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EVALUATION OF MEAT PROCESSING KNOWLEDGE, ATTITUDE, AND PRACTICE WITH SOCIO-ECONOMIC CONDITION OF BUTCHERS

Md. Arafat Jaman[1*], Ayesha Khatun[2], Tahera Yeasmin[3] , Begum Fatema Zohara[1], Md. Faruk Islam[1]

[1]Department of Medicine Surgery & Obstetrics , Faculty of Veterinary & Animal Science; Hajee Mohammad Danesh Science and Technology University (HSTU), Dinajpur, Bangladesh. [2]Department of Animal Science and Nutrition, Faculty of Veterinary & Animal Science, Hajee Mohammad Danesh Science and Technology University, Dinajpur. [3]Department of Dairy and Poultry Science, Faculty of Veterinary & Animal Science ;Hajee Mohammad Danesh Science and Technology University (HSTU), Dinajpur, Bangladesh

Corresponding e-mail: arafatjaman.hstu@gmail.com

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ABSTRACT

The present research set out to assess Bangladesh's socioeconomic situation, meat processing knowledge, attitudes, and practices (KAP), and the state of the nation's butcher shops. The investigation of 200 butcher shops was carried out between June 2022 and July 2023 using an organized questionnaire. The interview schedule addressed the butchers' socioeconomic situation, the meat market's infrastructure, their educational attainment and other characteristics. Seventy two percent of butchers chose agriculture as their secondary career, 98% were men, and 16% were illiterate. Each week the percentage of slaughter animals with the highest ratio (1-2) was 49%, and the percentage of animals with the lowest ratio (>5) was 23%. The butchers incomes per month ranged between 30000 and 40000 (BDT), 34% had the highest proportion, and for those >40000 (BDT), 16% had the lowest. The roofs of the butcher shops were tin sheds (90%). The drainage system is an important issue for butcher shops, which were subdivided into no sewerage (45%), soil made (26%), cannel (15%), and concrete (14%). It was concerning to learn that 27% of butchers were aware of an antibiotic withdrawal period. The meat shop's biosecurity is currently appropriately managed to a 43% extent. 31% of butchers were knowledgeable about animal welfare and animal enjoyment. The negative effects of steroid use were known to 38% of butchers. Only 23 % of butchers knew about antibiotic resistance. In terms of meat handling and hygiene procedures, only 34% have training. The r_s value of knowledge of quality meat, known as diseased animals, known as life-threatening zoonotic diseases, parasitic infestation knowledge, environmental pollution concern, knowledge of the antibiotic withdrawal period, knowledge of animal welfare, knowledge of the harmful effects of steroid use, knowledge of microbial resistance, and training on meat handling negatively correlated with the educational level and had a significant ($p<0.01$) negative strongly ($r_s > 0.3$) relationship with the educational level. It indicates that the educational level increased with the improved awareness of knowledge about the health hazards of meat, which was significant ($p<0.01$). To solve current challenges, the government and the appropriate authority in the livestock industry should take necessary action.

Keywords: Butcher, socioeconomic situation, knowledge, biosecurity, livestock

Introduction

A meat marketing chain can be defined as the full range of activities required to bring a product (e.g., live cattle) to final consumers passing through the different phases of production, processing, and delivery. Only 2% of the farmers in the research sold their cattle directly to the marketplace; the majority sold to local dealers (70% to village traders, 15% to sub-district traders, 3% to district traders, 10% to other farms, and 2% to butchers). According to Patrick (2010), rather than selling their cattle to butchers directly, the majority of farmers in Bali and Lombok prefer to sell them to collectors, either on-farm or in a local market. According to Priyanti's (2012) research, live weight, body condition, breed, and sex all affected farm-gate cow prices. This suggests that price information about market demands is effectively transmitted. The sellers who were interviewed stated that the primary buyers of beef from the traditional market were restaurants, street vendors, homes, and companies that produced meatballs, in that order of significance. According to Priyanti and Putu (1999), wet markets control the majority of the beef industry and provide a tiny amount of the prime-grade meat

that restaurants and hotels need. Still, the majority of large hotels, eateries, and supermarkets would rather purchase their imported meat from meat distributors (Patrick *et al.* 2010). Beef cattle from neighboring provinces may travel through East Java before arriving in Jakarta as the major end-market, according to Deblitz *et al.* (2010). He noted in Hadi *et al.* (2002) that livestock are transported by land and sea from East Java to Jakarta. Farmers in West Nusa Tenggara have a tendency to sell and slaughter unhealthy cattle, as stated by Hermansyah and Mastur (2008). According to Alam *et al.* (2009), there were no government regulations pertaining to slaughterhouses that were followed there. The Bangladeshi government introduced the "Slaughterhouses Act 2011," a new law pertaining to animal slaughter and meat quality control, with the goal of improving meat safety through facility modernization. The slaughter of animals is a rather taboo topic; no one wants to know about it. noted anthropologist Noelle Vialles (Vialles 1994).

