Study of Fly Density Levels in Citra Baraka Traditional Market, Enrekang Regency

Abdul Halim[1*], Ashari Rasjid[2], Mulyadi[3]

[1,2,3] Department of Environmental Health, Makassar Health Polytechnic
[*]Corresponding author: halimgura09@gmail.coom

*Info Artikel:Diterima ..bulan...20XX ; Disetujui ...bulan .... 20XX ; Publikasi ...bulan ..20XX *tidak perlu diisi*

ABSTRACT

Traditional markets are one of the public places that have high potential to become a location for the development of disease vectors, especially flies. Activities at the Citra Baraka Market in Enrekang Regency produce organic waste from leftover food, meat, fish, and vegetables that are not managed properly, so that they become a breeding ground for flies that have the potential to transmit diseases such as diarrhea, dysentery, and typhoid. This study aims to determine the level of fly density in various locations in the market, namely: chicken slaughterhouses, vegetable traders' areas, fish traders' areas, and existing waste management systems. The type of research is descriptive research using a fly grill as a measuring tool for fly density. The results of the study showed that the density of flies in the chicken stall was 6 /grill block, (TPS) showed results at 10/grill block, the vegetable stall area showed results of 3/grill block, the fish stall showed results of 5/grill block, with a category exceeding the standard quality standards according to Permenkes No. 2 of 2023 (<2/grill block). Waste management facilities are said to be unfit for health based on the results of observations that have been carried out. The conclusion of this study shows that the results in the chicken stall are 6 chickens/grill block, in the Temporary Shelter (TPS) location 10 chickens/grill block, in the vegetable stall 3 chickens/grill block, in the fish stall 5 chickens/grill block, the waste management facilities do not meet standards and are said to be unhealthy based on the results of observations that have been carried out, thus supporting an increase in the fly population

Keywords : Density; Environmental Sanitation; Flies; Traditional Market; Waste Management

INTRODUCTION

Indonesia is classified as a developing country. The population of Indonesia in 2020 reached approximately 269,603,400 people, where public health and environmental conditions are crucial aspects to be addressed as they are closely related to the improvement of community health status, which is still in progress. The simplest actions to maintain health can be carried out through preventive and promotional efforts, including the prevention of disease emergence through the empowerment of clean and healthy living behaviors (Renstra Dinkes SUL-SEL, 2018).

According to data from the Central Bureau of Statistics (BPS), the total population of South Sulawesi in 2020 reached 9,073,509 people across 24 regencies/cities, with an average growth rate of 1.18% over the last ten years. Makassar City had the largest population, with 1.5 million inhabitants. Enrekang Regency ranked 19th with a population of 225,172 people (BPS SulSel, 2022). The South Sulawesi provincial health profile data for 2020 showed that the highest diarrhea morbidity rate (1,159–2,686 cases) was found in Makassar, East Luwu, Maros, Pare-Pare, Soppeng, Wajo, Jeneponto, Bantaeng, Gowa, Enrekang, Pinrang, and Pangkep, while the lowest (663 cases) occurred in Tana Toraja, Sinjai, Selayar, Barru, and Palopo (Dinkes SUL-SEL, 2020). Data from the Enrekang District Health Office between 2015–2019 recorded communicable diseases that were treated and reported, including diarrhea (5,113 cases), cough (7,840 cases), and ARI (6,974 cases). Meanwhile, data from Baraka Health Center in Baraka District for 2021 reported diarrhea (331 cases), cough (708 cases), and common cold (531 cases).

Baraka Market is a traditional market located in Baraka District, Enrekang Regency, South Sulawesi. This market serves as the economic hub for the local community, where residents buy and sell daily necessities. As a traditional market, Baraka Market reflects local community life, including direct interactions between sellers and buyers. The market provides food, clothing, and household

goods, and is often crowded with street vendors. However, cleanliness frequently becomes an issue in this traditional setting. Trading activities and the wide variety of goods sold generate waste, which can be associated with diseases such as diarrhea. Flies are capable of transmitting bacteria, viruses, or parasites that cause diarrhea, including Escherichia coli, Salmonella, Shigella, and Vibrio cholerae. They often come into contact with sources of these pathogens, such as human or animal feces, garbage, and organic waste, which serve as breeding habitats for flies. Diseases originating from such waste can be mechanically transmitted by flies.

