# Analysis of Waste Management in Regional Slaughterhouse Companies in Medan City

## K. Daulay, Hasnudi, A. Sadeli, E. Mirwandhono and N. Ginting

*Animal Production Study Program, Faculty of Agriculture, University of North Sumatra, Padang Bulan, Medan 20155, Indonesia.*
*\*Co-responding author:prof_hasnudi@yahoo.com*

**Abstract.** Slaughterhouse produce alot of contaminated waste. This study aims to determine the process of waste management and test the content of wastewater in the Regional Slaughterhouse Company of Medan City. This research was conducted from August to September 2021. This research was a descriptive quantitative and laboratory tests were carried out. The population in this study were 30 employees or workers at the Medan City slaughterhouse and the entire population was sampled because the number was relatively small. The research indicators were the inlet, waste treatment tub, the water, the utilization of algae, and the outlet. Analysis of research data using a quantitative approach (descriptive statistics) and laboratory test to determine the content of BOD, COD, TSS, oil or fat, NH3-N, and the pH of wastewater. The results showed that the waste management process at the Medan City Slaughterhouse Regional Company was in the good category, which means that the waste management at the slaugterhouse was adequate because it had met the requirements for the slaughtering process at the slaugterhouse. However, in the process of cleaning and routine maintenance on the oxidation pond, the slaughterhouse is in the fairly good enough category. The quality status of the outlet wastewater (oxidation pond) is in the good category and has met the quality standards. Based on the results of Multiple Linear Regression analysis that waste management at the inlet ($X_1$), waste treatment tub ($X_2$), water ($X_3$) and algae ($X_4$) affects the outlet (Y) in the City Slaughterhouse Regional Company. Medan

**Keywords**: algae, inlet, waste management, waste treatment tub, waste water quality

## 1. Introduction

Slaughterhouse is a building complex with a special design and construction that meets certain technical and hygienic requirements and is used as a slaughterhouse for public consumption. Slaughterhouse as a place for slaughtering animals must ensure that the product meets the ASUH principle and its existence must meet the technical requirements in accordance with the Indonesian National Standard (SNI) for RPH, namely SNI 01-6159-1999 [1]. Safe means that it does not contain biological, chemical or physical hazards that can cause disease and affect health. Healthy means the fulfillment of nutritional needs for health and does not cause disease. Whole means not mixed with other similar products. Halal means that it comes from halal animals that are cut and handled according to Islamic law [2].

Slaughterhouse buildings must be designed and equipped with facilities specified in accordance with the standards. The ASUH meat products must be guaranteed by the abattoir with facilities to monitor the health of the slaughtered animals, comply with regulations, and ensure proper animal

slaughter procedures [3]. In addition, the location of the abattoir must be located on the outskirts of the city, far from community settlements and has a good waste management system.

The presence of slaughterhouses as a place that produces meat for the community, on the other hand also produces waste that has an impact on the environment. In general, slaughterhouses have three main sources of waste, namely stock yards, slaughter rooms, and carcass or meat processing sites (packing house) [4].

Meat production in abattoirs can cause environmental problems if the waste is not managed properly. In addition, it will also have an impact on the people who live around the RPH [5]. Animal waste treatment is an effort that provides many benefits. On the other hand, waste treatment will reduce the impact on the environment. Livestock waste is residual waste from livestock raising business activities, livestock slaughterhouses and livestock product processing. Waste consists of solid and liquid parts, including feces, urine, feed residue, fat, blood, nails, feathers, horns, bones, and rumen contents [6]. Each RPH has a special building unit, namely IPAL.

Based on this, the authors are interested in conducting research related to the analysis of waste management in the Regional Slaughterhouse Company in Medan City.

## 2. Materials and Methods

This research was conducted at the Regional Slaughterhouse Company in Medan City. This research was conducted in August - September 2021.

### 2.1. Data Collection Method

Primary data were obtained from observation data and direct interviews with respondents through questionnaires as well as data from laboratory test results regarding the content of the abattoir wastewater parameters. Secondary data was obtained through a literature study and data obtained from several related agencies for research purposes.

