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Research Paper

Meat Production Practices in Slaughterhouse and Retail Meat Shops in Bareilly District of Uttar Pradesh

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ABSTRACT

The present study was taken up in Bareilly district of Uttar Pradesh to analyze the meat processing and production practices in the slaughter houses and retail meat shops. Twenty butchers of large animal slaughterhouse (LAS), ten butchers of small animal slaughterhouse (SAS) and thirty meat retailers were randomly selected for the study. Results of the study revealed that majority of butchers were illiterate, with 5 to 15 years of experience, medium work load and without formal training. Various factors for unhygienic meat production include social backwardness, low income, poor personal hygiene, and poor state of existing buildings of LAS and SAS. Retail meat shops lacked essential facilities. Majority of meat handlers were unaware to the public health hazards due to unhygienic meat. The study reveals that there is an urgent need of creating awareness among all the stakeholders of meat production viz. livestock owners, butchers and retailers regarding meat hygiene and associated health hazards.

Key words: *Meat production, slaughterhouse, butchers, retail meat shops.*

INTRODUCTION

Mutual dependence of man and livestock is age old on this planet and in India livestock can be considered as the backbone of its rural economy in terms of income, employment, social/gender equity, agricultural sustainability, and diversification and foreign exchange earnings. According to APEDA (2010) India's exports of animal products have increased from Rs. 5129.27 crores in 2007-08 to Rs 6913.11 crores in 2008-09. India's export of buffalo meat products has been increased from Rs. 3549.78 crores in 2007-08 to Rs. 4839.71 crores in 2008-09. The export of sheep/goat meat products has also increased from Rs. 134.10 crores in 2007-08 to Rs 493.37 crores in 2008-09. According to minutes of the meeting of the technical committee of direction for improvement of animal husbandry and dairying statistics (CSO 2010), in the year 2009-10, Uttar Pradesh alone contributed to 12.4% (0.5 million ton) of meat production. Currently, UP stands first in India, as far as milk and meat production is concerned. (ict.agri.net.in). During last two decades, the meat production has increased three folds in the state. Hence, animal husbandry sector is contributing a significant amount in state as well as national GDP.

In many developing countries, lack of appropriate slaughtering facilities and unsatisfactory slaughtering techniques are causing unnecessary losses of meat as well as invaluable by-products from animal carcasses (Joshi *et al.* 2003). There are two types of slaughterhouses operating in the country, organized and unorganized. India has 3600 registered slaughter houses under local bodies, yet most of them are highly ill managed, unhygienic and overcrowded (Padda and Thind 2002). The infrastructure facilities for hygienic slaughter and processing of meat are not adequate to meet the minimum standards of hygiene (Das *et al.* 2006).

Further, globally, food-borne illness is a growing public health problem because of the increasing global trade in food, changes in the way food is produced and changes in consumer requirements.

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These changing patterns cause new challenges in the way of food safety management. About 75 percent of the new communicable diseases that have affected humans over the past 10 years have been caused by pathogens originating from an animal or from products of animal origin. It is observed that along with meat, water used for meat processing also carries some diseases (Campylobacteriosis, Amoebiasis, Ascariasis etc.) to human beings during unhygienic handling of meat and its products particularly in unorganized sector in developing countries like India (Pal 1997). Keeping above points in view the present study was conducted to assess the meat production practices in the slaughter houses and retail meat shops in Bareilly district of Uttar Pradesh.

MATERIALS AND METHODS

Twenty butchers from the large animal slaughter house ten butchers from the small animal slaughter house and thirty retailers of Bareilly district were selected randomly to study their awareness regarding meat associated zoonotic diseases. The following parameters were selected for the study, *i.e*. supply chain of meat, socio-personal profile of butchers and meat retailers, educational profile, income profile, work and work load, meat production practices at large and small animal slaughter houses.

