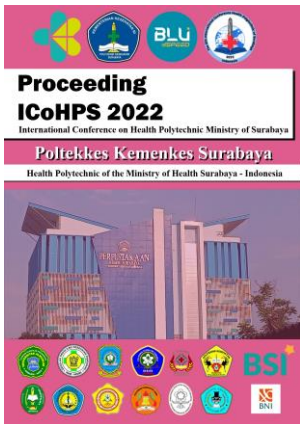


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**THE 5<sup>th</sup> INTERNATIONAL CONFERENCE ON HEALTH POLYTECHNICS OF  
SURABAYA (ICOHPS)**

**2<sup>nd</sup> International Conference of Environmental Health (ICoEH)**

**FACTORS AFFECTING THE EVENT OF SCABIES DISEASE IN TAHFIDZUL  
QUR'AN NURUL FALAH ISLAMIC BOARDING PONDOK, PONCOL DISTRICT,  
MAGETAN REGENCY**

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**ABSTRACT**

Scabies is a skin disease caused by the infestation and sensitization of the mite *Sarcoptes scabies hominins variant* and its products on the body. The number of scabies diseases is increasing every year. The incidence of Scabies in Magetan was 4.10% in 2013, an increase in 2014 to 7.66%. Then, having an increase in 2015 to 8.23% (Magetan District Health Office). Based on the cases of scabies disease, the sufferer is dominated by students.

The purpose of this study is to determine the condition of sanitation, personal hygiene, students' behavior, occupancy density, and room conditions at the Nurul Falah Islamic Boarding School, Poncol, Magetan, in 2022.

~~The type of this research is descriptive and aims to discuss the problems that exist. Descriptive research is a research method carried out with the main aim of making a description or description of an objective situation.~~

The form of implementation is by using a survey approach. The instruments used are observation sheets and questionnaires.

The results showed that sanitation conditions did not fulfill the requirements, then showed poor personal hygiene at 51.4% and good personal hygiene at 48.6%. Then, it shows that students' behavior is 29.3% good and 70% bad. The density and condition of the rooms in this Islamic boarding school also do not fulfill the requirements.

Based on the study's results, it is recommended that students improve personal hygiene and good behavior. For example, not borrowing clothes from each other, washing bed linen regularly, washing hands with soap after activities, and the rooms inhabited by students must be adjusted to the student's capacity in the dormitory. This study concluded that the sanitation conditions, behavior and personal hygiene of students, and the occupancy density of Islamic boarding schools still did not meet the requirements. Improvements are needed for variables

that still do not meet the requirements so that they are better for improving health quality and minimizing disease incidence.

**Keywords:** *Boarding school, occupancy density, personal hygiene, room conditions, sanitation, Scabies, student behavior*

## **BACKGROUND**

Healthy concepts formulate that the situation is perfect physically, mentally, and socially in extensive coverage, not only free from disease or weakness/disability. In this definition, healthy is not only free from illness or disability. (World Health Organization).

Sanitation (a healthy environment) is crucial to keep the environmental health. It is because of an effort to prevent interference problem health due to factors environment that can be potentially harmful to health. Thus, environmental sanitation is an effort to repair and prevent health problems that are caused by environmental factors external to humans that conduct by individuals, communities, or countries (Chandra, Budiman, 2007:1-2).

According to Hidayat & Ramlah (2019), the relationship between room conditions and personal hygiene to the incidence of skin diseases in the female dormitory of the Sultan Hasanuddin Islamic Boarding School, Gowa explained that the variable occupancy density was seven rooms (70%) that did not complete the health requirements. The variable number of microbes is ten rooms (100%) that fulfill the requirements in the female dormitory. Then, the ventilation variable is ten rooms (100%) that do not complete the ventilation variable requirements. The variable of bathing habits can be concluded that there is no relationship between bathing habits and the incidence of skin diseases in the female dormitory of Pondok Pesantren Sultan Hasanuddin, Gowa. The variable changing clothes habits can be concluded that there is a relationship between the habit of changing clothes with the incidence of skin diseases in the female dormitory of the Sultan Hasanuddin Islamic Boarding School, Gowa.

Based on research (Kuspriyanto, 2013) at Islamic Boarding Schools in Pasuruan, East Java, it was explained a high incidence of Scabies disease was due to the lack of facilities for providing good clean water and bad behavior of students in PHBS. The most urgent condition to give attention to is increasing students' knowledge of maintaining clean and healthy living behavior.

## **RESEARCH METHOD**

To discuss the problems that exist in this research, the type of this research is descriptive. ~~Descriptive research is a research method that is carried out with the main aim of making a description or descriptive of an objective situation.~~ The form of implementation is

by using a survey approach. It aims to know directly about the state of sanitation facilities and the density of bedroom occupancy as well as disease complaints at the Tahfidzul Qur'an Islamic Boarding School Nurul Falah, Poncol, Magetan.

