

## **ANALYSIS OF HYGIENE AND SANITATION IN CHICKEN SLAUGHTERHOUSES IN JAMPANG VILLAGE, BOGOR REGENCY, WEST JAVA PROVINCE, INDONESIA**

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### **ABSTRACT**

This chicken slaughterhouse in Jampang Village, Bogor Regency, West Java, Province, Indonesia is a home industry that is engaged in chicken slaughter. The problem in this research is the process of slaughtering chickens that do not meet the standards. The purpose of this study was to identify the hygiene and sanitation of chicken slaughterhouses. Data collection was done by filling out questionnaires and observations. The observation sheet is made based on SNI-01-6160-1999 concerning Poultry Slaughterhouses. The observation sheet was used to assess the hygiene and sanitation conditions using the scoring method. This study used descriptive statistics to analyze the observed data. The scoring method is done by determining the weight for each variable and determining the value for each of the assessed aspects. The results showed that the workers were in good health. Not yet using boots, masks, aprons and headgear. The building is still integrated with the residence. The layout is not in line with the flow of the production process. Sewerage drain is readily available. The cage has never been washed using water and detergent. The conclusion is that the hygiene of the chicken cutters and the sanitation of the buildings still do not meet the requirements. The proposal for improvement is the health of chicken slicers and the use of equipment are things that need to be considered, the building must be separated from the residence, the layout should be improved in the direction of the production process, the building construction is made rodent-free, the chicken coop must be cleaned regularly with water and detergent.

*Keywords:* Hygiene, Sanitation, Chicken Slaughtering House

### **INTRODUCTION**

The increasing need for poultry meat for public consumption from year to year is an indication that this type of animal food commodity is in great demand by the public because the price is relatively affordable for all levels of society, easily available everywhere

and is available continuously. Small business actors or households use the potential to increase the demand for consumption of poultry meat so that the commodity business grows rapidly. Ironically, the development of this business has not been matched by the application of the technical aspects of hygiene-sanitation, it has even tended to neglect

consumers' rights to safe food (Ministry of Agriculture, 2010)

This Small and Medium Enterprise Chicken Slaughterhouse in Jampang Village is a home industry which is engaged in chicken slaughter. This home industry is located on Jl. Parung-Bogor, Jampang village, Parung sub-district, Bogor regency. Currently, the conditions of the chicken slaughterhouse have not met (SNI 01-6160-1999) in the aspects of location, equipment, construction, use of standard equipment and hand washing facilities. So that it can cause the movement of bacteria and lack of hygiene in chicken products. One of the improvement efforts made is by conducting a hygiene and sanitation analysis based on the SNI 01-6160-1999 reference.

The purpose of study is to evaluate the implementation of hygiene and sanitation of chicken slaughterhouses.

## MATERIALS AND METHODS

Data collection was done by filling out questionnaires and observations. The observation sheet is made based on SNI-01-

6160-1999 concerning Poultry Slaughterhouses (Badan Standarisasi Nasional, 1999). The observation sheet was used to assess the hygiene and sanitation conditions using the scoring method

This study used descriptive statistics to analyze the observed data. The scoring method is done by determining the weight for each variable and determining the value for each of the assessed aspects. Multiplying the weight and value gives the score. The total score was used to assess the good and bad conditions of hygiene and sanitation in the chicken slaughterhouse.

## RESULTS AND DISCUSSION

### Results

The chicken slaughterhouse in Jampang village is traditionally managed together with the owner and two employees. Table 1 shows the results of research on hygiene and sanitation in the slaughterhouse.

Table 1. Distribution of Health Variable Assessment Results for Chicken Butchers in Slaughterhouses in Jampang Village

No.	Health Chicken Cutters	Frequency	Percentage
1	General state of health at work	3	100%
2	Routine health check-ups once a year	1	33,33%

Table 1 shows that all employees of the chicken slaughterhouse in Jampang Village who were research respondents were working in a healthy condition at the time of the observation. However, only 33.33% admitted to having their

health checked regularly at least once a year.