### 2.2. . Data Analysis

The research to be conducted is classified as a qualitative descriptive research type. The analysis was carried out on the described data using descriptive statistical methods which function to describe activities regarding the Waste Management Process at the Regional Slaughterhouse Company in Medan City through a measurement scale by Liekert [7]. In this Likert scale, there are 5 scale options which can be seen in the following table:

**Table 1**. Likert Scale on Waste Management Process of a Slaughterhouse [7]

| Description | Mark |
|---|---|
| Very good | 5 |
| Good | 4 |
| Fairly good | 3 |
| Notenough good | 2 |
| Not good | 1 |

The analysis test of the quality of the slaughterhouse waste water through laboratory test is carrie doutby measuring the quality of the wastewater in the Regional Slaughterhouse Company of Medan City with parameters BOD, COD, TSS, NH3-N, pH and oil or fat at the WWTP outlet were analyzed using the Storet method, which is compared to the quality standard of slaughter house wastewater based on the Regulation of the Minister of the Environment of the Republic of Indonesia No. 5 of 2014.

**2.3. Research instrument**

**Table 2**. Variables and Indicators of Measurement of Research Variables

| Variable | Sub Variable | Indicator |
|---|---|---|
| Waste Management Process at the Wastewater Treatment Plant (WWTP) Medan City Slaughterhouse | Inlet | - Blood and urine residue<br>- Water used for washing blood, offal, and cutting tools<br>- Leftover meat, fat, bones and offal<br>- Urine in thecage<br>- Feces in the cage |
| | Waste treatment tank | - Sedimentation Tub<br>- Filtration Tub<br>- Cleaning Tub |
| | Water | - Water Availability<br>- Water flow |
| | Algae | - Utilization of Algae (Algae) |
| | Outlet | - Scent/Smell<br>- Water Quality<br>- Routine Maintenance |

**Table 3.** Measuring the score of each indicator on sub-variables

| Sub Variable | Value Measurement |
|---|---|
| *Inlet* | Maximum Score = Highest Score x Respondents x Questions<br>$\qquad$ 5 30 5<br>$\qquad$ = 750<br>Minimum Score = Lowest score x Respondents x Questions<br>$\qquad$ 1 30 5<br>$\qquad$ = 150<br><br>Class Range = $\dfrac{\text{Highest total score (750)} - \text{Lowest score total (150)}}{\text{Total Score (5)}}$<br>$\qquad$ = 120<br>Based on the values obtained, categories can be made, namely:<br>Very good $\qquad$ : 634 – 750<br>Good $\qquad$ : 513 – 633<br>Fairly good $\qquad$ : 392 – 512<br>Not enoughgood $\qquad$ : 271 – 391<br>Not good $\qquad$ : 150 – 270 |
| Waste treatment tank | Maximum Score = Highest Score x Respondents x Questions<br>$\qquad$ 5 30 3<br>$\qquad$ = 450<br>Minimum Score = Lowest score x Respondents x Questions<br>$\qquad$ 1 30 3<br>$\qquad$ = 90<br><br>Class Range = $\dfrac{\text{Highest total score (450)} - \text{Lowest score total (90)}}{\text{Total Score (5)}}$<br>$\qquad$ = 72<br>Based on the values obtained, categories can be made, namely:<br>Very good $\qquad$ : 382 – 450<br>Good $\qquad$ : 309 – 381<br>Fairly good $\qquad$ : 236 – 308<br>Not enoughgood $\qquad$ : 163 – 235<br>Not good $\qquad$ : 90 – 162 |
| Water | Maximum Score = Highest Score x Respondents x Questions<br>$\qquad$ 5 30 2<br>$\qquad$ = 300<br>Minimum Score = Lowest score x Respondents x Questions<br>$\qquad$ 1 30 2<br>$\qquad$ = 60<br>Class Range = $\dfrac{\text{Highest total score (300)} - \text{Lowest score total (60)}}{\text{Total Score (5)}}$<br>$\qquad$ = 48<br>Based on the values obtained, categories can be made, namely:<br>Very good $\qquad$ : 253 – 300<br>Good $\qquad$ : 205 – 252<br>Fairly good $\qquad$ : 157 – 204<br>Not enoughgood $\qquad$ : 109 – 156<br>Not good $\qquad$ : 60 – 108 |
| Algae | Maximum Score = Highest Score x Respondents x Questions<br>$\qquad$ 5 30 1<br>$\qquad$ = 150 |

