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ANALYSIS OF FOOD WASTE IN CLASS III PATIENTS ON THE ADEQUACY OF ENERGY AND MACRONUTRIENTS IN THE FOOD SERVICE IN RSUD KANJURUHAN MALANG DISTRICT

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Abstract
Background: *Food service is a set of activities ranging from menu planning to food distribution to consumers to achieve optimal health status through proper nutrition. Food organization is the provision of quality food according to nutritional needs, cost, safe and acceptable to consumers in order to achieve optimal nutritional status.* ***Objective****: To analyze the residue of ordinary food in class III patients against the adequacy of energy and macronutrients in the provision of food at Kanjuruhan Hospital Malang Regency.* ***Methods:*** *This type of research is descriptive observational. The method used to observe the food waste (visual comstock), with observations made for 3 days. The research was conducted by observing the remaining food consumed by class III patients at the Nutrition Installation of Kanjuruhan Hospital, Malang Regency.* ***Result****: The menu on days 1 and 3 did not meet the hospital's minimum service standards, which were still above 20%, while the menu on day 2 met the hospital's minimum service standards, which were <20%. Nutrient adequacy on days 1 and 3 was lowest for protein and on day 2 for fat.* ***Conclusion:*** *Based on observations that have been carried out for 3 days, the results showed that only one day had met the minimum service standards determined by the Department of Health.*

Keywords : *Nutritional Adequacy, Food Waste*

INTRODUCTION

Food service is a series of activities ranging from menu planning to food distribution to consumers, in order to achieve optimal health status through proper diet. According to the Ministry of Health of the Republic of Indonesia (2013), food service is providing quality food according to nutritional needs, cost, safe and acceptable to consumers in order to achieve optimal nutritional status.

Quality nutrition services in hospitals will help speed up the healing process of patients, which also means shortening the length of hospitalization days so that it can save medical costs. One of them is food service, which aims to provide food by considering nutritional needs and food flavors. General hospital food standards consist of regular food, soft food, filter food and liquid food (PGRS Guidelines, 2013).

Food waste is an important indicator of resource efficiency and consumer perceptions of the food supply. Food waste data is often used to assess the effectiveness of nutrition education programs, food organization and service, and the appropriateness of food consumption by groups or individuals. On some occasions, patients are able to consume the food provided, but on other occasions they do not even touch the food provided or throw it away. This situation affects the level of consumption, which in turn leaves food waste (Nida, 2011).

Food that meets nutritional needs and is consumed completely will accelerate healing and shorten the days of hospitalization of the sick (Depkes RI, 2013). Food that is served if it meets the needs but is still left over or not consumed completely, will cause patients to experience nutritional deficiencies and prolong the healing process (Moehyi, 1999).

Research conducted by Wiwin and Weny (2014) on the percentage of food waste in Palem I and II rooms in 2014 showed a result of 31.96%, which does not meet the minimum service standard set by the Ministry of Health, which is ≤ 20%. Research conducted at several hospitals in Indonesia shows that the average food waste ranges from 17% to 67%. Research conducted at Hasan Sadikin Hospital Bandung obtained soft food of food waste of 31.2%, at Sardjito Hospital Yogyakarta obtained an average morning food waste of 23.41%, while research at Hajj Hospital Surabaya is known as much as 53.3%.

According to the Decree of the Minister of Health of the Republic of Indonesia Number 129/Menkes/SK/II/2008 concerning Minimum Hospital Service Standards (SPM), the remaining food that is not eaten by patients is at most 20%. The fulfillment of these requirements is an indicator of the success of nutrition services in every hospital in Indonesia (Ronitawati et al., 2018).

Based on the description above regarding the percentage of food waste in hospitals, the authors are interested in conducting research on the remaining food in class III patients on the adequacy of energy and macronutrients in the provision of food at Kanjuruhan Hospital, Malang Regency.

METHODS

This type of research is observational which is descriptive in nature using percentage. The research was conducted by observing the remaining food consumed by class III patients at the Nutrition Installation of Kanjuruhan Hospital, Malang Regency.

This research was conducted on October 3-5, 2024. Observations using cross sectional. Were made for three days a week at the Nutrition Installation of Kanjuruhan Hospital Malang Regency. The method used in the observation of food waste is comstock, with the types of food observed including (staple foods, animal side dishes, vegetable side dishes, vegetables and fruits). The population in this study were all class III patients at the Nutrition Installation of Kanjuruhan Hospital Malang Regency as many as 90 patients. The sample used in this study implements the Slovin formula, so in deciding the sample size can use the Slovin formula with the results of 47 samples. The analysis of nutrients observed for adequacy included macronutrients (energy, protein, fat and carbohydrates).

