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Economic-Based Food Waste Management Strategy (Qualitative Study at Elang Medika Corpora/EMC Alam Sutera Hospital in South Tangerang)

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ABSTRACT

This study aims to analyze the implementation of food waste management at EMC Alam Sutera Hospital, assess its impact on the environment and hospital operations, and identify strategies for utilizing it to increase economic value. The approach used is qualitative with descriptive research type. Data were collected through interviews, observations, and documentation, then analyzed using data reduction, data presentation, and conclusion drawing. The results showed that food waste management at EMC Alam Sutera Hospital is carried out through sorting organic waste, processing it into compost, and distributing the processed products for use in the hospital area or for sale to the surrounding community. This strategy has a positive impact on the environment by reducing the volume of waste disposed to landfills and increasing operational efficiency through reduced waste disposal costs. In addition, the utilization of food waste as compost provides economic opportunities for the hospital by making it an additional source of income while supporting the circular economy principle.

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1. INTRODUCTION

Every year, hospitals generate large amounts of food waste, which, if not managed properly, can cause environmental problems and burden operational budgets (Halimah et al., 2023). Food waste in hospitals comes from various sources, such as food leftovers from patients, cafeterias, and other operational activities. Amid growing awareness of the importance of sustainability, hospitals now face the challenge of not only reducing the amount of food waste but also utilizing it to increase economic value (Awuor et al., 2021).

One approach that can be implemented is through a comprehensive and integrated food waste management strategy. This strategy includes identifying food waste sources, assessing the volume and

types of waste generated, and implementing reduction, reuse, and recycling practices (Çakmak Barsbay, 2021). Food waste reduction can be achieved by improving efficiency in food service, such as optimizing portion sizes served to patients and staff. Meanwhile, reuse can involve donating food that is still edible to communities in need (Cook et al., 2022).

Utilizing food waste to increase economic value can be achieved in various ways, one of which is converting organic waste into compost or biogas. Waste processing technologies such as biodigesters enable hospitals to convert food waste into an alternative energy source that can be reused for hospital operations. Additionally, processing food waste into compost can also be sold as a commercial product, which not only reduces waste but also generates additional income for the hospital.

EMC Alam Sutera Hospital, as one of the leading healthcare facilities in Tangerang, is committed to providing the best possible care to its patients. With operations that include providing food for patients, staff, and visitors, the hospital generates a significant amount of food waste. Waste management has become an increasingly urgent issue, especially considering the environmental impact and costs involved. In an effort to maintain operational and environmental sustainability, EMC Alam Sutera Hospital is striving to implement more efficient and environmentally friendly food waste management strategies.

EMC Alam Sutera Hospital, as one of the largest hospitals in Tangerang, generates a significant amount of food waste daily. According to internal data, approximately 10-15% of the total food prepared for patients, staff, and visitors ends up as waste that is discarded. If estimated over a month, the amount of food waste discarded exceeds one ton. This adds a significant financial burden and has a negative impact on environmental pollution, especially if the food waste is disposed of without proper management.

The research gap from previous studies highlights several areas that require further exploration. Although the study by Arriz-Jorquiera et al. (2024) offers a mathematical approach to optimizing food service processes in hospitals, with significant results in reducing food waste and costs, this research is limited to a single hospital context and does not account for the stochastic nature of patient demand variations. The study also does not delve deeply into the differences in nutritional needs and specific dietary patterns for different patient groups across various hospitals or within highly varied dietary contexts. Therefore, there is a need for further studies that can assess the applicability of this model in broader and more varied contexts, as well as test the model's adaptability to fluctuations in demand and more diverse dietary needs.

On the other hand, the study by Cook et al. (2023) identified the impact of the COVID-19 pandemic on hospital food services, such as increased food waste and significant operational changes. While this study provides insights into the pandemic's impact, no study has specifically evaluated food waste management strategies in the context of operational changes caused by COVID-19. Further research is needed to explore how operational changes and technologies adopted during the pandemic influence food waste management and how these strategies can be integrated into post-pandemic practices. This includes further analysis of the effectiveness of food waste data collection methods and technologies implemented during the pandemic, as well as their impact on reducing waste and overall hospital operational costs.

