Case Study # 3

Management of Quality

Chick-n-Gravy Dinner Line & Tip Top Markets

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PRODUMA – A0A

Submitted to:
Prof. Engr. Glenn Guevarra
The operations manager of a firm that produces frozen dinners had received numerous complaints from supermarkets about the firm's Chick-n-Gravy dinners. The manager then asked her assistant, Ann, to investigate the matter and to report her recommendations.

Ann's first task was to determine what problems were generating the complaints. The majority of complaints centered on five defects: underfilled packages, a missing item, spills/mixed items, unacceptable taste, and improperly sealed packages.

Next, she took samples of dinners from the two production lines and examined each sample, making note of any defects that she found. A summary of those results is shown in the table.

The data resulted from inspecting approximately 800 frozen dinners. What should Ann recommend to the manager?

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Line</th>
<th>Underfilled</th>
<th>Missing Item</th>
<th>Spill/Mixed</th>
<th>Unacceptable Taste</th>
<th>Improperly Sealed</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/12</td>
<td>0900</td>
<td>1</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/12</td>
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<td>2</td>
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<td>✓</td>
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<td></td>
</tr>
<tr>
<td>5/13</td>
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<td>✓</td>
<td></td>
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</tr>
<tr>
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<td>1345</td>
<td>1</td>
<td>✓</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/13</td>
<td>1530</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>5/14</td>
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<td></td>
<td>✓</td>
<td></td>
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<tr>
<td>5/14</td>
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<td>1</td>
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<td></td>
</tr>
<tr>
<td>5/15</td>
<td>1030</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15</td>
<td>1145</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5/15</td>
<td>1500</td>
<td>1</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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<td>5/16</td>
<td>0845</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>5/16</td>
<td>1030</td>
<td>1</td>
<td></td>
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</tr>
<tr>
<td>5/16</td>
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<td>1</td>
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</tr>
<tr>
<td>5/16</td>
<td>1545</td>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Ann should make the following recommendations to the manager:

1. Of the 5 defects observed, give priority to reducing the defect Unacceptable Taste. The Pareto Chart shown below shows Unacceptable Taste has the most number of defects. A Cause-and Effect Diagram or Ishikawa diagram should be used to better understand how this problem can be solved.

![Pareto Chart](image1)

2. To reduce the number of Unacceptable Defects, we should first investigate Line 1 because it is producing more of this type of defect as compared to Line 2. The chart below shows Line 1 produced 14 Unacceptable Taste defect as compared to only 8 of Line 2.

![Unacceptable Taste Defect Chart](image2)
3. After successfully reducing the Unacceptable Taste defect, the Missing Item defect can be investigated. After the Missing Item defect is reduced, the Spill/Mixed defect can be investigated. And so on until all the 5 defects are reduced or completely removed.

4. The Scatter Diagram below shows there is no relationship between the time the defects were observed and the number of defects found. Hence, any effort to reduce the number of defects may not be based on any time of the day. Test runs on production lines 1 and 2 may be conducted irrespective of time of the day.
Tip Top Markets is a regional chain of supermarkets located in the Southeastern United States. Karen Martin, manager of one of the stores, was disturbed by the large number of complaints from customers at her store, particularly on Tuesdays, so she obtained a complaint record from the store's customer service desk for the last eight Tuesdays.

Assume you have been asked to help analyze the data and to make recommendations for improvement. Analyze the data using a check sheet, a Pareto diagram, and run charts. Then construct a cause-and-effect diagram for the leading category on your Pareto diagram.

On July 15, changes were implemented to reduce out-of-stock complaints, improve store maintenance, and reduce checkout lines/pricing problems. Do the results of the last two weeks reflect improvement?

Based on your analysis, prepare a list of recommendations that will address customer complaints.