## RESEARCH RESULT

### a. Scabies Incident

*Table IV.1 Distribution of the frequency of scabies in the Nurul Falah Islamic Boarding School*

Scabies	Amount (variable)	Precentage%
Scabies	28	20%
Tidak scabies	112	80%
Total	140	100.0

*Source: Poskestren data on the incidence of scabies in the male dormitory of the Nurul Falah Islamic boarding school in January-March 2022*

Based on table VI.1 shows that 28 (20%) students suffer from scabies and 112 (80%) students do not suffer from scabies.

### b. Sanitary Conditions

*Table IV.2 Distribution of sanitation conditions in Nurul Falah Islamic Boarding School in 2022*

No.	Sanitation	Amount	Precentage%
1.	Qualify	9	43%
2.	Not qualify	12	57%
	Total	21	100%

*Source: The results of research on sanitation conditions at the Nurul Falah Islamic Boarding School in June 2022*

Based on table IV.2 shows the sanitary conditions at the Nurul Falah Islamic Boarding School which fulfill the requirements with 9 a percentage of 43% and those that do not meet the requirements with 12 a percentage of 57%.

### c. Personal Hygiene

*Table IV.3 Personal distribution hygiene at the Nurul Falah Islamic Boarding School in 2022*

<b>Category</b>	<b>Amount</b>	<b>Precentage%</b>
Good	68	48,6%
Poor	72	51,4%
Total	140	100%

*Source: assessment results of personal hygiene of Nurul Falah Islamic Boarding School in June 2022*

Based on table VI.3 shows the personal hygiene of students at the Nurul Falah Islamic Boarding School with 68 good results with a percentage of 48.6% and 72 bad with a percentage of 51.4%

#### **d. Student behavior**

*Table IV.4 Behavior distribution students at the Nurul Islamic Boarding School Falah 2022*

<b>Category</b>	<b>Amount</b>	<b>Precentage%</b>
Good	54	38,6%
Poor	86	61,4%
Total	140	100%

*Source: assessment results of the behavior of students at the Nurul Falah Islamic Boarding School in June 2022*

Based on table VI.4 shows the behavior of students in Nurul Falah Islamic Boarding School (Boy) resulting in 54 well-behaved with a percentage of 38.6% and misbehaving 86 with a percentage of 61.4%.

#### **e. Occupancy Density**

*Table IV.5 Distribution of occupancy density in Nurul Falah Islamic Boarding School 2022*

<b>Occupancy density</b>	<b>Amount</b>	<b>Precentage%</b>
<8m <sup>2</sup> inhabited/2 person	7	100%
8m <sup>2</sup> inhabited/2 person	0	0%
Total	140	100%

*Source: assessment results occupancy density in Nurul Falah Islamic Boarding School in June 2022*

Based on table VI.5 shows the condition of the density of dormitory occupancy in Nurul. Islamic Boarding School Falah (Son) does not fulfill the condition.

#### **f. Room condition**

*Table IV.6 Distribution of results room condition assessment dormitory and mosque in Nurul Falah Islamic Boarding School in 2022*

<b>Room condition</b>	<b>Amount</b>	<b>Precentage%</b>
Fulfilled	6	46%
Not fulfilled	7	54%
Total	13	100%

*Source: assessment result room condition in Nurul Falah Islamic Boarding School in June 2022*

Based on table IV.6 shows the condition of the room at Nurul Islamic Boarding School Falah that meets requirement 6 with a percentage of 46% and who do not meet requirement 7 with a percentage of 54%.

## **DISCUSSION**

### **a. Scabies Incident**

Based on the table, several sick people was 28 with a percentage of 20%, and among those who were not sick with a portion of 112 with a portion of 80%. According to the boarding school administrator's confession, Scabies at the Nurul Falah Islamic Boarding School (boy) occurred quickly and continuously. The cause of Scabies is because students do not apply personal hygiene. For example, borrowing towels and clothes from other students, students' fingernails are rarely cleaned, using unclean garments. Then later, the density of bed occupancy does not meet the requirements. Seventeen students occupy the capacity of the 3x4 room. The handling of Scabies at the Nurul Falah Islamic Boarding School (**Putra**) is also very lacking. Most students are reluctant to seek treatment because they think Scabies is only a trivial disease. So that there is no clear picture of the problem of Scabies, and no comprehensive prevention has been carried out.



Scabies is an infectious disease caused by *Sarcoptes scabies varian hominis*. Scabies is an endemic disease in many communities. This disease can affect all races and groups around the world. This disease is often found in children and young adults but can affect all ages. Incidence for men and women is the same. Scabies has four primary or cardinal signs: nocturnal pruritus, attacking a group of people, tunnels, and parasites (Zaida Victoria Narcissa Betancourth Aragón, 2010).