Table 2 shows distribution of variable assessment results for the use of standard equipment at the slaughterhouse in Jampang Village

Table 2. Distribution of Variable Assessment Results for the Use of Standard Equipment at the Slaughterhouse in Jampang Village.

No.	Standard Equipment Terms of Use	Frequency	Percentage
1.	Only wear special clothes for work	3	100%
2.	Wearing boots	0	0%
3.	Using a mask	0	0%
4.	Using the apron	0	0%
5.	Use a head covering	0	0%

Table 2 shows that all respondents wore special clothes only for work. Meanwhile, none of the employees or respondents used boots, masks, aprons and headgear while working.

Meanwhile Table 3 shows distribution of assessment results of handwashing behavior variables in slaughterhouses in Jampang Village

Table 3. Distribution of Assessment Results of Handwashing Behavior Variables in Slaughterhouses in Jampang Village

No.	Hand Washing Behavioral Requirements	Frequency	Percentage
1.	Wash your hands before work	3	100%
2.	Wash your hands after work	3	100%
3.	Wash your hands after going to the bathroom	3	100%
4.	Wash hands with running water and soap	3	100%

Table 3 shows that all respondents wash their hands before working, wash their hands after work, wash their hands after going to the bathroom / toilet, wash their hands with running water and soap. So that 100% responsive

already has good hand washing behavior. Table 4 shows distribution of assessment results of other good behavior variables in slaughterhouses in Jampang Village

Table 4. Distribution of Assessment Results of Other Good Behavior Variables in Slaughterhouses in Jampang Village

No.	Other Requirements of Good Conduct	Frequency	Percentage
1.	Do not smoke while working	3	100%
2.	Not eating / drinking while working	3	100%
3.	Do not touch the face and ears while working	1	33,33%
4.	Do not sneeze or cough in the presence of the product	2	66,66%

Table 4 shows that all respondents (100%) admit that they never smoke and eat / drink while working, but all respondents claim to be smokers. Meanwhile, 33.33% or one respondent claimed to have never touched the face and ears, while because of the splash of hair or itching they did. Only one respondent, 33.33%, admitted to having sneezed / coughed on the product. The job of slaughtering chickens is related to dirty objects, so that the hands must be kept so that they do not hit the face, especially the mouth, because the mouth can be an entry point for disease agents. Table 5 shows distribution of location variable assessment results in slaughterhouses in Jampang Village.

Table 5. Distribution of Location Variable Assessment Results in Slaughterhouses in Jampang Village

No.	Location Requirements	Yes	No
1.	Not beside the highway	✓	
2.	Not near the metal and chemical industry	✓	
3.	Not prone to flooding	✓	
4.	Do not become one with the residential building		✓

Table 5 shows that the Chicken Slaughterhouse in Jampang Village is not next to a highway, is not near the metal and chemical industry, is also not prone to flooding. However, the Chicken Slaughterhouse in Jampang Village is still one with the residential building. Table 6 shows distribution of assessment results of variable building construction in slaughterhouses in Jampang Village.

Table 6. Distribution of Assessment Results of Variable Building Construction in Slaughterhouses in Jampang Village

No.	Building Construction Requirements	Yes	No
1.	Layout in the direction of the process flow		✓
2.	There is a clear physical separation between clean and dirty areas		✓
3.	The walls are light colored, waterproof, and not easily corrosive		✓
4.	The floor is waterproof, non-slip, not easy to corrosive, and has no holes		✓
5.	The roof is waterproof and has no holes	✓	
6.	Construction is designed to be rodent free		✓
7.	Ventilation not less than 10% of floor area	✓	
8.	Buildings are cleaned and disinfected every 2 weeks		✓

Table 6 shows the results of the assessment of the construction of a chicken slaughterhouse in Jampang Village. The layout in the slaughterhouse is not in line with the flow of the chicken slaughtering production process due to the insufficient space, so most of the slaughtering processes are carried out close to one another. There is no clear physical separation between clean and dirty areas. The walls are not made of waterproof and corrosive material. The floor has not been made of materials that are not waterproof, slippery, corrosive, and not perforated. The roof of the building is watertight and has no holes. The building construction has not been designed to be rodent free. Good ventilation is more than 10% of floor area. Buildings have not been cleaned and disinfected regularly every 2 weeks. Table 7 shows distribution of assessment results of variable building completeness in slaughterhouses in Jampang Village.

