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RESEARCH ARTICLE
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Hygiene and Sanitation of Fresh Cow Milk Quality in Getasanyar, Sidorejo, Magetan

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ABSTRACT

Milk is a source of animal protein which is necessary for the growth of the human body. Fresh milk from healthy cows is obtained by using the milking method. This study aims to determine the hygiene of cage sanitation and equipment sanitation, milking behavior, and quality of fresh cow's milk in Getasanyar Village, Sidorejo District, Magetan Regency. This research is descriptive. Sampling technique with purposive sampling design. Collecting data using observation and interviews laboratory examination. The results showed that the sanitation of cattle pens for farms 1 and 2 (40%) was good (60%) bad, and farm 3 (75%) was good (25%) bad. Sanitation of farm equipment 1 and 2 (60%) good (40%) bad, farm 3 (75%) good (25%) bad. The behavior of dairy farms 1 and 2 has bad behavior, farm 3 has good behavior. The physical quality of milk does not change. The chemical quality pH and temperature of fresh cow's milk 1, 2, and 3 did not meet the requirements. The microbiological quality of the germ numbers of fresh cow's milk on farms 1, 2, and 3 met the requirements, and Escherichia coli in fresh cow's milk on farms 1 and 2 did not meet the requirements, farm 3 met the requirements. Sanitary hygiene with milking behavior on milk quality does not meet the requirements.

Keywords: fresh cow milk; hygiene; sanitation; quality

INTRODUCTION

Background

Health is a human right and one of the elements of welfare that must be realized by the ideals of the Indonesian nation as referred to in Pancasila and the 1945 Constitution of the Republic of Indonesia. Every activity to maintain and improve the highest level of public health is carried out based on non-discriminatory, participatory, and sustainable principles in the context of the formation of Indonesian human resources, as well as increasing the nation's resilience and competitiveness for national development [(1)].

Food is anything that comes from biological sources of an agricultural, plantation, forestry, fishery, animal husbandry, water, and water products, both processed and unprocessed, which is designated as food or drink for human consumption, including food additives, food raw materials, and other materials used in the process of preparing, processing, and/or making food or beverages. Processed Food is food or drink that is processed in a certain way or method, with or without additional ingredients. Food Home Industry is a food company that has a place of business in the residence with manual to semi-automatic food processing equipment. Processed foods are foods or beverages that are processed in a specific way, with or without additional ingredients. Food Home Industry, hereafter abbreviated IRTP, is a food company that has a business located in the residence with semi-automatic manual food processing equipment [(2)].

To improve health status, especially in developing countries, it is necessary to pay attention to several factors that have a major impact, namely environmental factors and human attitude factors, for example how to handle healthy and nutritious food and drinks, including handling dairy cow's milk [(3)].

Milk is a source of animal protein that is needed for the growth and development of the body and in maintaining health. Fresh cow's milk is an important element in the dairy processing industry. As food of animal origin, milk is a perishable food. Fresh, liquid milk originating from healthy and clean cows, obtained using the correct milking method, whose natural content is not reduced or added by anything and has not received any treatment except cooling [(4)].

To obtain good fresh milk, all efforts must be aimed at minimizing the number of bacteria present in milk by taking into account several factors that affect the quality of milk, namely sanitation, cleanliness of the cage, health and hygiene of handlers, health and hygiene of animals, cleanliness of milking equipment and maintaining fresh milk purity [(3)]. Therefore, maintaining the cleanliness of the environment, livestock, and milking equipment milkers needs to be considered to minimize contamination in cow's milk that has been milked. One of the causes of the high number of germs in milk may be caused by several factors such as milker hygiene, cage sanitation, and poor equipment.

Based on the preliminary study, there are 3 dairy farmers. The number of dairy cows is 25 and the number of milkers in each cage has 4 milkers producing +250 liters of milk/day, the milking results are accommodated and then distributed to the milk processing industry. Based on the results of interviews and observations, there is behavior that milkers do not use personal protective equipment, gloves, and masks when milking. The condition of the roof cage is damaged. The results of the microbiological test for the number of germs meet the Indonesian National Standard 3141.1:2011 concerning Fresh Milk Quality Standards, namely > 1,100 CFU/ml. The results of the Escherichia coli examination based on the standard of SNI 3141.1:1998 regarding the Quality Standard of Fresh Milk did not meet the standard because it was positive for Escherichia coli. The results of the chemical test pH are 6.0, the quality standard is from 6.3 to 6.8. Temperature 250C quality standard from 27.50C. The two chemical parameters do not meet the requirements based on the Indonesian National Standard 3141.1:2011 concerning Fresh Milk Quality Standards.

