

POTENTIAL AND QUALITY OF FISHERY PRODUCTS IN EAST NUSA TENGGARA

Potensi Dan Mutu Produk Perikanan di Nusa Tenggara Timur

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ABSTRACT

Indonesia is a country that has quite large marine and fisheries resources and East Nusa Tenggara is one of the provinces in Indonesia that has very large fisheries resources, for this reason further exploration is being carried out to utilize these fisheries resources for both the domestic and export markets. This research is to find out about the marine and fisheries potential in East Nusa Tenggara and the quality of these fishery products by making direct observations at the Fish Quarantine Station for Quality Control and Safety of Fishery Products (SKIPM) Kupang, East Nusa Tenggara to find out about the fishery products that are trafficked from the SKIPM. The results of the research show that East Nusa Tenggara has a very large and varied fisheries potential such as Anggoli, Skipjack, Cakalang, Crab Meat, Sweet Lip Fish, Grouper, Red Snapper, Onaga, Hermit crab, Mud Crab, Lobster, Beef Sei Tuna, Shark Fin, Mutira snails, Mackerel, Sea Cucumbers, Tuna Loin, Fan Shrimp, Ronggeng Shrimp, Seaweed and among these products Seaweed and Skipjack tuna are the highest number of fishery products trafficked from SKIPM Kupang, East Nusa Tenggara. The research results also show that 19 products originating from several fish processing units in East Nusa Tenggara province have met the maximum limit criteria for *Escherichia coli* contamination, namely <3 MPN/g with sensory pass quality or were still suitable and safe for consumption or marketing.

Keywords: *Fishery Resources*, East Nusa Tenggara, Microbiological Quality, Sensory Quality

ABSTRAK

Indonesia merupakan negara yang kaya akan sumber daya kelautan dan perikananannya dan Nusa Tenggara Timur merupakan salah satu provinsi di Indonesia yang memiliki potensi perikanan yang sangat menjanjikan. Untuk itu dilakukan eksplorasi lebih lanjut guna pemanfaatan sumberdaya perikanan tersebut baik untuk pasar domestik maupun pasar ekspor. Penelitian ini membahas terkait potensi kelautan dan perikanan yang ada di Nusa Tenggara Timur serta mutu dari hasil perikanan tersebut dengan cara melakukan observasi langsung ke

Stasiun Karantina Ikan Pengendalian Mutu dan Keamanan Hasil Perikanan (SKIPM) Kupang Nusa Tenggara Timur untuk mengetahui terkait produk perikanan yang dilalulintaskan dari SKIPM Nusa Tenggara Timur. Hasil penelitian menunjukkan bahwa Nusa Tenggara Timur memiliki potensi perikanan yang sangat banyak dan beragam seperti Anggoli, Cakalang, Daging Rajungan, Ikan Bibir Manis, Ikan Kerapu, Ikan Kakap Merah, Onaga, Kelomang, Kepiting Bakau, Lobster, Sei Tuna Sapi, Sirip Hiu, Siput Mutira, Tenggiri, Teripang, Tuna Loin, Udang Kipas, Udang Ronggeng, Rumput Laut dan diantara produk tersebut Rumput Laut dan Cakalang merupakan jumlah produk perikanan tertinggi yang dilalulintaskan dari SKIPM Kupang Nusa Tenggara Timur. Hasil penelitian juga menunjukkan bahwa dari 19 produk yang berasal dari beberapa unit pengolahan ikan yang ada di provinsi Nusa Tenggara Timur telah memenuhi kriteria batas maksimum cemaran *Escherichia coli* yaitu <3 MPN/g dengan mutu sensori *pass* atau masih layak dan aman untuk dikonsumsi atau dipasarkan.

Kata kunci: Sumber Daya Perikanan, Nusa Tenggara Timur, Mutu Mikrobiologi, Mutu Sensor

INTRODUCTION

Indonesia is a country rich in marine and fishery resources. About 5.8 million km², or two-thirds of Indonesia's total area consists of oceans. East Nusa Tenggara Province (NTT) is an archipelagic province located in the south of Indonesia, has a sea area of 200,000 km² (outside the EEZ) which has potential marine and fishery resources to be utilized by the Indonesian people.

