

LIFO 정책하에서 재고에 따른 수요변화와  
유통기한이 있는 제품의 재고모형에 관한 연구

**An Inventory Model for Perishable Items  
with Stock-dependent Demand Rate under LIFO Policy**

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**Extended Abstract**

For retailers who deal with foodstuff such as fishcakes or milk, their sales volume tend to depend on the amount of stock displayed. And most foodstuff have their expiry date, that is, they have a fixed known lifetime. Any units which remain unsold by their expire date are considered outdated, and must be disposed of.

In this paper, we investigate procurement policy for a single item with stock-dependent demand rate and fixed lifetime. The demand rate is assumed to be a function of current stock level. For a fixed lifetime item, issuing the oldest units first (FIFO) minimizes expected quantity outdated and a FIFO issuing policy fits the interest of the vendors. However, stock-dependent demand rate implicitly implies that all units in stock are being displayed for sale, thus the consumers enforce the issuing policy and the last-in-first-out (LIFO) policy will generally result to maximize consumer's satisfaction. An example is retail food distribution where consumers check an expiration date on shelf items and choose the newest. Thus it is assumed that the item is depleted by LIFO issuing principle in this study.

To find an optimal procurement policy, a mathematical model under LIFO issuing policy is developed along with its solution methodology. For the model, a periodic review inventory model is adopted with the demand rate  $D(i) = \alpha i^\beta$ ,  $\alpha > 0$ ,  $0 < \beta < 1$  where  $\alpha$  and  $\beta$  are scale and shape parameters. We examine the sensitivity of the decision variables to changes in the parameter values. The effects of these changes on the optimal policy are discussed in brief.