Purpose

Based on the description of the background, it is appropriate to analyze the hygiene and sanitation aspects of the quality of fresh cow's milk in Getasanyar Village, Sidorejo District, Magetan Regency, Indonesia. The purpose of the study was to describe cage sanitation, equipment sanitation, and milking behavior and to determine the physical quality (color, smell, taste, viscosity), chemistry (pH and temperature), and microbiology (number of germs and Escherichia coli) of fresh cow's milk. By using a purposive sampling research design, it is done by setting certain criteria that must be met by the sample used in the study.

METHODS

Research Design

The research was conducted using a descriptive method, where problem-solving procedures were investigated by describing the state of the subject or object in the study, which could be people, institutions, communities, and others based on facts as they are [(5)].

Population and Sample

The population in this study was 3 dairy farmers. The sample was the object under study and is considered to represent the entire research population. The sample criteria were: 1) The location of the farm that has the largest cattle population. 2) Fresh milk that is used to accommodate 4 tubes of fresh milk with a size of 15 liters. 3) Four permanent milkers are working on the farm. 4) The quality of milk is taken from the total number of containers used to hold milk. The sample size taken from each farm is 250 ml. The sampling technique is purposive sampling.

Research Variables

The variables in this study were: 1) sanitation of the cage, 2) equipment sanitation, 3) milking behavior (knowledge, attitude, action), 4) physical quality (color, odor, taste, viscosity), chemical quality (ph and temperature), and microbiological quality (germ count and escherichia coli).

Research Sites

A dairy farm in Getasanyar Village, Sidorejo District, Magetan Regency, Indonesia for inspection of cage sanitation 2) equipment sanitation 3) milking behavior (knowledge, attitudes, actions). Examination of physical

samples (color, aroma, taste, viscosity), chemical (pH and temperature), and microbiology (number of germs and Escherichia coli) were carried out at the Microbiology Laboratory of the Diploma-3 Study Program of Sanitation, Magetan Campus, Poltekkes Kemenkes Surabaya and the Central Health Laboratory Surabaya.

Data Collection

Primary data were obtained from the results of observation, interviews, and laboratory examinations. Secondary data were obtained from: a) Magetan District Health Office, b) Department of Animal Husbandry of Magetan Regency. The data collection tool used was a questionnaire sheet. Data collection techniques were: 1) interview, 2) observation, 3) examination to obtain data on respondent identity, milker behavior, cage sanitation, equipment sanitation, milker behavior (knowledge, attitude, action), and knowing the quality of fresh cow's milk.

Data Analysis

Data processing were: 1) scoring of the scores from each observation sheet that has been made; 2) editing the completeness of the questionnaire, clarity of writing, suitability of answers to each other and uniformity; 3) tabulating grouping data into simple tabular forms gives an idea of the distribution of one variable.

In the data analysis process, on the assessment of sanitation of cages and sanitation of equipment if the answer is "Yes" a score of 1, if the answer is "No" a score of 0. The good category scores 8-15 or 46%-100% and the bad category scores <7 or <46%. The results of the laboratory examination of the pH and temperature chemical tests were matched with the Indonesian National Standard 3141.1:2011 concerning Fresh Milk Quality Standards. The results of the microbiological test for the number of germs were matched with the Indonesian National Standard 3141.1:2011 concerning the Quality Standard of Fresh Milk. The results of the Escherichia coli examination were matched with the Indonesian National Standard 3141.1:1998 concerning Fresh Milk Quality Standards.

RESULTS

Cage Sanitation Assessment Results

Table 1. Distribution of cage sanitation

Sanitation cage	Amount			Percentage		
	Farm-1	Farm-2	Farm-3	Farm-1	Farm-2	Farm-3
Yes	6	6	11	40%	40%	75%
Not	9	9	4	60%	60%	25%
Total	15	15	15	100%	100%	100%

Based on table 1, it can be seen that the sanitation of the cages on farms 1 and 2 wa 6 condition sanitation cage was “Not” (40%) and on farm 3 had 11 condition sanitation cage was “Not” (75%). While the sanitation of the cages on farms 1 and 2 obtained 60% included in the bad category while on farm 3 obtained 25% included in the good category.