East Nusa Tenggara Province is one of the provinces in Indonesia that has a huge potential for marine and fishery resources. According to BPS NTT (2024), capture fisheries production from 2020 and 2022 has increased by 182,350 tons to 190,594 tons. Fishery commodities are one of the sources of nutrition whose prices can be reached by all levels of society (Apelabi et al., 2015). Thus, Indonesia has great potential in utilizing its fishery resources. Indonesia must have the ability to handle its own marine products and fisheries properly and correctly so that they can be exported abroad without any rejection problems and can increase state revenue. Optimizing the continued use of fish resources is a crucial aspect to ensure the sustainability of fish resources (Nelwan et al., 2015).

The development of the marine and fisheries sector is currently faced with various challenges, including the upstream sector, aspects of processing and marketing fishery products, and marine products in the downstream sector. The implementation of quality management on fish products that have just been caught is also important to be carried out. This is related to the assessment of the quality and quality of fish as raw materials from a catch before the fish is sent to the processing unit, therefore the quality and quality of safety from upstream to downstream of industrial activities can be well maintained (Hananingtyas, 2017). The quality of fishery raw materials can be assessed from 3 aspects, namely chemical quality, microbiological and physical quality. These three aspects are indicators to determine whether the fishery products are safe and still suitable for consumption or not. Fish is a perishable product because it has a high enough water content so that fish is a suitable medium for the growth of rotten bacteria or other microorganisms. The presence of these microbes causes fish to experience a decay process very quickly (Hardianti et al., 2019)

The Fish Quarantine Station for Quality Control and Safety of Fishery Products (SKIPM) Kupang, East Nusa Tenggara is an organization under the auspices of the Ministry of Marine Affairs and Fisheries (KKP) which was formed to carry out tasks and functions such as organizing fish quarantine, quality control and safety of fishery products and fish biosecurity (Putri, 2024). With the establishment of SKIPM, it is hoped that the quality of each fishery product can be more guaranteed so that it is safe and suitable for further use. One of them is

for the benefit of shipping activities both in the domestic and export markets. All fishery products that will be sent both domestically and for export must go through SKIPM for inspection before shipment as a guarantee that the products are safe and feasible. Every industry or stakeholder must inform SKIPM Kupang NTT in advance to carry out an inspection and from the results of this inspection, a health certificate (HC) will be issued for both domestic and export purposes. The activity aims to ensure that fishery products trafficked from the East Nusa Tenggara region are not illegal products, Unreported, Unregulated Fishing, or IUU Fishing and is a safe and quality product for consumers.

This research will discuss the potential of fisheries in East Nusa Tenggara as seen from the many fishery products trafficked from SKIPM Nusa Tenggara Timur, what commodities are trafficked from SKIPM Nusa Tenggara Timur complete with market destinations, both domestic and export markets. In addition, this research will also describe how the quality of fishery products trafficked from SKIPM East Nusa Tenggara.

METHODS

This research was carried out at the Fish Quarantine Station for Quality Control and Safety of Fishery Products (SKIPM) Kupang, East Nusa Tenggara from November to December 2023. Data collection was carried out by means of interviews, direct observations, namely by making direct observations at SKIPM Kupang. Conduct direct observations related to what fishery products enter SKIPM Kupang and which cities or countries will be sent to. Direct observation of microbiological quality testing and sensory quality was also carried out. (SNI) 2332.1:2015 MPN Method (Most Probable Number) used in the *Escherichia coli* bacteria test on fishery products then to determine sensory tests on fishery products are carried out using the pass and fail forms, pass means fishery products and are still suitable and safe for consumption and fail means fishery products are no longer suitable for consumption because they have begun to rot with indications of sour odor and foul odor in fishery products. The data will be processed and described clearly to know the potential of fishery commodities in East Nusa Tenggara (NTT). The tools and materials used in this study are Stationery and Office (ATK).

RESULT

From the results of the study, it is known that fishery products in East Nusa Tenggara are not only used to meet or meet local needs but are also shipped both domestically and abroad. The delivery of fishery products sourced from East Nusa Tenggara is carried out by several stakeholders or owners of Fish Processing Units (UPI) both small and medium scale where UPI must meet several requirements such as being certified Good Fish Handling Practices (CPIB), Processing Feasibility Certificate (SKP) or even Hazard Analysis and Critical Control Points (HACCP)). To deliver fishery products, there are several required documents that must be met, one of which is the packing list and health certificate issued by SKIPM Kupang, East Nusa Tenggara.

