

Analysis of the automated production of pre-packaged sandwiches

[Nutrition](#), [Food Safety](#)



Product: Pre-Packaged Sandwich

These are sandwiches which are made BY Foo Go which is a company owned by Greencore group. They do customizations according to the preference of daily consumers. These sandwiches are targeted for people who are always busy with their daily routine and are looking for a food option which they can have on the go. They are made of ingredients like bread, cheese, mayonnaise, ham and so on. Current situation: Production process of the Pre-Packed Sandwiches These sandwiches are made in two different process, depending upon the type and demand of the customers. First process includes combination of manual labor and flexible automated assembly lines and the second process is a fully automated assembly line. This difference takes place because the first process is used for sandwiches which have specific requirements by individual customers. On the other hand, the second process is used for bulk orders which have the same ingredients.

The steps in first process are as follows:

1. The bread pieces are visually inspected to remove the damaged ones (with holes and other flaws.. After which they are placed on the belt where the slices are separated.
2. Internal roller spreads melted butter on the bread slices. This is followed by an automated machine squirting the right type and quantity of mayonnaise as per the request of the customers.
3. Specific ingredients like cold cuts and cheese is laid by the worker manually on the bread slices.

4. Bricks of ham is placed on the automatic slicer where the workers program the slicer which cuts the appropriate quantity of ham which will be put on the bread slices.
5. The ham slices are then placed on the bread slices moving on the belt in the assembly line by the workers manually.
6. The workers manually close the sandwiches and stack in piles of two in the assembly line.
7. The sandwiches are brought to a mechanized cutter where the vertical blade is in constant motion like a saw cutting the sandwich in two halves.
8. The two halves are packed as one sandwich later in the assembly line.
9. The slices are then manually placed in the box and left on the belt again which is followed by the hot seal packaging covering the box.

The steps in the second process are as follows:

1. A robot sucks up the slices and transfers them on a moving belt
2. Positioning plates perfectly moves the bread slices so that they are aligned in respect to the nozzles which will put other ingredients.
3. The nozzles release the appropriate ingredients which has been set up on every second slice of the bread.
4. The robotic arms flip the empty slice and covers the other slice of the bread.
5. An ultrasonic knife cuts the sandwich into two halves ensuring cleaner edges and appropriate cutting.
6. The robotic arms again pick up the slices and flips on the other half to make a complete sandwich for the box.

7. The sandwiches are then picked up automatically and placed on the triangular trays. This is then forwarded to the ceiling and labelling section. After the following steps in both the process, the sandwiches are sent to the stores within the next 12 hours where they offered to the customers. These sandwiches have a shelf life of 3 days after which they are picked up by the company when the new sandwiches are stocked up on the shelves of the supermarket again daily.

Analysis of the production process

Seeing this, we can understand the production of pre-packed sandwich on a commercial level. We will use the concepts we have learnt so far which mainly include Just in time, Mass production and Agile mass customization. Application and implications of these concepts in respect to the production of pre-packed sandwiches.

Just in Time

As we know Just in time is all about procuring the right material from the right supplier at the right time and at the right place. This ensures elimination of excess time in the production process and ensures greater productivity by improving the quality of the product. Being a product in the FMCG packed food sector it is very essential that Foo Go takes care of the quality of the product being delivered to its customers. This can be done by ensuring the following steps:

1. Choosing the right supplier for the ingredients of the sandwich such as bread slices, ham, cheese, butter and so on.

2. Emphasizing on the quality of these ingredients rather than the price.
3. Ordering the appropriate quantity at regular intervals to ensure that only fresh materials are supplied and avoiding wastage.
4. Producing the right quantity according to the demands of the customers and not forecasting excess demands which may lead to wastage - lean production.
5. Also, having a smooth flow of materials and final products through and an appropriate logistics operation.

Mass Production

In the subject of economics mass production is referred to as economies of scale, this means that producing a larger quantity reduces the cost per unit as the fixed cost gets shared by the total production ensuring greater sales and greater profits at a cheaper selling price. This results in greater efficiency by reducing a large amount of errors which would or else originally take place. This concept could be applied in the second process of fully automated assembly line. The sandwiches must be prepared in a continuous manner which could serve the common taste of the maximum population.

