

Inventory management within a food factory

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ABSTRACT

An efficient management of inventories means proper planning and usage of one of more control methods as Just in Time(JIT), Material requirements planning(MRP), Vendor Management Inventory(VMI) or Distribution resource planning(DRP). The stock coverage before production capacity is influenced by many aspects, activities or factors, as: delivery time, payment term, payment methods, risk assuming in terms of delivery terms agreed and accepted, transport administration, minimum quantity delivered, stock buffer, planned quantities to be supplied according to the production and sales plan, monthly average consumption, product category ("jumper" or not), availability of one article on market. Each food stock needs Bulletin analysis and Declaration of conformity , migration tests for packaging that come into direct contact with the product. The management methods used will pay attention to storage capacity, ambient or temperature controlled spaces, mandatory and optional documents, the frequency of inventory management, humidity records, Quality standards followed, internal and external audit, physical and qualitative reception, issuance and tracking complaints, labelling, items identifying, samples management, expired items administration ,losses recording, key performance indicators and many other aspects.

Keywords: stocks coverage, minimum and maximum boundary, manufacturing cycle, shelf life

INTRODUCTION

This paper aims to analyze stocks of food factory, in their relationship with both upstream and downstream sources, the places where the stocks are consumed. It's analyzed that part of supply chain of stocks, both raw and packaging materials before production capacity. The correlation of stocks with the operating result, with regards to increasing or decreasing of them, means efficiency.

1. STOCKS FLOW TILL COMPANY WAREHOUSE

The flow of raw and packaging materials till company warehouse means activities of Purchasing and Logistic Departments made in order to deliver the article required "in the best quality", "at the right time" and "in the most cost-effective way". The procurement is more effective if company manages to find multiple sources of supply for the same raw or auxiliary materials and services. A few objectives pursued by analyzing suppliers are to identify strategic suppliers and to determinate the dependence of the company by certain suppliers. For example when a recipe is established by using a specific type of spices this means an agreed supplier, a fixed source.

Before the building of stock the link with supplier is mandatory to be created. A business relationship starts with supplier's identifying and verification. The evaluation of suppliers is very important activity of Procurement Department. Considering supplier's certifications, current customer portfolio and its availability, the negotiation is open. There are analyzed aspects as minimum of delivery, delivery time, payment terms , methods of

payment, payment instruments, terms of delivery, freight administration, possibility of creating a buffer stock at supplier, average monthly consumption referring to article subject of negotiation, prices and discounts quantities and values, pallets policy, information about the temperature during transport and storage, the insurance of goods during transport, the timing of the transfer of ownership.

The delivery of an article means a purchase order issued based on terms agreed before each delivery. Commercial terms are with regards to a minimum of delivery, unit price, condition of delivery, lead time, day of delivery, **facultative documents** as Analysis Report or Bulletin of microbiological analyses, Bulletin of antibiotic residues, Pallets Notes and **mandatory documents** : the contract or purchase order signed and stamped by both parties, Packing list, CMR, Invoice, Technical Specification, Declaration of Compliance or Conformity, temperature diagram for each delivery, migration tests for those packaging which come in direct contact with the product.

Before a purchase order the link with supplier is mandatory to be created. A business relationship starts with supplier's identifying and verification. The evaluation of suppliers is very important activity of Procurement Department. Considering supplier's certifications, current customer portfolio and its availability, the negotiation is open. A purchase order contains the information similar with the final invoice: information about both supplier, and customer, date of issuing, the article ordered, the quantity, the unit measure, the unit price, the discount agreed, the value, the date of delivery.

The purchase order together with the packing list, reception and invoice represent the set of documents required by Accountancy Department. Based on it the payment to supplier for the article bought will be done according to commercial terms agreed.

No article can be delivered to a food production company before testing. This means a request of Research & Development Department for an article. The article is sought from several suppliers, active suppliers or not still. Before delivery of minimum of quantity needed by a trial period, a technical specification of article required is mandatory to be provided by each contacted supplier. Also, the unit price and delivery terms(transport is included or not within unit price) are very important aspects because of Controlling Department which needs them for an internal calculation in order to make a simulation of final cost of finished goods. The Controlling Department will provide information about profitability of article tested.

2. EFFICIENT MANAGEMENT OF EXISTING STOCK

2.1. CONTROL METHOD USED

Inventory is one of the most critical aspects of most businesses. Management inventory within a company is essential because of fact that it tends to become an important part of a company's balance sheet.

The company uses the Material Requirements Planning (MRP) as software dedicated for inventory management.