From the results of the research, several fishery commodities were obtained from SKIPM Kupang, East Nusa Tenggara as shown in Figure 1 below.

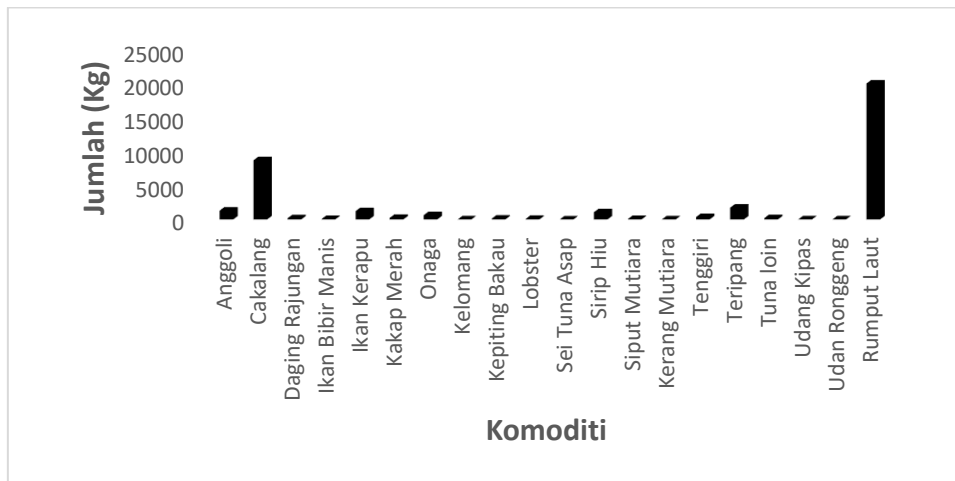


Figure 1. The amount and commodities of fishery products trafficked at SKIPM Kupang, East Nusa Tenggara (NTT)

From Figure 1 above, it is known that the fishery potential in East Nusa Tenggara is very diverse and very large, namely there are 35,758.49 kg of fishery products that are trafficked from SKIPM Kupang, East Nusa Tenggara for 1 month, namely the end of November to the end of December. Seaweed products are the largest fishery product trafficked at SKIPM Kupang, East Nusa Tenggara, followed by skipjack products.

From the results of the study, several destinations were obtained for the delivery of fishery products that were trafficked from SKIPM Kupang, East Nusa Tenggara as shown in Figure 2 below.

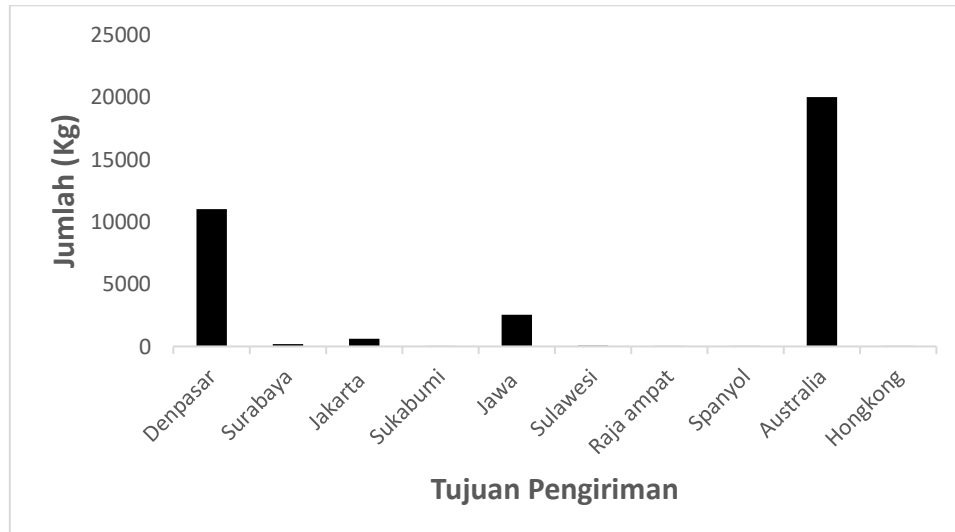


Figure 2. Number and destination of delivery of fishery products trafficked at SKIPM Kupang, East Nusa Tenggara (NTT)

From Figure 2 above, it is known that there are 10 destinations for shipping fishery products in East Nusa Tenggara, namely Denpasar, Surabaya, Jakarta, Sukabumi, Java, Sulawesi, Raja Ampat, Spain, Australia and Hong Kong. The most shipping destinations for fishery products in East Nusa Tenggara are Australia and followed by the city of Denpasar, Indonesia during the period from late November to the end of December 2023.