$$\text{Minimum Score} = \text{Lowest score x Respondents x Questions}$$
$$1 \ 30 \ 1$$
$$= 30$$

$$\text{Class Range} = \frac{\text{Highest total score (150)} - \text{Lowest score total (30)}}{\text{Total Score (5)}}$$
$$= 24$$

Based on the values obtained, categories can be made, namely:

Very good           : 127 – 150
Good                 : 103 – 126
Fairly good         : 79 – 102
Not enoughgood   : 55 – 78
Not good            : 30 – 54

Outlet

$$\text{Maximum Score} = \text{Highest Score x Respondents x Questions}$$
$$5 \ 30 \ 3$$
$$= 450$$

$$\text{Minimum Score} = \text{Lowest score x Respondents x Questions}$$
$$1 \ 30 \ 3$$
$$= 90$$

$$\text{Class Range} = \frac{\text{Highest total score (450)} - \text{Lowest score total (90)}}{\text{Total Score (5)}}$$
$$= 72$$

Based on the values obtained, categories can be made, namely:

Very good           : 382 – 450
Good                 : 309 – 381
Fairly good         : 236 – 308
Not enoughgood   : 163 – 235
Not good            : 90 - 162

## 3. Results and Discussion

### 3.1 Inlet

The results of the research on the waste management process in the sub-variables of the inlet are as follows:

**Table 4**. Waste Management Process at theInlet.

| Category | Score | Frequency | Percentage | Weight |
|---|---|---|---|---|
| **Waste blood and urine residue** | | | | |
| Very good | 5 | 7 | 23.3% | 35 |
| Good | 4 | 19 | 63.3% | 76 |
| Fairly good | 3 | 4 | 13.3% | 12 |
| Not enoughgood | 2 | - | - | |
| Not good | 1 | - | - | |
| Amount | | 30 | 100% | 123 |
| **Waste water from washing blood, offal, and cutting tools** | | | | |
| Very good | 5 | 11 | 36.7% | 55 |
| Good | 4 | 18 | 60% | 72 |
| Fairly good | 3 | 1 | 3.3% | 3 |
| Not enoughgood | 2 | - | - | - |
| Not good | 1 | - | - | - |

| Category | Score | Frequency | Percentage | Weight |
|---|---|---|---|---|
| Amount | | 30 | 100% | 130 |
| **Meat, bone, fat and offal waste** | | | | |
| Very good | 5 | 6 | 20% | 30 |
| Good | 4 | 22 | 73.3% | 88 |
| Fairly good | 3 | 2 | 6.7% | 6 |
| Notenough good | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 124 |
| **Urine waste in the cage** | | | | |
| Very good | 5 | 8 | 26.7% | 40 |
| Good | 4 | 22 | 73.3% | 88 |
| Fairly good | 3 | - | - | - |
| Notenough good | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 128 |
| **Fecal waste in the cage** | | | | |
| Very good | 5 | 6 | 20% | 30 |
| Good | 4 | 23 | 76.7% | 92 |
| Fairly good | 3 | 1 | 3.3% | 3 |
| Not enoughgood | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 125 |
| **Total** | | | | **630** |

Based on table 4 shows "that the total score obtained for the sub-variable inlet is 630 with a good category which is in the interval (513 - 633), this shows that some respondents' answers feel good with the inlet of Regional Slaughterhouse Company of Medan City. This is in accordance with the opinion of [8] that in general, abattoir wastewater consists of urine, blood, fat, and water used for washing. Washing water and blood come from the equipment room, slaughter room, and cage from the storage process, the slaughter process, the carcass division process and the process of removing offal. Unusable fat that comes from the skinning process.