On the other hand, we believe that the Foo Go's USP is handcrafting the best sandwiches which meets the individualistic taste of its every unique customer. Hence mass production will lead to excess storage and wastage as the sandwiches are perishable items which cannot be sold after a span of 3 days. Also producing a similar sandwich for all its customers may backfire its operations resulting in lower sales and market share. Agile Mass

CustomizationAs explained earlier mass production is not suitable for the first process which Foo Go uses, although this will be a perfect example of

Agile Mass Customization. This is because Foo Go can take the request of its customers and make it according to their expectations. This ensures the customers can create their own value from the product they purchase. Due to all this, Foo Go can increase its sales and capture a large market share in packed food industry.

Problems and threats

1. Threat of being supplied old ingredients from its suppliers. We believe that this is a serious problem because these ingredients constitute the major part of the sandwich which is offered to the customers.
2. Threat of human error in identifying the damaged bread loafs in the first step. If this takes place Foo Go's time and resources are of a waste as it cannot be finally offered to its customers.
3. Threat of breakdown or malfunction of the automated machinery in the factory. This will result in making an inappropriate sandwich and not able to fulfil the production requirements on time.
4. Dealing with errors and problems which take place in the middle of the assembly line (mishandling and inappropriate work duties by the employees..

Proposals and recommendations

We believe that problems and threats which Foo Go faces could be minimized and eliminated by following an effective quality and inspection strategy. Foo Go could establish a procurement and inspection department which could deal multiple functions leading to greater efficiency. The functions would range from developing a healthy relationship with all its

suppliers. Also, getting the right product at the right time in the right quantity. This will enable Foo Go to eliminate its employs in the assembly line to stay idle due to unavailability of ingredients at the right time.

Since a lot of manual labor could result in small human errors it is advisable that Foo Go leads to automation such as dispensing ingredients on the sandwiches like the second process. The human work force could work on the quality aspect and the operations of this machinery. This would ensure that Foo Go does not compromise on its USP of it making specialized and unique sandwich for every customer. At the same time, the machines in the assembly line must be checked with regular maintenance and repairs so that the machine does not break down and malfunction.

Through regular inspections in the assembly line the company will be able to eliminate the errors occurring in the middle of the process. All this will lead to greater success for the company as delivering the right quantity at the right time avoids a lot of wastage and idle labor and machine hours for the company. This ensures making more quantity of sandwiches if needed in the same amount of working hours or making the existing quantity in a shorter span of time. All this will help Foo Goo generate higher profits and lead to greater efficiency.

Future opportunities

In today's world, people are always on the go and occupied with their busy daily routines. Hence eating home cooked food is next to a luxury thing which only a few can afford. This leads to people buying more of packed food

from super markets. This can be perfectly analyzed by looking at the market growth rate of packed food items. Foo Go, producing pre-packed sandwiches can capture a high potential of market share in this category. Also, we believe that people are looking for healthier options rather than eating the general snacks and fast food items. Foo Go can focus on variety of sandwiches which focuses on the value aspect of health and nutrition to its customers. Providing a combination of both taste and health will help the company to establish new market shares and gain the confidence from its new customers. The company producing the pre-packed sandwiches has a competitive advantage in today's packed food industry as it can meet the different demands of its customers in a unique manner. The company can modify every sandwich in a different manner according to its customers taste and preferences. This should be continued in the future as well because this is an important criterion which customers look into while buying a packed food product in the super market.

Conclusion

Through this assignment we can understand the different aspects and procedures which take place in the production of pre-packed sandwiches. It is very fascinating and interesting to understand that such a big assembly line is set up for a sandwich which we buy from the supermarket. It is very useful to understand the practicality of concepts like Just in time, Lean production, Mass production and Agile mass customization in the real world. Through this assignment we can understand that how such concepts are applied for making every product in any industry. It is also understood that

how suppliers play a major role in the success of a company. Hence, we can relate that maintaining a healthy relationship with the suppliers is very important as getting the right product from the right supplier at the right time is the key to success for greater profits. Also, being a company producing perishable product like pre-packed sandwiches it is very important not to waste time. Hence ideal time of labor and machine hours during the production process will only lead to excess costs and lower profits.

Setting the factory near to suppliers and the customer markets i. e. the supermarkets will reduce the transportation time and hence increase the shelf life of the pre-packed sandwiches as the production will take place in a quicker manner and reach fresh to the customers in a very short span of time. If these concepts are applied in the right manner for the production process then the company can reach a stage where the profits are maximized by capturing a very high market share i. e. through reducing costs, wastage and increasing production.