RESULTS AND DISCUSSIONS

The supply chain of meat and meat products include butchers, retailers and consumers. The butchers are the primary and critical unit of the value chain. In the demand driven economy there is increased demand of hygienic meat by consumers as the final unit of chain. Retailers are the middle man of the chain involved in processing and handling of meat products.

Socio-personal profile of butchers & meat retailers*:* As the primary unit of the supply chain of meat and meat products, butchers are critical for hygienic meat production. Cent percent respondents of all the three groups viz. butchers of LAS and SAS and retailers were male. This clearly indicates the dominance of male in this business. The results indicate that butchers of both LAS and SAS belong to other backward castes while 6.66 percent of retailers belong to general castes. During the course of investigation it was reported that slaughtering and meat retailing is the traditional occupation of Quereshi community and they are engaged in this profession for securing their livelihood as well as continuing this tradition.

Educational profile*:* Present study reveals that majority (40%) of meat handlers were illiterate. Further, analysis unveils that majority (45%) of butchers of LAS were illiterate, while 40 percent butchers of SAS were illiterate and the lowest percentage of illiterates were from retailers (36.67%). None of the butchers of both LAS and SAS had education above middle school, whereas 13.33 percent of retailers had high school education. It is concluded that penetration of education among the meat handlers is very unsatisfactory considering public health significance associated with their work.

Annual earnings from meat slaughtering *:* Majority (51.67%) of respondents were earning low income between Rs. 51,000 to Rs. 75,000 annually, while 30 percent earned Rs. 15,000 to Rs. 50,000 and 18.33 percent earned more than Rs. 75,000 from their respective profession. Only 36.67 percent meat retailers were able to earn more than Rs. 75,000 annually from their profession.

Work experience and work load*:* Majority (60%) of butchers of LAS had less than 5 years of experience while majority of both butchers of SAS and retailers (60% and 53.33% respectively) had 5 to 15 years of experience of their work. Majority (100%) of butchers of SAS had low workload whereas majority (80% and 60% respectively) of butchers of LAS and meat retailers had medium workload. It was observed during this study that butchery work was more labour intensive while meat retailing was skill oriented. Otupiri *et al.* (2000) carried out a study to explore the nature of the knowledge, attitude and practices of butchers who operate at Kumasi

slaughterhouse in Ghana. The study was largely descriptive, employing qualitative methods and tools. Butchers were interviewed and their practices along the production line observed. They reported that knowledge, attitudes, practices and beliefs of the butchers are largely inadequate for their profession in view of the important public health role that butchers play.

Meat production practices of large animal slaughterhouse: Transport of animals to be slaughtered was not carried out properly. Animals were fatigued and soiled with faecal material, which had an adverse impact on the safety and suitability of meat from them. The transport vehicles were not well designed and maintained for safe and efficient loading, unloading and transportation which posed great risk of injury and stress. In LAS, no competent person undertaking ante-mortem inspection was noticed. The animals presented for slaughter were not sufficiently clean, thus hygienic slaughter and dressing were compromised due to this.

Slaughtering means putting the food animals to death and thereafter preparing the carcasses for human consumption. Slaughter of animals at LAS was carried out by Halal method. There was no standard method of bringing the animal to the floor for slaughter. In LAS, the slaughtering and dressing of animals were carried out in slaughterhalls as well as open campus of slaughterhouse without restraining them properly. The animals were slaughtered in front of other animals causing great fear in them. Sometimes the animal necks were turned, other times they were roped and pulled down and sometimes the animals were simply slammed to the ground. Because of the paucity of space in slaughter halls of LAS, the space between two animals was minimum and thus, while grounding, animal fell on next animal and it was soiled with spilling water. Butchers used to bring even more than 10 animals at a time and slaughter them one after another. The animals roamed freely before slaughter and generally walked on cut meat creating great concern to hygienic meat production. Even butchers and other workers moved freely over carcasses without caring for the slightest hygienic measures.

