ABSTRACT

CV XYZ is a company that distributes pumpkin-based products, such as pumpkin brownies, pumpkin sticks, pumpkin chips, and pumpkin pudding for resale to customers. In inventories of pumpkin brownies, pumpkin sticks and pumpkin crackers, there is a problem where overstock occurs with an average of 21%. Overstock causes stockpile in the warehouse, which makes products irregularly coming out and causing some pumpkin brownies products to reach their lifetime before they can be sold. Products that reach their lifetime first cause losses to the company. Overstock and the resulting losses caused total inventory costs to exceed the budget limit by 45%. Based on this, identification of the root of the problem is carried out to find out the main cause.

The selected root causes are there is no definite reorder time and there are no provisions regarding the order quantity, which causes the main problem in the form of increasing total inventory costs. From the root causes, an alternative solution offered is designing an inventory policy. An inventory policy is designed to minimize total inventory costs using the continuous review (Q, r) method by considering fixed lifetime. Through this method, it can help determine the optimal order quantity, reorder point, and total inventory cost.

The proposed optimal number of orders are 275 for pumpkin brownies, 251 for pumpkin sticks, and 243 for pumpkin chips. The reorder points are 73 for pumpkin brownies, 47 for pumpkin sticks, and 35 for pumpkin chips. Safety stocks for each product are 25 for pumpkin brownies, 18 for pumpkin sticks, and 15 for pumpkin chips. Then, the calculation result for proposed inventory cost in this period is Rp721.715. Besides proposing for the current period, proposal is also carried out for the next period.

The next period is proposed firstly by making a demand forecast using Winters and Decomposition method. These two methods are chosen because they can be used to forecast demand with seasonal variation patterns. Later, it is found out that the best method is to use Decomposition, because this method has the lowest MSE, MAD and MAPD for the three products. After obtaining the demand forecasting result, calculation for inventory cost can be carried out using the same method as before.

Based on the results obtained, the optimal number of orders for the next period are 252 for pumpkin brownies, 243 for pumpkin sticks, and 223 for pumpkin chips. The reorder points are 52 for pumpkin brownies, 40 for pumpkin sticks, and 23 for pumpkin chips. Safety stocks for each product are 18 for pumpkin brownies, 13 for pumpkin sticks, and 7 for pumpkin chips. Then, calculations are carried out for the same cost components as before. The calculation results show that the total inventory costs that will be incurred in the next period are Rp608.006.

Next, a comparison is made of the actual total inventory costs with the proposed one. The proposed total inventory costs indicate that there has been a decrease in the actual total inventory costs. It can be concluded that the proposed method of continuous review (Q, r) with fixed lifetime can minimize total inventory cost. The percentage of minimization is 71%. Other than that, comparison between proposed total inventory cost for this period and next period is also carried out to give aware about future expense. The result shows that for next period, total inventory cost will decrease by 16% due to the impact of demand forecast that also experience a decrease.

Keywords: ***inventory, overstock, Continuous Review (Q, r), fixed lifetime.***