The Need of Catering Food Materials using Lotting Technique

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Abstract. The purpose of this study is to minimize the purchase cost for each food from the catering menu. Therefore, raw material inventory control method is needed to plan arrival schedule, order schedule, and the amount of ordering of each foodstuff. The technique of determining the amount of ordering (lotting technique) used there are three, namely the least unit cost technique, the lot for lot technique and the least total cost technique. The results of this study indicate that the company can minimize the cost of purchasing food based on lead time, storage time limit, and optimal lotting techniques. Lead time is the period between the order to the delivery time, the storage time limit is how long the best time required for the quality of foodstuffs are maintained, while the lotting technique is the optimal size of order quantity. The lotting technique chosen for each type of food material is different. The cost of purchasing the food consists of the price of the foodstuff, the ordering fee for the type of material and the storage cost for the type of foodstuff. There are 16 types of foodstuffs with the cost of purchasing the smallest raw material with the lot for lot techniques. There are 29 types of foodstuffs with the least unit cost techniques. And 10 types of foodstuffs with the least total cost technique as a lotting technique with the purchase of the smallest raw material. Of the 55 types of food raw materials, the company was able to save the cost of purchasing groceries of 33,06,371.75 IDR per month. Of course, in order to apply this planning, the company must provide facilities in order to extend the life of the foodstuff in accordance with predetermined lead time and to ensure the quality of the foodstuff is guaranteed.

1. Introduction

The lotting process is the process of determining the optimal order size of each raw material based on the calculation of the net need for raw materials. The lotting process is closely related to the determination of the number of components that must be provided. The lotting process itself is very important in the material needs plan. The proper use and selection of techniques greatly affect the effectiveness of material requirements plans. The lot size means the number of items to be ordered, which is associated with the amount of the inventory costs, such as the cost of the setup, the cost of storage, the cost of capital, and the price of the item itself. By paying attention to these costs the ideal lot size will determine minimum inventory cost [1,2]. Lot size is very important and difficult in production planning. Up to now, many techniques of lotting have been developed by experts [3].

The raw material is very important for the company because the raw material is an input to the manufacturing process, without input then the company can not produce the output [4]. Especially for food-based companies, storing large quantities of raw materials can cause problems. In addition to the
cost of expensive storage, raw materials are stored too long will expire. But if the availability of raw materials cannot meet the demand for production will cause the demand is not met.

There are a lot of research related to raw material requirement planning. The object of research from these studies is generally in the manufacturing company [5-7]. Very unfortunate it was rarely applied to the company in the field of food serving the menu catering both personal and corporate. Whereas if viewed in terms of the life of raw materials, raw materials to eat catering menu has a greater risk due to its short life. Therefore, this research is necessary because the raw material of the catering menu greatly affects the ordering time, the number of reservations and the amount of storage.

The purpose of this study is to minimize the purchase cost for each food from the catering menu.

2. Method
The design of this study was a case study design, in which the data used as the basis for evaluation of decision selection is data in April 2017. The data collected in the form of lead time data and storage time limit, customer data, the price of each raw material, the cost of storage, the cost of ordering, production schedules, demand data and raw material requirements. From these data, data processing has been done in the form of arrival schedule for each foodstuff, schedule of order for each foodstuff, the amount of optimal order for each foodstuff. The determination of the booking amount is based on the selected lotting technique. There were three lotting techniques used, namely the lot for lot, the least unit cost and the least total cost. Planning of raw material needs is determined based on the smallest purchase cost.

3. Results and discussion
The comparison of the cost of purchasing food that has been issued by the company and the use of selected lotting techniques for the planning of each raw material can be seen in Table 1. Type of foodstuffs numbered 1-10, the selected lotting technique is the least total cost because it yields the smallest purchase cost for the materials. For the type of ingredients numbered 11-39, in order for the company to minimize the cost of purchasing 29 types of foodstuffs, the lotting technique used is the least unit cost. As for the remaining types of other foodstuffs, used the lot for lot technique for the cheapest purchase for 16 types of food. With the use of the best lotting techniques, the company can save on the cost of purchasing groceries in April [8, 9]. However, the company had to buy as many as four large meat freezers or eight meat freezers of size, and a six-piece showcase, to be able to implement food planning from this catering menu [10].

