



# Knowledge of chicken retail entrepreneurs on hygienic slaughtering practices in municipal areas of Kerala<sup>#</sup>

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## Abstract

An assessment on knowledge of hygienic slaughtering practices in selected municipal corporations of Kerala was carried out. Thirty chicken retail entrepreneurs from each three selected municipal corporations of Kerala to a total of 90 were randomly selected for the study. Analysis of data revealed that 26.7 per cent of the respondents had high level of knowledge, 44.4 per cent had moderate level of knowledge and 26.9 per cent had low level of knowledge in hygienic meat processing. The respondents had more knowledge on scientific waste disposal and packaging processes and least knowledge in environmental hygiene in and around the meat stall. This demonstrates that a tailored training program is critical in the knowledge of hygiene slaughtering practices of chicken retail entrepreneurs in Kerala.

**Keywords:** Hygiene, municipal corporation, retail chicken meat stall entrepreneurs

A significant proportion of the population in Kerala state, India is non-vegetarian, embracing meat, fish, and other animal products which are important components of their dietary staples. Poultry meat, in particular, holds a dominant position in the hearts and plates of Keralites, mainly due to its absence of religious taboos. This preference for poultry accounts for a substantial 35 per cent contribution to Kerala's meat consumption (GOK, 2021). Fresh meat, readily available at retail meat stalls, remains the preferred choice among non-vegetarians. Meat stalls sell meat on daily, weekly and seasonal basis. Chicken meat stalls are running on daily basis to meet the demands

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of the population. However, this surge in meat production and consumption raises concerns about hygiene. Meat stalls often operate in unhygienic open spaces, where carcasses are displayed in full view of the public (GOK, 2021). This context necessitates urgent attention for modernising the scientific infrastructure of slaughter operations, promoting value addition, and enhancing human resource development to ensure the availability of adequately trained personnel in the sector. The current study seeks to address these pressing issues by examining the knowledge of scientific and hygienic meat production practices among butchers in selected municipal corporations of Kerala so as to get an overall idea of their behavioural traits.

### Materials and methods

The study was conducted among chicken retail entrepreneurs. A chicken retail entrepreneur is he who starts a business in the poultry industry and sells fresh cut chicken on daily basis. Total of 90 chicken retail meat stalls were selected from three municipal corporations of Kerala viz., Thiruvananthapuram, Ernakulam and Kozhikode based on highest human population. *Ex post facto* research design was followed in this study. From each corporation, official source lists of chicken retail meat stalls from authorities were collected. Out of the total stalls, 30 chicken retail meat stalls were selected from each municipal corporation by simple random sampling, and thus a total of 90 chicken retail entrepreneurs from the three municipal corporations were selected as the respondents of the study. Data were collected using pretested structured interview schedule which was constructed based on the discussion with experts and relevancy testing with judges. After relevancy testing, the statements obtained were further taken for knowledge test and the reliability coefficient was 0.90 and it showed high internal consistency. This was administered to 90 chicken retail entrepreneurs from the three municipal corporations. The collected data were statistically analysed using the software: Statistical Package for the Social Science (SPSS). Frequencies, percentage, mean and mean of means were worked out for proper interpretation.

### Results and discussion

#### *Knowledge of chicken retail entrepreneurs on personal hygiene*

The present study exhibits that among the various items under the personal hygiene of fresh chicken retail entrepreneurs in the meat stall, “person with trimmed nails should only be permitted to handle meat”, was a good practice (MS 0.96) and was ranked first; next practices in the decreasing order of ranking were “picking of nose should not be done in meat stall” (MS 0.95), “cover and sneeze away from the meat processing area” (MS 0.93), “washing hands before starting work” (MS 0.93), “apron is mandatory in the meat stall” (0.91), “cover the cuts and wounds with bandage or gloves in the meat stall” (MS 0.85), “head should be covered in meat stall” (MS 0.75) and “gloves should be used while handling meat” (MS 0.54). It was further evident that respondents were also aware about some facts like “tobacco should not use while handling meat” (MS 0.47) followed by “cigarettes should not used while handling meat” (MS 0.4), “money should not be used while handling and processing meat” (MS 0.31), “rubbing of eyes cannot be done in meat stall” (MS 0.3), “wash hands after using washroom” (MS 0.22), “jewellery should not be used in the meat stall” (MS 0.17), “mobile phones should not be handled during meat processing” (MS 0.15), “awareness about the occupational hazards or disease that spread from chicken” (MS 0.12) and that “meat handlers should undergo annual medical examination” (MS 0.06).