According to Nuraini & Wijayanti (2016), the results of the study on the relationship between gender and level of knowledge with the incidence of Scabies in the Nurul Islam Islamic boarding school in Jember, it can be concluded that the target of PHBS disease prevention in Nurul Islam Islamic boarding school should be prioritized. It refers to the boys and methods to increase students' knowledge of PHBS. To overcome this incident, Islamic boarding schools should pay attention to the personal hygiene of students and the density of bed occupancy that meets the requirements to minimize or eliminate the incidence of Scabies in Islamic boarding schools.

#### **b. Sanitary Conditions**

Based on the results of the distribution table, this study shows the sanitation conditions in the Nurul Falah Islamic Boarding School that meet the requirements 9 with a percentage of 43% and those who do not meet the requirements 12 with a percentage of 57%. Sanitation is a public health effort that focuses on monitoring the physical structure where people use it as a shelter, which affects the degree of human health. These sanitation facilities include ventilation, temperature, humidity, occupancy density, natural lighting, building construction, waste disposal facilities, human waste disposal facilities, and clean water (Azwar, 1990). This study is in line with (Mayrona et al., 2018), showing that 39 students suffer from scabies at the Matholiul Huda Al Kautsar Islamic boarding school (84.8%).

There is an influence between environmental sanitation practices, including bathroom hygiene practices, bedroom cleanliness, environmental hygiene, ablution practices, and prayer room hygiene practices, with the incidence of scabies at the Matholiul Huda Al Kautsar Islamic boarding school, Pati district. Efforts in the sanitation conditions of this Islamic boarding school should improve the quality of sanitation in bathroom hygiene, waste management, and healthy latrines to show that the category meets the requirements and avoids the

occurrence of diseases that are influenced by the sanitation of the Islamic boarding school.

### c. Personal Hygiene

The table of research results at the Nurul Falah Islamic Boarding School shows that the condition of good behavior or personal hygiene of students (male) is 68 with a percentage of 48.6% and the bad one is 72 with a percentage of 51.4%. The bad behavior of students is of various kinds, such as students' hair and fingernails being not short or clean, students not washing their hands before entering class, and students' clothes being worn alternately with other students. Maintenance of personal hygiene greatly determines health status, where individuals consciously and on personal initiative maintain health and prevent disease. This personal hygiene effort includes the cleanliness of hair, eyes, ears, teeth, mouth, skin, nails, and cleanliness in dressing.

Personal hygiene is essential to maintain. If this is not considered, various impacts will appear, especially skin diseases such as scabies. Poor personal hygiene will increase the incidence of scabies. Scabies is a contagious infectious disease caused by infection and sensitization by the mite *Sarcoptes scabiei var hominis* (Sarcoptes sp.) and its products. Transmission of scabies can occur through direct contact with scabies sufferers or contact with objects contaminated by scabies. It can cause scabies endemic (Gusni et al., 2021). Compared with research (Gusni et al., 2021), the condition of environmental factors affects the incidence of skin diseases in female students. This is because the environmental conditions in Anshor Al-Sunah Islamic Boarding School, Kampar are not optimal.

The shape of economic factors does not affect the incidence of skin diseases in female students. This is because the student's pocket money adequacy is sufficient to meet the needs of buying toiletries. The condition of personal hygiene factors affects the incidence of skin diseases in female students, and this is due to the lack of personal hygiene behavior of female students in Anshor Al-Sunah Islamic Boarding School, Kampar Regency. Compared with research (Gusni et al., 2021), the condition of environmental factors affects the incidence of skin diseases in female students, and this is because the environmental conditions in Anshor Al-Sunah Islamic Boarding School, Kampar Regency is not optimal.

Economic factors do not affect the incidence of skin diseases in female

students. It is because the student's pocket money adequacy is sufficient to meet

the needs of buying toiletries. The condition of personal hygiene factors affects the incidence of skin diseases in female students. This is due to female students' lack of personal hygiene behavior in Anshor Al-Sunah Islamic Boarding School, Kampar Regency. Efforts to personal hygiene or personal hygiene need awareness from each student, including hand hygiene, hair, feet, and skin. Poor personal hygiene can affect students, especially in this scabies incident. It is better if the boarding school administrator can help confirm poor personal hygiene from students who should not borrow clothes from each other in Islamic boarding schools. There are no borrowing towels from each other because one of the students has washed or dirty towels. And use the mattress only for yourself.