The blood collection was not done after slaughtering and most of blood was wasted causing pollution. Blood of the animals, which can be collected for effective utilization was thus lost. Due to lack of means and tools to hang the carcass for dehiding in LAS it was carried on the floor itself, which caused contamination of the meat. The hides were left spread on the floor of the slaughter area after cut meat was transported and it attracted birds and dogs. Similarly, legs, bones, hooves, etc. were not removed immediately from the slaughter area.

Evisceration is the process of removing viscera from the carcass and this particular process during slaughtering generates maximum amount of waste. During the course of study it was witnessed by the researcher that butchers at LAS did not care for preventing the intestines from puncturing during evisceration which lead to contamination of carcass. More over they threw the visceral content nearby the carcass which was totally unacceptable from the hygiene point of view. A look at the accumulated visceral content was most appalling and the foul odour coming from it was most offensive.

Carcasses were not inspected by competent person for quality and safety in LAS. After evisceration, buffalo carcasses in LAS were cut in two parts and carried over from place of slaughter to a platform for sale by slaughterhouse workers. The cut carcasses were further reduced in size for convenient transportation by meat retailers. The platform on which the cut carcasses were placed was full of blood clots and dirt. Workers, birds, dogs and meat retailers moved freely on platform. In addition to all these incidences, dogs and birds were observed devouring on open carcasses in full view of workers, retailers and others present there. All these gross discrepancies in hygienic meat production were so much embedded in daily routine of butchers, slaughterhouse workers and others that they never evoked any alarm among them. All the activities related to slaughtering, dressing and presenting the cut carcasses for sale

at LAS presented a story of negligence of hygiene during meat production, which put the public health issue under a gigantic question mark. It can be concluded from the results that in the LAS a number of unacceptable practices in terms of ethics, animal welfare, public health and hygiene are being carried out and appropriate measures are required to check the unethical practices inside LAS.

Meat production practices at small animal slaughterhouse (SAS)*:* A veterinarian, one clerk, four peons and one gatekeeper work at SAS to maintain day to day activity of the slaughterhouse. The slaughter work started at 5.00 AM on most of the days and was carried out till 8.00 AM to 9.00 AM based on demand for meat on that day. A slaughter fee of Rs. 25 per animal was charged by Bareilly Nagar Nigam. The maintenance of slaughterhouse premises was entrusted with Nagar Nigam.

The small animal slaughterhouse (SAS) was the place for slaughter of goats and sheep. Animals were brought to the slaughterhouse either by driving on hoof or using some vehicles viz. rickshaw, three wheeler etc. An animal market operated on the road leading to SAS was also frequently used by retailers to acquire animals. In SAS also, animals were slaughtered by Halal method. The bleeding operation was carried out by experienced butcher on the animal grounded on slaughter hall floor, by severing all blood vessels of neck and passages oesophagus and trachea.

To avoid contamination of the carcass through accidental cuts or punctures of the stomach and intestines, simple but well-directed steps should be followed but care was not exercised to avoid puncturing the intestines by many butchers in SAS. The first step in evisceration was to cut around the bung or rectum and free it completely from all attachments and drop it out of the pelvic cavity, but butchers did not followed the procedure of tying the bung and the cut end of the oesophagus which contaminated the carcasses. The body cavity was entered into to sever the ureter connections to the kidneys while the intestines were loosened up further, then the stomach and intestinal mass (also known as the paunch) were pushed slightly out of the midline opening. The final stage in evisceration was the removal of the contents of the chest cavity. By cutting the thin muscle sheet or diaphragm separating this cavity from the belly, the pluck (*i.e.* heart, lungs, trachea and oesophagus) were pulled out as a unit. The pluck was not hung on a hook instead it was placed on floor itself. Paunches were also dropped on floor. Scientifically the stomachs and intestines should not be opened while carcasses dressing is in operation as such a move can easily cause contamination of the meat, but it was observed that butchers were frequently doing it. It was veterinarian's duty to examine the slaughter products for evidence of disease and abnormality and eliminate them from the public meat supply, but inspection was normally not carried out by him. Meat was preferred warm, in the freshly slaughtered state; hence it was delivered to markets soon after dressing. By choice, therefore SAS had no need for cold storage and are thus not provided for it in the design. Butchers hence tailored their supplies to the daily needs of the community and surpluses hardly occur.