Equipment Sanitation Assessment Results

Table 2. Distribution of equipment sanitation

Sanitation equipment	Amount			Percentage		
	Farm-1	Farm-2	Farm-3	Farm-1	Farm-2	Farm-3
Yes	9	9	11	60%	60%	75%
Not	6	6	4	40%	40%	25%
Total	15	15	15	100%	100%	100%

Based on table 2, it can be seen that the value of farms 1 and 2 was 9 with a percentage of 60% and farm 3 was 11 with a percentage of 75%. While the sanitation of livestock equipment 1 and 2 obtained 40%, farm 3 obtained 25%. Equipment sanitation on farms 1, 2, and 3 was in a good category.

Milking Behavior Assessment Results

Milker Knowledge Level

Table 3. Distribution of respondents based on knowledge level category

No	Category	Amount			Percentage		
		Farm -1	Farm -2	Farm -3	Farm -1	Farm -2	Farm -3
1.	Well	1	1	2	50%	50%	100%
2.	Bad	1	1	0	50%	50%	-
	Total	2	2	2	100%	100%	100%

Based on table 3, it can be seen that on farms 1 and 2 there were 2 respondents (50%) who had good knowledge and 2 respondents (50%) who had poor knowledge, while on farm 3 there were 2 respondents (100%) who had good knowledge.

Milking Attitude Level

Table 4. Distribution of respondents by attitude level category

No	Category	Amount			Percentage (%)		
		Farm-1	Farm-2	Farm-3	Farm-1	Farm-2	Farm-3
1.	Well	1	1	2	50%	50%	100%
2.	Bad	1	1	0	50%	50%	-
	Total	2	2	2	100%	100%	100%

Based on table 4, it can be seen that on farms 1 and 2 there were 2 respondents (50%) who had a good attitude and 2 respondents (50%) had a bad attitude while on farm 3 there were 2 respondents (100%) who had a good attitude.

Milker Action Level

Table 5. Distribution of respondents by action level category

No	Category	Amount			Percentage (%)		
		Farm-1	Farm-2	Farm-3	Farm-1	Farm-2	Farm-3
1.	Well	1	1	2	50%	50%	100%
2.	Bad	1	1	0	50%	50%	-
	Total	2	2	2	100%	100%	100%

Based on table 5, it can be seen that on farms 1 and 2 there were 2 respondents (50%) who had good actions and 2 respondents (50%) had bad actions, while on farm 3 there were 2 respondents (100%) who had good actions.

Results of Physical Quality Examination of Fresh Cow's Milk

Table 6. Physical quality examination results of fresh cow milk

No	Panelists	Organoleptic Examination Results			
		Color	Smell	Flavor	Thickness
	Sample 1				
1.	Panelists-1	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
2.	Panelists-2	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
3.	Panelists-3	Yellowish White	Typical Milk	Slightly Sweet	Thick, Not Slimy
4.	Panelists-4	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
5.	Panelists-5	Yellowish White	Typical Milk	Slightly Sweet	Thick, Not Slimy
6.	Panelists-6	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
7.	Panelists-7	White	Typical Milk	Slightly Sweet	Thick, Not Slimy

No	Panelists	Organoleptic Examination Results			
		Color	Smell	Flavor	Thickness
	Sample 2				
1.	Panelists-1	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
2.	Panelists-2	Yellowish White	Typical Milk	Slightly Sweet	Thick, Not Slimy
3.	Panelists-3	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
4.	Panelists-4	Yellowish White	Typical Milk	Slightly Sweet	Thick, Not Slimy
5.	Panelists-5	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
6.	Panelists-6	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
7.	Panelists-7	Yellowish White	Typical Milk	Slightly Sweet	Thick, Not Slimy
	Sample 3				
1.	Panelists-1	Yellowish White	Typical Milk	Slightly Sweet	Thick, Not Slimy
2.	Panelists-2	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
3.	Panelists-3	Yellowish White	Typical Milk	Slightly Sweet	Thick, Not Slimy
4.	Panelists-4	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
5.	Panelists-5	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
6.	Panelists-6	White	Typical Milk	Slightly Sweet	Thick, Not Slimy
7.	Panelists-7	White	Typical Milk	Slightly Sweet	Thick, Not Slimy

Based on table 6, it can be seen that the physical quality of fresh cow milk according to the Indonesian National Standard 3141.1:2011 met the requirements, namely, there was no change in color, smell, taste, and viscosity.

