al* (2010) [22], who indicated that 96.3% of the respondents knew that contaminated meat and raw meat were vehicles for disease transmission to humans. The difference could be due to lack of information about the meat borne zoonotic diseases in the current study area.

**Table 8:** Familiarity of hygienic practices

No	Description	Male (%)	Female (%)	Total (%)
<b>1</b>	<b>Hygiene Practices followed by butchers</b>			
	Yes	6 (6.98)	0 (0.00)	6 (6.98)
	No	73 (84.88)	7 (8.14)	80 (93.02)
<b>2</b>	<b>Any Zoonotic incidence in Proddatur of your Knowledge</b>			
	Yes	0 (0.00)	0 (0.00)	0 (0.00)
	No	79 (91.86)	7 (8.14)	86 (100.00)
<b>3</b>	<b>Do you Need any Training Programme for awareness on Zoonotic diseases</b>			
	Yes	67 (77.91)	3 (3.49)	70 (81.40)
	No	12 (13.95)	4 (4.65)	16 (18.60)
<b>4</b>	<b>Effluent Disposal</b>			
	Drainage	79 (91.86)	7 (8.14)	<b>86 (100.00)</b>
	Processing	0 (0.00)	0 (0.00)	<b>0 (0.00)</b>

When the butchers were enquired, whether they require any training related to Zoonotic diseases, 81.40 % of the respondents were enthusiastic in attending trainings and gaining knowledge related to symptoms, identification, different modes of disease spread, vectors causing the transmission of Zoonotic diseases. However 18.60 % of the butchers were either reluctant or were busy to attend such trainings. All the butchers were accustomed to release the wastes into municipal drainage. None of the butchers were aware about the effluent treatment methods, and the vast benefits of effluent treatment in preventing spread of various diseases.

## CONCLUSION

Veterinary medicine (including zoonoses) is unique among the health professions, as around 60 percent of all illustrated agents of infections of human beings are shared in nature with other vertebrate animals. Many animal allied problems, which negatively influence human health and economy, subsist in all countries of the world, which include zoonoses, food borne diseases and pollution of the environment from animal sources. Zoonoses cannot be restricted without a complete, multidisciplinary approach that includes health education and community contribution as well. Numerous other diseases are there, which may be transmitted to human beings through contamination during production, processing and handling of food products of animal origin. Besides, human activities like working with animals and in their sheds, inappropriate disposal of waste from animal sheds, skinning of diseased animals, slaughtering of diseased animals, disposal of infective material from the infected animals and poor

personal hygiene practices have been reported to be vital risk factors contributing to recurrent outbreaks of zoonotic diseases in humans. Lack of awareness about the zoonotic diseases among butchers is one of the most important rationales for the outbreak of zoonotic diseases in people.

The present survey revealed that most of the butchers had high school education and most of them acquired this profession from their ancestors. Most of the butchers were having awareness regarding the commonly occurring zoonotic diseases, identified diseases by observing the lesions and their control. None of the butchers follow strict hygienic practices and most of them were interested in attending training programmes pertaining to zoonotic diseases. There is a pressing need of imparting them necessary training to improve their awareness. People who come in contact with meat should be aware of and comply with hygienic requirements. Butchers constitute the most vital link involved in meat production and processing chain. And imparting knowledge to improve their awareness will result in decline in meat associated diseases.

- ❖ There is every need to impart training for the butchers of Proddatur area regarding the hygienic practices,
- ❖ Effluent treatment methods and
- ❖ As most of the butchers were familiar only with Rabies, proper awareness has to be created regarding identification of carcasses with different diseases (Anthrax, Tuberculosis, Brucellosis etc.).

Sustained education, awareness enlightening programmes and alliance between veterinary and human health care professionals are considered to be

decisive to create awareness among the public about zoonotic diseases and to combat those diseases. Therefore efforts by both veterinary and human health care professionals should focus on competent ways of improving public knowledge of zoonotic diseases and their transmission modes, the development of enhanced herd disease management plans and the establishment of food safety systems.