Table 7. Distribution of Assessment Results of Variable Building Completeness in Slaughterhouses in Jampang Village

No.	Building Completeness Requirements	Yes	No
1.	Place of drop of live birds	✓	
2.	Employee rest area		✓
3.	Storage of personal belongings		✓
4.	Bathroom	✓	
5.	Parking lot	✓	
6.	Generating Set		✓

Table 7 shows that the chicken slaughter house in Jampang Village is a business that is still being pioneered and has become one with the owner's residence, so for the reduction of live poultry there is in the front yard of the house of the chicken slaughterhouse owner. After that the poultry are transported to the backyard of the owner's house, where the chicken slaughterhouse is located. So that there is no place to rest for employees and a place for storing personal items specifically made for employees. There is a bathroom and a parking

lot. The two facilities are also integrated into the owner's house. The chicken slaughter house in Jampang Village does not yet have a generating set, so when the power goes out, cutting activities cannot be carried out, because the feather removal machine cannot be used and this process is carried out manually. Table 8 shows distribution of results of variable assessment of clean water supply in slaughterhouses in Jampang Village.

Table 8. Distribution of Results of Variable Assessment of Clean Water Supply in Slaughterhouses in Jampang Village

No.	Clean Water Provision Requirements	Yes	No
1.	Water availability is sufficient	✓	
2.	Water is tasteless, colorless, and odorless	✓	

Table 8 shows that water is colorless and odorless. The availability of clean water is also quite adequate. According to SNI 01-6160-1999, water sources must be available in sufficient quantities and meet the standard requirements for drinking water quality. The

minimum water supply must be provided, namely 25 - 35 liters / head / day. Table 9 shows distribution of results of variable assessment of handwashing facilities in slaughterhouses in Jampang Village.

Table 9. Distribution of Results of Variable Assessment of Handwashing Facilities in Slaughterhouses in Jampang Village

No.	Hand Wash Requirements	Yes	No
1.	Equipped with soap and hand dryer		✓
2.	Located in an easily accessible place at each stage of the cutting	✓	

Table 9 shows that the chicken slaughterhouse in Jampang Village does not yet have hand washing facilities equipped with soap and hand dryers, but the facilities for grandchildren are easy to reach at each slaughtering stage, because the building is not too large so that every chicken butcher can reach the hand washing facilities at any time. But the drawback

is that the layout is not in accordance with the process flow. It is feared that the layout that is not in accordance with the process flow will cause an unhygienic cutting process. Table 10 shows distribution of results of variable assessment of wastewater drainage at the slaughterhouse in Jampang Village.

Table 10. Distribution of Results of Variable Assessment of Wastewater Drainage at the Slaughterhouse in Jampang Village

No.	Wastewater Drainage Requirements	Yes	No
1.	Waterproof and easy to clean		✓
2.	Current (Incompressible)	✓	

Table 10 shows that the chicken slaughterhouse in Jampang Village already has a Wastewater Disposal Channel that meets the requirements, because the channel built is watertight and immediately discharged into a holding pond. Chicken slaughtering waste is directly used as catfish broodstock feed which

can later be cultivated again. From the results of observations, the RPA in Jampang Village has a smooth sewerage. Table 11 shows distribution of the variable assessment results for cutting knives at slaughterhouses in Jampang Village

Table 11. Distribution of the Variable Assessment Results for Cutting Knives at Slaughterhouses in Jampang Village

No.	Cut knife tool requirements	Yes	No
1.	Rusty		✓
2.	Washed every day	✓	
3.	Washed with detergent water		✓

Table 11 shows that the knife and pot utensils used are not corroded. Knives and pans used at RPA are washed daily. The knives and pans used are also washed using detergent water.

