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Kavya Gupta
Division of Veterinary Public Health and Epidemiology, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S. Pura, Jammu and Kashmir, India

M Rashid
Division of Veterinary Public Health and Epidemiology, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S. Pura, Jammu and Kashmir, India

MA Malik
Division of Veterinary Public Health and Epidemiology, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S. Pura, Jammu and Kashmir, India

HK Sharma
Division of Veterinary Public Health and Epidemiology, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S. Pura, Jammu and Kashmir, India

Corresponding Author:
Kavya Gupta
Division of Veterinary Public Health and Epidemiology, Faculty of Veterinary Sciences and Animal Husbandry, Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu, R.S. Pura, Jammu and Kashmir, India

Assessment of hygiene practices followed by retailers of small slaughtering premises in Jammu city

Kavya Gupta, M Rashid, MA Malik and HK Sharma

Abstract
The present study was conducted to assess the hygienic practices followed by the retailers in Jammu city. A structured questionnaire was developed to know the current status of hygiene and sanitation practices and another semi structured questionnaire was administered to know the risk factors of meat contamination. The butchers were randomly chosen and interviewed by visiting the retail shops/outlets. The data were coded, tabulated and analysed using Statistical Package for the Social Science (SPSS) and Statistical Analysis System (SAS) software. The survey revealed that all the butchers were male, mostly in the age group of 16-45 years. Majority of the butchers were trained by relatives and friends (73%). Sixty seven percent retail shops/outlets and slaughtering premises were in the market area and most of them (63%) were small structured. Most of the butchers (100%) were found using soaps and detergents (10%) for hand sanitization. Majority of the shops were operational with proper licensing from the Municipal Corporation authorities of the Jammu city.

Keywords: Hygienic practices, questionnaire, risk factors. SPS, SAS

Introduction

Slaughterhouse is a premise that is used for slaughtering and dressing of meat for human consumption. At the same time, it enables proper meat inspection to be carried out and the resulting waste materials are thus suitably be handled to remove any potential danger or meat-borne infectious agents reaching the public or contaminating the environment (FAO, 2012) [3]. The contamination of meat can occur in multiple steps along the food production chain including production, processing, distribution, retail marketing and handling.

Lacking of poor sanitation and hygienic practices can lead to microbial contamination, meat quality deterioration and post-harvest meat losses (Bogere and Baluka, 2014) [2]. Several factors like poor meat handling, in appropriate food safety laws, poor regulatory systems, lack of financial resources to invest in safe equipments and lack of education for food handlers (Okonko *et al*., 2009) [4]. In India, just like other developing countries with predominately agricultural-based economies, fresh meat is mainly distributed through butcheries. Lack of awareness on good hygiene practices, hygienic means of transporting meat and hygienic situation of butcheries may lead to deterioration of the meat quality.

Most of the slaughtering premises are highly ill managed, overcrowded, unhygienic and lacking basic facilities like water, electricity, and ventilation, drainage and water disposal in Jammu city. In spite of increased consumer demand on food safety standards, there are still hygiene and sanitary practices along with food production chain which contribute to unacceptable level of microbial load in meat and poses a health risk to consumers. Therefore, the present study assesses butchers personal hygiene, awareness of some meat borne disease and there way of handling and processing of meat in Jammu city of Jammu and Kashmir.

Materials and Methods
Study design
The present study was conducted in the Jammu city to assess the hygienic practices used by the butchers of small slaughtering premises. A cross sectional study based on the two questionnaires, one was administered to know the current status of food hygiene and sanitation practices of butcher shops and the other to assess the risk factors of meat contamination.

Study area

The present study was conducted in 10 locations of Jammu city namely Sidhra, Amphalla, Rehari, Kacchi Chawni, Channi Himmat, Narwal, Gandhi Nagar, New plot, Bathindi and Gujjar Nagar.

Sampling method and size

Butchers were randomly chosen and interviewed by visiting their retail shops/outlets. The respondents were not compelled to participate in the interview. A total of 30 retail shops/outlet were surveyed.

