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## Awareness and practices followed by the butchers in hygienic meat production chain in YSR Kadapa district of Andhra Pradesh

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### Abstract

Meat quality and butcher's awareness plays a key role in production of hygienic meat and preserving the public health. A structured questionnaire was developed and a total of 208 butcher shops were surveyed in the pilot study. The survey revealed that 34.61% of the butchers had high school education. Among the total shops surveyed, 95% had no license, sewage facilities (71.15%), lairage (70.19%), floor and its slope for proper drainage (68.75%), ventilation (60.09%) were inadequate. only 52.88 % were maintaining the disinfectants. Most of the butcheries are having ample level of insects (65.38%) and stray animals (55.28%). Only few of the butcheries are having clean cages/ lairage (26.44%), feed (25.48%) and water (29.80%). Only 12.01 % and 5.28 % of the butchers were aware about meat borne diseases and occupational hazards respectively. Further most of the butchers were wearing dirty, used shirts (71.15%) and foot wear (76.92%). Many of the butchers were unaware of using face masks/head gear/ hand gloves/aprons (7.69%). During slaughtering practice, touching their nose during work (16.82%), spitting (69.71%), usage of tobacco products (46.15%), wiping of hands with same cloth in between the work (83.17%), counting the money while working (66.34%) was observed. Based on the results obtained in the study, it is concluded that most of the butchers required education and awareness training about hygienic meat production, threatful meat borne diseases, sanitary conditions and hygienic slaughter techniques in the butcher shops to safe guard the health of themselves and meat consumers.

**Keywords:** Butchers, hygienic practices, awareness, meat borne diseases, public health

### 1. Introduction

Abattoir is a place where the knowledge and training of the meat handlers is of mighty importance so as to ensure the safety of food and public health. Meat handlers play an important role in safe guarding the chain of production, processing, storage and preparation (Abd-Elaleem *et al.*, 2014) [1]. Mishandling and lack of knowledge towards the production chain leads to the outbreaks of food borne illness thus costing the lives. Personal hygiene of butchers also marks an important role in preventing the entry of food borne pathogens (Fawzi *et al.*, 2009) [8]. In developing countries like India, consumption of meat is gradually increasing as a result of increasing population, urbanization and rising income (Sans *et al.*, 2015) [24]. A lack of awareness and the conventional practices followed in processing, handling and marketing reflects the poor quality meat. Poor meat hygiene and sanitation may lead to risk of food borne illness upon consumption (Gurmu *et al.*, 2013) [10]. Several factors like poor food handling, inappropriate food safety laws, poor regulatory systems, lack of awareness among the butchers and consumers are some of the other factors that degrade the meat quality in developing countries (Guo *et al.*, 2017) [9].

Animals are the major source of high value protein food and these animals harbors food borne bacteria in their intestines and cause illness when the intestinal contents comes in contact with meat and poultry carcasses (Pal *et al.*, 2015) [17]. Food safety has been a major knot in international trade and in preserving the public health among which meat borne diseases and hazards are the hallmark of the public health issues. In many developing countries the fresh meat is primarily distributed through markets or small or medium meat stalls where the hygiene is the least concern. Along with the above issues, knowledge of meat handlers and butchery workers are lacking the knowledge on the burning issues public are facing because of the consumption of parlous meat (Gurmu *et al.*, 2013) [10] and the measures such as licensing, inspection, supervision are not routine which makes the hygiene and sanitation status underprivileged.

Although there are laws and legislation governing the abattoir operation in India, awareness among the butchers in regard to meat hygiene and personal hygiene seem to be assessed. Hence, present study assesses butcher's personal hygiene, awareness about some meat borne diseases, their way of handling and processing of meat in YSR Kadapa district (Andhra Pradesh State, India).

## 2. Materials and Methods

### 2.1 Study Design

A cross sectional study design based on the questionnaire and a brief interview was done to assess the knowledge of the butchers on the personal hygiene, hygienic measures followed during meat handling, their source of knowledge in managing the retail shop and their awareness regarding the meat borne diseases.