Based on the above background description, the author is interested in conducting further research on "Economically-Based Food Waste Management Strategies (A Qualitative Study at EMC Alam Sutera Hospital in South Tangerang)."

2. METHOD

In this study, the design used will involve strategies to understand and evaluate the management and utilization of food waste at EMC Alam Sutera Hospital with an appropriate approach to identify and address existing challenges and opportunities. According to Sugiyono (2020), the qualitative approach focuses on a deep understanding of social phenomena through the collection of descriptive and interpretive data. This approach aims to explore and understand the meanings, experiences, and

perspectives of individuals or groups involved in the situation being studied (Komara et al., 2023). In this study, the qualitative approach will be used to delve deeply into food waste management strategies, their impact on the environment and hospital operations, and the potential for utilizing waste to increase economic value. This approach allows researchers to gain a more comprehensive understanding of the phenomena occurring in the field.

This research will be conducted at EMC Alam Sutera Hospital, which is the main focus in examining food waste management and utilization strategies to increase economic value, and will begin in January 2025 and end in March 2025. During this period, various research activities such as data collection, interviews, observations, and analysis of results will be carried out to achieve the research objectives.

In this research, the participants are individuals or groups directly involved in the process of managing and utilizing food waste at EMC Alam Sutera Hospital. Participants in this research include hospital staff, such as kitchen staff, operational managers, and medical personnel involved in serving food to patients. The main research instrument in this study is the researcher himself, who acts as a key instrument in data collection and analysis. As a researcher, this role involves designing and conducting interviews, direct observation in the field, and documentation related to food waste management at EMC Alam Sutera Hospital.

3. FINDINGS AND DISCUSSION

Implementation of Food Waste Management at EMC Alam Sutera Hospital

Food waste management at EMC Alam Sutera Hospital is part of operational management aimed at improving efficiency and reducing environmental impact. The food waste generated comes from inpatients who do not finish their meals for various reasons, such as health conditions and differing appetites. To address this, the hospital has specific procedures in place for food waste management, from sorting to transportation by the Environmental Agency.

According to interviews with kitchen staff, this aligns with the procedures implemented in food waste management. They explained that:

> "The management procedure begins with sorting at the nutrition unit, packaging according to waste categories, transportation three times a day, placement at the hospital's waste collection point, and finally transportation by the Environmental Agency every day."

This procedure shows that the hospital has clear stages from food waste separation to final disposal. Sorting is carried out by the nutrition unit, which distinguishes between wet and dry waste, ensuring that each type of waste is handled appropriately. After that, food waste is packaged in specific containers and transported three times a day to prevent accumulation. The waste is then placed in the hospital's temporary storage facility (TPS) until it is finally collected by the Environmental Agency every day. Through this process, the hospital aims to minimize potential contamination and maintain cleanliness around the healthcare facility.

When determining the quantity and type of food provided to patients, medical staff and nutritionists follow specific procedures to reduce food waste. Based on interviews with medical staff, they explained that:

> "The procedure for determining patient meals involves calculating calorie needs based on body weight, activity level, and the patient's medical condition. Additionally, meals are tailored to patients' preferences through a menu selection to encourage them to finish their meals."

This process not only considers nutritional needs but also pays special attention to patients' preferences. Nutritionists calculate daily calorie intake based on various factors, such as body weight and activity level, to ensure patients receive appropriate nutrition. The availability of menu options aims to provide patients with alternatives that better suit their tastes, thereby encouraging them to finish their meals. This approach reflects the hospital's efforts to balance medical needs with patient comfort, thereby minimizing food waste.

The implementation of food waste management at EMC Alam Sutera Hospital has demonstrated a structured system, from the initial sorting stage to final disposal. Waste sorting is carried out by the nutrition unit, which separates wet and dry waste according to established categories. Food waste classified as organic waste is placed in special containers and transported three times a day to prevent accumulation that could cause unpleasant odors or attract pests. After collection, food waste is placed in a Temporary Storage Facility (TSF) and then routinely transported by the Environmental Agency. This workflow operates on a consistent schedule, enabling the hospital to maintain a clean environment and reduce disturbances to patients and healthcare staff caused by unpleasant odors or visuals.

