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Unit cost calculation for low calorie diet packages to support the nutrition installation entrepreneurship of UGM Academic Hospital

***Pratiwi Dinia Sari[1], Yusmiyati[1], Indah Suhertanti[1], Erma Fitriana[1]**

[1]Universitas Gadjah Mada Academic Hospital
Correspondence: pratiwidiniasari@ugm.ac.id

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Abstract

Introduction: Nowadays, people have the awareness to maintain weight and to eat healthy diet. However, people prioritize practicality in preparing food due to the limited ability to prepare healthy food. Nutrition Installation in Universitas Gadjah Mada Academic Hospital has the potential to become a profit center by developing an entrepreneurship sector, specifically by providing a healthy catering services. To organize a good healthy catering services, preparations need to be done, including those related to human resources, equipment, operating systems, and to-be-applied tariffs.

Objective: The purpose of this study was to determine the unit cost of the low-calorie diet package, the product of the entrepreneurship sector of Nutrition Installation.

Methods: Descriptive research with quantitive approach. This research was held at the Nutrition Installation in UGM Academic Hospital from June to November 2019, with the research steps conducted: 1) Identifying the details of the low-calorie diet package, 2) Identifying the direct cost consisting of direct non-overhead cost and direct overhead cost, 3) Identifying the indirect cost, 4) Calculating the unit cost.

Results: The unit cost for a low-calorie diet package is IDR 70.553 per portion consisting of lunch, snack, assessment, and nutritional consultations per package.

Conclusion: The unit cost obtained from this study can be used as the basis to determine the tariff for the hospital's Nutrition Installation's healthy catering services.

KEYWORDS: *healthy catering service, low calorie diet, nutrition department, unit cost*

1. Introduction

Obesity is one of several nutritional problems in Indonesia that has not been overcome. Based on the 2018 Riskesdas (Basic Health Research) by the Ministry of Health, the level of obesity in Indonesian adults is 21.8%. This prevalence increased from the results of Riskesdas 2013 which stated that the obesity rate in Indonesia was 14.8%[1]. The condition of obesity is closely related to serious medical disorders, namely the emergence of degenerative diseases such as heart problems, hypertension, and diabetes mellitus. Basically, to lose weight, dietary regulation is needed to achieve negative energy balance, which can be done by changing lifestyle patterns including eating and physical activity[2]. The recommended calorie restriction for weight loss is reduction of 500-1000 kcal/day, with the minimum calorie count for women being 1000-1200 kcal/day, while for men it is 1.200-1.400 kcal/day[3].

Food was originally needed only to maintain human survival. But in recent years, lifestyle factors have become important and widely applied in describing the process consumers make about food decisions[4]. Most people nowadays do have the awareness to maintain weight and to eat a healthy diet. Health awareness is a concern of everyone to be better and motivated to improve and maintain their health and quality of life by implementing a healthy lifestyle[5]. But oftenly the public awareness to regulate eating patterns does not go accordingly with its application.

The tendency of society today is to prioritize practicality in preparing food due to the limited ability to regulate and prepare healthy food menus[6].

Hospitals are currently being demanded to be able to be independent in financing both private hospitals, state-owned hospitals, and government hospitals[7]. One of the targets in developing independence is the achievement of cost recovery[8]. The Nutrition Installation of RSA UGM has the potential to become a profit center for the hospital if it is able to develop food services, one of which is developing a nutritional entrepreneurship ecosystem by providing diet catering. To be able to apply this nutritional entrepreneurship, certain preparations are needed to be done, including those related to human resources, equipment, administration system, and the applied-to-be tariff. The quality of goods, the intended consumers, and the market atmosphere must be a consideration to set this tariff policy[9]. Based on this background, it is necessary to further analyze the cost of a low-calorie diet package of RSA UGM's Nutrition Installation to support its entrepreneurship sector. The purpose of this study was to determine the unit cost of a low-calorie diet package to support the stated installation's entrepreneurship sector.

2. Materials and Methods

This research is a descriptive study with quantitative approach. The descriptive type of study was needed to analyze and interpret all data collected. The quantitative approach was chosen to explain the nominal unit cost calculation for a low-calorie diet package. This research was conducted at the Nutrition Installation at RSA UGM. The time coverage for research is June to November 2019.