#### **d. Student's Behavior**

In this study, 54 students behaved well, and 86 students misbehaved. In theory, poor hygiene behavior is a significant factor in scabies disease. At the time of the interview, it showed that students' behavior was still lacking in clean and healthy living behavior. Such as not changing clothes twice a day, wearing clothes or praying tools with other friends, making one laundry with another friend's laundry, not using detergent when washing clothes, putting dirty clothes in one place with another friend, and not changing clothes at the same time and sweating, taking turns using soap with other friends. Those are some examples of unsanitary or healthy behavior. In addition, students' behavior in the form of cleanliness of bed linen and mattresses shows that most students do not wash the sheets and dry the mattress regularly.

Health behavior is a person's response to stimuli related to illness and disease, the health care system, food and drink, and the environment (Notoatmodjo, 2007). balanced menu, adequate rest, stress control, effort and how to respond to illness and disease, perception of illness, knowledge of causes of disease symptoms, and others. (Becker in Notoatmodjo, 2007). This research is in line with (Makful & Pirawati, 2019), which show two descriptions of the behavior of the students of the Assyafi'iyah Islamic Islamic Boarding School regarding the implementation of PHBS, while the behavior or actions of the students regarding the performance of PHBS are not suitable as many as 81 people (54.0% ), while the excellent behavior of the students was 69 people (46.0).

Thus, it can be said that students' behavior towards PHBS is not good. It is recommended that students not exchange personal items such as clothes and

towels. Students should take a bath at least twice a day, and it is recommended that students wash their hands after activities and should use soap, dry the mattress regularly, and always maintain personal hygiene and the boarding school environment. They are increasing counseling efforts in Islamic boarding schools regarding procedures for carrying out and maintaining good behavior.

**e. Occupancy Density**

Based on the measurements of this study shows that the density of occupancy does not meet. There are no adequate occupancy densities. Based on the observations, there are only seven rooms in the Tahfidzul Qur'an Nurul Falah Islamic Boarding School, Poncol, Magetan. Their residents are a combination of first junior high school and third high school with 140 students. In each room with an area of 3x4, there are four rooms containing 25 students. A room measuring 6x4 has two rooms filled with 30 students, while a room with a size of 8x4 has 1 room filled with 35 students.

Occupancy density is the ratio between the floor area of the house and the number of family members in a household. Occupancy density is one of the crucial indicators for the quality of life because it affects the safety and health of housing for house members. Assessment of occupancy density using the provisions of Kepmenkes No. 829 of 1999, the standard of occupancy density that meets health requirements is a room area of 8 m<sup>2</sup> for two persons.

This study is in line with research (Husna et al., 2021) which shows the factors that play a role in the high prevalence of scabies in developing countries related to poverty, one of which is residential density. An environment includes dormitories, groups of school children, family members in densely populated houses, and even between residents in a village. Occupancy density is included in one of the requirements for housing health, where high occupancy density, especially in bedrooms, will facilitate the transmission of scabies disease by direct contact from one person to another. In conditions of residential density that do not meet these requirements, scabies bacteria overgrow in the room because a narrow space supports it, and the occupants are clustered. And make the transmission of scabies easier. The public health center should provide counseling and knowledge about the standard of residential density, which should be at least one person occupying 8 m, to the boarding school administrator. Therefore, the housing thickness is significant, so there is no incidence of scabies disease.

**f. Room condition**

From the results of this study, the condition of the room assessed is a dormitory and a mosque. The first variable, namely the dormitory, shows 80%, which is considered eligible, and the second variable, the mosque, also offers 80%, which is regarded as suitable. However, in the components assessed from each variable, there are still components that do not have a maximum score, such as in the dormitory where the occupants exceed the capacity or indicate the density of the room occupancy. And the mosque variable is taken, for example, on dirty and smelly prayer tools, and the ablution place shows the floor is still slippery and messy and there is a puddle. Healthy conditions are not only needed for the body, but a dwelling also needs to be healthy. Various requirements are included in the criteria for a healthy house, according to the Ministry of Health, that need to be considered when building a house. A healthy home can also affect the health conditions of its occupants. In addition to being healthy, the house must also include aspects of safety, health, comfort, and convenience for its residents. As stated in the Law of the Republic of Indonesia Number 28 of 2002 concerning Buildings, regarding the benchmark for the reliability of a building. Public places are places that influence environmental health problems. The basis for the implementation of the mosque's environmental sanitation is Kep. Minister of Health 288/Menkes/SK/III/2003 concerning Guidelines for Public Facilities and Buildings Sanitation. Compared with research (Riptifah, 2018) based on the Regulation of the Minister of Health Number 1077 of 2011 concerning Guidelines for Air Sanitation in the Home Room that humidity that is too high or low can cause the growth of microorganisms to thrive.