Most of the respondents were aware of the fact that persons who reported working in the meat stall should trim their nails which is in sharp contrast to the findings of Asare (2020) who observed that majority of butchers were unaware of the fact that that keeping long nails compromised hygienic standards during meat handling. In the present study, good portion of chicken retail entrepreneurs also knew that it was mandatory to use an apron and to cover head with a cap. Most of the respondents were uncomfortable with using gloves due to fear of damage when in contact with water. Gebeyehu and Tsegaye (2022) also reported that majority of abattoir and butcher shop workers knew

**Table 1.** Distribution of chicken retail entrepreneurs based on their knowledge about personal hygiene

Sl. No	Statements	Answers	Mean score	Rank
1	Handling meat with trimmed nails is a good hygiene practice	True/false	0.96	1
2	Do you agree picking of nose can be done in the meat stall?	Agree/Disagree	0.95	2
3	Is it necessary to cover and sneeze away from meat processing area?	Yes/No	0.93	3
4	Washing hand before starting work is a good hygiene practice	True/false	0.93	3
5	Is it necessary to use an apron in the meat stall?	Yes/No	0.91	5
6	Do you agree that it is necessary to cover the cuts and wounds of workers with bandage or gloves in the meat stall?	Agree/Disagree	0.85	6
7	Head should be covered in the meat stall	True/false	0.75	7
8	Gloves should be used in the meat stall	True/false	0.54	8
9	Consumption of tobacco inside the meat stall	True/false	0.47	9
10	Smoking of cigarettes can be done inside the meat stall	True/false	0.4	10
11	Money can be handled during meat processing	True/false	0.31	11
12	Do you agree that rubbing of eyes can be done in the meat stall?	Agree/Disagree	0.3	12
13	Hands should be washed after using washroom	True/false	0.22	13
14	Wearing jewellery inside the meat stall	True/false	0.17	14
15	Handling of mobile phones in the meat stall	True/false	0.15	15
16	Do you know about the occupational hazards/diseases from chicken?	Yes/No	0.12	16
17	Do you know that meat handlers should undergo medical examination annually?	Yes/No	0.06	17

that head-cover, gowns and gloves should be used for prevention of meat contamination. Similarly, Al Banna *et al.* (2021) also reported that majority of butchers had high knowledge about using gloves, caps and aprons. Both the results were similar to the findings of this study.

Majority of the respondents knew that it was necessary to cover cuts and wounds with bandage gloves in meat stall. Study by Tegegne and Phyo (2017) also agreed with the present study that respondents knew that person with wounds, bruises or injuries on their hands must not touch or handle meat. Only few of the respondents in this study knew that hands should be washed after using washroom and this was in disagreement with the findings of Adesokan and Raji (2014) who reported that 78.2 per cent respondents knew that hands should be washed after using toilets.

In the present study it was also noted that chicken retail entrepreneurs did not know that jewellery should not be worn inside the meat stall. This finding was not in agreement with that of Tegegne and Phyo (2017) who reported that majority of respondents studied knew that personal stuffs such as watches, rings and jewellery should be removed during meat processing. Jewellery is a potential source of micro-organisms, because the skin under the jewellery provided a favourable habitat for contaminating microorganisms to proliferate (Trickett, 1997). A good response was received from chicken retail entrepreneur who were aware that one should cover and sneeze away from meat processing area. They were aware that using mobile phones and handling money led to spread of diseases related with meat processing and consumption. A large number of respondents of this study were not aware

about the occupational hazards in this area and this was in agreement with the findings of Gebeyehu and Tsegaye (2022) and Islam *et al.* (2022) and they stated that majority of the abattoir workers were not aware about the occupational hazards. Lack of knowledge about zoonotic diseases and occupational dangers will undoubtedly put chicken retail entrepreneurs at risk for contracting those illnesses and hazards. In order to protect the public health from serious sickness, there is a need to improve communication between veterinary and human health care professionals through awareness campaigns and there also has to be attempts to design and execute capacity development programmes.

***Knowledge of chicken retail entrepreneurs on maintenance of environmental hygiene in and around the meat stall***

It was found that on item wise analysis majority of the fresh chicken retail entrepreneurs were aware that the entry of stray animals to meat stall should be avoided (MS 0.98) as a part of environmental hygiene in and around the fresh chicken retail entrepreneur and this item was ranked first followed by items in decreasing rank order – “the drainage should be properly covered” (MS 0.93), “nylon /wooden cutting surface should be cleaned before starting work” (MS 0.32), “stainless steel table and utensil should be used for meat processing” (MS 0.16), “partition of hygienic and unhygienic area with wall”, “necessity of insectocuter in meat stall” and “washing of premises of meat stall daily with detergents and sanitizers” (MS 0.13). “Cleaning weighing machine regularly in the meat stall” (MS 0.11), “usage of sterilised and cleaned knives in the meat stall” (MS 0.1) and “separate dress changing room for staff in the meat stall” (MS 0.01) were lesser-known components.