### 2.2 Study Area

The present study was conducted in major parts (Kadapa town, Kodur, Proddatur, Pulivendula, Rayachoty, Rajampet) of the Kadapa district, Andhra Pradesh, India from April 2018 to November 2018. The assessed butchers are of various ages, educational qualifications and experience.

### 2.3 Sampling Method & Size

Butchers to be interviewed are selected using simple random sampling and are assessed by the personal interview by visiting their retail shop. The respondents were not compelled to participate in the interview. Before proceeding for the questionnaire, the principle of the study and the methodology was explained in a lucid way along the consent from the respective butcher. A total of 208 shops were surveyed.

### 2.4 Study Methodology

The assessment included a brief interview and questionnaire. A semi structured questionnaire was prepared and used for face to face interview to evaluate the awareness among butchers. Interview was conducted in their vernacular language. The questionnaire included the details of butcher's educational status, location of his retail shop, structure of the shop, source of media, experience, license details, their awareness towards the personal hygiene, meat borne diseases and meat hygiene. Some observations were noted by observing their maintenance of shop, equipment, the level of hygiene (personal and meat) they maintained while selling meat, way of disposal of the waste and the drainage facilities availability.

## 2.5 Data collection and Analysis

Data from the questionnaires was noted and analyzed using Microsoft excel, 2007. The findings were depicted in the form of percentage. The protective equipments used by the butchers, inside and the outside environment of the butcheries, facilities observed, source of media and training were depicted in pie chart, pie chart, doughnut diagram and bar diagram respectively.

## 3. Results and Discussion

Meat lodges different kinds of bacteria initially and are further contaminated during handling, processing, unhygienic measures followed during the selling of the meat (Rouger *et.al.*, 2017) [22]. Consumption of such meat is the major contributor for the transmission of several diseases and also the resistant bacterial strains (Marshall *et.al.*, 2011) [14].

### 3.1 Location and structure of the shop

In the current study butcher shops opted for assessment were located in market area and residential area at 61.53% and 34.61% respectively. The retail shops were categorized into three types i.e., open, small, medium and they are 19.23%, 46.15%, 34.61% respectively. Among the butcher shops 95% shops did not have government license which should be marked under a major concern. Although the butcher shops were maintained under different categories, none of the butchers were having organized infrastructure.

### 3.2 Educational status, experience and their age

The majority of butchers involved are of different ages ranging from 20 to >50 and their experience were observed to be 0 to >30 years. The details of educational status, experience, and their age are tabulated in Table 1. The educational status undoubtedly reflects the perception levels of the butchers which further reflects their hygienic practices while handling the meat and personal hygiene. The present study have shown a suboptimal levels of the butcher's educational status which shows the need of creating the awareness among them and implementing the disease prevention and control measures. Along with the educational status. Experience will also reflects the discernment levels of the butchers in understanding the measures which need to be taken.

**Table 1:** Describing the age, years of experience and educational status.

Age in years	20-30	30-40	40-50	>50
	48 (23.07%)	56 (26.92%)	80 (38.46%)	24 (26.92%)
Years of Experience	0	1-10	11-20	>30
	16 (7.69%)	64 (30.76%)	72 (34.61%)	56 (26.92%)
Educational status	<5/ No education	10 <sup>th</sup>	Intermediate	Degree
	88 (42.30%)	72 (34.61%)	32 (15.38%)	16 (7.69%)