Data collection and statistical analysis

A semi structured questionnaire was prepared and used for face-to-face interview to evaluate the awareness among butchers. Interview was conducted in local 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. The data were coded and tabulated. The frequency and percentage were determined and stored in excel sheet. The Statistical Package for the Social Science (SPSS) and Statistical Analysis System (SAS) software was used to drive the inferences. The findings were depicted in the form of table and graphs.

Results

Education status, experience and their age

The educational attainment of the respondents was evaluated in terms of different levels of school education.37% of the respondents had acquired education up to higher secondary level. 30% of the respondents were matriculate, whereas 20% of the respondents had acquired only primary education. Out of the total respondents, only 13% were graduate. The level of schooling was found highly significant. (Fig. 1).

The majority of the butchers were of different age groups ranging from 16-30 to 61-75. However, the average age of all the butchers was 34 years and maximum of the butchers (14) came under the category of 16-30 age group followed by (11) in the age group of 31-45 years. However, only one candidate was found in the category of 51-65 age group. The majority of the butchers (37%) had experience of less than 5 years of slaughtering followed by 26% with experience of 11-15 years. (Fig. 2).
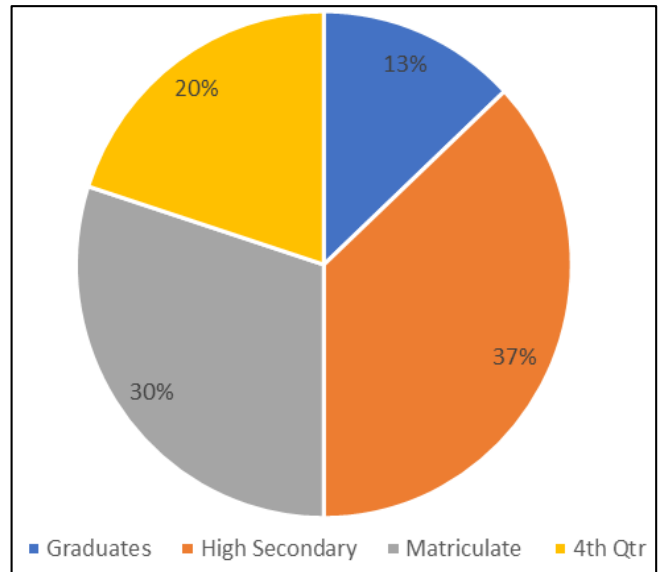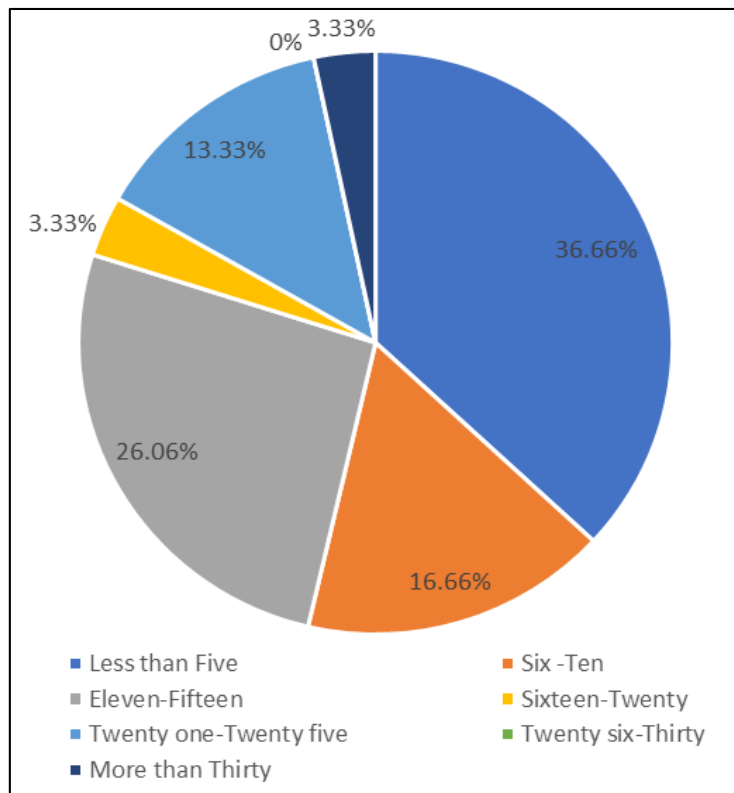