Meanwhile Table 12 shows Distribution of Results of the Variable Assessment of Dyeing Pans at the Slaughterhouse in Jampang Village

Table 12. Distribution of Results of the Variable Assessment of Dyeing Pans at the Slaughterhouse in Jampang Village

No.	Dip Tool Requirements	Yes	No
1.	Rusty	✓	
2.	Washed every day	✓	
3.	Washed with detergent water		✓

Table 12 shows that the pot utensils used are corroded. The pans used at RPA are washed every day. Pans used but never washed using detergent. Table 13 shows Distribution of Variable Assessment Results of Hair Removal Tools at the Slaughterhouse in Jampang Village

Table 13. Distribution of Variable Assessment Results of Hair Removal Tools at the Slaughterhouse in Jampang Village

No.	Hair Removal Tool Requirements	Yes	No
1.	Rusty	✓	
2.	Washed every day	✓	
3.	Washed with detergent water		✓

Table 13 shows that the hair removal tool used is corroded. Feather pluckers used in chicken slaughterhouses are washed every day. Hair removal tools that are used but never washed using detergent. Table 14 shows distribution of variable assessment results for poultry cages in slaughterhouses in Jampang Village

Table 14. Distribution of Variable Assessment Results for Poultry Cages in Slaughterhouses in Jampang Village

No.	Building Completeness Requirements	Yes	No
1.	Cleaned every day	✓	
2.	Washed with water and detergent		✓

Table 14 shows that the poultry cages in the chicken slaughterhouse in Jampang village are cleaned every day. The cage is never washed using water and detergent, but only swept and cleaned of dirt and chicken feathers. Table 15 shows distribution of results of assessment of sanitation variables in slaughterhouses in Jampang Village



Table 15. Distribution of Results of Assessment of Sanitation Variables in Slaughterhouses in Jampang Village

No.	Building Completeness Requirements	Yes	No
1.	Fasting chicken before cutting	✓	
2.	Carcass washed clean running water	✓	
3.	The carcass is placed on a waterproof floor and not the cutting floor		✓
4.	Chicken carcasses temporarily stored in closed containers		✓
5.	Chicken carcass burned		✓

Table 15 shows that the chickens are satisfied before being slaughtered, the carcasses are washed in running water, the carcasses are placed on the slaughtering floor, the dead chicken carcasses are not stored in a closed container, but the chicken carcasses are immediately given as catfish animal feed without being burned first.

### Discussions

Table 1 shows that all workers were in good health at the time of observation. However, only 33.33% admitted to having their health checked regularly at least once a year. In general, all chicken slaughterers appear to be in good health while working, but only a small proportion of chicken slaughterers undergo routine health checks once a year.

Table 2 shows that all workers (100%) wear special clothes for work. Meanwhile, none of the workers have used boots, masks, aprons and headgear while working. According to SNI 01-

6160-1999, standard equipment for workers in the cutting and handling process of meat are special workers' clothes, a plastic apron, head cover, nose cover and boots.

Table 3 shows that all respondents wash their hands before working, wash their hands after work, wash their hands after going to the bathroom / toilet, wash their hands with running water and soap. So that 100% responsive already has good hand washing behavior.

According to the Directorate of Veterinary Public Health and Post-Harvest (2010), one of the requirements of workers that must be fulfilled is washing hands before and after working, after going to the toilet, after sneezing or coughing which is covered with hands, touching contaminated materials, and others..

Table 4 shows that all workers (100%) admit that they never smoke and eat / drink while working, but all respondents claim to be smokers. Meanwhile, 33.33% or one respondent claimed to have never touched the

face and ears, while because of the splash of hair or itching they did. Only one respondent, 33.33%, admitted to sneezing / coughing on the product.