Several factors can cause lousy humidity, namely poor house construction such as leaky roofs, floors, and walls that are not waterproof and a lack of natural and artificial lighting. The moisture that meets the requirements is 40-60%<sup>11</sup>. Mites can survive 2-3 days at room temperature when the relative humidity is more than 30%; the higher the relative humidity, the higher the survival rate. In Islamic boarding schools is the incidence of scabies, a skin disease mainly affecting students. Cases occur in densely populated areas, and the number of cases is large in boarding schools. Density can be seen from the thickness of the bedroom occupancy, which is a minimum bedroom area of 4 m<sup>2</sup>, and it is not recommended for more than two people in one bedroom, except for children

under the age of 5 years. In efforts to improve the condition of the room in this cottage, the cottage should pay attention to the aspect of the building where the walls look dirty and have streaks, the floor is slippery, and the density of the sleeping rooms inhabited by students so that it shows that the condition of the room is comfortable and healthy.

### **CONCLUSION**

1. The incidence of scabies disease in the male dormitory of the Nurul Falah Islamic Boarding School Poncol shows that 20% of the total students are still affected by scabies disease.
2. Sanitation conditions in the Nurul Falah Islamic Boarding School still do not meet the requirements.
3. Personal hygiene of students at the Nurul Falah Islamic Boarding School shows poor personal hygiene of students.
4. The behavior of students at the Nurul Falah Islamic Boarding School shows terrible behavior from students
5. Occupancy Density at Pondok Pesantren Nurul Falah lives in a room with an area of  $<8\text{m}^2$  for two people.
6. The condition of the room at the Nurul Falah Islamic boarding school shows that it does not meet the requirements of the subjects assessed, including dormitories and mosques.
7. Personal hygiene, student behavior, and residential density affect the incidence of scabies disease at the Nurul Falah Islamic Boarding School, Poncol, Magetan.

### **SUGGESTION**

1. Socializing about clean and healthy living behavior needs to be done to avoid scabies disease.
2. It is necessary to improve sanitation in the Nurul Falah Islamic Boarding School so that sanitation in the cottage shows that it meets the requirements.
3. Bad student personal hygiene needs counseling about clean and healthy living behavior.
4. There needs to be an increase in students' behavior in terms of knowledge, attitudes, and actions at the Nurul Falah Islamic Boarding School.
5. There needs to be an increase in the occupancy density for students at the Nurul Falah Islamic Boarding School, which according to health requirements, is a room area of  $8\text{ m}^2$  for two people.

6. It is necessary to increase the requirements for healthy houses or the sanitation requirements of the Nurul Falah Islamic Boarding School for dormitories and mosques.

7. Every month, it is hoped that there will be counseling for students about personal hygiene, student behavior, and residential density for cottage owners to provide space for students according to health requirements. Other researchers, can conduct research by employing direct interviews without any learning activities at the Islamic boarding school.

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**THE 5<sup>th</sup> INTERNATIONAL CONFERENCE ON HEALTH POLYTECHNIC  
FROM SURABAYA (ICOHPS)  
2<sup>nd</sup> International Conference from Environment Health (ICoEH)**

**ANALYSIS OF NITROGEN PHOSPHAT POTASSIUM IN LIQUID ORGANIC  
FERTILIZER BASIC WASTE LIQUID TOFU  
WITH VARIATION OF TOMATO MOLE**

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**ABSTRACT**

Utilization of tofu liquid waste can be used as a new alternative to fertilizer because the tofu liquid waste it has the availability of nutrients needed by plants with the addition of Tomato Mole. The purpose of this study was to determine the quality of liquid organic fertilizer using tofu liquid waste as raw material with the addition of a variety of MOL Tomato (*Solanum Lycopersicum*) bioactivator.

This type of research is experimental research with a posttest only design. This study used tomato MOL variations (15 ml, 20 ml, 25 ml) with 3 repetitions in each treatment within 14 days of fermentation. Data collection techniques used pre-experimental and documentation methods. result analysis technique with table adds parameters to analysis.

Nitrogen, Phosphate, and Potassium content in liquid organic fertilizer using 1 liter of tofu liquid waste as raw material with the addition of various moles of tomatoes fermented for 14 days, namely 15 ml (1.5%), 20 ml (2%) and 25 ml (2,5%). In the variation of 15 ml ( 1.5%) the resulting Nitrogen, Phospat, and Potassium Nitrogen, Phospat, and Potassium content of (2.10%),

variation of 20 ml (2%) resulted in the content of Nitrogen, Phospat, and Potassium of (2.33%), and in the variation of 25 ml (2.5%) resulted in the content of Nitrogen, Phospat, and Potassium of (3.45%) of the three variations already meeting the quality standards, ~~namely~~ PERMENTAN RI NO. 261/KPTS/ SR.310/ M/ 4/2019 ie 2- 6 %.