There isn't much information in the literature regarding the hygienic conditions and working conditions in Bangladesh's meat industry. Rahman (2001) claims that Bangladeshi livestock is treated carelessly during the handling of slaughtered animals. Large-scale slaughterhouses and meat processing facilities in emerging nations are not the same as those located in rural areas with smaller-scale slaughterhouses (Clottey 1985). From this point of view, the present study was undertaken to assess the present status of the beef markets in the selected Rangpur & Dinajpur district, to determine the meat processing knowledge, attitude, and practice (KAP) analysis of butchers and to evaluate the socioeconomic condition of butchers.

Materials and Methods

Study area: The investigation proceeded for an entire year, from June 2022 to July 2023. Interviews with butchers and slaughterhouse employees were conducted in Bangladesh's Dinajpur and Rangpur districts in order to acquire the information. The respondents were chosen to finalize passing through the different phases of production, processing, and delivery of meat. A randomly chosen respondent who worked in a meat shop was interviewed in each upazila.

Process of data collection: The survey was performed using socioeconomic and knowledge, attitude, and practice (KAP) data about meat processing that were gathered through in-person interviews and the observational synthesis of a common pre tested standard questionnaire. Data from respondents was collected through in-person interviews. The majority of the time, interviews were conducted at the respondents' houses and fields when they had free time. The observation of slaughterhouses and butcher shops was carefully done. Government livestock authorities were questioned during key informant interviews (KII). A total of 300 meat shop data points were collected.

Parameters studied: The socioeconomic standing of the butchers, the infrastructure of the meat market, the relationship between educational attainment, and other factors were all covered in the interview schedule. Identification of problems and recommendations during marketing.

Computing and statistical analysis of data: Descriptive analysis was done, like average and percentages as well as Spearman correlation coefficient (r_s) and level of significance through SPSS Statistics 25.0.

Spearman correlation coefficient is measured by following the formula,

$$r_s = 1 - \frac{6 \sum d_i^2}{n(n^2 - 1)}.$$

Where ,

- $d_i = \mathrm{rg}(X_i) - \mathrm{rg}(Y_i)$, is the difference between the two ranks of each observation.
- n is the number of observations

Results and Discussion

The socio-economic conditions of butchers were categorized into five distinct categories: level of education, sex, occupations other than beef trading, work experiences, and attendance at training on meat handling. The level of education of the butchers was classified into five groups: illiterate, primary, SSC, HSC, and above SSC, respectively.

The outcomes reveal that the highest proportion (55%) of the butchers studied at the primary level, followed by SSC (20%), illiterate (16%), HSC (7%), and 2% who had a level of education above the graduate level. The state of education is currently getting better in Bangladesh. About 80.5% of kids in 2017 finished their primary education, with 98% of them attending school. 59.6% of secondary school students nationwide and 50.5% of postsecondary students are enrolled in secondary education (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021). 98% of the butchers were male, and 72% of butchers had taken agriculture as their secondary occupation. The highest proportion of the butcher`s work experience was between 5 and 10 years. Smigic *et al.* (2016) discovered that the majority of the employees in a study on Serbian meat establishments had between two and eight years of work experience. Every week the ratio of slaughtered animals (1-2) with the highest percentage was 49%, and the one with the lowest percentage (>5) was 23%. The largest percentage of income (31000–40000 BDT) was 34%, while the lowest percentage (>40000 BDT) was 16%. Only 34% of those who attended training on meat handling found this study. Meat handlers gain more understanding from training programs (Ansari-Lari *et al.* 2010). Food borne illness prevention mostly depends on the training of meat workers (Nel *et al.* 2004, Shojaei *et al.* 2006). It is assumed that workers in slaughterhouses have received training (Nel *et al.* 2004).

In this study the infrastructure of the meat shop was divided into three broad categories (floor type, type of roof and drainage system) which were further sub divided into various parameters. Floor type was further classified into bricks, concrete and soil respectively. The highest ratio was bricks made floor (48%) and then concrete (35%) and soil (17%) respectively. The highest percentage of roofs of the shops were tin sheds (90%). As reported by Cook *et al*. (2017), in western Kenya, 72% of slaughterhouses had solid walls, 89% had cement floors, and 65% had roofs. The drainage System is an important issue for butcher shop which was sub divided into no sewerage (45%), soil made (26%), cannel (15%) and concrete (14%). According to research done in 2007 by Alam *et al.* (2009) and Mahendri *et al.* (2012), 40% of the slaughterhouses in

Table 1. Socio-economic characteristics of the butcher/seller in butcher shops

Parameters	Categories	Frequency	Percentage
Level of Education	Illiterate	32	16%
	Primary	110	55%
	SSC	40	20%
	HSC	14	7%
	Graduate &Over	4	2%
Sex	Male	196	98%
	Female	4	2%
Other occupations than beef trading	Agriculture	144	72%
	Business	56	28%
Work experiences	< 5 years	64	32%
	5–10 years	116	58%
	> 10 years	20	10%
Monthly income (BDT)	10000-20000	44	22
	21000-30000	56	28
	31000-40000	68	34
	40000<	32	16
Slaughter animal (Weekly)	1-2	98	49
	3-5	56	28
	>5	46	23
Attended training on meat handling	Yes	68	34%
	No	132	66%

the Gazipur area lacked suitable lighting, 40% had poor ventilation, and 50% lacked drainage facilities. Alam *et al.* (2020) found the same condition in Mymensingh and Gazipur in 2017. The necessary utilities that were found in the butcher shops were tabulated in Table 2. The water supply system was tube well (80%), pond (13%) and tap water (7%) respectively. Electricity supply was sub-divided into no electricity (63%), grid (35%) and non grid (2%). The waste disposal system of the meat shops was categorized into offer to dog (37%), pit (32%) and open field (31%). The exact process by which diseases spread from one animal to another and from humans to animals was hotly debated in the late 19th and early 20th centuries (Rosenkrantz, 1985).