This study uses one single variable, which is the unit cost of a low-calorie diet package per serving. The unit cost is more precisely the total cost needed to produce one portion of food consisting of staple foods, side dishes, vegetables, and fruits with a total energy content of 400-420 Kcal, and snacks with an energy content of 100-130 Kcal. This unit cost consists of three components as follow: 1) Direct non-overhead costs, namely the cost of food and consumables used as the main raw material for the production of low-calorie diet food packages; 2) Overhead costs, i.e. costs of other items than direct material to help turn materials into finished products, including costs of tools and equipment depreciation, cost for supporting materials, maintenance and repair cost, indirect labor cost, and other costs such as electricity, water and fuel; 3) Direct labor cost, i.e. costs of the labors who directly involved in the production process of low-calorie diet packages.

The type of data used in this study is quantitative data, which includes Nutrition Installation's data of expenditure, electricity cost, water usage cost, depreciation cost, as well as data on the number of patient food portions produced by Nutrition Installation and human resource cost.

3. Results

In the initial stage of the study, identification was done on the type of diet catering service going to applied by the RSA UGM's Nutrition Installation. The diet package provided is a low-calorie diet package for weight loss consisting of nutritional assessment activities, nutritional consultation activities, five times of lunch and five times of snack.

After the low-calorie dietary menu is set, identification was conducted on the direct non-overhead costs. Direct non-overhead costs are costs that can be traced to the product[10]. These costs consisting of food costs, the cost of consumables used to serve the diet package, as well as nutrition consulting services. Food cost is obtained by identifying the ingredient requirements per serving of each menu, by using existing recipe standards. After finding out the details of each menu's material requirements, the cost of food items per menu is calculated based on Nutrition Installation expenditure data. The cost of consumables is calculated by calculating the need for consumables used to package the food packages. In this study, the price of food used is based on Nutrition Installation expenditure data in July 2019. Details of direct non-overhead costs are presented in Table 1.

After obtaining the amount of direct non-overhead costs, the next step was to identify

direct labor cost. The calculated direct labor costs are those directly involved in the production process og the low calorie diet package. The next component needed to be identified is overhead costs. Overhead costs are costs of items outside than direct materials that help in turning materials into finished products. Overhead costs include costs of tools and equipment depreciation, cost for supporting materials, maintenance and repair costs, indirect labor cost, and other costs such as of electricity, water, and fuel[11]. The cost data is secondary data obtained from the RSA UGM's Assets Team and Finance Section. Details of direct labor cost and overhead costs can be seen in Table 2 below.

Table 1. Details of Direct Non-Overhead Costs

Day	Menu	Food cost (IDR)	BHP (IDR)
1	Red rice	1.113	2.400
	Pepes Ikan (roasted fish wrapped in banana leaf)	5.826	
	Urap (mixed vegetables with coconut)	2.814	
	Orange	2.280	
	Summer smoothies	5.933	450
2	Potato	2.800	2.400
	Teriyaki beef	6.743	
	Carrot & broccoli soup	2.637	
	Apple	4.200	
	Fruit salad with yoghurt sauce	5.270	1.100
3	Red rice	1.113	2.400
	Black pepper chicken	2.991	
	Capcay (*jap-chae*)	3.032	
	Banana	3.200	
	Green juice	10.308	450
4	Potato	2.800	2.400
	Tom yam	2.685	
	Stir-fried bok choy & carrot	1.222	
	Watermelon	1.320	152
	Fruit fitbar	5.000	
5	Red rice	1.113	2.400
	Grilled chicken	5.792	
	Pecel (blanched vegetables salad with peanut sauce)	1.403	
	Melon	1.800	152
	Fruit salad with yoghurt sauce	5.270	1.100
Sum		85.966	15.404
Average cost per serving		17.193	3.081

Table 2. Details of Direct Overhead Costs (in the Nutrition Installation of 2018)

Component of expenses	Total cost (IDR)
Direct Labor Costs	**609.394.500**
Overhead Costs	
Other ingredients and needs	73.029.420
LPG	97.634.500
Non-direct labor cost	194.751.335
Electricity & water	20.766.720
Tools and equipment depreciation	93.016.446

Direct labor costs and overhead costs per portion are obtained by dividing the total amount of direct overhead costs and indirect costs by the number of portions produced by Nutrition Installation in 2018. Based on the 2018 Nutrition Installation report (4) it is known that the total number of meals and snacks the Nutrition Installation produced in 2018 was 109.154 servings, so the direct overhead cost per serving was IDR 5.583, and the indirect cost per serving was IDR 4.390.00.