<table>
<thead>
<tr>
<th>June 1</th>
<th>June 8</th>
<th>July 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>out of orange yogurt</td>
<td>fish smelled funny</td>
<td>wrong price on spaghetti</td>
</tr>
<tr>
<td>bread stale</td>
<td>lemon yogurt past sell date</td>
<td>water on floor</td>
</tr>
<tr>
<td>checkout lines too long</td>
<td>couldn't find rice</td>
<td>store looked messy</td>
</tr>
<tr>
<td>overcharged</td>
<td>milk past sell date</td>
<td>store too warm</td>
</tr>
<tr>
<td>double charged</td>
<td>stock clerk rude</td>
<td>checkout lines too long</td>
</tr>
<tr>
<td>meat smelled strange</td>
<td>cashier not friendly</td>
<td>cashier not friendly</td>
</tr>
<tr>
<td>charged for item not purchased</td>
<td>out of maple walnut ice cream</td>
<td>out of Cheese Doodles</td>
</tr>
<tr>
<td>couldn't find the sponges</td>
<td>something green in meat</td>
<td>triple charged</td>
</tr>
<tr>
<td>meat tasted strange</td>
<td>didn't like music</td>
<td>out of Saran Wrap</td>
</tr>
<tr>
<td>store too cold</td>
<td>checkout lines too slow</td>
<td>out of Dove Bars</td>
</tr>
<tr>
<td>light out in parking lot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>June 15</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>wanted smaller size</td>
<td>overcharged on special</td>
<td>undercharged</td>
</tr>
<tr>
<td>too cold in store</td>
<td>couldn't find aspirin</td>
<td>out of brown rice</td>
</tr>
<tr>
<td>out of Wheaties</td>
<td>undercharged</td>
<td>out of mushrooms</td>
</tr>
<tr>
<td>out of Minute Rice</td>
<td>checkout lines too long</td>
<td>overcharged</td>
</tr>
<tr>
<td>cashier rude</td>
<td>overcharged on eggs</td>
<td>checkout wait too long</td>
</tr>
<tr>
<td>fish tasted fishy</td>
<td>bread not fresh</td>
<td>shopping cart broken</td>
</tr>
<tr>
<td>ice cream thawed</td>
<td>didn't like music</td>
<td>couldn't find aspirin</td>
</tr>
<tr>
<td>double charged on hard rolls</td>
<td>lost wallet</td>
<td>out of Tip Top lunch bags</td>
</tr>
<tr>
<td>long wait at checkout</td>
<td>overcharged on bread</td>
<td>out of Tip Top straws</td>
</tr>
<tr>
<td>wrong price on item</td>
<td></td>
<td></td>
</tr>
<tr>
<td>overcharged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fish didn't smell right</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
June 22
milk past sale date
store too warm
foreign object in meat
store too cold
eggs cracked
couldn’t find lard
out of 42 oz. Tide
fish really bad
windows dirty

couldn’t find oatmeal
out of Bounty paper towels
overcharged on orange juice
lines too long at checkout
couldn’t find shoeaces
out of Smucker’s strawberry jam
out of Frosted Flakes cereal
out of Thomas’ English Muffins

June 29
checkout line too long
out of Dove soap
out of Bisquick
eggs cracked
store not clean
store too cold
cashier too slow
out of skim milk
charged wrong price

restrm not clean
couldn’t find sponges
checkout lines slow
out of 18 oz. Tide
out of Campbell’s turkey soup
out of pepperoni sticks
checkout lines too long
meat not fresh
overcharged on melon

July 6
out of straws
out of bird food
overcharged on butter
out of masking tape
stockboy was not helpful
lost child
meat looked bad
overcharged on butter
out of Swiss chard
too many people in store
out of bubble bath
out of Dial soap

store too warm
price not as advertised
need to open more checkouts
shopping carts hard to steer
debris in aisles
out of Drano
out of Chinese cabbage
store too warm
floors dirty and sticky
out of Diamond chopped walnuts

July 20
out of cucumbers
checkout lines too slow
found keys in parking lot
lost keys
wrong price on sale item
overcharged on corn
wrong price on baby food
out of 18 oz. Tide
out of Tip Top tissues
checkout lines too long
out of romaine lettuce
out of Tip Top toilet paper
out of red peppers
out of Tip Top napkins
out of apricots
telephone out of order
out of cocktail sauce
water on floor
out of onions
out of squash
out of iceberg lettuce
out of Tip Top paper towels