Chemical Quality Inspection Results of Fresh Cow Milk

Table 7. Chemical quality inspection results of fresh cow milk

Farm-1	Chemical quality inspection results of fresh cow milk	
	pH	Temperature ^{0}C
A	6,6	25
B	7,0	25
C	7,0	25

Farm-2	Chemical quality inspection results of fresh cow milk	
	pH	Temperature ^{0}C
A	6,7	25
B	6,0	25
C	6,0	26
Farm-3	Chemical quality inspection results of fresh cow milk	
	pH	Temperature ^{0}C
A	6,7	25
B	7,0	25
C	7,0	25

Based on table 7, it can be seen that the chemical quality: pH, and temperature of fresh cow's milk according to the Indonesian National Standard 3141.1:2011 regarding fresh milk met the requirements, namely with a pH of 6.3-6.8 and a temperature of 27.5^{0}C. Meanwhile, in laboratory examination, the pH and temperature of the milk on farms 1, 2, and 3 did not meet the requirements according to the Indonesian National Standard 3141.1:2011 concerning fresh milk.

Microbiological Quality Inspection Results of Fresh Cow Milk

Based on table 8, it is known that the results of the microbiological quality inspection of the germ number examination met the requirements of the Indonesian National Standard 3141.1:2011 concerning fresh milk, the germ number quality standard is 1 x 106CFU/ml. Examination of *Escherichia coli* on farms 1, 2 samples A, B did not meet the requirements and sample C met the requirements, while on farms 3 samples A, B, and C met the requirements according to the Indonesian National Standard 3141.1:1998 regarding *Escherichia coli* quality standard fresh milk, which was negative.

Table 8. Microbiological quality inspection results of fresh cow milk

Sample	Microbiological Quality Examination Results					
	Number of bacteria		Quality standards	*Escherichia coli*		Quality standards
	Average	Information		Results	Information	
Farm 1						
A	35.000	Well	$1x10^6$	Positive	Not eligible	Negative
B	550	Well	$1x10^6$	Positive	Not eligible	Negative
C	760	Well	$1x10^6$	Negative	Qualify	Negative
Farm 2						
A	46.000	Well	$1x10^6$	Positive	Not eligible	Negative
B	59.000	Well	$1x10^6$	Positive	Not eligible	Negative
C	63.000	Well	$1x10^6$	Positive	Not eligible	Negative
Farm 3						
A	32.000	Well	$1x10^6$	Negative	Qualify	Negative
B	133.000	Well	$1x10^6$	Negative	Qualify	Negative
C	20.000	Well	$1x10^6$	Negative	Qualify	Negative

Analyzing Sanitary Hygiene with Milking Behavior on Milk Quality

Based on the results of table 1-8, the results of sanitation hygiene in cowsheds with milker behavior that know attitudes and milking actions are not good, the quality of milk physically meets the requirements, and microbiological chemistry does not meet the requirements. So sanitation hygiene with milking behavior on milk quality does not meet the requirements.

DISCUSSION

Cage Sanitation Assessment

Based on the observation of the sanitary status of the cattle cages, most of the sanitary facilities are still poor. Poor hygiene because on the farm the cage roof is made from asbestos and zinc. The roof is broken or perforated such that cows are susceptible to heat and rain. Furthermore, the cage was cleaned twice a day, before and after milking, using clean water without the use of disinfectants or soap. Dirty drains, open, no covers and filters, do not have a slope angle on the floor so that there is a puddle of water on the floor of the cage, the slope of the floor is needed to make it easier for farmers to carry out the cleaning process in the cowshed. Plenty of cow dung is in the drains causing the water not to run smoothly and causing an unpleasant smell.