The following research results are the results of testing the sensory quality and microbiological quality of products trafficked at SKIPM Kupang, East Nusa Tenggara.

Table 1. Fishery products trafficked at SKIPM Kupang, East Nusa Tenggara (NTT)

| No | Product Name | <i>E. Coli</i> Test (MPN/g) | Sensory Tests |
|-----|-------------------|-----------------------------|---------------|
| 1. | Anggoli | <3 | Pass |
| 2. | Skipjack | <3 | Pass |
| 3. | Crab meat | <3 | Pass |
| 4. | Sweet lipped fish | <3 | Pass |
| 5. | Grouper | <3 | Pass |
| 6. | Red snapper | <3 | Pass |
| 7. | Onaga | <3 | Pass |
| 8. | Hermit | <3 | Pass |
| 9. | Mangrove crab | <3 | Pass |
| 10. | Lobster | <3 | Pass |
| 11. | Smoked tuna sei | <3 | Pass |
| 12. | Shark fins | <3 | Pass |
| 13. | Pearl snail | <3 | Pass |
| 14. | Tengiri | <3 | Pass |
| 15. | Sea cucumber | <3 | Pass |
| 16. | Tuna loin | <3 | Pass |
| 17. | Fan shrimp | <3 | Pass |
| 18. | Dragonfish | <3 | Pass |
| 19. | Seaweed | <3 | Pass |

From Table 1 above, it is known that all fishery products transported through SKIPM Kupang East Nusa Tenggara have good microbiological and sensory quality, all test results are still in accordance with the required standards.

DISCUSSION

East Nusa Tenggara Province (NTT) is known to have abundant marine and fishery resource potential. The fishery commodities with the highest amount of traffic in SKIPM Kupang, East Nusa Tenggara (NTT) are seaweed and skipjack fish. Seaweed is one of the leading mariculture products in this region because it provides great profit value (Marcelien et al., 2019). In addition, skipjack fish, as an example of pelagic fish, also shows a high production level in SKIPM Kupang, East Nusa Tenggara (NTT). Pelagic fish itself is a type of fish that lives in surface waters to the middle layer (Amri, 2017) and is the main commodity produced in Indonesian seas. Various other types of pelagic fish that are abundant in NTT include Tuna, Tenggiri, Kite, Selar, and Pufferfish, making this region very potential to support the fisheries sector (Leba, 2020).

The destination areas for shipping fishery products that are trafficked from SKIPM Kupang, East Nusa Tenggara (NTT) with the highest numbers are Denpasar and Australia. The contribution of Fisheries GDP to National GDP in 2023 is 2.66 percent, this value is higher than in 2022 (2.58 percent). The export value of fishery products in Indonesia in 2023 has also increased. In 2020, the export value of fishery products was 5.21 USD billion and increased to 5.63 USD billion in 2023 (KKP, 2024).

Testing of sensory quality and microbiological quality in fishery products is important to ensure product quality and safety. Generally, foods that are a source of bacterial infections are low-acid foods such as meat, fish, eggs and processed products. One of the bacteria that can cause infection is *Escherichia coli*. These bacteria spread easily by contaminating water and contaminating materials that come into contact with it (Di et al., 2017). *Escherichia coli* is a bacterium that can cause disorders in the digestive tract with symptoms of nausea, heartburn, vomiting, and diarrhea if it is found in fish meat

and consumed by humans (Maimunah *et al.*, 2020), so it is important to avoid *E. coli* contamination in fishery products. *E. coli* bacteria can contaminate fishery products because they are caused by non-sterile handling processes and environments (Maruka *et al.*, 2017). According to Marpaung, (2015) preservation and processing is one way to preserve fish from the decay process, so that it can be stored for a long time until it is time to be used as an ingredient for consumption. Fish is a perishable product because it has a high enough water content so that fish is a suitable medium for the growth of rotten bacteria or other microorganisms. The presence of these microbes causes fish to experience a decay process very quickly (Hardianti *et al.*, 2019).