## ETHICAL ISSUES

All the participants were informed about the purpose of study and their willingness was noted in the questionnaire.

## CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

## AUTHORS' CONTRIBUTION

All authors have equal contribution for this article.

## FUNDING/ SUPPORTING

Authors carried out this investigation out of their personal interest and with their personal budget.

## REFERENCES

- [1] Yadav Y, Kumar S. The food habits of a nation. *The Hindu* 2006 Aug 14, [Online]. (2006) Available from : URL:<http://news.sulekha.com/nlink.aspx?cid=121151>
- [2] WHO. Managing Zoonotic public health risks at the human animal-ecosystem interface. Strong inter-sectoral partnerships in health. Food safety and zoonoses. (2010 Available at: [www.who.int/foodsafety](http://www.who.int/foodsafety))
- [3] WHO. The Control of Neglected Zoonotic Diseases. Report of a Joint WHO/DFID-AHP Meeting with the participation of FAO and OIE. Geneva. (2005) Available at: [http://whqlibdoc.who.int/publications/2006/9789241594301\\_eng.pdf](http://whqlibdoc.who.int/publications/2006/9789241594301_eng.pdf)
- [4] Nkuchia MM, Ruth L, Chris AB, and Henriette V. Infectious disease surveillance. Blackwell Publishing Inc. Malden, Massachusetts 02148-5020 USA. 2007; pp. 246-48.
- [6] WHO. Water borne Zoonoses, Identification, Causes, and Control. (2004) Available at: [http://www.who.int/water\\_sanitation\\_health/diseases/zoonoses.pdf](http://www.who.int/water_sanitation_health/diseases/zoonoses.pdf)
- [7] Jonathan R and Joshua L. Emerging infectious diseases from the global to the local perspective. A Summary of a Workshop of the Forum on Emerging

- Infections. National Academy Press Washington, D.C. (2006) Available at: <http://www.nap.edu/openbook.php?isbn=0309071844>
- [8] Human death statistics-1 available at: <http://www.livescience.com/21426-global-zoonoses-diseases-hotspots.html>
- [9] Human death statistics-2 available at: [http://www.huffingtonpost.com/2012/07/07/zoonoses-study-finds-nim\\_n\\_1654967.html?ir=India](http://www.huffingtonpost.com/2012/07/07/zoonoses-study-finds-nim_n_1654967.html?ir=India)
- [10] Padd GS and Thind SS. Present status and a strategic action plan for the Development of meat and poultry sector. *Indian Food Industry*, 2002; 21(5): 8-13
- [11] Wastling JM, Akanmori BD, and Williams DJL. Zoonoses in West Africa: Impact and control. *Parasitology Today*, 1999; 15(8): 309-11.
- [12] Swai ES, Schoonman L and Daborn CJ. Knowledge and attitude towards zoonoses among animal health workers and livestock keepers in Arusha and Tanga, Tanzania. *Tanzan. J. Health Res.*, 2010; 12(4): 282-88.
- [13] Mosalagae D, Pfukenyi DM and Matope G. Milk producers` awareness of milk-borne zoonoses in selected smallholder and commercial dairy farms of Zimbabwe. *Trop. Anim. Hlth. Prod.*, 2011; 43(3): 733-39.
- [14] John K, Kazwala R. and Mfinanga GS. Knowledge of causes, Clinical features and diagnosis of common zoonoses among medical practitioners in Tanzania. *BMC Infect. Dis.*, 2007; 8(1): 162. Doi: 10.1186/1471-2334-8-162
- [15] Asbjer E. Dog population management in Malawi and Peru. Project report, Department of Biomedical Sciences and Veterinary Public Health. Swedish University of Agricultural Sciences. 2009; P.54. Available at: [http://stud.epsilon.slu.se/963/1/asbjer\\_e\\_100325.pdf](http://stud.epsilon.slu.se/963/1/asbjer_e_100325.pdf)
- [16] McDermott JJ, Arimi SM. Brucellosis in sub-Saharan Africa: epidemiology, control and impact. *Vet. Microbiol.* 2002; 90(1-4): 111-34.
- [17] Perry BD, Randolph TF, McDermott JJ, Sones KR and Thornton PK. In: Investing in Animal Health Research to Alleviate Poverty. International Livestock Research Institute (ILRI), Nairobi, Kenya, 2002; P. 133.
- [18] Joint WHO/ FAO Expert Committee on Zoonoses Second Report, 1959, WHO Technical Report Series No. 169. Available at: [http://apps.who.int/iris/bitstream/10665/40435/1/WHO\\_TRS\\_169.pdf](http://apps.who.int/iris/bitstream/10665/40435/1/WHO_TRS_169.pdf)
- [19] Dawit Tesfaye, Daryos Fekede, Worku Tigre Alemayahu Regassa and Amene Fekadu. Perception of the public on the common zoonotic diseases in Jimma, Southwestern Ethiopia. *International Journal of Medicine and Medical Sciences* 2013;5(6): 279-85. DOI: 10.5897/IJMMS2013.0931