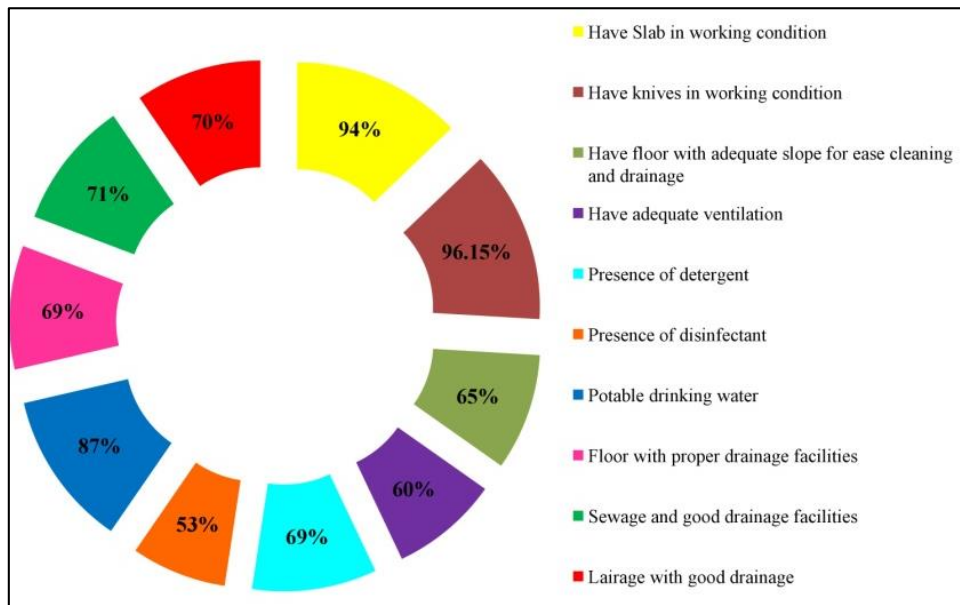
### 3.3 Facilities observed in butcher shops:

In the present study, the facilities and their adequacy was assessed by visual inspection of the butcher shop and the details were noted. From the observations the facilities like working slab (94.23%), knives (96.15%), availability of potable drinking water (86.53%) (Figure 1) were adequate in most of the butcher shops but can be prospected for bacteriological studies for evaluating the levels of contamination. But the facilities such as sewage facilities

(71.15%), lairage (70.19%), floor and it's slope for proper drainage (68.75%) were inadequate which indicates poor hygienic environment (Figure 1). Ventilation in many butcheries (60.09%) was inadequate (Figure 1) and is indicative of poor meat quality as air gets trapped inside and may lodge flora (Bhandare *et al.*, 2007; Omoruyi *et al.*, 2011) [6, 15]. The above observations were on par with the observations published by Pradhan *et al.*, 2018 [20]. Only 69.23% & 52.88% of butcher shops are maintaining

detergents and disinfectants respectively which may reflect the risk of contamination due to higher microbial loads due to unhygienic practices followed in most of the meat retail shops

(Parvin *et al.*, 2017) [18]. The above observations should be regarded as the most common cause of contamination which may lead to public health issues.