Miner *et al.* (2020) reported that a large percentage of respondents in their study knew that proper cleaning and handling of instruments, utensils, daily washing of working area, regular medical checkups can reduce the chance of transmission of certain diseases.

It is interesting to note that almost all the respondents in this study knew that proper

fencing of meat stall was essential to avoid stray animals and that it was mandatory to cover the drains. However, they could not afford this due to lack of financial resources. Chicken retail entrepreneurs opined that they did not know that the cutting surfaces should be washed every day, instead they scraped the wooden surfaces everyday with knife for cleaning.

The above findings clearly indicate the need for creating awareness that scarping surfaces of cutting areas was not a cleaning method as it would not completely wash out remaining part of flesh that would stick on the cutting surface. These entrepreneurs sharpened their knives everyday with files under the false impression that this was the better way of cleaning knives when compared to sterilising the knives.

***Knowledge of chicken retail entrepreneurs on pre-slaughter processes***

Data revealed that most of the fresh chicken retail entrepreneurs knew that an isolation room was necessary for disease or disease suspected chicken as well as separate the diseased and disease suspected chicken from the healthy ones and this was ranked first among the knowledge on pre-slaughter knowledge with a mean score of 0.87 MS. This was followed by items like “cleaning of crates and removing droppings regularly is a required process” (MS 0.55), “unawareness about the feed withdrawal time and water withdrawal time” (MS 0.44) and “the correct frequency for cleaning the holding /assembling area” (MS 0.11) in decreasing order of ranking.

It was worthwhile to note that most of the entrepreneurs knew that isolation rooms were needed for the diseased and disease suspected chicken. Venkata *et al.* (2019) and Islam *et al.* (2022) reported in their study that butchers were aware that healthy birds should be selected and that this was a critical pre-requisite for hygienic meat production. Almost all the respondents were unaware about how many hours before slaughter, should feed and water should be withdrawn for animals. This awareness practice should be promoted and encouraged to avoid bacterial contamination at the time of viscera removal.

**Table 2.** Distribution of chicken retail entrepreneurs based on their knowledge about maintenance of environmental hygiene in and around the meat stall

Sl. No.	Item	Answers	Mean score	Rank
1	Do you agree that entry of stray animals inside the meat stall should be avoided?	Agree/Disagree	0.98	1
2	Properly covered drainage system should be there in the meat stall	True/false	0.93	2
3	Nylon /wooden cutting surfaces should be cleaned before starting work in the meat stall	True/false	0.32	3
4	Is it necessary to use stainless steel table and utensils for meat processing?	Yes/No	0.16	4
5	Do you agree that separation of clean and unhygienic area with a partition is essential in a meat stall	Agree/Disagree	0.13	5
6	Do you agree that an insectocutor is needed in the meat stall?	Agree/Disagree	0.13	5
7	Do you agree that the premises of meat stall should be washed with appropriate detergents and sanitizers daily?	Agree/Disagree	0.13	5
8	Weighing machine should be cleaned before starting work and whenever necessary	True/false	0.11	8
9	Cleaned and sterilised knife should be used during slaughter	True/false	0.1	9
10	Do you agree that separate dress changing rooms for staff in the meat stall is necessary?	Yes/No	0.01	10

**Table 3.** Distribution of chicken retail entrepreneurs based on their knowledge about pre-slaughter processes

Sl. No.	Item	Answers	Mean score	Rank
1	Do you agree that having an isolation room for diseased or disease suspected chicken is necessary?	Agree/Disagree	0.87	1
2	Is it necessary to separate the diseased and disease suspected chicken from healthy ones?	Yes/No	0.87	1
3	Is it necessary to clean the crates and remove droppings regularly?	Yes/No	0.55	3
4	How many hours before the slaughtering of chicken the feed should be withdrawn?	<ul style="list-style-type: none"> <li>• 1-2 hours</li> <li>• 12-24 hours</li> <li>• 8-12 hours</li> <li>• 6-8 hours</li> </ul>	0.44	4
5	How many hours before the slaughtering of chicken the water should be withdrawn?	<ul style="list-style-type: none"> <li>• 1-2 hours</li> <li>• 12-24 hours</li> <li>• 8-12 hours</li> <li>• 6-8 hours</li> </ul>	0.44	4
6	How frequently do you clean the holding/assembling area?	<ul style="list-style-type: none"> <li>• Daily</li> <li>• Once in two days</li> <li>• Weekly other</li> </ul>	0.11	6