| No | Raw Materials | Lotting Technique | Using lotting techniques (IDR) | Expenses in April (IDR) | The cost that could be minimized (IDR) |
|----|---------------|-------------------|-------------------------------|------------------------|---------------------------------------|
| 1  | Squid         | Least Total Cost  | 29,215,041.26                | 29,514,562.50          | 299,521.24                           |
| 2  | Cabbage       | Least Total Cost  | 6,849,105.61                 | 7,753,040.63           | 903,935.02                           |
| 3  | Meat          | Least Total Cost  | 39,778,176.88                | 39,916,500.00          | 138,323.12                           |
| 4  | Corn Grains   | Least Total Cost  | 5,651,794.16                 | 5,847,328.13           | 195,533.97                           |
| 5  | Chinese Cabbage| Least Total Cost  | 6,270,029.78                 | 6,567,759.38           | 297,729.60                           |
| 6  | Lemongrass    | Least Total Cost  | 9,035,361.98                 | 9,367,994.22           | 332,632.24                           |
| 7  | Shrimp Paste  | Least Total Cost  | 651,421.27                   | 674,167.66             | 22,746.39                            |
| 8  | Fish          | Least Total Cost  | 24,219,291.26                | 25,013,812.50          | 794,521.24                           |
| 9  | Salt          | Least Total Cost  | 2,941,625.90                 | 3,392,611.25           | 450,985.35                           |
| 10 | Vermicelli    | Least Total Cost  | 24,211,675.84                | 30,488,615.63          | 6,276,939.79                         |
| 11 | Chicken       | Least Unit Cost   | 236,640,136.86               | 244,225,250.00         | 7,585,113.14                         |
| 12 | Shallot       | Least Unit Cost   | 87,354,626.64                | 91,985,907.14          | 4,631,280.50                         |
| 13 | Cucumber      | Least Unit Cost   | 2,986,470.82                 | 3,233,750.00           | 247,279.18                           |
| No | Raw Materials      | Lotting Technique | Using lotting techniques (IDR) | Expenses in April (IDR) | The cost that could be minimized (IDR) |
|----|--------------------|-------------------|-------------------------------|-------------------------|--------------------------------------|
| 14 | Green Chili        | Least Unit Cost   | 12,683,506.95                 | 13,508,389.97           | 824,883.02                           |
| 15 | Lime Leaves        | Least Unit Cost   | 612,156.46                    | 614,065.99              | 1,909.53                             |
| 16 | Candlenut          | Least Unit Cost   | 7,303,749.68                  | 7,504,589.31            | 200,839.63                           |
| 17 | Bay Leaves         | Least Unit Cost   | 1,688,128.13                  | 1,716,406.17            | 28,278.04                            |
| 18 | Sugar              | Least Unit Cost   | 3,394,312.30                  | 3,678,609.50            | 284,297.20                           |
| 19 | Garlic             | Least Unit Cost   | 55,782,961.36                 | 58,871,494.47           | 3,088,533.11                         |
| 20 | Carrot             | Least Unit Cost   | 3,231,055.20                  | 3,277,862.50            | 46,807.30                            |
| 21 | Curly Red Chili    | Least Unit Cost   | 6,656,562.79                  | 6,892,893.01            | 236,330.22                           |
| 22 | Ginger             | Least Unit Cost   | 16,676,015.33                 | 16,770,272.94           | 94,257.61                            |
| 23 | Tamarind           | Least Unit Cost   | 12,429,058.30                 | 13,008,049.50           | 578,991.20                           |
| 24 | Soy sauce          | Least Unit Cost   | 48,150,410.55                 | 52,097,250.00           | 3,946,839.45                         |
| 25 | Egg                | Least Unit Cost   | 41,209,951.75                 | 44,620,202.97           | 3,410,251.22                         |
| 26 | Red Chili          | Least Unit Cost   | 11,701,309.79                 | 11,937,440.63           | 236,130.84                           |
| 27 | Long Beans         | Least Unit Cost   | 3,222,355.14                  | 3,236,904.81            | 14,549.67                            |
| 28 | Bean Sprouts       | Least Unit Cost   | 14,089,157.43                 | 14,323,742.97           | 234,585.54                           |
| 29 | Soy sauce          | Least Unit Cost   | 8,864,448.31                  | 8,505,864.94            | 641,416.63                           |