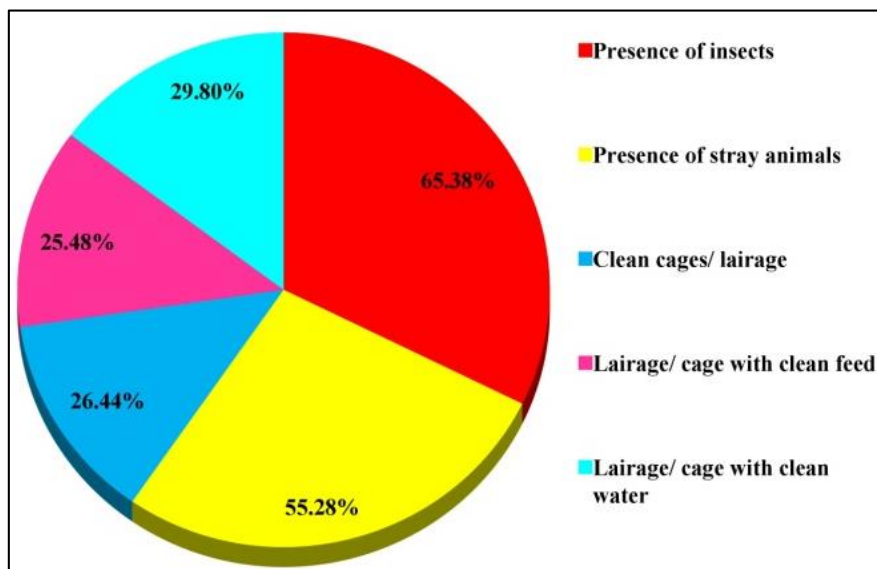


**Fig 1:** Doughnut diagram indicating the facilities observed in the butcher shops

**3.4 Innards and in situ environment of the butcheries**

Innards of the butchery should be hygienic since this reflects the quality of the meat. From the visual inspection of the area it was observed that most of the butcheries are having ample level of insects (65.38%) and stray animals (55.28%) (Figure 2) around the butchery settings which may be vectors for many dreadful infectious diseases. Stray animals may act as source for many zoonotic diseases which makes the health of

the public questionable (Babero *et al.*, 1963) [4]. These observations firmly indicate the need of awareness among the butchers in providing hygienic meat. Only few of the butcheries are having clean cages/ lairage (26.44%), feed (25.48%) and water (29.80%) needed for the poultry and the animals (Figure 2) which indicates need of providing the appropriate knowledge through the respective authorities.



**Fig 2:** Pie chart depicts the inside and the outside environment of the butcheries

**3.5 Opinion of the butchers in maintaining the meat hygiene**

Most of the butchers were aware about selection of healthy birds or animals (98.55%), cleanliness of the equipment (95.19%), cleanliness of the surroundings (73.07%) and the personal hygiene (69.71%) which are essential for hygienic meat production. Although they were aware of the above criteria, the awareness regarding the zoonotic diseases

(12.01%) and the occupational hazards (5.28%) is very poor and these observations (Table 2) were congruent with data published by Prabhakar *et al.*, 2017. This poor awareness regarding the zoonotic diseases and occupational hazards will certainly expose them to the threat from those diseases and hazards. In this regard there is a need to enhance the inter communication between the veterinary and human health care professionals in creating awareness among the butchers in

safe guarding the health of the public from the serious food borne illnesses.

**Table 2:** Describing the opinion of the butchers regarding the mainatanance of meat hygiene

Attitude	Percentage (Yes)%
Do you think selection of healthy birds/ animals is important for hygienic meat production?	205 (98.55%)
Do you think cleanliness of the equipment is important for hygienic meat production?	198 (95.19%)
Do you think cleanliness of the place is important for hygienic meat production?	152 (73.07%)
Do you think personal hygiene is important for hygienic meat production?	145 (69.71%)
Are you aware of the diseases that are transmitted through butchering or eating meat	25 (12.01%)
Are you aware of Occupational hazards/ diseases from the animals and birds	11 (5.28%)

**3.6 Slaughter practices followed by the butcheries**

The present study have shown that butchers were quite aware about cleaning knife, slab and floor before each slaughter (71.63%), washing of the carcass before and after evisceration (78.36%), immediate removal of viscera after slaughtering the bird (95.19%). Surprisingly some of the butchers were contaminating the slaughtered meat by touching the feathers and stomach contents (15.38%), meat getting in touch with

the live birds/ animals and their contents (16.82%) which will certainly hinder the meat quality. It was observed that many of the butchers are not following the complete sticking (drainage of blood) (66.34%). This incomplete sticking will lead to microbiological deterioration of the meat thus compromising the quality (Warriss, 1984) [26]. The slaughter practices followed by the butchers involved in the present study are depicted in Table3.