RESULTS AND DISCUSSION

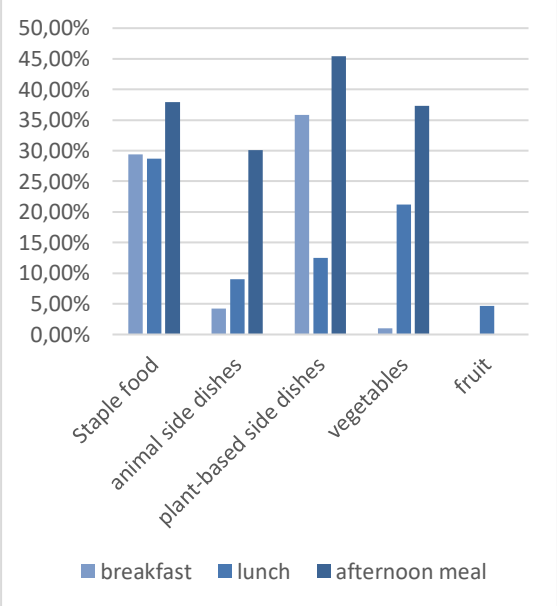
A. Food Waste Analysis

The distribution of food waste using the Comstock method is presented in the following figure:

Tabel. 1 Menu Day- 1

Breakfast	Lunch	Afternoon Meal
Rice, chicken soup, fried tofu.	Rice, eggs bali, tempeh mendoan, clear spinach and papaya fruit.	Rice, tofu + meat stew, and carrot + vermicelli vegetables.

1. Food Waste Day 1



Picture 1. Percentage of Food Waste Menu Day 1

Based on observations of the rest of the morning meal in class III patients on October 3, 2024, the percentage of food waste food from staple foods was 29.4%, animal side dishes was 4.2%, vegetable side dishes was 35.8%, and vegetables was 1%. The menu cooked in the morning on October 3, 2024 was rice, chicken soup, fried tofu. It can be seen from the percentage of food waste that the most remaining food is vegetable side dishes (fried tofu) and rice. This can occur because fried tofu when paired with chicken soup is not suitable, and some patients complain that the taste of the food served is bland and unattractive. So it can be replaced with fried tempeh and can also be influenced by the patient's decreased appetite.

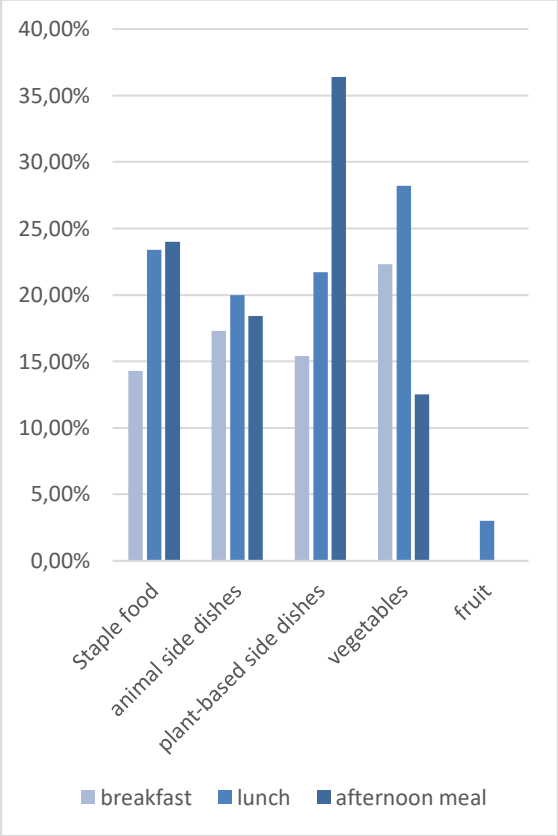
Based on observations of the rest of the class III lunch on October 3, 2024, the percentage of food waste from staple foods was 28.7%, animal side dishes was 9%, vegetable side dishes was 12.5%, vegetables was 21.2%, and fruit was 4.7%. The menu cooked at noon on October 3, 2024 is rice, eggs bali, tempeh mendoan, clear spinach and papaya fruit. It can be seen from the percentage of food waste that the most remaining is rice and vegetables. This can happen clear spinach is less preferred because of its bland taste.

Based on the observation of the rest of the afternoon meal of class III on October 3, 2024, the percentage of food waste from staple foods was 37.9%, animal side dishes was 30.1%, vegetable side dishes was 45.4%, and vegetables was 37.3%. The menu cooked in the afternoon on October 3, 2024 was rice, tofu + meat stew, and carrot + vermicelli vegetables. It can be seen from the percentage of food waste that the most remaining food is vegetable side dishes. This can occur because tofu stews are less preferred or not to the taste of most patients and can also be influenced by the patient's decreased appetite.