Table 3 from this study reveals that 77% of butchers knew what quality meat was. Identified diseased animals—about 72% butchers. Slaughterhouses and meat markets disclosed that 10% of their operations involved the slaughtering of sick animals and the same results found by Cook *et al.* (2017). There were about 39% of butchers known to have life-threatening zoonotic diseases. This is an unacceptable situation that may lead to the spread of zoonotic diseases such as cysticercosis (Mann *et al.* 1983). In the study by Cook *et al.* (2017), just 34% of employees in slaughterhouses were aware of the zoonotic illness. Only 43% of butchers were aware of parasite infections. 36% of butchers were aware of the dangers of pollution. It was concerning to learn that 27% of butchers had knowledge of the antibiotic withdrawal period. The meat market's biosecurity is only properly maintained in 43% of its areas. 31% of butchers were knowledgeable about animal welfare and enjoyed it. 38% of butchers knew that using steroids had negative effects. The fact that only 23% of butchers were aware of antibiotic resistance was a very dangerous incidence. Only 34% of people received training on hygienic methods for handling meat. Both theories have traditionally been applied to federal meat inspection legislation, such as the Meat Inspection Acts of 1891 and 1906 [Kolko, (1963), FAO (CAC/RCP 58-2005)]. Legal authorities have set criteria that farmers must go by in order to guarantee the quality of their beef (Murphy *et al.* 2014).

Table 2. Infrastructure of meat shop

Parameters	Categories	Frequency	Percentage
Floor Type	Bricks	96	48%
	Concrete	70	35%
	Soil	34	17%
Type of Roof	Building	18	9%
	Straw made	2	1%
	Tin shed	180	90%
Drainage System	Cannel	30	15%
	Concrete	28	14%
	No sewerage	90	45%
	Soil made	52	26%
Water Supply	Pond	26	13%
	Tap water	14	7%
	Tube well	160	80%
Electricity	Grid	70	35%
	No electricity	126	63%
	Non grid	4	2%
Waste Disposal system	Offer to dog	74	37%
	Open field	62	31%
	Pit	64	32%

Table 3. Correlation between the Educational Level and other variables

Parameter	Categories	% of farmers	Spearman correlation coefficient (r_s)	Level of sig.
Knowledge of quality meat	Yes	77	-.766**	**
	No	23		
Known as diseased animal	Yes	72	-.850**	**
	No	28		
Known as life threating zoonotic diseases	Yes	39	-.644**	**
	No	61		
Parasitic infestation knowledge	Yes	43	-.652**	**
	No	57		
Environmental pollution concern	Yes	36	-.404**	**
	No	64		
Knowledge Antibiotic Withdraw period	Yes	27	-.642**	**
	No	73		
Biosecurity Maintain	Yes	43	-.654**	**
	No	57		
Knowledge of Animal Welfare	Yes	31	-.636**	**
	No	69		
Knowledge of Harmful effect of steroid use	Yes	38	-.642**	**
	No	62		
Knowledge of Antimicrobial Resistance	Yes	23	-.652**	**
	No	77		
Training on meat handling	Yes	34	-.637**	**
	No	66		

$r_{s,}$=Spearman correlation coefficient; NS, Non-significant ($p>0.05$); *= $p<0.05$, **= $p<0.01$

The r_s value of knowledge of quality meat, known as diseased animals, known as life-threatening zoonotic diseases, parasitic infestation knowledge, environmental pollution concern, knowledge of the antibiotic withdrawal period, knowledge of animal welfare, knowledge of the harmful effects of steroid use, knowledge of microbial resistance, and training on meat handling negatively correlated with the educational level and had a significant ($p<0.01$) negative relationship with the educational level. The r_s value of all parameters had a negative correlation but was strongly ($r_s > 0.3$) correlated (Table 3), which was significant ($p<0.01$). Here we can say that poor educational level and biosecurity are more suspected of using illegal ways to increase the risk of public health. It indicates that the educational level increased with the improved awareness of knowledge about the health hazards of meat, which was significant ($p<0.01$).

Conclusion

The goal of the current study was to determine the current state of the beef markets and the quality of the beef in the Dinajpur and Rangpur district of Bangladesh. This experiment was carried out to assess the state of the market using a survey. The outcome showed that the state and quality of the beef market are related to a number of internal and external factors. It is acceptable to use hygienic procedures while processing and management raw beef in order to manage dangerous bacteria that could endanger public health. To address present issues, the government and the appropriate livestock sector authorities have to step up.

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