Fig 1: Education status of the butchers

Fig 2: Years of experience of butchers

Location and structure of shops
The location of 67 % shops (20) was in the main market area, whereas 10 shops were located in residential area (63%) of the shops were small constructed shops whereas 37% were medium size. The location of shops in market area are at par with residential area and small structures shops are also are at par with medium constructed shops as indicated by chi square test (Table 1). Majority of the shops (97%) were operational with proper licensing from municipal authorities to do the business. (Table 1).

Table 1: Location and Structure of Shop.

Location and Structure of Shop (n=30)	Number (%)	Chi square test (Likelihood ratio)
Location of shop		
a) Market area	20(67.0)	
b) Residential area	10(33.0)	3.39^{ns}
Structure of shop		
a) Small constructed shop	19(63.0)	
b) Medium constructed shop	11(37.0)	2.15^{ns}
Licence		
a) with licence	29(97.0)	
b) without licence	01(3.0)	32.82^{**}

**: significant at 1 percent level of significance.

Facilities available in butcher shop
The observations on hygienic practices in butcher shop were assessed by personal visit and the details are presented in Fig. 3. From the observations, the facilities like clean knives (90%), good working slab (76.6%), hot water (50%), cold water (70%), proper lighting (90%), disinfectants (30%), detergents and soaps (100%) were adequate. But these were further assessed for bacteriological studies for evaluating the levels of contamination. Other facilities such as sewage facilities (53.3%), lairage (46.6%), floor and its slope for proper drainage (70%) were inadequate which indicated poor hygienic environment observed in the butcher shop and therefore, indicative of poor meat quality (Fig. 4).
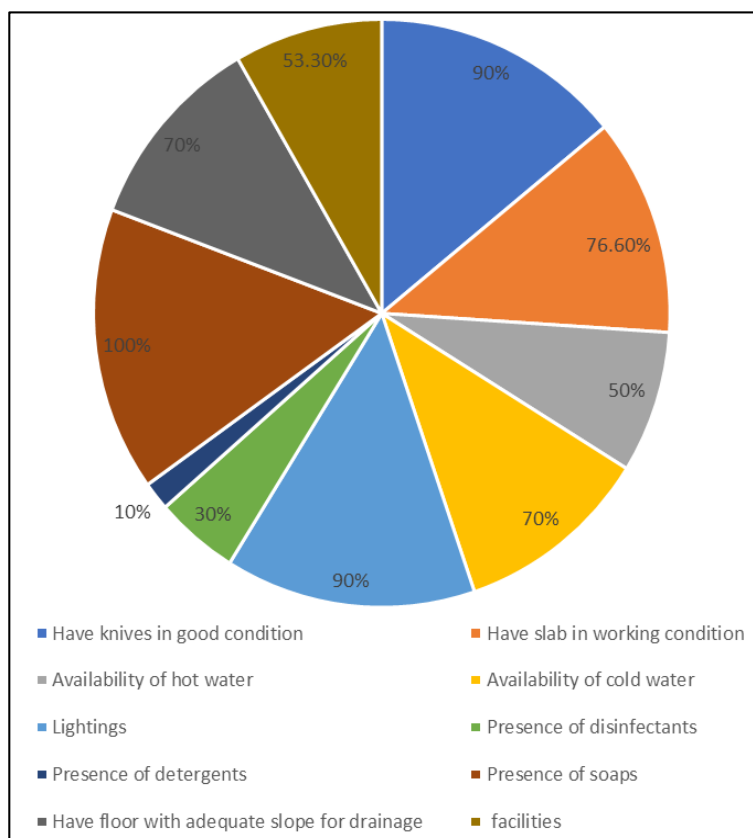