MPN (Most Probable Number) which is a method used to determine the presence of coliform bacteria including *Escherichia coli* bacteria (Imamah *et al.*, 2021). *E. coli* testing on all fishery products trafficked at SKIPM Kupang, East Nusa Tenggara (NTT) showed results that met the standards in accordance with the provisions of SNI 7388:2009 (BSN, 2009). The low level of *E. coli* contamination shows that the production process and handling of fishery products at SKIPM Kupang, East Nusa Tenggara (NTT) is good, so that the quality of products is maintained and the products are safe for traffic. This is supported by the results of sensory tests on all fishery products trafficked at SKIPM Kupang, East Nusa Tenggara (NTT), which also shows that all fishery products are safe for human consumption. The temperature factor is very important to pay attention to, because temperature is very influential in inhibiting the growth of bacteria and can destroy decaying bacteria. Low temperatures are very effective in inhibiting the growth of several bacteria, namely, psychrophilic bacteria (bacteria that tolerate low temperatures and live at a temperature of 7-15°C), mesophilic bacteria (bacteria that grow at a temperature of 15-45°C with an optimal growth temperature of 40°C), and thermophilic bacteria (bacteria that grow at a temperature of 40-80°C with an optimal growth temperature of 45°C) (Cempaka & Asiah, 2020). The growth of coliform bacteria and *E. coli* will be inflamed when fishery products are stored in freezing temperatures (-6°C) and cold temperatures (10°C) can inhibit the growth of bacteria (Siburian, 2012). Ice is used to control the temperature of fishery products in SKIPM Kupang, East Nusa Tenggara (NTT). The ice used uses ice sheets, because it is more evenly distributed in reaching all parts of the fish's body, faster in cooling, and more economical and practical (Darwanto *et al.*, 2022).

CONCLUSION

The results of the study show that there is a potential for fisheries in East Nusa Tenggara, namely Anggoli, Skipjack, Crab Meat, Sweet Lip Fish, Grouper, Red Snapper, Onaga, Crab, Mangrove Crab, Lobster, Smoked Tuna Sei, Shark Fin, Mutira Snail, Mackerel, Sea Cucumber, Tuna Loin, Fan Shrimp, Ronggeng Shrimp, Seaweed and among these products seaweed and skipjack are the highest number of products trafficked from SKIPM Kupang East Nusa Tenggara. The results of the study also showed that 19 products from several fish processing units in East Nusa Tenggara province had met the maximum limit criteria for *Escherichia coli* contamination, which is <3 MPN/g with sensory pass quality or still feasible and safe for consumption.

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REFERENCES

- Amri, K. (2017). Analisis Hubungan Kondisi Oseanografi dengan Fluktuasi Hasil Tangkapan Ikan Pelagis di Selat Sunda. *Jurnal Penelitian Perikanan Indonesia*, 14(1), 55–65.
- Apelabi, P. C., Wuri, D. A., Urias, M., & Sanam, E. (2015). Perbandingan Nilai *Total Plate Count* (TPC) dan Cemaran *Salmonella* sp. pada Ikan Tongkol (*Eutynnus* sp.) yang