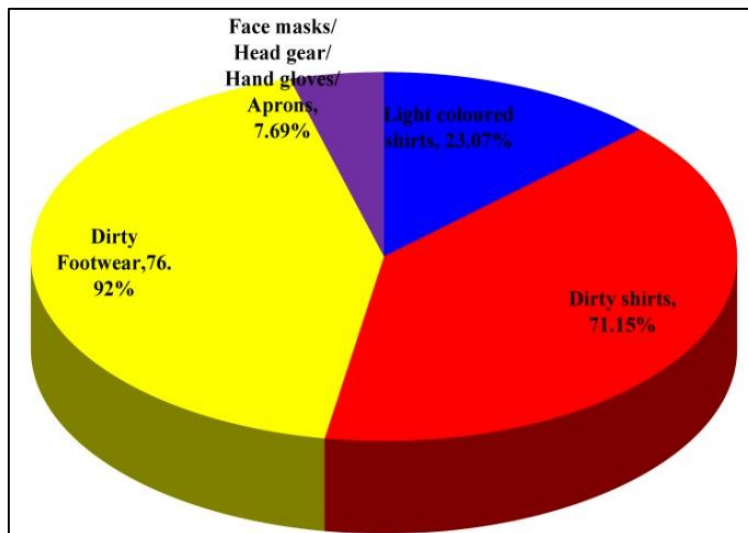
**Table 3:** Depicts the slaughter practices followed by the butchers during production of meat.

Practice	Percentage(Yes)%
Cleaning knife, slab and floor before each slaughtering	149 (71.63%)
Ensure complete drainage of blood from the carcass	138 (66.34%)
Whether feathers or stomach contents come in contact with flesh	32 (15.38%)
Whether slaughtered meat get in touch with live/ raw birds or their contents	35 (16.82%)
Washing of the carcass before and after evisceration	163 (78.36%)
Did immediate removal of viscera after killing the bird	198 (95.19%)

**3.7 Protective equipments used by butchers**

Using of protective equipments will reduce the level of contamination and will help in providing the quality meat. The protective equipment can act as defense against the contaminants and thus protects butchers from meat borne diseases. The usage of the protective equipments and the awareness regarding their usage are delineated in the figure 3.

In the present study it has been observed that butchers were wearing dirty shirts (71.15%) and foot wear (76.92%). Very few butchers were aware of using face masks/head gear/ hand gloves/ aprons (7.69%). The usage of the above protective equipments will certainly help reducing the contaminating the meat.



**Fig 3:** The protective equipments used by the butchers.

**3.8 Practices followed by the butchers during slaughter and sale of meat**

From the study most of the butchers were washing their hands before start of the work (100%) and touching their nose during work (16.82%). Some of the butchers were having open cuts on their hands & legs (15.38%). Some of the stupefying observations like spitting (69.71%), usage of tobacco products (46.15%), wiping of hands with same cloth

in between the work (83.17%), counting the money while working (66.34%) was observed. These observations (Table 4) will reflect their poor awareness towards the personal hygiene and wiping of hands with same cloth, the counting money during the work may act as source of microbial contamination (Alemu, 2014) [2]. This firmly indicates the need of creating awareness regarding the personal hygiene.



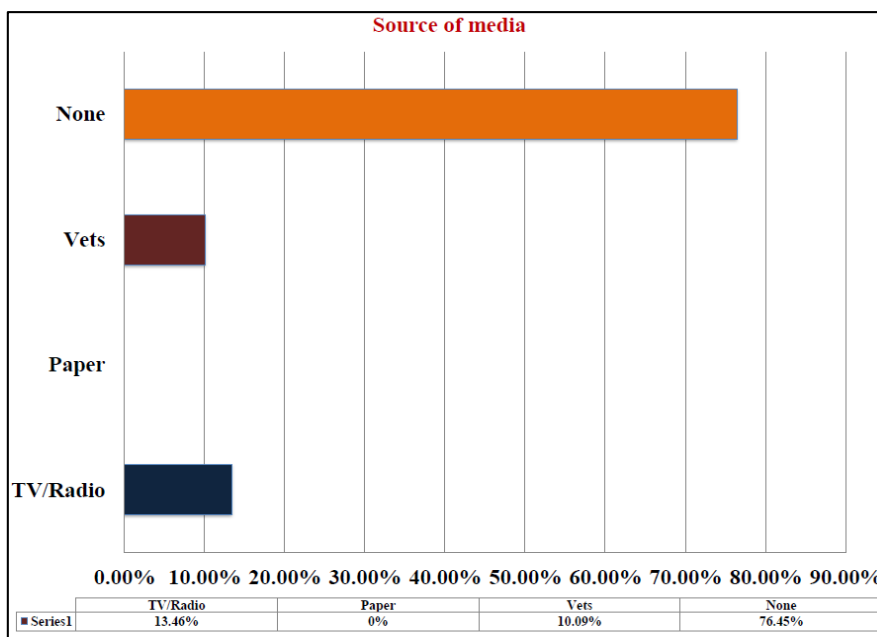
**Table 4:** Describes the Practices that have been followed by the butchers during meat production.