Flies are insects belonging to the class Hexapoda, which comprises around 60–70% of arthropod species. They thrive in moist environments, wet garbage, feces, and decaying organic matter. Their presence often indicates poor sanitation in an area. Of the 60,000–100,000 fly species, several act as disease vectors, transmitting illnesses such as diarrhea caused by Salmonella, Escherichia coli, and Shigella, typhoid fever caused by Salmonella typhi, and cholera caused by Vibrio cholerae. Due to their frequent contact with waste and excrement, flies have a high potential to spread diseases if environmental hygiene is not maintained (Rahmayanti et al., 2022).

Food stalls are among the favorite spots for flies because of food waste in open trash containers, which produce distinct odors. Flies often perch on dirty floors or tables even after cleaning. According to the Ministry of Health Regulation No. 2 of 2023 concerning Guidelines for Healthy Market Management, food selling areas must be free from disease vectors, including flies. Observations revealed that not all vendors had trash bins; some simply piled up waste around the stalls, while others shared bins, leading to mixed garbage such as meat and vegetable waste that produced strong odors. Some trash containers were inadequate, lacked covers, or were merely plastic bags, causing waste to overflow and scatter. In vegetable stalls, flies were abundant as garbage was placed close to the stalls and goods were left uncovered. The accumulation of wet waste without proper disposal facilities generated foul odors that attracted flies (Sulasmi & Wahyuni, 2022).

In fish auction areas, large amounts of vegetable waste, plastic, and stagnant dirty water were found, making the floor slippery and unclean. These conditions attracted flies, which serve as vectors of disease that can be mechanically transmitted to vendors, buyers, and nearby residents. Fly density was influenced by uncovered waste, leftover fish, meat, vegetables, and fruit left in the open, producing strong odors and serving as breeding sites. The stench from fish waste further attracted flies to reproduce in the area (Rante, R. I. & S., 2022).

Ineffective waste management can provide breeding grounds for disease vectors such as flies. The relationship between waste management and fly density in temporary waste storage sites indicates a correlation between waste handling and fly population levels. Measuring fly density is crucial to understanding their prevalence. According to the Decree of the Indonesian Ministry of Health No. 2 of 2023 on environmental health quality standards and requirements for disease vectors and carriers as well as their control, an area is considered compliant if the number of flies landing on a fly grill is fewer than two. Therefore, if the number exceeds the established standard, control measures are required (Permenkes No. 2 of 2023).

MATERIAL AND METHOD

The type of research applied is descriptive research, which aims to describe the level of fly population at Citra Baraka Market, Enrekang Regency. The population studied in this research includes all aspects related to waste management that contribute to the increase of fly populations at Citra Baraka Market, Enrekang Regency. The samples examined in this study consisted of 10 points from each stall, including vegetable stalls, chicken slaughter stalls, fish stalls, and the temporary waste disposal site (TPS) available at Citra Baraka Market, Enrekang Regency. The information obtained from observations and measurements is presented in tables and narratives, and the number of fly density samples and waste management practices were analyzed based on the established criteria. The data in this study were analyzed descriptively to understand the results of the variables under investigation.

RESULT

Table 1. Fly Density at Citra Baraka Market

Location	Time		Average
Fissh Stall	Morning	7	5
	Afternoon	3	
Vgetable Stall	Morning	3	3
	Afternoon	2	
Chicken Stall	Morning	5	6
	Afternoon	6	
Temporary Waste Disposal Site (TPS)	Morning	11	10
	Afternoon	8	
	Total		6

Source: Primary Data, 2025

Table 1 shows the average fly density at Citra Baraka Market, namely 5 flies/block grill at the fish stall, 3 flies/block grill at the vegetable stall, 6 flies/block grill at the chicken stall, and 10 flies/block grill at the TPS area.

Table 2. Observation Results of Waste Management Facilities

No	Location	Observation	Result Observation				Description
			Yes		No		
			Value		Value		
1	Fish Stall	Waste collection	1	14%	6	86%	Does Not Meets the requirements ≤70%
		Waste segregation	2	22%	7	78%	
2	Vegetable Stall	Waste collection	1	14%	6	86%	Does Not Meets the requirements ≤70%
		Waste segregation	1	11%	8	89%	
3	Chicken Stall	Waste collection	5	71%	2	29%	Meets the requirements >70%
		Waste segregation	2	22%	7	78%	Does Not Meets the requirements ≤70%

Source: Primary Data, 2025

Table 2 shows that for the waste collection variable, the fish stall had a “Yes” response of 1 (14%) and waste segregation had a “Yes” response of 2 (22%). At the vegetable stall, waste collection had a “Yes” response of 1 (14%) and waste segregation had a “Yes” response of 1 (11%). At the chicken stall, waste collection had a “Yes” response of 5 (71%) and waste segregation had a “Yes” response of 2 (22%).