In this study, it is necessary to conduct further research by reviewing the length of fermentation time to obtain optimal results of Nitrogen, Phospat, and Potassium content, laboratory examination of the MOL content of tomatoes before the research process is carried out to determine the levels of N, P, K in tomato MOL.

Keywords: *Liquid organic fertilizer*, Tofu Liquid Waste Utilization, Tomato MOL

## BACKGROUND

Waste is the result of a process or activity either from industry or domestic or household. Waste can cause pollution to the environment and can cause disease germs so that human health is disturbed. Waste can contaminate soil, and water and cause a bad smell and aesthetically can reduce the beauty of the environment.

The tofu industry is one of the food processing industries with the basic ingredients of soybeans which produce a protein source. According to data from the Central Statistics Agency for Magetan Regency in 2020, as many as 115 tofu factories are currently operating. The existence of the tofu industry causes the waste from processing soybeans. The waste generated by the tofu industry is in the form of solid waste and liquid waste.

Tofu liquid waste contains high enough organic compounds that will pollute the environment and endanger human health if discharged into rivers without undergoing a waste treatment process (Antika et al., 2020).

According to Kustiani & Saptorini research, (2019) liquid organic fertilizer whose basic ingredients come from animals or plants that have undergone fermentation and the product form is in the form of liquid. The chemical content in it is a maximum of 5%.

Liquid organic fertilizer is a solution from the decomposition of organic materials derived from plant residues, animal waste, and humans containing one or more carriers of elements needed by plants. The method that can be used in the process of making organic fertilizer for tofu liquid waste is the anaerobic fermentation method as a method that is easy to do, inexpensive, does not require large land, and can increase the nutrient content of tofu liquid waste.

This research was conducted in Surarmajan Village, Maospati District, Magetan Regency, the survey results were at the Tofu Industry Factory produced approximately 8 quintals of soybeans per day. A lot of tofu liquid waste that is wasted can hurt the health of the local community.

In the process of making liquid organic fertilizer, namely by using local microorganisms (MOL). MOL is a local microorganism found in various types of decaying organic matter and can usually be used to accelerate the degradation process of organic waste in the manufacture of organic fertilizer.

According to Juanda et al, (2011) suggested that local microorganisms are a collection of microorganisms that can be bred, which serves as a starter in the manufacture of organic fertilizers where the raw materials also come from the agricultural environment such as straw, animal waste, fruit and vegetable waste, one of which can be using tomatoes as raw material for local microorganisms (MOL).

The increasing production of tomatoes has not been matched by adequate post-harvest handling and optimal storage methods, because tomatoes are easy to rot if not used immediately. The community's post-harvest tomato management is not optimal, causing rotting tomatoes to be found in various traditional markets which eventually become part of the market waste.

Tomato MOL ( *Solanum lycopersicum* ) is a local microorganism found in decaying organic matter and can usually be used to accelerate the degradation process of organic waste in the manufacture of fertilizers. (Shim et al., 2018) .

Based on the problems in the field, it is necessary to treat tofuand tomato ( *Solanum lycopersicum* ) liquid waste as liquid organic fertilizer.

Liquid organic fertilizer from tofu and tomato waste ( *Solanum lycopersicum* ) can later be used as an alternative to inorganic fertilizers because it contains organic compounds that can increase nutrient availability, stimulate plant root growth and leaf growth (Puspawati et al., 2016)

## RESEARCH METHODS

### **Type of Research**

The type of research used is pre-experimental research with a research design using a *posttest only design* there is no control and only one group is measured and observed after being given *posttest treatment*.

### **Population and Sample**

this study is tofu liquid waste water and uses 3 variations of tomato mole volume (15 ml, 20 ml, 25 ml). Each of the variations will be tested for 3 replications so that a total of 9 samples will be obtained. This research was conducted in Suratmajan Village, Maospati District, Magetan Regency, Ruang Workshop Sanitation Study Program Diploma III Campus Magetan Poltekkes Ministry of Health Surabaya, as well as the examination of Nitrogen, Phospat, and Potassium content in Liquid Organic Fertilizer in Laboratory and Soil Fertility Faculty of Agriculture, Sebelas Maret University (UNS) Surakarta.

### **Research variable**

The independent variable in this study was the volume concentration of the Tomato MOL (15 ml, 20 ml, 25 ml). While the dependent variable in this study is the physical quality of organic fertilizer, levels of. The Confounding Variables include the presence of odor, color, texture, and pH.

### **Research site**

The location of this research is in the Darso tofu factory, Suratmajan Village, Maospati District, Magetan Regency, East Java, Indonesia, Workshop room for Sanitation Study Program Diploma III Campus Magetan Health Polytechnic Ministry of Health Surabaya, Indonesia and Laboratory and *Soil Fertility Faculty of Agriculture Sebelas Maret University (UNS) Surakarta*, Indonesia.