Apart from the carcass, other edible meat included red offals (liver, kidney and heart), grey offals (stomach, intestine, lungs and spleen) and dark offals (head and feet). Stomach and intestines were emptied and sold on the site of dressing itself. The dark variety (head, feet) were also inside the SAS premises. Blood was flushed into effluents and under normal conditions of slaughter does not constitute a by-product, but waste.

Next to the animal, equipment and methods of operation, the personal hygiene of the butchers is the most singularly important factor in slaughter operations, the reason being that the contamination of meat and disease transmission depend equally on the human element as well as on the tools and methods of operation. Individuals assigned to slaughter services must be of sound health and of good personal habits. People who were sick or with boils and sores were also seen working in SAS. They were never examined for their health condition. Some

butchers habitually exhibited unhygienic habits like spitting, nose-blowing and coughing. Joshi *et al.* (2003) reported that meat quality is adversely affected by careless handling conditions in the slaughtering places as well as in the meat markets or shops. He emphasized that the programmes should be instituted with strong focus on prevention and control of meat-borne diseases to reduce infection risk of consumers and meat handlers and to avoid contamination of the environment.

Cleanliness and waste disposal at retail meat shops: The retail meat shops should maintain sufficient cleanliness and have protection from direct sun, dust and wind. Retailers (86.67 percent) got their shop cleaned at the beginning of day's operations while 60 percent also cleaned the shop during the day's operations and 40 percent at the conclusion of day's operations also. The cleaning practice was not very effective, and timing of cleaning was flexible. It was noticed that different furniture, instruments and settings were not cleaned regularly. In all the shops meat cutting instruments were cleaned, while floors were cleaned in 80 percent of shops. Benches, walls and doors were cleaned in 13.33 percent, 13.33 percent and 6.67 percent of shops respectively. They paid least attention towards cleaning of surrounding of their shops and overall picture of shops with their surrounding was gloomy. Handling of liquid and solid waste influences both hygiene and general aesthetic appearance of the retail meat shops. Only 26.67 percent of the retail meat shops were maintaining good system of waste disposal. Troeger (2003) recommended focusing on good hygiene practice (GHP) as standardized measures for production and processing of safe, high quality meat products.

Personal hygiene of meat retailers: Personal hygiene of those who come directly or indirectly into contact with meat is prerequisite and an important component of meat hygiene. Meat retailers are required to maintain a high degree of personal cleanliness and where appropriate, wear suitable protective clothing, head covering and footwear. Cuts and wounds should be covered by suitable waterproof dressings. The study reveals that majority of respondents did lack in one or more aspects. Only 20 percent of meat retailers wore clean clothes. It was observed that head covering (60%) was a good practice followed by meat retailers as per their Islamic law related to slaughter of animals and sale of meat. It was reported that meat retailers washed their hands before work (56.66%), after visiting toilet (100%), after meat handling (6.66%) and after touching other contaminated objects (60%). Sixty percent of meat retailers were wearing rings. Little *et al.* (1999) investigated 212 environmental samples from 105 halal butcher premises in London and reported that no personnel of 85 premises had received meat hygiene training.

CONCLUSION

Present study reveals the various facets of the prevailing meat production practices in the slaughter houses and retail shops. Social backwardness, low income, poor personal hygiene, poor state of existing buildings of LAS and SAS emerged as the major constraint in hygienic meat production. Instant need of up-gradation of the slaughter houses is felt in meat industry and business environment to meet out the demand of the quality meat. Further, the inspection of the retail meat shops also needs to be strictly done to assess that they follow hygienic meat production.

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