Table 3. Observation Results of Waste Disposal Facilities at TPS

Location	Observation	Result Observation				Description
		Yes		No		
		Value		Value		
Temporary Waste Disposal Site (TPS)	Temporary waste disposal	4	57%	3	43%	Does Not Meets the requirements ≤70%

Source: Primary Data, 2025

Table 3 shows that for the waste disposal variable at the TPS area, the "Yes" response was 57%.

Table 4. Temperature and Humidity

Indicator	Time			Average
	Monday	Thursday	Senin	
Temperature	26˚C	25˚C	26˚C	26˚C
Humidity	79%	80%	79%	79%

Source: Primary Data, 2025

Table 4 shows that the average temperature at the observation sites ranged between 25–26 °C on Monday and Thursday, with an overall mean of 26 °C. Meanwhile, the average air humidity ranged from 79–80%, with an overall mean of 79%

DISCUSSION

Fly Density Level at Citra Baraka Traditional Market

Measurements at Citra Baraka Market showed high fly density in the chicken, fish, vegetable stalls, and the temporary disposal site (TPS). The density at the fish and chicken stalls was triggered by slippery and dirty floors due to washing water and the location of the stalls near the river with scattered waste. These results are consistent with research conducted at Oeba Market, Kupang City, which also found the highest fly density at fish and chicken stalls (Inna et al., 2023). Fresh fish and meat attract flies to land. Research by Sulasmi in Parepare City also stated that if the fly population on fish is not controlled, it may pose health problems (Sulasmi and Wahyuni, 2022). Based on the research conducted at Citra Baraka Traditional Market, the results from each measurement point are as follows:

1. Fly Density at the Fish Stall

Fly density measurements at the fish stall over three days showed an average of 5 flies per grill block, exceeding the standard (<2 flies). The high number of flies was caused by the strong odor of raw meat, which attracts flies. Research in Parepare City indicated that flies are highly attracted to fresh fish and meat, and uncontrolled populations can lead to health risks (Sulasmi and Wahyuni, 2022).

According to Yuda (2023), fly density measurement using fly grills at the meat stall in Alai Market, Padang City, showed averages of 9 flies on the first day and 7 on the second day, with an overall average of 8 flies exceeding the standard of <2 flies. The high density was caused by waste mixed with blood that did not drain properly, the odor of raw meat, and piles of plastic waste and bones near the entrance, which mixed with foul-smelling waste and attracted flies.

Fly density at meat stalls poses risks as flies carry bacteria, viruses, and pathogens. When landing or making contact with meat, flies can transmit germs, leading to contamination and infection if the meat is consumed without proper cooking. Flies also reduce meat quality by causing discoloration, foul odors, and increased bacterial counts, thus affecting its appearance, taste, and safety. Furthermore, flies act as disease vectors, transferring pathogens to meat and potentially causing

foodborne illness. Controlling flies at fish stalls is crucial to maintaining hygiene by implementing good sanitation practices, such as storing meat in closed containers, keeping storage areas clean, and using fly traps like sticky tape, fly paper, or other pest control methods.

2. Fly Density at the Vegetable Stall

Fly density measurements at the vegetable stall over three days showed an average of 3 flies per grill block, exceeding the standard (<2 flies). This indicates the need for further observation of surrounding areas that may serve as breeding grounds for flies, making the vegetable stall a critical point. Measurements at the vegetable stall in Alai Market, Padang, showed an average of 7 flies per block (8 flies on the first day, 6 on the second), exceeding the standard (<2 flies). The high density was caused by uncovered rotten vegetable waste placed near the produce, as well as overflowing waste bins.

Moderate fly density at vegetable stalls can cause contamination, reducing product quality, freshness, appeal, and market value while creating a negative impression of hygiene and food safety. To prevent fly increase, vegetables nearing spoilage should be stored in closed containers, while rotten vegetables can be used as fertilizer. Observations showed that vegetable waste was still scattered, attracting flies. Improving sanitation by cleaning stalls, disposing of waste properly, and applying fly control measures such as sticky traps or bait is necessary.