Practice	Percentage (Yes)%
Wash his/ her hands before start of the work	208 (100%)
Touches his/ her own nose while at work	35 (16.82%)
Any open cuts in the hands & legs of butchers	32 (15.38%)
Spitting while working	145 (69.71%)
Use of tobacco products during work	96 (46.15%)
Wiping of hands with same cloth in between the work	173 (83.17%)
Counting of money in between work	138 (66.34%)

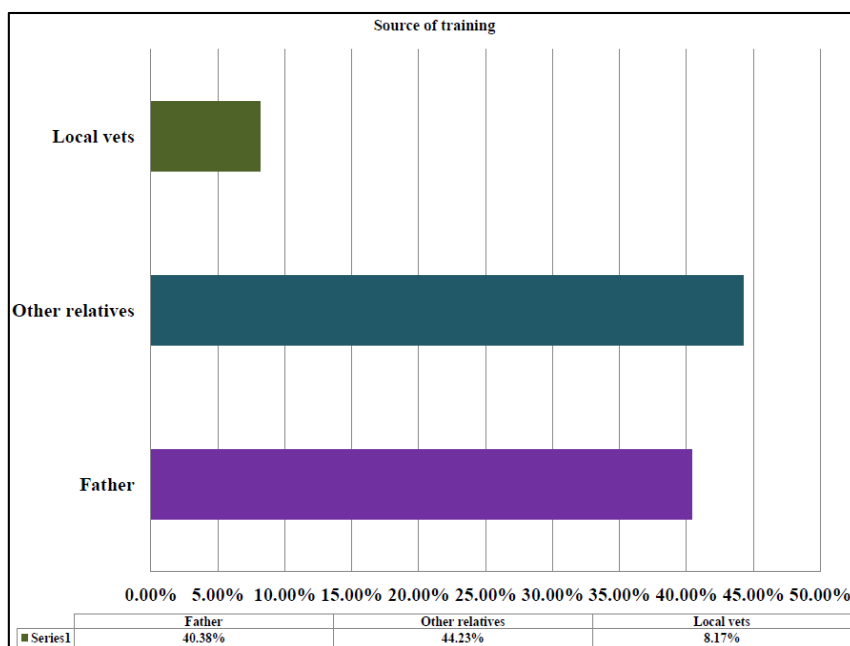
**3.9 Source of media, training for the butchers**

The butchers were interviewed for their source of media and a surprising responses were observed. Only few of the respondents are following television/ radio (13.46%), Veterinary sources (10.09%) and none of the respondents are following News paper. The source of media for the butchers is portrayed in Figure 4. It clearly indicates that most of the

respondents are lacking awareness about hygienic practices, personal hygiene, zoonotic diseases and occupational hazards because of their unwillingness towards media sources. Most of the butchers are trained by father (40.38%) and relatives (44.23%) but a few are being trained by local vets (8.17%) (Figure 5).



**Fig 4:** Depicts the source of media for butchers



**Fig 5:** depicts the source of training for butchers.

#### 4. Conclusion

Butchers level of awareness was very less regarding the hygienic meat production, personal hygiene and the diseases associated with meat. From this study it clearly describes the low perception levels of the butchers, their poor awareness in producing hygienic meat. The present study concluded that improving the knowledge of the butchers through various channels like advertisements, seminars, presentations by some veterinary and medical health professionals, measures from government public health department can provide a pavement for the production of clean meat and in protecting the health of consumers.

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