One of the factors affecting milk quality is the cleaning of the farm cage. The condition of the farm cage must be: a) the location of the cage must be free from pig pens, chickens, and other livestock to maintain flavor (taste and smell) because milk easily absorbs odors; b) cage construction in planks or concrete; c) cage ventilation should be good so that air circulates well; d) landfills must be located away from the drum[(6)].

Equipment Sanitation Assessment

Sanitation assessment of all breeders' equipment is in good condition. Because the equipment used is always clean, but in cleaning the plate do not use soap or disinfectant so that contamination is possible. Equipment storage is only placed on the floor of the cage even if the equipment is clean.

While the correct way to wash the tools is: to get clean tools and wash the tools with cold or warm water so that the remnants of milk disappear. Then wash with warm soapy water, brush, and rinse. The tools are then soaked in boiling water for 2-3 minutes or evaporated for 30 seconds [(6)].

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Milking Behavior Assessment

Knowledge

Each milker has a different level of knowledge, this can affect the sanitary conditions of the cage, sanitation of equipment, and the milking process. The results of the milking knowledge assessment obtained on the farm are mostly good.

A good respondent's knowledge about knowing how to clean the cage every day, knowing that it is better to wash hands with soap after defecating because a person's physical condition can affect a person's hygiene level. While the respondents' poor knowledge is the lack of knowledge of the requirements of a good milking process about the use of personal protective equipment such as masks and gloves because respondents are not accustomed to using personal protective equipment when milking, this can have a bad impact on health and the environment and can affect the quality of milk.

Attitude

The results of the milking attitude assessment obtained on farms were mostly good, namely, the respondents considered it necessary or agreed with the cleanliness of the cage by cleaning the cage every day, washing hands with soap after defecating, and washing hands and milk containers before and after milking cows.

Respondents who have a bad attitude generally consider it less necessary or disagree if they are sick with the flu or cough, do not milk, wash hands and milk containers before and after milking, use personal protective equipment such as masks, gloves

Action

The results of the assessment of milking actions obtained on farms are mostly bad, because of the bad habits of the respondents in cleaning the cages that are not done cleanly there is still cow dung left behind, before milking do not wash their hands first, do not use personal protective equipment such as masks, gloves so that it can cause contaminated milk and decreased milk quality[(6)].

Physical Quality Assessment of Fresh Cow Milk

The color, smell, taste, and viscosity of fresh cow's milk did not change according to the Indonesian National Standard 3141.1:2011. Milk is not contaminated by foreign objects such as drug residues or antibiotics that can affect the color, aroma, taste, and consistency of milk.

Chemical Quality Assessment of Fresh Cow Milk

Based on the results of the pH and temperature test of farms 1, 2, and 3, it was found that fresh milk met the requirements, namely with a pH of 6.3 – 6.8 and a temperature of 27.5^0C. Meanwhile, in laboratory examination, the pH and temperature of the milk on farms 1, 2, and 3 did not meet the requirements.

Microbiological Quality Assessment of Fresh Cow Milk

The results of microbiological quality checks for germ numbers and Escherichia coli in fresh milk. The quality of milk on farms 1, 2, and 3 samples A, B, and C were examined for germ numbers that met the standard quality standards for germ numbers, namely 1 x 106CFU/ml. Examination of Escherichia coli on farms 1, 2 samples A, B did not meet the requirements and sample C met the requirements, while on farms 3 samples A, B, and C met the requirements according to the Indonesian National Standard 3141.1:1998 regarding Escherichia coli quality standard fresh milk, which was negative.

Assessing Sanitary Hygiene with Milking Behavior on Milk Quality

Sanitary hygiene in cattle pens is considered poor because some of the roofs of the pens are made of asbestos and zinc and there are broken or perforated roofs so that the cows may be exposed to heat and rain. Milking behavior that knows attitudes, and milking actions that are not good.