“The main objective of MRP is to use the demand for higher-level items to drive the demand for lower-level (dependent) items. Similarly, the main objective of DRP is to use demand at downstream facilities to drive demand at upstream (supplying) facilities. The logic used in DRP is really just an extension of MRP logic. “

MRP is a method of planning and control of inventory, with implications in procurement activities with the aim of minimizing inventory and to plan efficient each delivery. This means that are always available the followings information:

- a list of all articles, raw and packaging materials required by all finished goods
- inventory records
- weekly, monthly production plan

- clients firm orders
- a forecast of clients orders

The list of all articles represents all raw material or packaging materials required by all finished goods. It is a structure of finished goods. Each article as finished good has a recipe. The recipe means quantities or values of raw materials (meat, spices, for example) and packaging (labels, films, bags, boxes, casings, clips). A recipe will always include the percentage of losses allowed.

The inventory records means the actual stock of raw and packaging materials, available stocks within Warehouse Company, the quantities open, ordered already to suppliers, the lead time of purchasing for each article. Current stock is recorded both a physical and script. Stock's updating occurs after each settlement of production orders which can be made daily or weekly. The sooner, the better, in terms of accuracy of stocks registered into management inventory system. A settlement of production orders means an updating of recording of all work in progress (WIP) articles.

Production plan of the company analyzed is frozen for next week and open for the period ahead, depending on production capacity, sales forecast and firm clients orders. Without a production plan the Material Requirements Planning (MRP) cannot issue requirements of raw and packaging materials. Production plans content the quantity of each article as finished product, planned to be realized on next week.

Clients' firm orders represent actual customer requests for the next period.

The forecast of clients' orders means estimating demand for final products, for a time horizon. All these information are provided by Sales and Marketing Department because of them responsibilities to keep in contact with each client referring to possible quantity required by market, marketing activities (promotions, samplings, so on). Information available about market behavior in the past are also an essential input.

2.2. THE FREQUENCY OF INVENTORY COUNTING

According to Romanian law the inventory stocks is mandatory once a year.

Nevertheless a good warehouse or stocks manager will perform this inventory at the end of each month, for a good accuracy of the data and especially there where are kept the products that are intended for human consumption. This is not only the correct management of the pluses or minuses of inventory.

An monthly inventory can be a warning of losses greater than those accepted by the recipes, a good administration of those articles with short life, updating of the minutes referring to products expired or products which cannot be used because of special requirements of clients as new labels, new design for a film or for a bag or for boxes, new recipe, new article which require new raw and packaging materials, the supervising of monitoring reports referring to humidity and temperature within warehouse during last 30 days. Products with lower lifetime are carefully managed within food Production Company. To pay attention to these articles means to announce in due time those people responsible for production plan building and to find a way to produce and sell the finished products which require these raw materials.

2.3. STORING STOCKS

The flow of raw and packaging materials till company warehouse "in the best quality", "at the right time" and " in the most cost-effective way" is a responsibility of Purchasing and Logistics Departments. The activities of the flow presented require not only the high quality of service, but the quality of the product delivered.

Keeping the quality of service means to ensure that at any time or place in the chain has to be provided:

- Cleanliness of storage conditions, even during the transportation
- Compliance with temperature control conditions for those article which require a special temperature, both in the truck and in the warehouse
- Keeping away from direct light exposure
- Pest control of the places where the goods are stored
- Segregation of goods so that the products are stored isolated from those goods which might affect their properties

Securing high quality of service is equal to preserving the quality of products.

The quality of product delivered may be challenged on delivery or reception point before placing the item in stock, or after delivery, when it is used and can be detected the non-compliance. In both cases, a formal complaint is issued to supplier. Supplier shall analyze product claimed or the lot of article delivered and give an official response which describes the solution found: replacement item, commercial discount for the whole quantity delivered or describing of all measures took for the prevention of nonconformity complained.

The warehouse of raw and pack materials has to prove in every moment the goods traceability. Product traceability consists of quick identification of a route of a product in the supply chain. Product lot code is the key information for traceability report. A traceability report provides the information about all customers were products were shipped to and their related quantities. To be able to recall a product from the market traceability report includes the following information: the quantity of boxes coming in the warehouse, the quantity of boxes shipped to customers (per Delivery Note document) and the quantity of boxes currently in stock in the warehouse. This means that the lot number of each raw and pack material is a mandatory information. The lot number is an information filled in Declaration of Conformity, a document which accompanying the article to the destination. If the packing list is mandatory from commercial point of view, providing the information about net quantity, supplier name and address, date of delivery, a Declaration of Conformity or Certificate of Compliance provides information about lot number, production date, expiry date, date of issuing, and it s required by Quality Department of production plant (responsible for traceability), by Sanitary Veterinary Authorities and by Auditors.

Because of two types of articles categories handled there are different storage conditions: **temperature controlled** (TC) for meat and specials spices and **ambient** for spices, labels, boxes, films, bags, casings, auxiliary materials for production activity and cleaning materials. These mean more warehousing spaces with the own management inventory.