The implementation of this system still faces problems that cannot be fully controlled by the system that has been implemented. The amount of food waste produced is greatly influenced by the physical and medical condition of patients undergoing treatment. Patients who experience nausea, vomiting, weakness, or side effects from medication tend not to finish their meals. This leads to unpredictable variations in the volume of food waste. Despite regular transportation and sorting schedules, these fluctuations continue to complicate capacity estimates and further management. This uncertainty limits the efficiency of management to technical aspects alone, while the influence of patient characteristics cannot be eliminated from the process.

Differences in eating preferences among patients further complicate the implementation of food waste management. Menus designed by nutritionists based on nutritional needs and medical diagnoses may not align with each patient's taste preferences. Some patients find the food too bland due to seasoning adjustments, while others lose their appetite due to weakened psychological or physical conditions. This mismatch often results in uneaten food, despite the nutritional value being carefully considered. This situation cannot be resolved solely through distribution and sorting systems, as food consumption responses heavily depend on individual acceptance of the served meals.

The determination of the quantity and type of food for patients is based on energy requirements calculated according to body weight, activity level, and medical condition. This process establishes food provision standards aimed at aligning portions with patients' actual needs. However, challenges persist when the food provided is not consumed as planned. Even when food quantities are accurately adjusted, it does not guarantee that the food will be consumed, especially if patients experience temporary or chronic loss of appetite. As a result, the amount of leftover food depends not only on the quantity of food provided but also on the actual consumption conditions, which vary significantly each day.

The presence of family members or patient companions in the care room also influences food consumption, though not always in a consistent manner. In some cases, the presence of companions helps ensure patients attempt to eat, but in other situations, this social interaction does not sufficiently impact food consumption levels. Such situations demonstrate that microenvironmental factors within the care room contribute to the emergence of food waste, even though technical procedures have been optimized. This aspect cannot be fully used as an indicator of system success or failure, as it stems from the interaction between human factors and operational procedures.

The Impact of Food Waste Management on the Environment and Hospital Operations

Food waste management at EMC Alam Sutera Hospital has a significant impact on the environment and hospital operations. Environmentally, food waste that is not managed properly can cause unpleasant odors, attract animals, and increase the volume of waste that must be disposed of. From an operational perspective, food waste management requires manpower, time, and specific facilities, including temporary storage areas and transportation processes. Therefore, the hospital strives to implement systematic food waste management procedures to minimize these negative impacts.

Based on interviews with kitchen staff, this aligns with the procedures already in place for food waste management at the hospital. They explained that:

"All food waste is collected, sorted at the nutrition unit according to wet and dry waste categories, then contained and transported three times a day before being placed at the hospital's waste transfer station and collected daily by the Environmental Agency."

This process is carried out regularly to ensure that no food waste is left to accumulate for too long in the kitchen area or temporary storage rooms. Sorting is done meticulously by kitchen staff and the nutrition unit, where organic waste such as food waste is separated from inorganic waste to prevent mixing that could slow down the management process. Containment uses specially labeled trash bags to facilitate waste identification. Transportation is carried out three times a day to avoid accumulation, while the hospital's waste collection points are kept clean to prevent unpleasant odors that could disturb patients or visitors. After that, the Environmental Agency is responsible for transporting waste from the collection points daily. These steps ensure that food waste management is carried out systematically, minimizing environmental impact, and maintaining the hospital's sterility.

Food waste management at EMC Alam Sutera Hospital demonstrates that this process not only impacts environmental cleanliness but also directly influences hospital operations and the work patterns of staff involved. The sorting, transportation, and utilization of waste have been designed to reduce negative environmental impacts, maintain facility cleanliness, and maximize efficiency in providing food for patients. Challenges such as unpleasant odors, the potential presence of pests, and sudden changes in patient status are part of the dynamics of food waste management, but collaboration between units and systematic procedures help the hospital maintain a balance between operational efficiency and environmental responsibility. This process demonstrates that food waste management is not merely a daily routine but an integral part of the broader hospital management system, where every step is taken to ensure a clean environment, efficient use of resources, and the continuous application of sustainability principles in all aspects of waste management.