## 3.2 WasteTreatment Tank

The results of research on the waste management process in the sub-variables of the waste treatment tank are as follows:

**Table 5**. Waste Management Process in Waste Treatment Tub

| Category | Score | Frequency | Percentage | Weight |
|---|---|---|---|---|
| **Sedimentation Tub** | | | | |
| Very good | 5 | 1 | 3.3% | 5 |
| Good | 4 | 10 | 33.3% | 40 |
| Fairly good | 3 | 19 | 63.3% | 57 |
| Notenough good | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 102 |
| **Filtration Tub** | | | | |
| Very good | 5 | 1 | 3.3% | 5 |
| Good | 4 | 8 | 26.7% | 32 |
| Fairly good | 3 | 21 | 70% | 63 |
| Notenough good | 2 | - | - | - |

| Category | Score | Frequency | Percentage | Weight |
|---|---|---|---|---|
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 100 |
| **Cleaning Tub** | | | | |
| Very good | 5 | - | - | - |
| Good | 4 | 8 | 26.7% | 32 |
| Fairly good | 3 | 22 | 73.3% | 66 |
| Not enoughgood | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 98 |
| **Total** | | | | **300** |

"Table 5" shows that the total score obtained for the sub-variable soft he wastetreatment tank is 300 with a fairly good category whichis in the interval (236 – 308), this indicates that some of the respondents' answers feel quite good with the wastewatertreatment tank at Regional Slaughterhouse Company of Medan City.This is in accordance with the opinion of [9] that in general the WWTP waste treatment basin of an RPH consists of 3 tanks, namely, a settling basin, a filtration tank, and a purification tank. The filtration tank is to drain the liquid waste and hold a small amount of solid waste that cannot be deposited in thesettling basin.

### 3.3 Water At Regional Slaughterhouse Company of Medan City

The results of research on the process of waste management in water sub-variables are as follows:

**Table 6**. Waste Management Process in water at Regional Slaughterhouse Company of Medan City.

| Category | Score | Frequency | Percentage | Weight |
|---|---|---|---|---|
| **Availability of water** | | | | |
| Very good | 5 | 9 | 30% | 45 |
| Good | 4 | 14 | 46.7% | 56 |
| Fairly good | 3 | 7 | 23.3% | 21 |
| Not enoughgood | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 122 |
| **Water Flow** | | | | |
| Very good | 5 | 7 | 23.3% | 35 |
| Good | 4 | 15 | 50% | 60 |
| Fairly good | 3 | 8 | 26.7% | 24 |
| Not enoughgood | 2 | - | - | - |
| Not good | 1 | | | - |
| Amount | | 30 | 100% | 119 |
| **Total** | | | | **241** |

"Table 6" shows that the total score obtained for the sub-variable water in the abattoir is 241 with a good category which is in the interval (205 – 252). According to respondents' answers some feel good with the water conditions in Regional Slaughterhouse Company of Medan City. In the opinion of [10] that the water flow of an abattoir must be smooth and continuous or continuous in the whole process of activities at the abattoir.

### 3.4. Algae

The results of research on the process of waste management in the sub-variables of algae (algae) are as follows:

**Table 7**. Waste Management Process in Algae.

| Category | Score | Frequency | Percentage | Weight |
|---|---|---|---|---|
| **Utilization of Algae Plants** | | | | |
| Very good | 5 | 3 | 10% | 15 |
| Good | 4 | 9 | 30% | 36 |
| Fairly good | 3 | 12 | 40% | 36 |
| Not enoughgood | 2 | 6 | 20% | 12 |
| Not good | 1 | - | - | - |
| **Amount** | | **30** | **100%** | **99** |

"Table 7" shows that the total score obtained for the sub-variable algae (algae) is 99 with a fairly good category in the interval (79 – 102), this shows that according to the respondents' answers they feel quite good with the use of algaein Regional Slaughterhouse Company of Medan City. Algae plants in the abattoir oxidation pond are sufficient at the bottom of the pond and are able to act as a natural cleaner for the oxidation pond with the help of sunlight and oxygen. Algae plants with the help of sunlight are very efficient in destroying parasites and pathogenic bacteria [11].