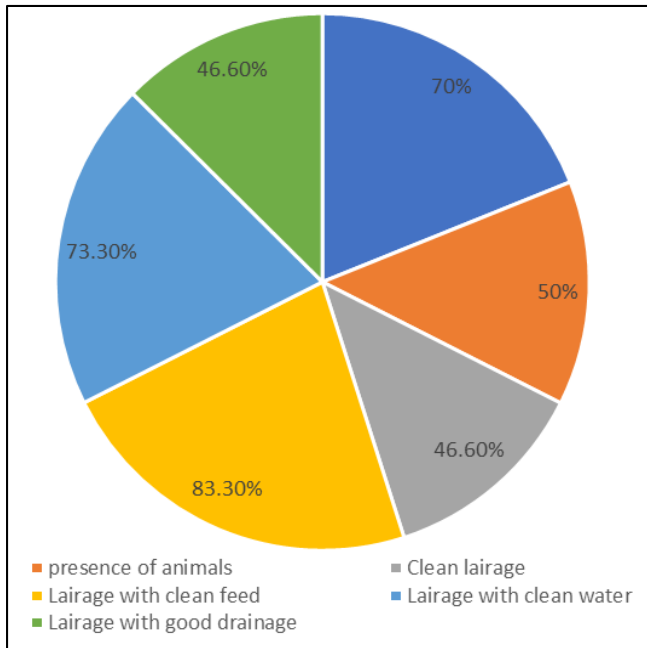**Fig 3:** Facilities observed in the butchers shop

Fig 4: Environment inside and outside of the butcheries.

Practices of butcher
1. Protective clothing/equipments
Using of protective clothing/equipment will reduce the level of contamination and will help in providing the quality meat. The protective clothing/equipments can act as a defence against the contaminants and protects butcher from meat borne diseases. It was observed that 63.3,60 and 76.6% of butchers found were wearing light coloured, clean and easy cleanable cloths respectively. About 80% of the butchers were not sanitizing their clothes during the sale of the meat. No butcher was found were using gloves during the slaughtering. Only 70% were found wearing gumboots/sleepers.

2. Practices during slaughtering
From the present study, it was observed that few of the butchers were found consuming tobacco products before start of the work or during the work (10%). Most of the butchers did not find spitting while slaughtering work (93.3%), wiping the hands with same cloth in between the work (73.3%), counting money in between work (73.3%), doing other work (40%) (Fig. 5).
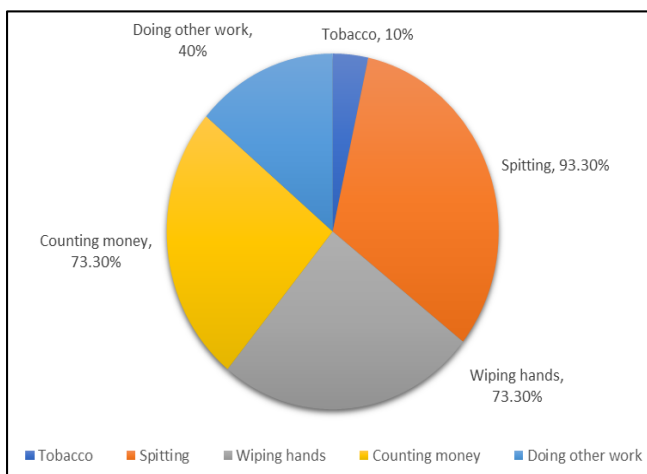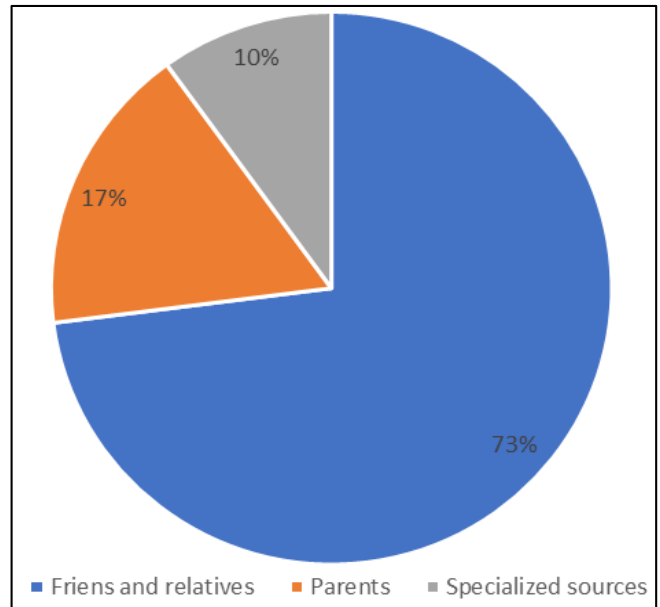