A dedicated place is arranged for those articles that contain allergens. The usage of these items requires a special attention, involving strict observance of flux.

Dedicated spaces have the samples, the refusal articles and the expired items or decommissioned also.

2.4. KEY PERFORMANCE INDICATORS, PRODUCTIVITY

As a measure of Management Inventory performance there are used some Key Performers Indicators (KPI's). Related to the transportation of goods there is" On Time Loading" (OT), number of loadings made in time versus total number of loadings. For reception point the "Invoice Accuracy" (IA) as number of invoices correctly issued versus total number of invoices.

The mains objectives of those who manage the inventory are to avoid any "out of stock", to obtain a good coverage stock per each category of articles which means less "Days on stock" and to obtained time to time a cost saving. The cost saving means the same effect with less effort, or a better effect with the same effort. It can be obtained, for example, be replacing a film with 180 my with one with the same structure but thinner, a better use of

storage space by creating a vertical storage space, easy to access, good manipulation and administration. A kind of cost saving could be the Order Size Rebate which is offered when the quantities ordered by the customer are such that the trucks ordered are fully utilized both in weight and cubic capacity. This allows to get better \$/kg rate on transportation. Benefits would be shared. The company which buy is encouraged to issue orders above certain percentage of truck utilization based on the product specifications.

CONCLUSION

Inventory management involves determining the optimal amount of stocks to be held, identifying of the right moment for a new purchasing and the right quantity which has to be bought.

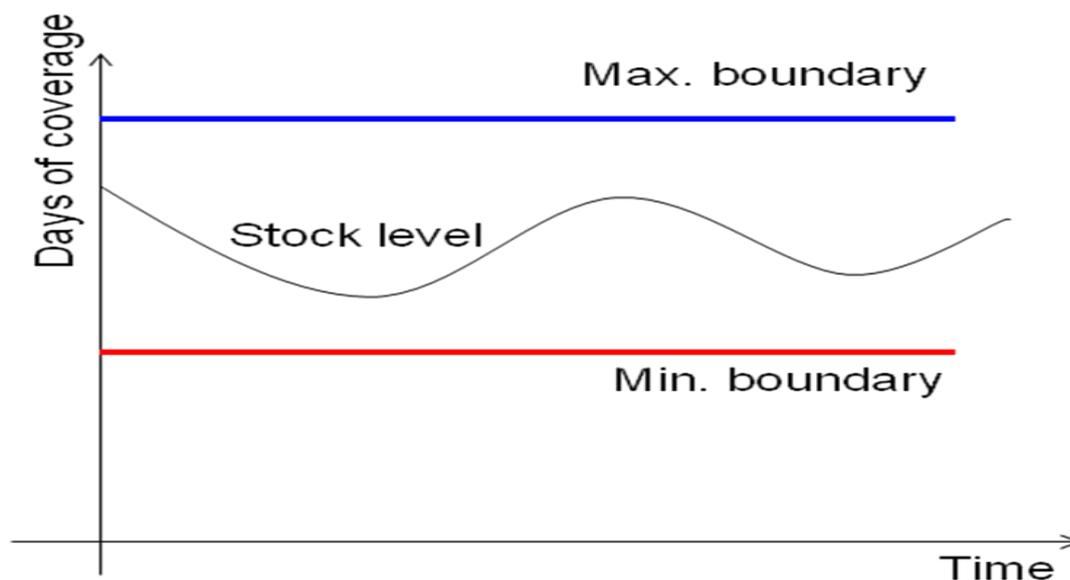
The stock level of raw and packaging materials is influenced by the actual sales (coverage of finished goods), sales estimates, production input (production lead time, production cycle time, minimum lot size, quarantine period) logistic input (transport time, shelf life, trade life).

“The maximum stock limit is the upper level of inventory and the quantity that must not be exceeded without specific instruction from the management. In other words, the maximum stock level is that quantity of material above which the stock of any item should not normally be allowed to go.”

“The minimum level or minimum stock is that level of stock below which stock should not be allowed to fall. In case the stock of any item falls below this level, there is the danger of stopping production and, therefore, the management should give top priority to the acquisition of new supplies.”

The Boundaries recommendation, presented below by Figure no 1 are influenced by **coverage of the actual stock** (days on stock), **production output** which depend on capacity utilization, raw and pack material availability, personnel usage and **sales estimates**.

Figure 1: Boundaries recommendation



When the operational result decreased during 2012 by 12% comparing with 2011, and purchase value with regards to acquisitions of both raw and pack materials decreased by 12%, it turns out a good stock management and the relevant figures.

But what about when a regretful translation of European law text has blocked the stock labels because of the label information which is against the law? Thus any delivery on market would be an offense. The stock remains locked until the local and national authorities will take the necessary steps by the Commission in Brussels, in order to correct the legal text translation.

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