3. Fly Density at the Chicken Stall

Fly density measurements at the chicken stall over three days showed an average of 6 flies per grill block, exceeding the standard (<2 flies). High density was caused by the odor of raw meat, blood-contaminated waste with poor drainage, and piles of rotting garbage that attracted flies. These findings are consistent with research in Oeba Market, Kupang City, which also found the highest fly density at chicken and fish stalls (Inna et al., 2023).

High fly density at chicken stalls has negative impacts since flies carry bacteria, viruses, and pathogens. When landing on meat, flies may transfer germs, causing contamination and increasing infection risk if the meat is not properly cooked. Flies also reduce meat quality by causing discoloration, foul odors, and bacterial growth, which affects appearance, taste, and safety. As vectors of disease, flies transfer pathogens between locations, including onto meat, which may lead to food poisoning. Controlling flies at chicken stalls is essential by maintaining cleanliness, storing meat in closed containers, and applying proper sanitation practices.

4. Fly Density at the Temporary Disposal Site (TPS)

Measurements at the TPS over three days showed an average of 10 flies per grill block, exceeding the standard (<2 flies). The high density was linked to poor waste collection, where garbage transportation was not carried out properly, causing waste to accumulate around the bins.

Research by Yuda (2023) at the TPS of Alai Market, Padang City, showed an average of 8 flies per grill block, also exceeding the standard (<2 flies). The high density was due to the dominance of organic waste at the TPS, which is highly attractive to flies. This led to faster decomposition of waste, disruption of the local ecosystem, operational challenges at the TPS, inconvenience for workers, and negative public perceptions of cleanliness and waste management. Fly control efforts at the TPS included cleaning areas after waste transport to remove residues and spraying insecticides around the TPS.

Research by Vania (2022) at Pulau Payung Market, Dumai, over seven days showed high fly density at vegetable, fruit, fish, and meat stalls (6–20 flies per grill block) and very high density at TPS 1–3 (>21 flies per grill block). This was caused by scattered waste and lack of separation between wet and dry waste. Flies prefer moist environments such as rotting plants, wet garbage, animal feces, and organic matter. The impacts include health risks since flies can transmit bacteria, viruses, and parasites causing diarrhea, fever, and skin diseases, as well as economic losses for vendors due to contaminated products. Control efforts involve improving environmental sanitation, eliminating breeding sites, cleaning stalls from residues, and ensuring proper waste management through organized collection, disposal, and transportation.

Observation of Waste Management in Citra Baraka Market

1. Waste Collection in Relation to Fly Density at Citra Baraka Market

Based on Table 5.2, the results of waste management facility observations show the percentage of waste collection and sorting in the fish and vegetable stalls is 14% each, while in the chicken stall it

is 71%. The Temporary Waste Disposal Site (TPS) functions as a temporary storage area before the waste is processed, recycled, or destroyed, and must comply with the standards set by the Indonesian Ministry of Health Regulation No. 17 of 2020.

This study shows a relationship between waste management and fly density at waste collection facilities, which serve as the initial storage locations for waste from each stall individually (Law No. 18, 2008). In Citra Baraka Market, many piles of waste are seen around the trading area. Observations indicate that each study point has a waste bin to store waste from each stall; however, several locations do not meet the standards of Permenkes No. 17 of 2020 on Healthy Markets, with an observation score of ≤70%. Fly density is influenced by various environmental factors, and 16 items were evaluated in the waste collection facilities, including the availability of waste bins in each stall, the condition of the bins (waterproof, lightweight, easy to clean), the presence of a lid that is easy to open and close, and the presence of flies around the waste container.

2. Waste Sorting Conditions in Relation to Fly Density at Citra Baraka Market

Based on Table 5.2, the results of waste management facility observations show the percentage of waste sorting in the fish, vegetable, and chicken stalls: fish stalls 22%, vegetable stalls 11%, and chicken stalls 22%. The observations indicate that none of the trading areas in Citra Baraka Market have waste sorting facilities, nor do they carry out the process of waste separation. Based on observations of waste management facilities, several stalls do not meet the standards of Permenkes No. 17 of 2020 on Healthy Markets, with an observation score of ≤70%. Ideally, waste sorting should separate organic and inorganic waste from trading areas up to temporary storage or final processing sites. However, in this market, waste is collected from each stall and taken directly to the TPS without separation. This condition leads to the mixing of organic waste (from stall activities) with inorganic waste (such as plastics from trading activities), potentially increasing fly density at the study site.