This is in line with Afifuddin's (2010) theory on the objectives of food waste management. The first step is to clearly define the food waste management strategy through the process of sorting organic and inorganic waste, scheduled transportation to temporary storage sites (TPS), and collaboration with the Environmental Agency. This strategy reflects the hospital's vision of maintaining environmental cleanliness while ensuring efficient operations. Analysis of potential negative impacts, such as unpleasant odors and the presence of pests, also indicates efforts to understand internal and external factors influencing the management process.

Facilities and responsibility boundaries are evident through the provision of a dedicated room for temporary food waste transit, the use of closed waste containers, and sturdy waste bags. The hospital has clearly defined roles for each unit, from the nutrition unit responsible for sorting to the cleaning staff tasked with transporting waste. The use of specialized transport equipment and strict supervision to prevent spills further demonstrate that facilities are managed effectively. The limits of responsibility are also defined through collaboration between units, ensuring that each team's tasks are carried out according to their respective roles.

Targets that include criteria for results, quality, and time limits are also apparent at EMC Alam Sutera Hospital. The frequency of organic waste collection, conducted three times a day, aims to prevent waste buildup and unpleasant odors. This target is specific and measurable, as it has a fixed schedule and tangible results in terms of hospital environmental cleanliness. Additionally, interdepartmental coordination to update information on patient numbers serves as a preventive measure to avoid over-preparing food, helping reduce food waste volume and improve operational efficiency.

The hospital has also implemented task operation measurements and plans through a patient meal scheduling system. Information about patients who are discharged or transferred to another room is reported immediately, allowing the kitchen team to adjust the amount of food prepared. This process aligns with Afifuddin's (2010) principle, which emphasizes the use of performance indicators to monitor and evaluate the effectiveness of implemented plans. The existence of this mechanism

demonstrates that food waste management in hospitals is not merely a daily routine but an integral part of a measurable operational system.

Strategies for Utilizing Food Waste to Increase Economic Value at EMC Alam Sutera Hospital

EMC Alam Sutera Hospital not only focuses on managing food waste to minimize environmental impact, but has also begun developing strategies to utilize food waste for economic value. These efforts aim to transform organic waste into useful products, one of which is through the processing of food waste into compost. This strategy is expected to reduce the amount of waste while also providing financial contributions to the hospital.

According to an interview with the operations manager, this aligns with the hospital's ongoing plans regarding food waste utilization. They stated that:

"The hospital has plans to utilize food waste into compost fertilizer to generate revenue."

The hospital not only has awareness of managing organic waste but also has a vision to process such waste into products with added value. This plan emerged from the desire to utilize resources that were previously considered useless into something more productive. Processing food waste into compost was chosen because, in addition to the relatively simple process, the end product also has good market potential, particularly for maintaining plants around the hospital or for sale to external parties. The hospital is currently in the process of reviewing various technical and financial aspects of this strategy, including how to manage the final product to ensure optimal utilization. This initiative demonstrates that the hospital is not only focused on medical services but also striving to integrate circular economy principles into its operations.

The hospital understands that while converting food waste into compost has many benefits, the process also presents its own challenges, particularly in terms of facilities and supporting infrastructure. One of the main challenges is providing adequate dedicated space for the food waste fermentation process, where organic waste undergoes specific stages before becoming ready-to-use compost. This space must have proper ventilation to reduce unpleasant odors and a security system to prevent the entry of wild animals such as rats or insects. The hospital is currently reviewing the ideal design for the space to ensure the processing runs smoothly without disrupting patient comfort or other operational activities. Hospital management is also considering the use of supporting tools such as composting bins, closed fermentation containers, and a good drainage system. They are striving to anticipate these technical challenges to ensure the food waste utilization strategy can be implemented effectively without negatively impacting the hospital environment.