- Dijual di Tempat Pelelangan Ikan (TPI), Pasar Tradisional, dan Pedagang Ikan. *Jurnal Kajian Veteriner*, 3(2), 121–137.
- BPS (Biro Pusat Statistik). (2024). *Nusa Tenggara Timur dalam angka*. Biro Pusat Statistik Nusa Tenggara Timur.
- BSN (Badan Standarisasi Nasional). (2015). SNI 7388:2009. Batas Maksimum Cemaran Mikroba Dalam Pangan.
- Cempaka, C., & Asiah, N. (2020). Pelatihan Pembuatan Yoghurt dari Susu Bubuk Full Cream pada Ibu-Ibu Kota Pelangi di Pancoran, Jakarta Selatan. *Indonesian Journal of Social Responsibility*, 2(1), 1–10. <https://doi.org/10.36782/ijsr.v2i1.25>
- Darwanto, A., Ridholumintu, G., Musyadad, R. A. (2022). Studi Komparasi Penggunaan Simplisia Daun Mangga dan Daun Sirih untuk Memperpanjang Masa Simpan Ikan pada Pengewetan Menggunakan Es. *Jurnal Inovasi Daerah*, 1(2), 120-134. <https://doi.org/10.56655/jid.v1i2.24>
- Di, K., Tradisional, P., & Besar, A. (2017). *Escherichia coli*, *Staphylococcus aureus*, *keumamah*. *Ilmu Kelautan*, 1(3), 574–58.
- Hananingtyas, I. (2017). Studi Pencemaran Kandungan Logam Berat Timbal (Pb) dan Kadmium (Cd) pada Ikan Tongkol (*Euthynnus sp.*) di Pantai Utara Jawa. *Biotropic*, 1(2), 41–50.
- Hardianti, F., & Aziz, I. R. (2019). Identification of Pathogenic Bacteria on the Salted Fish *Lutjanus vivanus* in Sorong City of West Papua. *Malaysian Journal of Microbiology*, 15(3), 237–244.
- Imamah, P. N., Efendy, M., Studi, P., Kelautan, I., Universitas, F. P., Madura, T., Ikan, K., & Sampang, K. (2021). Analisis Cemaran Bakteri *Escherichia coli* pada Daging Ikan Pelagis Kecil (studi kasus) di Perairan Laut Utara dan selatan Kabupaten. *Ilmu Kelautan*, 2(1), 17–24.
- KKP (Kementerian Kelautan dan Perikanan). (2024). *Capaian Kinerja Kementerian Kelautan dan Perikanan Tahun 2020 – 2024*.
- Leba, E. G. (2020). Masa Depan Kita Ada di Laut. *Jap Unwira*, 1(1), 55–69. <https://doi.org/10.30822/jap.v1i1.426>
- Maimunah, S., Sianipar, A. Y., & Thaib, C. M. (2020). Analisis Mikrobiologi *Escherichia coli* Jajanan Minuman di Sekitar Jalan Kapten Muslim Kota Medan. *Jurnal Farmanesia*, 7(1), 53–59. <https://doi.org/10.51544/jf.v7i1.2767>
- Marcelien, D. R. O., Felix, R., & Sunadji. (2019). *Rumput Laut (Kappaphycus alvarezii) sebagai Komoditas Unggulan dalam Meningkatkan Nilai Tambah Bagi Kesejahteraan Masyarakat di Provinsi Nusa Tenggara Timur*. *Jurnal Ilmiah Perikanan dan Kelautan*, 11(1), 62–69. <https://doi.org/10.20473/jipk.v11i1.10992>
- Marpaung, R. (2015). Kajian Mikrobiologi pada Produk Ikan Asin Kering yang Dipasarkan di Pasar Tradisional dan Pasar Swalayan dalam Upaya Peningkatan Keamanan Pangan di Kota Jambi. *Jurnal Ilmiah Universitas Batanghari Jambi*, 15(3), 145–151.
- Maruka, S., Siswohutomo, G., & Rahmatu, R. (2017). Identifikasi Cemaran Bakteri *Escherichia coli* pada Ikan Layang (*Decapterus russelli*) Segar di Berbagai Pasar Kota Palu. *Mitra Sains*, 5(1), 84–89. <https://doi.org/10.22487/mitrasains.v5i1.45>
- Nelwan, A. F., Zainuddin, M., & Kurnia, M. (2015). Produktivitas Penangkapan Ikan Pelagis Besar Menggunakan Pancing Ulur yang Berpangkalan di Kabupaten Majene. *Marine Fisheries: Journal of Marine Fisheries Technology and Management*, 6(2), 129–142.
- Putri, V. (2024). Analisis Cemaran Bakteri *Escherichia coli* pada Produk Perikanan di Stasiun Karantina Ikan Pengendalian Mutu dan Keamanan Hasil Perikanan Kupang, Nusa Tenggara Timur. *Prosiding Seminar Nasional Kontribusi Vokasi*, 1, 294–299.
- Siburian, E. T. (2012). Pengaruh Suhu dan Waktu Penyimpanan terhadap Pertumbuhan Bakteri dan Fungi Ikan Bandeng. *Unnes Journal of Life Science*, 1(2), 101 –105.

SNI (Standar Nasional Indonesia). (2015). *Penentuan koliform dan Escherichia coli*. SNI 2332-1;2015. Badan Standarisasi Nasional.