3. Temporary Waste Disposal Conditions in Relation to Fly Density at Citra Baraka Market

Based on observations, the Temporary Waste Disposal Site (TPS) facilities at Citra Baraka Market show 57% compliance and consist of only one unit on the west side of the market, located ≤10 meters from household trading areas. The TPS is situated along the main market pathway, which may disturb visitors. Waste collection does not follow a fixed schedule, causing scattered waste, with fly density measurements showing 11 flies/grill block in the morning and 8 flies/grill block in the afternoon. High fly density is influenced by temperature, humidity, wind, and surrounding environmental conditions. Although the TPS is made of concrete, it has no cover and waste transportation is not routine, thus attracting flies. Several trading areas also fail to meet the standards of Permenkes No. 17 of 2020 (≤70%), and foul odors from waste stored for more than 3 days trigger fly breeding. Generally, improper waste disposal or storage leads to:

a. Breeding grounds for vectors of environmentally based diseases, including flies.
b. Sources of soil, water, and air pollution, as well as aesthetic environmental pollution.
c. Sources for harmful microorganisms to grow and contaminate the environment and humans.

The results show that the highest fly density was found at the TPS facility in Citra Baraka Market. Of the 10 trading area points, waste collection and sorting facilities did not meet standards, yet fly density remained high. Environmental conditions of trading areas that fail to meet health requirements under Permenkes No. 17 of 2020, such as non-waterproof bins, rust-prone bins, uncovered or hard-to-clean containers, and the absence of waste sorting facilities, contribute to high fly populations in the market.

Flies are disease vectors for humans, utilizing various food sources such as organic waste, feces, and human food, and can also live as parasites on animals. High fly density disturbs humans and animals due to their bites and their ability to transmit diseases such as myiasis, cholera, dysentery, and typhoid. Disease transmission occurs when flies land on feces, carry germs on their bodies, and then land on human food. Flies undergo complete metamorphosis through the stages of egg, larva, pupa, and adult, with a life cycle of 7–22 days.

Privately managed TPS sites, consisting of open land without waste containers, cause scattered piles of waste, odors, and attract flies and rats. The impacts include health risks as breeding grounds for disease vectors, aesthetic disturbances, accident potential, and disease spread. According to Purba (2022), improperly managed waste can directly or indirectly pollute the environment, affecting human living conditions and other organisms. The TPS falls into the category of non-compliant and requires fly control. Control measures include sanitation of TPS areas by cleaning up leftover waste after

collection and fly eradication using insecticides through baiting or spraying.

Based on Table 5.4, the research results showed that the average air temperature at the study site during the 3-day observation was 26°C with 79% humidity. One factor influencing air temperature was weather/seasonal conditions at the site, which cannot be controlled. The air temperature range at the study site was still close to the effective temperature for fly activity.

CONCLUSION AND SUGGESTION

This study concludes that the fly density levels in various areas of Baraka Market, Enrekang Regency, exceeded the established standard (<2 flies/grill block), with an average of 6 flies/grill block in general areas and the chicken stall, 10 flies/grill block at the Temporary Disposal Site (TPS), 3 flies/grill block in the vegetable stall, and 5 flies/grill block in the fish stall. It is recommended that the management of Citra Baraka Market conduct regular monitoring and supervision of waste management, as well as improve environmental sanitation facilities and infrastructure.

REFERENCES

Badan Pusat Statistik. (2022). *Provinsi Sulawesi Selatan Dalam Angka2022*.Makassar.https://sulsel.bps.go.id/publication/2022/02/25/ d01e0faa0c453705064bcfc9/ provinsi-sulawesi-selatan-dalam angka2022.html. Diakses 18 Oktober 2024.

Dinas Kesehatan Provinsi Sulawesi Selatan. (2020). *Profil Kesehatan Provinsi Sulawesi Selatan Tahun 2022* Makassar. https://dinkes.sulselprov.go.id/. Diakses 18 Oktober 2024.