### 3.5. Outlet

The results of the research on the waste management process at the sub-variable outlet are as follows:

**Table 8**. Waste Management Process at RPH IPAL Outlet

| Category | Score | Frequency | Percentage | Weight |
|---|---|---|---|---|
| **Oxidation Pool Scent/Odor** | | | | |
| Very good | 5 | 3 | 10% | 15 |
| Good | 4 | 7 | 23.3% | 28 |
| Fairly good | 3 | 20 | 66.7% | 60 |
| Not enoughgood | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 103 |
| **Oxidation Pond Water Cleanliness** | | | | |
| Very good | 5 | - | - | - |
| Good | 4 | 9 | 70% | 36 |
| Fairly good | 3 | 21 | 30% | 63 |
| Not enoughgood | 2 | - | - | - |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 99 |
| **Routine Maintenance of Oxidation Pond Water** | | | | |
| Very good | 5 | - | - | - |
| Good | 4 | 8 | 26.7% | 32 |
| Fairly good | 3 | 19 | 63.3% | 57 |
| Notenough good | 2 | 3 | 10% | 6 |
| Not good | 1 | - | - | - |
| Amount | | 30 | 100% | 95 |
| **Total** | | | | **297** |

"Table 8" shows that the total score obtained for the sub-variable outlets is 297 with a fairly good category which is in the interval (236 – 308), this shows that according to the respondents' answers, some of the respondents feel quite good with the outlet in Regional Slaughterhouse Company of Medan City.

**3.6 Value of Waste Management ProcessAnalysis in Regional Slaughterhouse Company of Medan City.**

Table 9. Recapitulation of Overall Value Results on Waste Management Processes in Regional Slaughterhouse Company of Medan City

| Variable | Sub Variable | Mark | Description |
|---|---|---|---|
| Waste Management Process on Installation Wastewater Treatment (WWTP) Medan City Slaughterhouse | 1. inlet | 630 | Good |
| | 2. Waste Treatment Tank | 300 | Fairly good |
| | 3. Water at Slaughterhouse | 241 | Good |
| | 4. Algae | 99 | Fairly good |
| | 5. outlet | 297 | Fairly good |
| **Amount** | | **1567** | **Good** |

"Table 9" shows that the total value obtained fromthe waste management process in Regional Slaughterhouse Company of Medan Cityis 1567, this means that the overall assessment of the respondents towards themanagement process is good with intervals (1429 – 1764) indicating that the community feels good about the abattoir waste management process.

**3.7. Status of Wastewater Quality in Regional Slaughterhouse Company of Medan City**

Table 10. Results of measuring the quality of PD wastewater. Medan City RPH at the WWTP inlet andoutlet

| Parameter | Unit | Quality standards | WWTP Wastewater | |
|---|---|---|---|---|
| | | | *Inlet* | *Outlet* (Oxidation Pool) |
| BOD | mg/L | 100 | 81.63 | 40.82 |
| COD | mg/L | 200 | 160 | 80 |
| TSS | mg/L | 100 | 98 | 36 |
| Oil and fat | mg/L | 15 | 4 | 2 |
| Ammonia (NH3-N) | mg/L | 25 | 3.21 | 0.15 |
| pH | - | 6.0-9.0 | 6.3 | 7.1 |
| Total Coliform | Jl/100 mL | - | 25 | 23 |

**Table 11**. Storet test results in WWTP outlet wastewater (Oxidation Pool) Regional Slaughterhouse Company of Medan City.

| Parameter | Unit | Mark | Quality standards | Description |
|---|---|---|---|---|
| BOD | mg/L | 40.82 | 100 | Fulfil |
| COD | mg/L | 80 | 200 | Fulfil |
| TSS | mg/L | 36 | 100 | Fulfil |
| Oil and fat | mg/L | 2 | 15 | Fulfil |
| Ammonia (NH3-N) | mg/L | 0.15 | 25 | Fulfil |
| pH | - | 7.1 | 6.0-9.0 | Fulfil |
| **Category** | **Good** | | **Meet the Quality Standard** | |