The unit cost for a low-calorie diet package is the total of direct non-overhead costs, direct labor costs, and overhead costs. Details of unit cost are presented in Table 3.

Table 3. Details of Unit Cost

Component of cost	Total (IDR)	Cost per Portion (IDR)
Direct non-overhead cost		
Food materials	85.966	17.193
Consumables	15.404	3.081
Direct labor cost	609.394.500	5.583
Overhead cost	479.198.421	4.390
Total of unit cost		**30.247**

4. Discussion

Cost is a sacrifice of economic resources to achieve certain important goals at present or in the future. The costs of a sacrifice are formed by the value of the amount of production capacity required to produce goods[12]. The cost of goods manufactured is all costs, either directly or indirectly, incured to produce goods during a certain period[13]. Based on the analysis results, the unit cost obtained for a low-calorie diet package was IDR 30,247.00 per portion consisting of lunch, snack, as well as nutritional assessment and consultation.

Determination of production costs could be done using two approaches, i.e. full costing and variable costing[12]. Full costing is a method to determine production costs consisting of direct non-overhead costs, direct labor cost, and overhead cost, both as variable and full costing. Meanwhile, variable costing is a method to determine production costs consisting of direct non-overhead costs, direct labor costs, and overhead costs as variable costing[14].

Direct non-overhead costs are the costs of all materials that will be part of the cost (processing goods and finished goods) and can be traced economically to the cost objects[15]. The direct non-overhead costs in low-calory diet package are obtained by calculating all the food ingredients according to the menu set based on existing recipe standards. Stanards recipes are recipes that has been modified and standardized to create a quality or portions that are relatively the same in taste for each dish[16]. This standard aimed to maintain food quality and control the use of materials, so the direct non-overhead costs are always the same everytime it's produced.

The direct labor costs are the costs incurred for the use of direct labor in the processing of a product from raw materials to finished goods[17]. The installation's work system, which is carried out with 24-hour shift, also causes the number of its workers to be quite large: 43 people. This number of workers includes 13 nutritionists, 14 waitresses, 14 chefs, and 2 warehouse personnels. The workers whom included to direct labor in low calorie diet package production are the chefs and waitresses who are doing food preparation, production, and food serving arrangements, also nutritionists who are in charge of quality control. The human resource competencies in Nutrition Installation are specific according to the requirements of the Hospital Nutrition Services Guidelines. According to the guidelines, nutritionists must have a background of undergraduate study (bachelor or diploma) of Nutritional Studies, a minimum of high school education for waiters and warehouse officers, and a minimum of vocational cooking school for cooks[3].

Overhead costs are all manufacturing costs that are not included in direct non-overhead costs and direct labor costs[18]. This costs consist of tools and equipment depreciation cost, cost for supporting materials, maintenance and repair cost, indirect labor cost, and other costs such as electricity, water and fuel. It is known that the asset acquisition value of the Universitas Gadjah Mada Academic Hospital's nutrition installation in 2018 is idr 2,078,788,281.00. This high asses value results in a depreciation expense of idr 93,016,446.00 each year, which has an impact on the overhead cost.

On the other hand, the value of the assets and human resource costs of the Nutrition Installation are both potential capitals for the future of nutritional entrepreneurship. The Nutrition Installation's equipment and infrastructure that are complete, of high quality, and in accordance with the standard of sanitation hygiene, completed with competent human resources as both direct and non-direct labor add more value to the installation's diet catering if compared to other caterers. The sum of overhead and direct labor costs per portion may change according to the amount of portions produced.

Therefore, reducing both sums to get a lower unit cost can also be done by increasing the number of portions produced.

The weakness of this research is that it has not analyzed other administrative costs that may arise in the implementation of nutrition entrepreneurship, such as marketing costs.

5. Conclusions

The unit cost for a low-calorie diet package is IDR 30,247.00 per portion consisting of lunch, snack, nutritional assessment, and nutritional consultation.

Before setting a tariff or price for a low-calorie diet package, it is necessary to conduct a customer survey in collaboration with both Public Relations Installation and Marketing Installation to figure out the consumers' purchasing power and market prices. What also needs to be conducted is the unit cost analysis of other possible menus, so that the nutritional entrepreneurship is not limited to the low-calorie diet package.

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Competing interests

Researchers do not have a conflict of interest in conducting this research.

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