Emerty, V. Y., dkk, 2020. *Pengaruh Variasi Wama Pada Fly Grill Terhadap Kepadatan Lalat (Studi di Tempat pemotongan ayam Pasar Terban Kota Yogyakarta. Yogyakarta: Fakultas Kesehatan Masyarakat, Universitas Ahmad Dahlan. (online).https://ejournal.undip*

Fikri, E., & Prameswari, I. (2024*). Tinjauan Kondisi Sanitasi Pasar Berdasarkan Pendekatan Permenkes No. 17 Tahun 2020 (Studi: Pasar Margahayu Kecamatan Margaasih Kabupaten Bandung). Jurnal Kesehatan Lingkungan Indonesia, 23*(1), 111–119. https://doi.org/10.14710/jkli.23.1.111-119 Diakses 18 Desember 2024

Gusti, A. (2024). *Kesehatan Lingkungan Keluarga Nelayan*. Deepublish. Diakses 18 Desember 2024.

Indah Sri Wahyuni. (2019) *Faktor-Faktor Yang Mempengaruhi Kepadatan Lalat Pada Tempat pemotongan ayam di Jl. Abu Bakar Lambogo Kota Makassar.* Jurusan Kesehatan Lingkungan Poltekkes Kemenkes Makassar (Skripsi Tidak Diterbitkan)

Margareta, J., Widyanto, A., & Utomo, N. (2022). *Pengaruh Variasi Warna dan Umpan Pada Fly Trap Terhadap Jumlah Lalat yang Tertangkap. Buletin Keslingmas, 41*(2), 85–91.

Nendissa, A. R. (2022). *Studi Tingkat Kepadatan Lalat di Pasar Mardika Kota Ambon*. *Moluccas Health Journal*, *4*(2), 7–13.

Nisa, I., Thohari, I., & Nurmayanti, D. (2024). *Jurnal Higiene Sanitasi* Gambaran Kualitas Lingkungan Sekolah Dasar di Desa Dalegan ,. *4(1), 6–12.*

Novianti, R., Khaer, A., & Budirman, B. (2020). Studi Variasi Warna Lampu Terhadap Lalat Yang Terperangkap *Pada Alat Perekat Di Rumah Pemotongan Ayam Di Makassar*. *Sulolipu: Media Komunikasi Sivitas Akademika Dan Masyarakat, 20*(2), 144. https://doi.org/10.32382/sulolipu.v2i20.1633

Nurhikmayani. 2022 *Survey Indeks Kepadatan Lalat di Rumah Pemotongan Hewan (Ayam) di Kabupaten Pangkep Makassar* Jurusan Kesehatan Lingkungan Politeknik Kesehatan Makassar (Skripsi Tidak Diterbitkan).

Olviana Reni Inna, D., Romeo, P., & Landi, S. (2023).*Pengelolaan Sampah Dengan Tingkat Kepadatan Lalat Di Pasar Oeba Kecamatan Kota Lama Kota Kupang.* Jurnal Keperawatan Muhammadiyah (Vol. 8, Issue 3). Diakses 28 April 2025

Purba, M. J. (2024). *Faktor yang Berhubungan dengan Tingkat Kepadatan Lalat di Tempat Penampungan Sampah Sementara (TPSS) Kecamatan Telanaipura Kota Jambi 2023*. https://repository.unja.ac.id/63911/7/skripsi maijon pdf full.pdf

Peraturan Menteri Kesehatan Republik Indonesia Nomor 2 Tahun 2023, *Tentang Standar Baku Mutu Kesehatan Lingkungan 151(2), 10–17.*

Peraturan Menteri Kesehatan Republik Indonesia Nomor 17 Tahun 2020 *Tentang Pasar Sehat*. (Online).

Putra, R. A. (2018). *Tinjauan Pustaka dan Pendekatan Masalah http://repositori.unsil.ac.id/59/9/13.%20BAB%2011%20TINJAUAN% 20PUSTA KA% 20DAN% 20PENDEKATAN%20MASALAH pdf* Diakses 19 November 2024.

Renstra Dinas Kesehatan. (2018). *Rencana Strategis Perubahan Dinas Kesehatan Provinsi Sulawesi Selatan 2023.*(online)https://e-renggar.kemkes.go.id/ file_performance/1-190004-2tahunan-038.pdf. Diakses 18 Oktober 2024.

Rahayu, S. D., dkk, 2019. Efektivitas Variasi Limbah Sebagai Atraktan pada Eco-Friendly Trap terhadap Jumlah Lalat dan Jenis Lalat yang Terperangkap. Yogyakarta: Jurusan Kesehatan Lingkungan Poltekkes Kemenkes Yogyakarta. (online) http://e-journal-poltekkesjogja.ac.id/index.php/Sanitasi/article/view/ 938. Diakses 19 Oktober 2024.