Source: laboratory test results

Based on "Table 11", it can be seen that the status of water quality at the outlet of (Oxidation Pool) Regional Slaughterhouse Company of Medan City is included in the good category which indicates that the quality of theoutlet water (Oxidation Pool) has met the quality standard for slaughterhouse wastewater based on the Regulation of the Minister of the Environment of the Republic of Indonesia No. 5 year 2014

### 3.8 Classical Assumption Test

a. *Normality test*

**Table 12**. Normality test results

| Variable | asymp. Sig. (2-tailed) | Conclusion |
|---|---|---|
| Unstandardized Residual | 0.188 | Normal |

Based on "Table 12", the significance value of Kolmogorov-Smirnov in the Asymp.Sig (2-tailed) column is 0.188. The value obtained is greater than 0.05 so it can be concluded that the residual data is normally distributed andfeasibletouse.

b. *MulticollinearityTest*

**Table 13**. Multicollinearity test results

| Variable | Tolerance | VIF | Conclusion |
|---|---|---|---|
| *Inlet* | ,967 | 1.034 | No multicollinearity |
| Waste Treatment Tank | ,919 | 1.088 | No multicollinearity |
| Water in Slaughterhouse | ,915 | 1.093 | No multicollinearity |
| Algae | ,966 | 1.035 | No multicollinearity |

Based on "Table 13" that the Tolerance value of each model is greater than 0.1 and the VIF value of each model is less than 10. So it can be concluded that there are no symptoms of multicollinearity in the results ofthe data analyzed.

*c. Heteroscedasticitytest*

**Table 14**. Heteroscedasticity test results

| Variable | Correlation Coefficient | Absolute Residual |
|---|:---:|:---:|
| *Inlet* | ,908 | ,372 |
| Waste Treatment Tank | ,553 | ,585 |
| Water in Slaughterhouse | -,621 | ,540 |
| Algae | ,517 | ,609 |

Based on "Table 14" that the significant value of each model is greater than 0.05 or sig > 0.05. So it can be concluded that the analyzed data does not occurheteroscedasticitysymptoms.

**3.9 Model Fit Test**

*a. Coefficient of Determination Test (R2)*

**Table 15**. R2 . Test Results

| | | Model Summaryb | |
|:---:|:---:|:---:|:---:|
| R | R Square | Adjusted R Square | Std. ErroroftheEstimate |
| ,960a | ,923 | ,910 | ,468 |

Based on "Table 15", the results of the R2 or R Square test are obtained, namely 0.923, which means that the independent variables, namely inlet, wastetreatmenttank, water, and algaeare able to influence the dependent variable outletwas 92.3% while 7.7% was influenced by other variables.

*b. FTest*

**Table 16**. F test results

| | | ANOVAa | | | |
|---|:---:|:---:|:---:|:---:|:---:|
| Model | Sum ofSquares | df | MeanSquare | F | Sig. |
| Regression | 65,224 | 4 | 16.306 | 74,439 | ,000b |
| Residual | 5,476 | 25 | ,219 | | |
| Total | 70,700 | 29 | | | |

Based on "Table 16", the F-count value is 74,439 and the significance value is 0.000, which means F = 0.000 <0.05. So it can be concluded that the inlet, wastetreatmenttank, water, and algaesimultaneously significantly affect the outlet.

