



## INCREASE OF FOOD WASTE BASED ON FOOD TEMPERATURE AND FREQUENCY OF CHEMOTHERAPY BREAST CANCER PATIENT

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### Abstract

Food waste is one of the simple indicators used to evaluate the success of the food service. Frequency of chemotherapy can affect the food waste. The aim of this study is to analyze the relationship of temperature and frequency of chemotherapy against food waste on breast cancer patients. It was cross sectional study approach. The research samples were 16 breast cancer patients elected in consecutive sampling. Statistical analysis used correlation Pearson Test to know the relationship of temperature and frequency of chemotherapy against food waste. There was a correlation between food waste and food temperature in vegetable ( $p = 0.038$ ). There was a correlation between frequency of chemotherapy and food waste in staple food ( $p=0.029$ ), with food waste in vegetable side dish ( $p=0,028$ ), with food waste in animal side dish ( $p=0,006$ ), with food waste in vegetable ( $p=0,004$ ). There was a correlation between the food temperature and food waste of vegetable menu, frequency of chemotherapy with food waste of staple food, animal side dish, vegetable side dish and vegetable. It is strongly recommended that vegetables be cooked half-finished in the main kitchen then be cooked again in the pantry, so that the temperature of the vegetables when served is still warm.

Keywords: *Food Temperature, Frequency Of Chemotherapy, Food Waste*

### 1. Introduction

Cancer is an abnormal cell growth that tends to attack the surrounding tissue and spread to other body organs located far away. Cancer occurs due to uncontrolled cell proliferation (Corwin, 2009). Malnutrition is a condition that often occurs in people with cancer. The situation will increase morbidity and mortality as well as the quality of life of patients, so it needs good nutrition as a part of cancer sufferer therapy (Kusuma HS, 2014).

Based on the prevalence of breast cancer patients at RSUP Dr. Kariadi Semarang, the prevalence of breast cancer patients in RSUP Dr. Kariadi Semarang in 2019 was 47.97%. (Medical Record of Dr. Kariadi Hospital, Semarang, 2019).

Based on the weighing in January - July 2018, the amount of food waste of patients in

Dr.Kariadi General Hospital was 27.68%, animal side dishes was 53.15%, vegetable side dishes was 71.21% and vegetables was 74.31%. Based on the data above, it can be seen that the food served was not acceptable to patients. It can be seen from the remaining food that is greater than the standard found, which is <20%. (Mustakim, 2018)

The occurrence of food waste that is not spent by patients may be due to the too large portions, the patient's no appetite, or other causes. Factors that cause food waste are: internal factors (originating from within the patient) and external factors (factors originating from outside the patient). Internal factors include psychological and physical, appetite, eating habits and gender. External factors include the taste of food, class of care, and the atmosphere of the hospital environment (Muliani U, 2013).

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Based on the results of a research conducted by ISMI (2008), patients with a frequency of chemotherapy three times and with a frequency of radiation 12 times have energy intake and poor protein. The frequency of chemotherapy affects the intake of nutrients due to side effects resulting from chemoradiation in the form of nausea, vomiting and diarrhea. It can reduce the patient's nutritional intake. Usually cancer patients undergoing chemotherapy often experience anxiety. Anxiety faced by cancer sufferers and families is generally caused due to lack of knowledge about cancer and its treatment methods. Side effects experienced after undergoing chemotherapy can cause anxiety in patients.

Based on this background, the researchers wanted to know the relationship between food temperature and frequency of chemotherapy to food waste in breast cancer patients at Dr.Kariadi Hospital Semarang.

## 2. Method

This type of research is an observational study with a cross sectional approach to determine the relationship of food temperature and frequency of chemotherapy to food waste in breast cancer patients.

Population: This research was conducted in Rajawali 3A, 4B, and 5B in the ward room used for female cancer patients in Dr.Kariadi Hospital Semarang. The samples in this study were taken from patients undergoing treatment in Dr. Kariadi with the inclusion criteria as follows: patients were willing to be respondents, patients were older than 15 years old, they were hospitalized for at least 3 days, they could communicate well, they got soft food forms, and they stayed in care of class of 3. And the exclusion criteria are as follows: patients had complications of disease, patients were at transfer to another hospital, and the patient died before completing the study.

By using consecutive sample technique, the population that met the inclusion criteria had the opportunity to be used as a research sample. The samples in this study were breast cancer

patients who received chemotherapy at Dr.Kariadi Hospital Semarang.

The data obtained in the study were tested for normality of data using Shapiro Wilk because the data were less than 30 samples. Bivariate analysis was used to determine whether there was a relationship between food temperature and the frequency of chemotherapy for food waste in breast cancer patients in Dr.Kariadi Hospital Semarang. Bivariate statistical analysis used the Spearman Rank test because the data were not normally distributed ( $p$  value  $<0.05$ ). As for the data that is normally distributed, it used the Pearson test.

## 3. Result and Discussion

Subjects in this study Internal medicine room in Dr.Kariadi Hospital Semarang consisted of patients staying in Rajawali Room 3A, 4B, and 5B with a total sample of 16 respondents. This was in accordance with inclusion criteria.