- [20] Frizo Janssens, Jacqueline Leta, Wolfgang Glanzel and Bart De Moor. Toward mapping library and information science. *Information Processing and Management*.2006;42(6):1614-42.  
Doi:10.1016/j.ipm.2006.03.025.
- [21] Caulibaly ND and Yameogo KR. Prevalence and control of zoonotic diseases: collaboration between public health workers and veterinarians in Burkina Faso. *Acta Tropica* ,2000; 76(1) : 53-57.
- [22] Amenu K, Thys E, Regassa A and Marcotty T. Brucellosis and Tuberculosis in Arsi- Negele District, Ethiopia: prevalence in Ruminants and People`s Behaviour towards zoonoses. *Tropicultura*, 2010; 28(4): 205-10
- [23] Ashford DA, Whitney E, Ragunathan P and Cosivi O. Epidemiology of selected mycobacteria that infect humans and other animals. *Rev. Sci. Tech. OIE.*, 2001; 20(1): 325-37.
- [24] Al-Majali AM, Talafha AQ, Ababneh MM and Ababneh MM. Seroprevalence and risk factors for bovine brucellosis in Jordan. *J of Vet. Sci.*, 2009; 10(1): 61-65.
- [25] Brown PD. *Leptospira* spp. *Encyclopedia of Medical Genomics and Proteomics*, 2005
- [26] Levett PN. Leptospirosis. *Clin Microbiol Rev* 2001; 14(2): 296-26.
- [27] Otupiri E, Adam M, Liang E and Akanmori BD. Detection and management of zoonotic disease at the Kumasi slaughterhouse in Ghana. *Acta Tropica*, 2002; 76 (1):15-19
- [28] Hadley PJ, Holder JS, Hinton MH. Effects of fleece soiling and skinning method on the microbiology of sheep carcasses. *Vet Rec*, 1997; 140 (22): 570-74.
- [29] Otupiri E, Adam M, Laing E, Akanmori BD. Detection and management of zoonotic diseases at the slaughterhouses in Ghana. *Acta Trop* 2000; 74(2):44-48.
- [30] Abdel Hameed AA, El-Abagy MM, Mansour FA and Farag SA. Bio-contamination of air at a slaughter house in Cairo. *Egyptian J. Microbiol.*, 2002; 37(1): 43-56.
- [31] Kumar PV. Animal Slaughter Practices in Rural Kerala. A descriptive study, (1999). Dissertation, 1998-99, AMCHSS, SCTIMST, Trivandrum, Kerala, India.
- [32] Zinsstag, J, Schelling, E, Roth, F, Bonfoh, B, de Savigny D and Tanner M. Human benefits of animal interventions for zoonosis control. *Emerging Infectious Diseases*, 2007; 13(4): 527- 53.