*c. Partial Test (T Test)*

**Table 17**. T . Test Results

| Coefficientsa | | | | |
|---|---|---|---|---|
| Model | UnstandardizedCoefficients | StandardizedCoefficients | t | Sig. |
| | B | Beta | | |
| (Constant) | -6,487 | | -5.809 | ,000 |
| *Inlet* | ,545 | ,755 | 13.341 | ,000 |
| WasteTreatment Tank | ,345 | ,302 | 5,196 | ,000 |
| Water in Slaughterhouse | -,516 | -,303 | -5,199 | ,000 |
| Algae | ,399 | ,325 | 5,738 | ,000 |

Based on "Table 17", the variables inlet, waste treatment tank, water, and algae partially affect the dependent variable, namely outlet, because each of these independent variables has a value significance of 0.000 which means that the value is smaller than the value of = 5% or 0.000 <0.05.

**4.0 Conclusion**

1.  The waste management process at the Medan City Slaughterhouse Regional Company is in the good category, which means that the waste management at the abattoir is adequate and has met the requirements for the waste management process at the Slaughterhouse, but in the process of cleaning and routine maintenance in the oxidation pond Medan City Slaughterhouse Regional Company is in a fairly good category.

2.  Based on laboratory tests, the status of the wastewater qualityattheoutlet (oxidationpond) of the Medan City Slaughterhouse Regional Company is in the good category, which means that the quality of the wastewater at the WWTP outlet (oxidation pond) has met the quality standards of the slaughterhouse wastewater based on Regulation Minister of Environment of the Republic of Indonesia No. 5 of 2014.

3.  Based on the results of Multiple Linear Regression analysis that waste management attheinlet $(X_1)$,wastetreatmenttub $(X_2)$, RPH Water $(X_3)$ and Algae $(X_4)$ affects the outlet (Y) in the City Slaughterhouse Regional Company. Medan.

**REFERENCES**

[1]Badan Standarisasi Nasional (BSN). 1999. *SNI 01-6159-1999 Tentang Rumah Pemotongan Hewan*. Jakarta.

[2]Winarno, F.G, 1996. *Undang-Undang Tentang Pangan. Kumpulan Makalah Pada Musyawarah Wilayah II Dan Seminar Ilmiah Persatuan Ahli Teknologi Laboratorium Kesehatan Indonesia (PATELKI) Wilayah DKI Jakarta*, 25- 26 November 1996.

[3]Afiati, F. 2015. *PilihPilihDagingAsuh.* Biotrend, 4(1): 19–25.

[4]Gaznur, Z., Nuraini, H., & Priyanto, R. 2017. *Evaluasi Penerapan Standar Sanitasi Dan Higien Di Rumah Potong Hewan Kategori Ii (Evaluation Of Sanitation And Hygiene Standard Implementation At Category Ii Abattoir)*. Jurnal Veteriner, 18(1): 107–115.

[5]Padmono, D. 2005. *Alternatif Pengolahan Limbah Rumah Potong Hewan-Cakung*. Jurnal Teknologi Lingkungan BPPT, 6 (1): 303-310.

[6]Ginting, Nurzainah. 2007. Penuntun Praktikum: Teknologi Pengolahan Limbah Peternakan. Universitas Sumatera Utara, Medan.

[7]Sugiyono. 2012. *Metode Penelitian Kuantitatif Kualitatif dan R&B*. Bandung: Alfabeta.

[8]Peraturan Menteri LingkunganHidup No. 5 Tahun 2014 tentang Baku Mutu Air Limbah.

[9]Lubis, I. Tri Edhi, B.S. Dan Soemantojo, R. W. 2018. *Pengelolaan Air Limbah Rumah Potong Hewan Di Rph X, Kota Bogor, Provinsi Jawa Barat*. J. Manusia&Lingkungan, 25(1): 33-44.

[10]Yuriski, Ryan Isra., Riyanto H., Moh. S. 2018. Studi Evaluasi Kelayakan Sistem Instalasi Pengolahan Air Limbah (IPAL) Rumah Potong Hewan (RPH) Gadang Kabupaten Malang. Jurnal Mahasiswa Jurusan Teknik Pengairan Universitas Brawijaya, 2 (1).

[11]Kareth,Yermia. 2018. *Rancang Bangun Instalasi Pengolahan Air Limbah Rumah Potong Hewan Di Kabupaten Manokwari*. Tesis. Program Pascasarjana Universitas Papua Manokwari.