Food temperature is the level of heat of the food served. Food that is served hot can emit scents that are able to attract the food consumed (Kurniah and Pramono, 2010)

Food temperature is measured when the patient goes to the inpatient room at breakfast, lunch and dinner for 3 days. Measuring the temperature of food consumed by inpatients is by measuring the temperature of the food to the patient.

Temperature in food is a critical point that determines the growth of various kinds of bacteria in the food, especially in cooked food. Safe temperature for food is  $\leq 40^{\circ}\text{C}$  -  $\geq 60^{\circ}\text{C}$ . If the temperature is around  $40^{\circ}\text{C}$  -  $60^{\circ}\text{C}$ , the danger zone can allow bacteria to multiply in food. So the temperature must always be maintained so that the quality remains intact (Yunita A, 2014). According to the results, it is known that all food temperatures included in the danger zone.

The food waste was done by weighing (food weighing) for 3 times in breakfast, lunch, and dinner for 3 consecutive days. The known score was then made as a percent value to find out how much or how little was leftover food for hospitalized patients.

**Table.1** Describe of Food Waste

Kind of Food	Food Waste				
	≤ 20%		≥ 20%		average ± SD
	N	%	N	%	
Staple Food	3	18,75	13	81,25	30,87 ± 13,58
Animal side dishes	3	18,75	13	81,25	42,43 ± 15,72
Vegetable side dishes	2	12,5	14	87,5	35,81 ± 17,95
Vegetables	1	6,25	15	93,75	37,62 ± 18,39

The standard portion of the hospital Dr.Kariadi Hospital Semarang is 150gr staple food, 75 gr animal side dishes, 55 gr vegetable side dishes, 100 vegetables (the main ingredient is not using gravy) gr. The menu served is carrot vegetable menu + cauliflower.

**Table.2** Describe of Food Temperature

Variable	average	SD	min	Max
Staple food	48.37°C	3.269	42.00 °C	54.00 °C
Animal side dishes	38.10 °C	2.281	35.00 °C	42.40 °C
Vegetable side dishes	39.52 °C	3.852	34.50 °C	47.30 °C
Vegetables	50.06 °C	2.273	47.00 °C	53.20 °C

**Table 3.** Describe Frequency of Chemotherapy

Frequency	n	%
2	1	6.3
3	1	6.3
4	5	31.3
5	5	31.3
6	4	25
Total	16	100

Analysis of the relationship of food temperature and food waste of staple food used the Spearman test because the data were not normally distributed.

Overall, in this study, there was no relationship of food temperature with food waste of staple food after analyzing the relationship of food temperature and food waste of staple food p value 0.650 with a strength of r = 0.24. There was no relationship in the estimation that the temperature given by the hospital had decreased food temperature. One factor that caused a decrease in food temperature was the far distance of the pantry room with the central kitchen and it could cause a decrease in temperature in food.

Overall in this study, there was a relationship of food temperature and food waste of animal side dishes with p value 0.095 and r =

-0.17. There was no correlation between food temperature and food waste of animal side dishes. It is assumed that the temperature of animal side dishes has decreased when served to patient. This study is in line with the Hall of research (2011) at the Jakarta Hajj Hospital stating that there was no relationship between food temperature. The temperature of animal side dishes is 32°C - 39.9°C. The food waste of the animal side dishes was sampled during the 3 day study with a category of over 20%. This is in line with Nilda's research (2011) at SabangLihum Mental Hospital which stated that food waste of animal side dishes are > 25% as much as 52.5%.

There was a relationship of food temperature and food waste of vegetable side dishes with a p value of 0.210 and r = -0.337. There was no relationship between the temperature of the food and the food waste of the vegetable side dishes due to the different levels of warmth of the patient's food.

There was a relationship between food temperature and food waste of vegetables with a p value of 0.038 with the strength of the relationship (r = -0.567); where the higher the food temperature was, the lower the food waste would be. The food waste of the vegetables food averages was more than 20% and with food temperatures from 30°C to 40°C. This research is in line with research in several hospitals in Indonesia where the remaining vegetables are more than 20%.

**Table 4.** Correlation Frequency of Chemotherapy with Food Waste

Food Waste	Frequency of Chemotherapy	
	p value	R
Staple Food	0,029	0,544
Animal side dishes	0,006	0,653
Vegetable side dishes	0,028	0,549
Vegetables	0,004	0,0517

All samples (patients) were hospitalized with chemotherapy. The patients experienced a decrease in appetite after chemotherapy and the average of patients experienced nausea and no appetite. Observations for 3 consecutive days eating breakfast, lunch and dinner left a lot of food waste. Other things that became the factors causing food waste were the aroma of food and plate of food.

#### 4. Conclusion and Sugestion

Average food temperature is around 40°C - 60°C but it is still safe to be consumed. Average food waste is categorized as > 20%. There is a relationship between food temperature and vegetable food. There is a correlation between the frequency of chemotherapy with staple foods, vegetable side dishes, animal side dishes, and vegetable.

This research recommends that vegetables be cooked half-finished in the main kitchen then be cooked again in the pantry, so that the temperature of the vegetables when served is still warm.

#### 5. Acknowledgements

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