July 27
out of bananas
reported accident in parking lot
wrong price on cranapple juice
out of carrots
out of fresh figs
out of Tip Top napkins
out of Tip Top straws
windows dirty
out of iceberg lettuce
dislike store decorations
out of Tip Top lunch bags
out of vanilla soy milk

wanted to know who won the lottery
store too warm
oatmeal spilled in bulk section
telephone out of order
out of Tip Top tissues
water on floor
out of Tip Top paper towels
out of Tip Top toilet paper
spaghetti sauce on floor
out of Peter Pan crunchy peanut butter
I. Data Analysis

Check Sheet – The check sheet shows there are 184 customer complaints received during the past 8 Tuesdays. There are complaints that are similar and could be categorized for easier analysis. I came out with 12 categories, namely:

- Out-of-stock - 61
- Overcharged - 18
- Poor store maintenance - 16
- Long check-out waiting time - 14
- Defective products - 12
- Uncomfortable store temperature - 10
- Meat not fresh - 9
- Wrong price/under charge - 8
- Could not find items - 8
- Employees not courteous/helpful - 6
- Fish not fresh - 5
- Others – 17

The category Out-of-Stock has the most number of complaints at 61 while Fish Not Fresh has the least number of complaints at 5. The category Others includes all other complaints that minor complaints like ATM ate card, lost wallet, dislike store decoration, etc.

Pareto Chart – This chart shows that the out-of-stock category has the most number of complaints at 61. Based on the Pareto Principle or the 20-80 Rule which states that 80% of the effects come from 20% of the causes, the task of reducing the number of complaints can best be accomplished by focusing on the “significant few” versus the “trivial many”.
Run Chart – This chart shows the number of complaints received every Tuesday are moving horizontally with no indication of either going up or down in the coming Tuesdays. They just fluctuate about the average which is 20. There is no indication that the changes implemented on July 15 reflected improvement. As it is, the same level of complaints will continue in the future until more focused and effective strategies are implemented.
Cause-and-Effect Diagram – This shows that there are three main causes of the out-of-stock problem. They are:

1. The suppliers are refusing to deliver products until Tip Top Markets pay them for past deliveries;

2. The recent typhoons caused heavy damage to the crops of Tip Top Markets’ main suppliers of produce, hence, their inability to supply ordered produce. Other suppliers who are willing to make deliveries cannot do so because of the heavy damage to the roads leading to Tip Top Markets as a result of the heavy floods during the past months.

3. Some suppliers are unable to make deliveries because of production problems. They are not able to produce enough products because they don’t have enough raw materials. The high cost of importing raw materials from abroad and their limited financial capability prevent them from acquiring the required raw materials.
RECOMMENDATIONS:

1. To be able to significantly reduce the number of complaints fast, I recommend that Tip Top Markets start addressing the out-of-stock problem ahead of other categories of complaints. After addressing this problem, they should focus on the next category with the highest number of complaints which is Overcharged. The process should continue until the other major or significant categories are addressed.

2. Tip Top Markets should immediately find the financial resource to settle all its financial obligations to its major suppliers so that deliveries can be resumed.

3. The Purchasing Department should start scouting for other suppliers from other parts of the country not affected by the flooding of recent months. They should also look for other suppliers with sound financial backing and proven track record of honoring delivery commitments.

4. A Quality Team that will be in charge of ensuring quality service is provided to customers of Tip Top Market’s at all times should be created. It will be responsible for monitoring customer complaints and addressing them in the fastest and most efficient way. It should coordinate with the HR department to ensure that proper training on courtesy are provided to all employees. It will also be responsible for leading the company in creating an organizational culture that puts value to the twin concept of excellence and accountability. The Quality Team should be in charge of installing a Total Quality Management (TQM) program in the company.