The quality of milk is influenced by several factors: 1) The condition of the cage: a) The location of the cage must be free from pig pens, chickens, and other livestock to maintain flavor (taste and smell) because milk easily absorbs odors. b) Construction of cages made of boards or concrete. c) Ventilation of the cage must be good so that air circulation can run well. d) There must be a landfill located far from the cage. 2) The condition of the milk room: a) The milk room serves to temporarily store milk before it is brought to the milk collection center or consumers. b) It is better to avoid the milk room from the unpleasant smell of the cage, and the size of the milk room does not need to be too large but clean. 3) Cow health: cow health must always be maintained. 4) Health of cattle rearing: health of cattle rearing can affect the quality of cow's milk. If the worker/catcher suffers from tuberculosis or typhoid, the disease will be transmitted through milk to other milk consumers. 5) How to feed cows: feeding cows should be done not at the time of milking because the aroma of animal feed can be absorbed by milk. 6) Preparation of cows to be milked: cows are to be milked 30 minutes - 1 hour before milking, preferably

around the cow's groin. The nipple or udder is wiped with a cloth moistened with a disinfectant solution. This aims to reduce contamination and stimulate the gushing of cow's milk. 7) Preparation of milking: before milking, the milker's hands must be washed clean, as well as the tools used by the milker when expressing milk. The number of germs that can be corrected is 150-200 thousand / ml of milk. 8) The shape of the milk container used at the time of milking is a special place, where the place is slightly closed, only given a little hole. 9) Transfer of milk from the cage: after milking, the milk is brought to the milk room. This is intended to prevent the milk from smelling like cows or feces. 10) Milk filtering: to remove impurities from milk, milk should be filtered using a filter using a cotton filter or ordinary cloth that is washed and boiled after each use. Preferably after milking, immediately cooled milk. This is intended to inhibit and reduce the growth of germs. Milk should be cooled to a maximum of 7^0C, and a minimum of 4^0C. 11) How to wash utensils: to get clean utensils, wash utensils with cold or warm water so that the remaining milk is gone. Then wash with warm soapy water, brush, and rinse. The tools are then soaked in boiling water for 2-3 minutes or evaporated for 30 seconds. 12) Control of flies: supervision of flies needs to be done to reduce the number of germs, and also to keep the cows from getting restless. If the control of flies is carried out as well as possible, at least the number of germs will be suppressed. 13) How to cool the milk: preferably after milking, the milk is cooled immediately. This is intended to inhibit and reduce the growth of germs. Milk should be cooled to a maximum of 7^0C, and a minimum of 4^0C. 14) How to wash utensils: to get clean utensils, wash utensils with cold or warm water so that the remaining milk is gone. Then wash with warm soapy water, brush, and rinse. The tools are then soaked in boiling water for 2-3 minutes or evaporated for 30 seconds[(6)].

CONCLUSION

Based on the results of the analysis and discussion, the following conclusions can be drawn: 1) Sanitation of the cages for farms 1 and 2 is in a bad category, while farm 3 is in a good category. 2) Sanitation of livestock equipment 1, 2, and 3 are good categories. 3) Regarding The behavior of dairy farmers 1 and 2, two respondents have good knowledge and 2 respondents have bad knowledge while on farm 3, two respondents have good knowledge. On farms 1 and 2 2 respondents have good attitudes and two respondents have bad attitudes while on farms 3,2 respondents have good attitudes. On farms 1 and 2, two respondents have good actions and two respondents have bad actions while on farms 3 two respondents have good actions. 4) The physical quality of milk meets the requirements. 5) Chemical quality is not qualified. 6) Microbiological quality of germ numbers meets the requirements and Escherichia coli milk from fresh cows 1, and 2 does not meet the requirements, on farm 3 meets the requirements. 7) Sanitary hygiene with milking behavior does not meet the requirements.

REFERENCES

1. Republic of Indonesia. UU Nomor 36 Tahun 2009 Tentang Kesehatan. Jakarta: Republic of Indonesia; 2009.
2. IRTP. Pedoman pemberian sertifikasi produksi pangan industri rumah tangga. Jakarta: IRTP; 2018.
3. Navyanti F, Adriyani R. Higiene sanitasi, kualitas fisik dan bakteriologi susu sapi segar perusahaan susu X di Surabaya. J Kesehat Lingkung. 2015;8(1):36–47.
4. BSN. SNI 3141.1 Syarat mutu susu segar. Jakarta: Standar Nasional Indonesia; 2011.
5. Savira F, Suharsono Y. J Chem Inf Model. 2013;01(01):1689–99.
6. Setiawan E. Faktor penentu kualitas susu sapi saat pemerahan [Internet]. 2019 [cited 2022 Nov 7]. Available from: https://www.elinotes.com/2019/01/faktor-penentu-kualitas-susu-sapi-saat.html