2. Food Waste Day 2

Tabel. 2 Menu Day- 2

Breakfast	Lunch	Afternoon Meal
Rice, sunny side up eggs, tofu steak, long bean chayote.	Rice, Balinese chicken, tempeh orem-orem, urap-urap, and watermelon.	Rice cake, meatballs, steamed tofu + sla leaves + vermicelli.



Picture 2. Percentage of Food Waste Menu Day 2

Based on observations of the rest of the morning meal of class III on October 4, 2024, the percentage of food waste from staple foods was 14.3%, animal side dishes was 17.3%, vegetable side dishes was 15.4%, and vegetables was 22.3%. The menu cooked in the morning on October 4, 2024 was rice, sunny side up eggs, tofu steak, long bean chayote. It can be seen from the percentage of food waste that the most remaining is vegetables. This can occur because vegetables stir-fried long beans and chayote are less preferred to the taste of most patients and can also be influenced by the patient's decreased appetite.

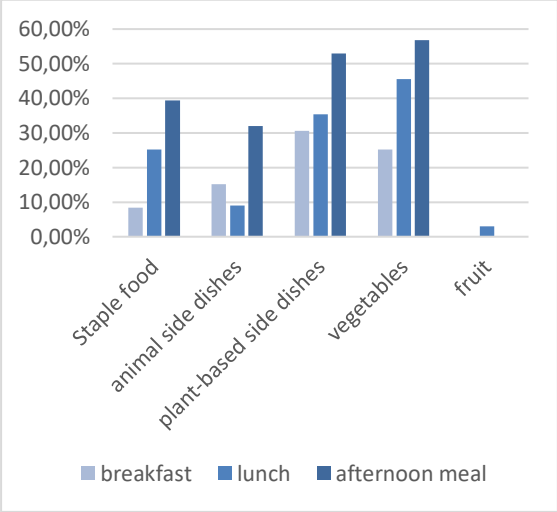
Based on observations of the rest of the class III lunch on October 4, 2024, the percentage of food waste from staple foods was 23.4%, animal side dishes was 20%, vegetable side dishes was 21.7%, vegetables was 28.2%, and fruit was 3%. The menu cooked at noon on October 4, 2024 was rice, Balinese chicken, tempeh orem-orem, urap-urap, and watermelon. It can be seen from the percentage of food waste that the most remaining food is vegetable side dishes (tempeh), vegetables and rice. This can occur because orem-orem tempe and urap- urap vegetables are less preferred to the taste of most patients and can also be influenced by the patient's decreased appetite.

Based on the observation of the rest of the afternoon meal of class III on October 4, 2024, the percentage of food waste from rice was 24%, animal side dishes was 18.4%, vegetable side dishes was 36.4%, vegetables was 12.5%, and fruit was 5.9%. The menu cooked in the afternoon on October 4, 2024 was rice cake, meatballs, steamed tofu + sla leaves + vermicelli. It can be seen from the percentage of food waste that the most remaining food is vegetable side dishes (tofu) and rice cake. This can occur because steamed tofu is less preferred to the taste of most patients and can also be influenced by the patient's decreased appetite.

3. Food Waste Day 3

Tabel. 3 Menu Day- 3

Breakfast	Lunch	Afternoon Meal
Rice, chicken rendang, tempeh opor, capcay soup.	Rice, curry seasoned meat, red spiced tofu, bobor spinach and banana ambon fruit.	Rice, fuyunghai, soy sauce tempeh, carrot + potato stew.



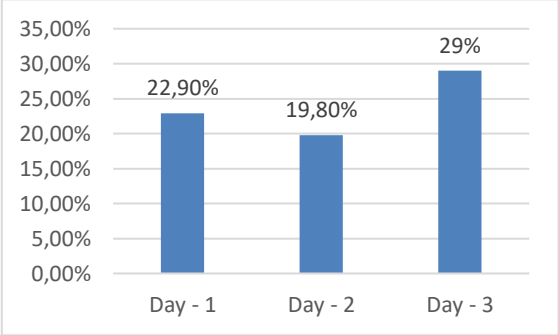
Picture 3. Percentage of Food Waste Menu Day 3

Based on observations of the rest of the morning meal of class III on October 5, 2024, the percentage of food waste from staple foods was 8.4%, animal side dishes was 15.2%, vegetable side dishes was 30.6%, vegetables was 25.2%. The menu cooked in the morning on October 5, 2024 was rice, chicken rendang, tempeh opor, capcay soup. It can be seen from the percentage of food waste that the most remaining food is vegetable side dishes (tempeh) and vegetable soup capcay. This can occur because opor tempe and capcay soup are less preferred or not to the taste of most patients and there are also patients who have eaten food from outside the hospital.