### **Data collection technique**

1) Observation, by making direct observations of conditions in the field regarding information obtained directly from data sources in writing and can be trusted in truth, 2 ) Interviewing , through direct questioning and answering to the owner of the tofu industry who is responsible for processing the tofu production process 3 ) Laboratory Examination Checking samples of liquid organic fertilizer after the fermentation process to check the levels of Nitrogen, Phospat, and Potassium 4 ) Documentation: support research data obtained from the photo, review from notes, files and another document that is following this research. Taking pictures are obtained During observation.

### Data analysis method

the data is analyzed from the quality of organic fertilizers seen physically and chemically, namely based on color, odor, pH N, P, K in tabular form based on PERMENTAN RI NO. 261 of 2019 concerning Minimum Technical Requirements for Organic Fertilizer, Biological Fertilizer, and Soil Improvement.

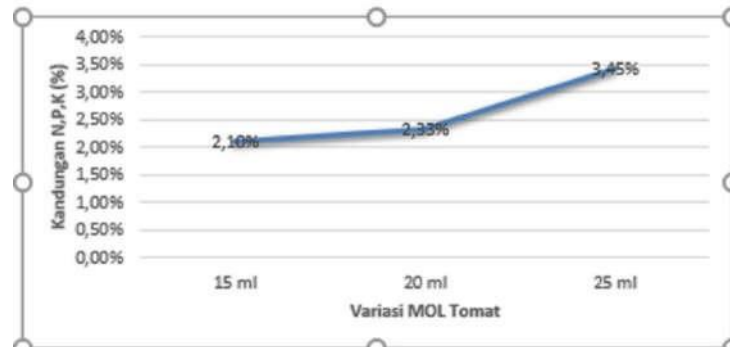
### RESEARCH RESULTS

No	Code	Results		
		N(%)	P(%)	K (%)
1.	15.1	0,10%	0,16%	1,86%
2.	15.2	0,09%	0,15%	1,86%
3.	15.3	0,10%	0,16%	1,87%
4.	20.1	0,09%	0,21%	2,03%
5.	20.2	0,11%	0,22%	2,02%
6.	20.3	0,12%	0,22%	2,03%
7.	25.1	0,12%	1,24%	2,06%
8.	25.2	0,12%	1,29%	2,06%
9.	25.3	0,12%	1,28%	2,06%

Source: Laboratory and Soil Fertility Faculty of Agriculture Sebelas Maret University (UNS) surakarta 2022

**Table 1. Table of Recapitulation of Examination Results Nitrogen, Phosphate, and Potassium LIQUID ORGANIC FERTILIZER**

No.	Code	Results			N+P+K (%)
		N(%)	P(%)	K (%)	
1	15	0,09%	0,15%	1,86%	0,39%
2	20	0,10%	0,21%	2,02%	0,47%
3	25	0,12%	1,27%	2,06%	0,58%
Information				MS	
Quality Standards				2-6%	



**Figure 1. Graph of Recapitulation of Examination Result for macro Element Nitrogen, Phospat, and Potassium LIQUID ORGANIC FERTILIZER**

Based on the results of the above recapitulation on the examination of liquid organic fertilizer with variations in the volume of tomato MOL (15 ml, 20 ml, 25 ml) that the content of Nitrogen (N), Phosphorus (P) and Potassium (K) has met the quality standards based on PERMENTAN RI NO. 261/KPTS/ SR.310/ M/ 4/2019 .

## DISCUSSION

### 1. Nitrogen (N)

Liquid organic fertilizer is fermented anaerobically for 14 days with 1 liter of tofu wastewater added with 15 ml (1.5%) MOL variation of tomatoes has an average nitrogen content of 0.09%, and the tomato MOL variation of 20 (2 %) ml has an average nitrogen content of 0.10%, in the variation of MOL tomato 25 (2.5) ml has an average nitrogen content of 0.12%. There was an increase in the nitrogen content of liquid organic fertilizers in this study, but the nitrogen content of liquid organic fertilizers in this study did not meet the requirements or was not following PERMENTAN RI NO. 261/KPTS/ SR.310/ M/ 4/2019 ie 2-6 %. The low nitrogen content may be caused by reduced nitrogen during fermentation and preparation for testing the nutrient content in the laboratory (Handayani, 2017).

The nitrogen element in liquid organic fertilizer is needed for the growth and development of vegetative parts of plants such as leaves, stems, and roots, plays an important role in the formation of green leaves for the implementation of the photosynthesis process, the formation of proteins, fats and various organic compounds, improving the quality of leaf-producing plants, breeding microorganisms in the soil (Rasyid, 2017).