The food waste utilization strategy at EMC Alam Sutera Hospital demonstrates a serious commitment to managing waste productively. Although still in the planning stage, this initiative marks the first step toward transforming food waste from mere waste into an economically valuable resource. Moreover, this strategy aims not only to increase hospital revenue but also to strengthen environmentally friendly practices within the healthcare environment. By processing organic waste into compost, the hospital not only helps reduce the volume of waste sent to landfills but also contributes to reducing methane emissions generated from the decomposition of organic waste. It is hoped that this strategy can serve as an example for other hospitals to adopt similar approaches, thereby creating a more sustainable healthcare ecosystem. EMC Alam Sutera Hospital believes that their responsibility extends beyond medical care alone but also includes responsible and innovative environmental management, all in pursuit of a better future.

The use of food waste as compost at EMC Alam Sutera Hospital demonstrates how healthcare institutions can be pioneers in innovative waste management. This initiative demonstrates that hospitals are not only involved in medical care but also contribute to environmental sustainability and promote the principles of a sustainable economy. Although still in the planning phase, this strategy has already involved various stakeholders and considered technical, operational, and economic aspects comprehensively. The hospital hopes that this initiative will not only help reduce organic waste but also serve as an example for other hospitals to adopt similar practices. This forward-thinking approach

demonstrates that environmental sustainability and economic efficiency can go hand in hand, creating a balance between healthcare services and ecological responsibility. EMC Alam Sutera Hospital is striving to build a productive food waste management system while strengthening its position as a healthcare institution committed to the future of the environment and operational sustainability.

The food waste utilization strategy at EMC Alam Sutera Hospital aligns with the management strategy theory proposed by Susilawati & Efawati (2024) and Darsana et al. (2023). The hospital has developed a long-term plan to manage organic waste productively, namely by processing food waste into compost. This process reflects strategic planning, where the hospital does not merely dispose of waste but utilizes it to create economic and environmental value. The plan is based on an analysis of internal factors such as kitchen capacity and processing space, as well as external factors, including market potential for compost products. This approach aligns with the concept of strategy as a framework involving the setting of direction and making important decisions to achieve organizational objectives.

This strategy reflects the primary function of management strategy, particularly in terms of communicating the vision. EMC Alam Sutera Hospital has a vision to become an innovative and environmentally friendly institution. This vision is communicated to various internal parties, such as the kitchen, cleaning, and environmental health teams, so that all units have the same understanding of the program's objectives. Communicating the vision is important so that the strategy does not remain merely a concept but can be translated into concrete actions involving all elements of the hospital. Cross-departmental collaboration demonstrates that this strategic vision has been effectively communicated to support program implementation.

This strategy leverages the hospital's internal strengths, such as kitchen facilities that produce food waste daily and a workforce ready to be involved in the waste processing process. These strengths are linked to external opportunities, such as the potential market for compost fertilizer among hospital visitors or the surrounding community. This is in line with the function of strategy according to Sofian (2013) regarding connecting internal strengths with external opportunities. The hospital does not only view waste as a problem but also as an opportunity to produce economically valuable products. This step demonstrates the utilization of internal success, namely the ability to manage waste, to explore new opportunities through composting as an additional source of income.

4. CONCLUSION

Based on the research findings and discussion, it can be concluded that the implementation of food waste management at EMC Alam Sutera Hospital is carried out through a series of structured processes, starting from the sorting of organic waste in the kitchen, processing it into compost, to the distribution of the processed results for use within the hospital area or offered to the surrounding community. This process involves cross-unit collaboration, including the kitchen team, cleaning staff, and environmental health team. This food waste management program has positive impacts on both the environment and hospital operations. From an environmental perspective, the program contributes to reducing the volume of organic waste disposed of at landfills. Operationally, this strategy improves waste management efficiency, reduces disposal costs, and strengthens the hospital's image as an institution committed to environmental sustainability. Additionally, the food waste utilization strategy is aimed at enhancing economic value through compost production, which has the potential to become an additional revenue source. The compost is partially used to improve the quality of green spaces within the hospital premises, while the remainder is offered to visitors and the surrounding community. This approach not only reduces waste but also transforms it into a productive asset that supports the principles of a circular economy.

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