Based on the observation of the rest of the class III lunch on October 5, 2024, the percentage of food waste from staple foods was 25.2%, animal side dishes was 9%, vegetable side dishes was 35.4%, vegetables was 45.5%, and fruit was 3%. The menu cooked at noon on October 5, 2024 is rice, curry seasoned meat, red spiced tofu, bobor spinach and banana ambon fruit. It can be seen from the percentage of food waste that the most remaining food is vegetables and vegetable side dishes (tofu). This can occur because bobor spinach and red seasoned tofu are less preferred or not to the taste of most patients and can also be influenced by the patient's decreased appetite.

Based on the observation of the rest of the afternoon meal of class III on October 5, 2024, the percentage of food waste from staple foods was 39.4%, animal side dishes was 32%, vegetable side dishes was 53%, vegetables was 56.8%. The menu cooked in the afternoon on October 5, 2024 was rice, fuyunghai, soy sauce tempeh, carrot + potato stew. It can be seen from the percentage of food waste that the most remaining is vegetables. This can occur because vegetable stews of carrots and potatoes are less preferred or not to the taste of most patients and can also be influenced by the patient's decreased appetite.

4. Total Percentage of Food Waste



Picture 4. Total Percentage of Food Waste

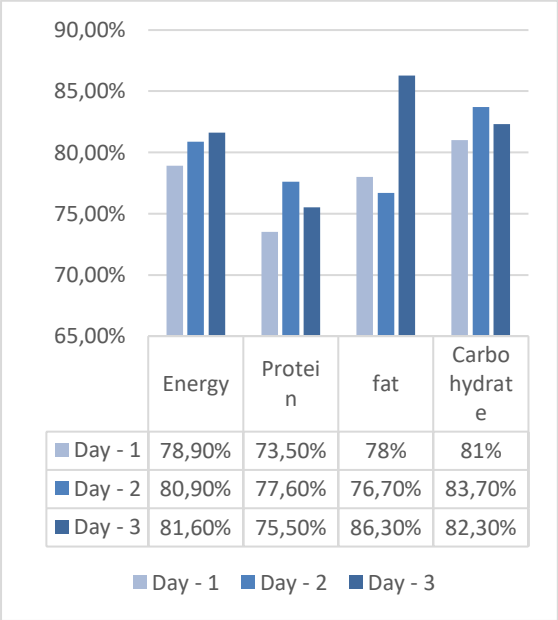
From the data above, it was found that the total percentage for food waste on the day 1 menu was 22.9%, on the second day it was 19.8% and on the third day it was 29%. Based on the minimum standards set by the Ministry of Health, namely 20% on the first day and third day menus have not met the SPM (Minimum Service Standards) because they are still above 20%, while the third day menu has met the SPM (Minimum Service Standards),

B. Nutritional Value and Nutrient Adequacy

Tabel. 4 average nutritional adequacy of the menu for 3 days

	Day- 1	**Day -2**	**Day- 3**
Energy	1.604,4 kkal	1.645,5 kkal	1.659 kkal
Protein	49,3 g	52 g	50,6 g

Fat	42,9 g	42,2 g	47,5 g
Carbohyrate	260,1 g	268,7 g	265,2 g



Picture 5. Average Percentage of Nutritional Value of Food

Based on the picture above, the average percentage of nutritional value adequacy based on food waste for day 1 is lowest in protein, which is 73.5%, on day 2 the lowest is in fat, which is 76.7% and on day 3 the lowest is in protein, which is 75.5%.

According to Supariasa (2013), if there is insufficient nutrition in the body, it can cause malnutrition. The pathogenesis of malnutrition goes through 5 stages, namely: First, nutrient inadequacy. If the nutrient inadequacy lasts for a long time, tissue reserves will be used to fulfill the inadequacy. Secondly, if this continues for a long time, tissue deterioration will occur, which is characterized by weight loss. Third, there are biochemical changes that can be detected by laboratory tests. Fourth, there are changes in function characterized by characteristic signs. Fifth, there are anatomical changes that can be seen from the appearance of classic signs. Excessive food waste, in conjunction with the patient's condition, can potentially result in malnutrition. Thus, it is crucial for the hospital to review and evaluate the current menu.

CONCLUSIONS

RSUD Kanjuruhan uses a self-management system in the provision of food. In self-managed hospital food delivery, the nutrition installation/nutrition unit is responsible for the implementation of all food delivery activities. In this self-management system, all necessary resources (personnel, funds, methods, facilities and infrastructure) are provided by the hospital.

The total percentage of class III food waste on October 03 and 05, 2024 can be said to have not met the minimum service standards of the hospital. Whereas on October 04, 2024 it has met the minimum service standards set by the Ministry of Health.

The average percentage of nutritional value adequacy based on food waste for day 1 was lowest in protein, on day 2 the lowest was in fat and on day 3 the lowest was in protein.

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