| 30 | Lime               | Least Unit Cost   | 2,222,224.20                  | 2,236,904.81            | 14,549.67                            |
| 31 | Pepper             | Least Unit Cost   | 7,864,448.31                  | 7,216,931.25            | 616,300.22                           |
| 32 | Tomato             | Least Unit Cost   | 6,600,631.03                  | 7,141,393.75            | 279,890.21                           |
| 33 | Potato             | Least Unit Cost   | 4,513,048.12                  | 4,691,040.63            | 177,991.20                           |
| 34 | Tofu               | Least Unit Cost   | 12,429,058.30                 | 13,008,049.50           | 578,991.20                           |
| 35 | Onion              | Least Unit Cost   | 1,975,108.66                  | 1,988,752.35            | 13,643.69                            |
| 36 | Green Onion        | Least Unit Cost   | 858,134.55                    | 859,593.90              | 1,459.35                             |
| 37 | Coriander          | Least Unit Cost   | 926,912.89                    | 945,829.41              | 18,916.52                            |
| 38 | Galangal           | Least Unit Cost   | 3,370,936.93                  | 3,231,499.19            | 22,102.26                            |
| 39 | Rice Grains        | Least Unit Cost   | 11,701,309.79                 | 11,937,440.63           | 236,130.84                           |
| 40 | Turmeric           | Lot for Lot       | 602,424.20                    | 602,424.20              | -                                     |
| 41 | Coconut Milk       | Lot for Lot       | 150,746,451.88                | 150,746,451.88          | -                                     |
| 42 | Chicken Liver      | Lot for Lot       | 2,097,250.00                  | 2,097,250.00            | -                                     |
| 43 | Chicken Gizzard    | Lot for Lot       | 2,097,250.00                  | 2,097,250.00            | -                                     |
| 44 | Spinach            | Lot for Lot       | 4,578,025.00                  | 4,578,025.00            | -                                     |
| 45 | Cayenne Pepper     | Lot for Lot       | 4,567,825.00                  | 4,567,825.00            | -                                     |
| 46 | Macaroni           | Lot for Lot       | 2,928,375.00                  | 2,928,375.00            | -                                     |
| 47 | Soy Nugget         | Lot for Lot       | 5,549,437.50                  | 5,549,437.50            | -                                     |
| 48 | Black Pepper       | Lot for Lot       | 2,610,562.50                  | 2,610,562.50            | -                                     |
| 49 | Vinegar            | Lot for Lot       | 164,625.00                    | 164,625.00              | -                                     |
| 50 | Noodle             | Lot for Lot       | 10,085,062.50                 | 10,085,062.50           | -                                     |
| 51 | Powder             | Lot for Lot       | 310,875.00                    | 310,875.00              | -                                     |
| 52 | Salak              | Lot for Lot       | 15,047,437.50                 | 15,047,437.50           | -                                     |
| 53 | Watermelon         | Lot for Lot       | 32,504,062.50                 | 32,504,062.50           | -                                     |
| 54 | Orange             | Lot for Lot       | 90,089,062.50                 | 90,089,062.50           | -                                     |
| 55 | Melon              | Lot for Lot       | 38,939,062.50                 | 38,939,062.50           | -                                     |
|    | Total              |                   |                               |                         | 33,006,371.75                        |
4. Conclusion
The company is currently making purchases based on the needs of raw materials on the day, so the purchase of food is done every day. By using selected lotting techniques in planning foodstuffs, the company is able to minimize the costs incurred. In addition, this technique is also computer-based so it can do the planning in a long time and easy to use. In order for the implementation to take place as planned, the company must be provided supporting facilities so that the age of the foodstuff will be in accordance with the planned lead time and the quality of each ingredient can be maintained.

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