Fig 5: Practices during the slaughtering

Sources of training for the butchers

Fig 6: Sources of training for the butchers

The butchers were interviewed for the sources of training. Majority of the butchers are trained by friends and relative (73%) followed by their parents (17%). Only 10% of the butchers got training from specialized sources (Fig. 6).

Risk factors for meat contamination
Very few slaughtering facilities (13%) were found with no water stagnation, floods, smoke, dust and other contaminants. Eighty seven percent butchers were found hoisting facilities for carcass for skinning and evisceration, whereas 63% of the butcher's facilities had clear demarcation between dirty and clean area during slaughtering. Majority of the butchers had removed heads, hides immediately after slaughtering and only (40%) butchers had a separate room for handling offals. Majority of slaughtering premises (73%) had adequate light for performing proper operation whereas (90%) did not have disposal pit. Eighty percent of the shops had floor made of hard material for easy washing and cleaning, 40% slaughtering premises had good drainage system whereas (37%) had adequate hot and cold-water facilities for washing used utensils, floor and walls after slaughtering. Seventy three percent of the slaughtering premises had a provision of washing dirty animals before slaughtering. Seventy percent butchers had used clean equipments before the start of slaughtering operations. Seventy seven percent wash their hands with cold water and soap before start of work and (73%) butchers had undergone the regular medical checkup. Majority of the butchers washed the carcass thoroughly when it came in contact with faeces and intestinal contents. The Chi square test indicated the significant differences for all the factors except clear demarcation between dirty and clean area during slaughtering, separate room for handling offal's, good drainage system and for availability of cold and hot water for washing used utensils, floor after slaughtering.

Discussion
In the present study, majority of the butchers had acquired higher secondary level. The education status reflects the perception levels of the butcher which may further reflects

their hygienic practices while handling the meat. The present study has also shown below optimum level of butcher's education status and therefore, there is a need for creating the awareness among the butchers for implementing the various disease prevention and control measures. The hygienic practices in butcher shop were assessed by personal visit and the facilities like clean knives, good working slab, hot water, cold water, proper lighting, disinfectants, detergents and soaps were adequate. The sewage facilities, lairage, floor and its slope for proper drainage were inadequate which indicated poor hygienic environment observed in the butcher shop and therefore, indicative of poor meat quality. Using of protective clothing/equipment will reduce the level of contamination and will help in providing the quality meat. The protective clothing/equipments can act as a defence against the contaminants and protects butcher from meat borne diseases. Majority of the butchers were not sanitizing their clothes during the sale of the meat and no butcher was found were using gloves during the slaughtering. The similar results were also reported by Tunner and Madhvi, 2015 [5]. It was observed that few of the butchers were found consuming tobacco products before start of the work or during the work. Most of the butchers did not find spitting while slaughtering work (93.3%), wiping the hands with same cloth in between the work (73.3%), counting money in between work (73.3%), doing other work (40%). All these practices will reflect their poor awareness towards the personal hygiene and may increase the chance of microbial contamination (Alemu, 2014) [1]. Wiping hands with common cloths during the work is a dirty practices as revealed by the study carried out while Tebbut, (1986) [7] and also reported that whipping clothes were heavily contaminated with E. *coli* and Cl-perferingens. The study further indicates that there is a dire need to create awareness regarding the personal hygiene.

Conclusion
Majority of the retail meat shop lack many facilities which are utmost important for maintaining the quality of the meat. Personal hygiene was poorly maintained by the butchers because of the poor knowledge in producing the hygienic meat, unawareness, lack of facilities and nature of work. The present study concluded that improving the knowledge of the butchers through some trainings by veterinarian and medical health professionals from the government public health departments can provide a way for the production of clean meat and protecting the health of the consumers.

Acknowledgement

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