According to the Directorate of Veterinary Public Health and Post-Harvest (2010), workers must wear clean clothes, avoid bad behavior (smoking, spitting, eating, coughing / sneezing in front of products, putting fingers in their mouths, biting nails), removing jewelry, not using makeup, excessive up, do not occupy equipment, and do not touch the nose, face, face, ears, and hair while working.

Table 5 shows that the chicken slaughterhouse is not located next to a highway, is not near the metal and chemical industry, nor is it prone to flooding. But the chicken slaughterhouse in Jampang Village is still integrated with the residential building.

Table 6 shows the results of the building construction assessment where the layout is not in line with the flow of the chicken slaughtering production process due to the insufficient space, so most of the slaughtering processes are carried out close to one another. There is no clear physical separation between clean and dirty areas. The wall is not made of waterproof and corrosive material. The floor is not made of materials that are not waterproof, slippery, corrosive, and not perforated. The roof of the

building is watertight and has no holes. The building construction has not been designed to be rodent free. Good ventilation is more than 10% of floor area. Buildings have not been cleaned and disinfected regularly every 2 weeks.

According to SNI 01-6160-1999, the layout must be designed so that it is in line with the process flow and has sufficient space so that all poultry slaughtering activities can run well and hygienically. The size of the room must also be adjusted to the cutting capacity. There are no clear boundaries between dirty and clean areas. So that workers are free to enter clean and dirty areas. This will cause cross-contamination through the skin, rumen fluids, blood, and labor of the carcass. So that the carcass produced and marketed becomes unsafe and unhealthy for consumption (Rohyati, 2017). A picture of the production room of a chicken slaughterhouse in Jampang Village can be seen in Figure 1. The chicken slaughterhouse building does not meet the requirements for walls and floors, as can be seen in Figure 1. This requirement is not fulfilled, among others, because there is a wall made of brick which is only roughened, without any more layers so that the material is not waterproof and has the potential to grow moss around the walls.



Figure 1. Construction of Chicken Slaughterhouses in Jampang Village

Table 7 shows the chicken slaughter house in Jampang Village is a small and medium-sized enterprise that is still being initiated and is integrated into the owner's residence, so that the reduction of live poultry can be found in the front yard of the owner's house. After that the poultry are transported to the backyard of the owner's house, where the chicken slaughterhouse is located.

Table 8 shows that the availability of clean water that is tasteless, colorless, and odorless is fulfilled. Clean water is a vital necessity, because most of the processes in a chicken slaughterhouse use clean water.

According to SNI 01-6160-1999, water sources must be available in sufficient quantities and meet the standard requirements for drinking water quality. The minimum water supply must be provided, namely 25 - 35 liters / head / day.

Table 9 shows that the Chicken Slaughterhouse does not yet have hand washing facilities equipped with soap and hand dryers. However, the means for grandchildren are easy to reach at each slaughtering stage, because the building is not too large so that each chicken cutter can reach the hand washing facilities. But the drawback is that the layout does not fit the process flow. It is feared that the layout that is not in accordance with the process flow will cause an unhygienic cutting process.

According to SNI 01-6160-1999, the ideal hand washing facilities are those designed in such a way that hands do not touch the water tap after washing hands, equipped with soap and a hand dryer, such as rags that are constantly replaced, tissue paper or mechanical dryers (Hand drier). Hand washing facilities are provided at every stage of the cutting process and are placed in easy-to-reach places.

Table 10 shows that the chicken slaughterhouse in Jampang Village does not yet have a Wastewater Disposal Channel that meets the requirements, because the channel that is built is not watertight and is immediately dumped into a holding pond. The waste of slaughtering chickens is directly used as catfish brood stock feed which can later be cultivated again. From the observation that the chicken slaughterhouse has a smooth sewerage.