Republik Indonesia. (2014). *Peraturan Menteri Lingkungan Hidup Republik Indonesia Nomor 5 Tahun 2014 tentang Baku Mutu Air Limbah*. Jakarta.

Risma Novianti, dkk. (2020). *Studi Variasi Warna Lampu Terhadap Lalat Yang T angkap Pada Alat Perekat di Tempat pemotongan ayam di Makassar, (*Skripsi Jurusan Kesehatan Lingkungan Poltekkes Kemenkes Makassar) (online) https://journal poltekkes-mks.ac.id/ojs2/index.php/ Solulipu Diakses 2 November 2024.

Saipin, Fadmi, F. R., & Mauliyana, A. (2019*)*. Efektivitas Variasi Umpan terhadap Penggunaan Perangkap Lalat (Fly Trap) di Pasar Basah Anduonohu Kota Kendari. *MIRACLE Journal of Public Health*, *2*(1), 112–120. https://journal.fikes-umw.ac.id/index.php/mjph/article/view/25/12

Susilowati, A. (2021). Jenis-Jenis Lalat. *Teknik Lingkungan*, *25*, 8–31.

Sulasmi, R. Wahyuni. (2022). *Hubungan Kondisi Pasar Dengan Tingkat Kepadatan Lalat di Kota Parepare*. Media Komunikasi Sivitas Akademika Dan Masyarakat, 22, 1–8. Diakses 28 April 2025

Syamsuddin S. dkk. (2019) *Modul Pest Control* .Makassar:Jurusan Kesehatan Lingkungan Politeknik Kesehatan Makassar.

Sebayang, G. A. B. (2021). *Karya tulis ilmiah gambaran tingkat kepadatan lalat di pusat pasar kabanjahe kabupaten karo tahun 2021*. Politeknik Kesehatan Kemenkes Medan.

Tangahu, H. (2022). *Makalah Tentang Lalat Dan Diare Di Kkp Kelas Ii Gorontalo 2022*. 1–12.

Vania. E. (2022). *Gambaran Sanitasi Dan Tingkat Kepadatan Lalat Di Pasar Pulau Payung Dumai Kecamatan Dumai Kota Tahun 2022*. Sumatra Utara : Poltekkes Medan.

Yuda. E. (2023) 'Gambaran Tingkat Kepadatan Lalat Di Pasar Alai Kota Padang Tahun 2023'. Sumatra Barat : Poltekkes Padang.

Yunus, H., & Juherah, J. (2020). Gambaran Penanganan Sampah Dengan Tingkat Kepadatan Lalat Di Pasar Tradisional Di Kota Makassar. *Sulolipu: Media Komunikasi Sivitas Akademika Dan Masyarakat*, *20*(1), 66. https://doi.org/10.32382/sulolipu.v20i1.1478

SURAT PERNYATAAN ORISINALITAS KARYA

Yang bertanda tangan di bawah ini :

Nama Lengkap	: Abdul Halim
NIM/NIP	: PO.71.4.221.21.1.001
Tempat/Tanggal Lahir	: Gura, 06 November 2002
Fakultas/Universitas	: Program Studi Sanitasi Lingkungan, Jurusan Kesehatan Lingkungan, Poltekkes Kemenkes Makassar
Alamat Rumah	: Gura

adalah benar hasil karya saya sendiri. Saya menyatakan bahwa:

1. Karya ilmiah ini tidak mengandung materi yang telah dipublikasikan oleh orang lain sebagai karya saya sendiri.
2. Karya ilmiah ini tidak mengandung sebagian atau seluruh karya orang lain yang telah saya ambil dan saya nyatakan sebagai karya saya sendiri.
3. Semua sumber referensi yang saya gunakan dalam karya ilmiah ini telah saya akui dan saya sebutkan dengan benar sesuai dengan kaidah ilmiah yang berlaku.

Demikianlah pernyataan ini dibuat dalam keadaan sadar dan tanpa ada unsur paksaan dari siapapun. Apabila di kemudian hari ditemukan ketidaksesuaian dengan pernyataan ini, saya bersedia menerima sanksi akademik sesuai dengan peraturan yang berlaku.

Makassar, 12 September 2025

Yang menyatakan,

Materai 10000

Abdul Halim

NIM PO.71.4.221.21.1.001