### **Knowledge of chicken retail entrepreneurs on slaughter processes**

This study showed that major portion of fresh chicken retail entrepreneurs knew that “hands should be washed after each slaughter” (MS

0.67) and it ranked first followed by items like “sterilising knife after each sticking and evisceration” (MS 0.6) and “knowledge on stunning process” (MS 0.1) in decreasing rank order.

**Table 4.** Distribution of chicken retail entrepreneurs based on their knowledge about slaughter processes

Sl. No.	Item	Answers	Mean score	Rank
1	Washing hands after each slaughter	True/false	0.67	1
2	Sterilising knife after each sticking and evisceration is a good practice	True/false	0.6	2
3	Do you know the stunning process?	Yes/No	0.1	3

Retail fresh chicken entrepreneurs in this study knew that hand washing could reduce the risk of spread of pathogens and this was in agreement with the findings of Adzitey *et al.* (2020) who reported that all respondents of their study were aware about washing hands before work.

#### **Knowledge of chicken retail entrepreneurs on post-slaughter processes**

Data depicts that good number of the fresh chicken retail entrepreneurs were aware that “the carcass should be checked for bruises and other lesions” (MS 0.88) and “consequences of piling of birds on dressing table” (MS 0.63).

Entrepreneurs in this study were well aware that it was necessary to check the

carcass for any bruises and lesions, as the consumers would refuse damaged flesh. Very few chicken retail entrepreneurs were aware of piling of birds on the dressing table. The piling of birds on the dressing table would affect the flesh damaged without heat dissipation.

#### **Knowledge of chicken retail entrepreneurs on scientific waste disposal**

The item “dustbin with lid should be placed in meat stall for waste disposal” (MS 1) was ranked first followed by “the correct techniques of waste disposal” (MS 0.94).

All the respondents were aware that a lid should be placed over the waste bin. Almost all entrepreneurs were aware of scientific waste disposal such as rendering, anaerobic or aerobic composting, incineration, collection

**Table 5.** Distribution of chicken retail entrepreneurs based on their knowledge about post-slaughter processes

Sl. No.	Item	Answers	Mean score	Rank
1	Checking of carcass for any bruises and other lesions is necessary	Yes/No	0.88	1
2	Piling of birds on the dressing table	True/false	0.63	2

**Table 6.** Distribution of chicken retail entrepreneurs based on their knowledge about scientific waste disposal

Sl. No.	Item	Answers	Mean score	Rank
1	Dustbin with lid should be placed for waste disposal in meat stall	True/false	1	1
2	What are the techniques used for disposal of waste?	<ul style="list-style-type: none"> <li>▶ Rendering</li> <li>▶ Anaerobic or aerobic composting</li> <li>▶ Collection of waste by municipal corporation or others</li> <li>▶ Incineration</li> </ul>	0.94	2

**Table 7.** Distribution of chicken retail entrepreneurs based on their knowledge about packaging processes

Sl. No.	Item	Answers	Mean score	Rank
1	Packaging covers should be stored properly from rodents and pest	True/false	1	1
2	Only virgin packaging materials should be used for packing meat	True/false	0.94	2

of waste by municipal corporations or others and generally this was the job of municipalities and other agencies. According to the study of Mathew *et al.* (2022), poultry slaughter waste also could be utilised for making live feeds for birds by producing the larvae through nutrient cycling of poultry slaughter waste.

#### **Knowledge of chicken retail entrepreneurs on packaging processes**

Fresh chicken retail entrepreneurs knew about protection of the packaging covers from rodents and pest (MS 1) and it ranked first followed in rank order by awareness on using virgin packing materials for meat packing (MS 0.94).

It was noted that respondents also knew that packaging materials must be protected and that only virgin packaging materials should be used.

#### **Conclusion**

The knowledge level of chicken retail entrepreneurs was very low. This shows that a tailor-made training programme is very essential to develop knowledge of scientific and hygiene production practice among fresh chicken retail entrepreneurs in Kerala. The training programmes must include the topic on capacity development programme which is to be designed and executed based on the study of the chicken retail entrepreneurs of Kerala.

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