According to SNI 01-6160-1999, ideally the Chicken Slaughterhouse has waste handling facilities and an incinerator. At least the liquid waste from the cutting process is temporarily stored, then drained when it is full. This is like the fecal storage in a septic tank. The waste produced from the process of slaughtering chickens in Jampang village includes feathers, blood, and chicken manure. However, all the waste is reused for fish feed in the owner's pond. Previously, the waste was collected for one day and immediately thrown into the pond.

Air and water environmental pollution due to waste generated from chicken farming, especially in the form of chicken manure and unpleasant odors and waste water. Air pollution, especially in the form of odors, is released during the decomposition process of chicken manure.

Table 11 shows that the knives and pans used do not rust. Knives and pans that are used are washed every day. The knives and pans used are also washed using detergent water..

According to the Directorate of Veterinary Public Health and Postharvest (2010), cleaning must use a detergent solution to dissolve or suspend dirt and layers of microorganisms.

Table 12 shows that the pot utensils used are corroded. The pot that is used is washed every day. Pans used but never washed using detergent. This condition can cause microbes to contaminate broiler chickens such as salmonella (Aerita *et al.*, 2014). The pan equipment used can be seen in Figure 2.



Figure 2. Equipment for a Chicken Slaughterhouse Dipping Pot in Jampang Village

Table 13 shows that the hair removal tool used in chicken slaughterhouses can be seen in Figure 3. The hair removal tool used in



Figure 3. Feather removal tool for a chicken slaughterhouse in Jampang village

According to SNI 01-6160-1999, equipment that is directly related to meat must be made of non-toxic, non-corrosive, easy to clean and densified and easy to care for.

Table 14 shows that the poultry houses are cleaned every day. The cage is never washed

using water and detergent, but only swept and cleaned of dirt and chicken feathers. The cage is never cleaned using water and detergent. Cages are thoroughly cleaned when stock runs out and when new stock arrives. According to Komnas FBPI (2008), eating, drinking, and

poultry cages must be washed and infected every day.

Table 15 shows that the chickens are satisfied before being slaughtered, the carcasses are washed in running water, the carcasses are placed on the slaughtering floor, the dead chicken carcasses are not stored in a closed container, but the chicken carcasses are directly fed as catfish animal feed. Good waste handling is to make a special hole and close it again because it can reduce environmental pollution (Aurora, 2014).

Chicken slaughterhouses always wash the cut chicken meat with clean, running water. According to the Directorate of Veterinary Public Health and Post-harvest (2010) the correct rinsing is by spraying the carcass using clean pressurized water.

The chicken slaughterhouse places the cut chicken meat on the floor as the same base as the ceramic cutting floor. Placing the carcass at the slaughtering place causes contamination of the chicken meat that has been cut, by the blood and feces of the chicken on the slaughtering floor. According to Komnas FBPI (2008), slaughtered chicken meat must be avoided from direct contact with the cutting floor.

Proposed improvements to the Chicken Slaughterhouse in Jampan Village based on SNI 01-6160-1999 include: routine health

checks, standard equipment must be met, sanitary buildings made separate from living quarters. In addition, spatial planning is improved in the direction of the process flow, there is a clear physical separation between clean and dirty areas. Walls and floors in buildings must be designed to be waterproof, not easily corrosive. The building construction is made rodent-free and disinfected every two weeks to maintain cleanliness. The completeness of the building must have an employee rest area, a place for storing personal items, and generating sets. Sanitation facilities must be fulfilled, one of which is a means of washing hands and providing soap, a cloth / hand drier as a hand dryer. Carcass tools can be replaced with tools made from stainless steel. The carcass must also be cleaned using detergent every day. The chicken coop should be cleaned and washed regularly. The carcass is placed on a waterproof mat and not the cutting floor, the chicken carcass should be temporarily stored in a closed container after which it is burned.

## CONCLUSIONS

The conclusions in this study are as follows the hygiene of the chicken butchers in Jampang village is below standard requirement and the sanitation of the equipment does not meet the requirements.

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