### 2. Phosphorus ( $P_2O_5$ )

Liquid organic fertilizer is fermented anaerobically for 14 days with 1 liter of tofu wastewater added with a variation of MOL tomato 15 (1.5%) ml has an average phosphorus content of 0.15%, and the MOL variation of tomato 20 (2 %) ml has an average phosphorus content of 0.21%, in the MOL variation of tomatoes 25(2.5) ml has an average phosphorus content of 1.27%.

the phosphorus content of liquid organic fertilizer in this study, but the phosphorus content is not following the Minister of Agriculture of the Republic of Indonesia NO. 261/KPTS/ SR.310/ M/ 4/2019 ie 2-6 %. The low phosphorus content in liquid organic fertilizer in this study was probably due to the relationship between P content and other elements in the fermentation process.



The length of fermentation determines the level of P concentration, but the longer the fermentation time does not mean that the P concentration is also increasing. This is following the opinion of Hidayati, et al (2011), which states that the phosphorus content is related to the N content in the substrate.

### 3. Potassium ( K<sub>2</sub>O )

The liquid organic fertilizer in this study which had been fermented for 14 days anaerobically with 1 liter of tofu wastewater added with 15 (1.5%) ml MOL variation of tomatoes had an average potassium content of 1.86%, and the MOL variation of tomatoes 20(2%) ml have an average potassium content of 2.02%, in the MOL variation of tomatoes 25(2.5%) ml have an average potassium content of 2.06%.

According to (Putra & Ratnawati, 2019a) the number of bacteria or binoculars found in tomato waste is *Actinomyces bacteria* that live above Ph 6 (neutral) in anaerobic conditions which have a role in the decomposition of organic matter and increase nutrient reserves in the soil and form humus that can work effectively in the process of fermenting organic matter.

the potassium content of liquid organic fertilizer in this study, but the potassium content did not meet the requirements or not following the RI Minister of Agriculture NO. 261/KPTS/SR.310/ M/ 4/2019 ie 2-6 %. The possibility of this happening is due to the slow activity of microorganisms so the potassium content of liquid organic fertilizer in this study tends to be low. The element of potassium functions in helping the formation of proteins and carbohydrates, accelerating plant growth, increasing plant resistance to drought and disease, and improving the quality of seeds or fruit.

### 4. The Relation of Laboratory Results Nitrogen, Phospat, and Potassiumwith the Minister of Agriculture of the Republic of Indonesia No. 261 the Year 2019

Nitrogen, Phosphate, and Potassium content in liquid organic fertilizer using 1 liter of tofu liquid waste as raw material with the addition of 15 ml (1.5%), 20 ml (2%), and 25 ml (2.5%). In the variation of 15 ml ( 1.5%) the resulting N,P,K content of (2.10%), the variation of 20 ml (2%) resulted in the content of N,P,K of (2.33%), and in the variation of 25 ml (3.45%) resulted in N,P,K content of (0.577%) and it can be seen from the graph that there was an increase in N,P,K macronutrients from this study but all three of the tomato mole variations had met the standard quality, namely the Minister of Agriculture of the Republic of Indonesia NO. 261/KPTS/ SR.310/ M/ 4/2019 ie 2-6 %.

### 5. Results of Measurements or Physical Observations

Based on the table of observations and measurements of pH in the first week and second weeks, the pH was 8. In a stable neutral condition, because the organic matter had been decomposed and there was a decrease in the activity of microorganisms. According to the Regulation of the Minister of Agriculture of the Republic of Indonesia No. 261/KPTS/SR.310/M/4/2019, the minimum technical requirement for the pH value of liquid organic fertilizer is 4-9. Based on the table of observations and measurements in the first week and second week, it is known that the odor in liquid organic fertilizer from tofu liquid waste and tomato mole bioactivator. The smell at the beginning of the fermentation process shows a very strong odor, but at the end of the fermentation, the pungent odor is slightly reduced.

## CONCLUSION

1) Based on the results of the analysis of the N, P, K content of 1 liter of tofu liquid waste with variations in tomato moles (15 ml, 20 ml, 25 ml) Ministry of Agriculture of the Republic of Indonesia NO. 261/KPTS/ SR.310/ M/ 4/2019. 2) The results of physical observations and measurements for 14 days of fermentation, pH of 8 which indicates a neutral and stable condition According to the Minister of Agriculture of the Republic of Indonesia NO. 261/KPTS/ SR.310/ M/4/2019, the minimum technical requirement for the pH value of liquid organic fertilizer is 4-9. The smell of liquid organic fertilizer from tofu liquid waste and tomato mole bioactivator at the beginning of the fermentation process showed a very strong odor, but at the end of the fermentation the pungent odor was slightly reduced and smelled like tape and brownish with a liquid texture.

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