**Feasibility Analysis of New Methods for Food Expiry Management in Shoppers Drug Mart**

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Table of Contents

1

3

3

3

5

7

8

8

9

11

11

12

13

13

13

15

Introduction ……………………………………………………………………………………………………….

Data Section ……………………………………………………………………………………………………….

 Outcome and Outlook of Current Expiry Management …………………………….

*Food Expiry Statistics* ………………………………………………………………………

 *Economic Loss* ………………………………………………………………………………..

 *Environmental Impacts* …………………………………………………………………..

Methods for Reducing Inefficiency in Expiry Management ………………………

*Cost-Effectiveness Analysis of an Excel System* ……………………………….

 *Cost-Effectiveness Analysis of a Software-Based System* ………………..

Methods for Reducing Waste in Expiry Management ………………………………

*Feasibility of Sending Expiries to Waste Plants* ……………………………….

 *Feasibility of Donating to Be Expired Items to Charities* ………………….

Conclusion ………………………………………………………………………………………………………….

 Summary and Interpretation of Findings ………………………………………………….

 Recommendations …………………………………………………………………………………..

References ………………………………………………………………………………………………………….

Figures and Tables

Figure 1 Economic Loss of Shoppers Drug Mart Items Based on Expiries …………… 4

Table 1 Top 8 Expired Food Items ……………………………………………………………………… 4

Table 2 Customer Emotional Response to Purchasing Expired Food Items ………… 6

**INTRODUCTION**

With over 1300 stores in Canada, Shoppers Drug Mart is currently known as the leading drug store retailer in Canada (*Our Company*). Founded in 1962 by a Toronto pharmacist, Shoppers was created to allow individual pharmacists to practice business ownership while maintaining the personal aspect of a local pharmacy (*Our History*). There was never any intention for Shoppers to become a grocery store. But as the company evolved there became a need to open up the discussion of food in relation to pharmacy. Thus, in 2002 the first Shoppers Drug Mart food store opened (Harris). While Shoppers has continued to flourish as a company with the introduction of food, it is important to note that maintenance of grocery items is exceptionally difficult. In particular, the management of expiries is a very tedious and seemingly impossible task. Currently in Shoppers, expiries are handled manually every couple of months and items that are expired are thrown away. This system is not economically or environmentally feasible.

The current expiry management method in Shoppers Drug Mart is based on the first expired first out (FEFO) method. This means that when stocking new items, employees are expected to rotate the items. This way the old product on the shelf with the earlier expiry date is moved to the front, while the new product with the later expiry date is placed at the back of the shelf. Subsequently, every few months before a store inspection an employee is tasked with going through every individual item in the store to mark down soon to be expiring food items and to dispose of those already expired. The issue with the FEFO method is that it’s not guaranteed that every employee will follow it diligently and it is prone to errors as items could be missed or expiry dates misread. In terms of disposing the expired food, it is all thrown away in the garbage. Sending expired food to the landfill is therefore a concern too as it is economically taxing, and it is contributing to the rising levels of greenhouse gas emissions (Scheutz et al. 409).

The purpose of this report is then is to determine the feasibility of new methods for expiry management as well as to highlight the issues with the current system. To do this, the following questions need to be answered:

* Which products are frequently thrown out due to expiration?
* What is the yearly economic loss due to expiries?
* What is the consumer reaction to expiries?
* Is excel an efficient way of managing expiries or will a software program be more cost and time-effective?
* How does the waste to energy system work and what expired foods would be beneficial for this system?
* Which charities accept non-perishable expired or to be expired items?

To assist in answering these questions, this report will gather data from interviews of the Store Manager of Shoppers Drug Mart Surrey, Store 2235 and surveys of employees from this location. This report will also utilize customer surveys to understand consumer behaviour in response to expiries. To gain insight on waste reduction, a waste to energy plant and some charities will be contacted. Secondary sources will include studies on expiry management using software versus excel and on the environmental impact of discarding expiries.

**Data Section**

**Outcome and Outlook of Current Expiry Management**

To determine the feasibility of new methods of food expiry management in Shoppers Drug Mart, it is important to look in depth at the current system to analyze and accommodate its issues.

**Food Expiry Statistics.** As mentioned previously the current expiry management system relies on the FEFO method. Another part of this system is inventory management, where an employee must go through all the products in the store to detect expired items. Since, these methods are time-consuming and tedious, expiry management occurs over a time span of a few months. This means that when expired items are discovered, there are a lot of them. In order to fully understand the problems with such a schedule, it is relevant to look towards the statistics of food expiries in Shoppers Drug Mart.

Based on an interview conducted with the Shoppers Drug Mart manager, a quantitative analysis of expiries over the year of 2018 was conducted. In Figure 1, it is indicated that based on cost, food expiries represent 56% of the total expired items in the entire store. The results in Table 1 subsequently depict that the top four costly food items most commonly discarded due to expiration are bagged salads, packaged meat, baby formula, and boxed chocolates. Through qualitative discussion in the interview, it was revealed that items most susceptible to expiring are fresh foods such as bagged salads and packaged meats as they typically have upcoming expiry dates.

**Figure 1** Economic Loss of Shoppers Drug Mart Items Based on Expiries

|  |  |
| --- | --- |
| Expired Item | Economic Loss for 2018 |
| Bagged Salads | $1,746 |
| Packaged Meat | $1,744 |
| Baby Formula | $1,067 |
| Boxed Chocolates | $779 |
| Packaged Vegetables | $778 |
| Yoghurt | $712 |
| Packaged Fruit | $704 |
| Chocolate Bars | $596 |

**Table 1** Top 8 Expired Food Items

These statistics are indicative of the fact that the current method of expiry management is not feasible. It is especially concerning that such food items such as baby formula or packaged meat inundate such a large cost due to expiries, especially since they are food items that many people purchase. The most tangible issue with these food expiries here is that inventory management is not keeping up with the number of expiries. But, errors in the FEFO method or even items not being bought could also be contributing. Since inventory management is something that can be readily altered, it would make sense for it to occur more regularly to determine whether this reduces the number of expiries.

**Economic Loss**. In grocery stores, there are many areas that can contribute to money loss. This can range from store damages, to theft, and to expiries. Thus, it is important to mitigate such situations when possible to prevent going out of business. In terms of expiries there is a large economic loss as can be seen in Figure 1 and Table 1. Yet, alongside this tangible economic loss, it is also important to recognize the loss in terms of losing business from customers who encounter these expiries. Expiries aren’t necessarily something customers want to experience when purchasing food. Thus consumer response must be analyzed in conjunction with the current economic statistics.

In Figure 1, it is highlighted that in the year of 2018, food expiries represented approximately $25,000 in loss for this Shoppers Drug Mart Location. The large contributors to this loss are items such as bagged salads, packaged meat, and baby formula, resulting in up to $2,000 of expenses. In regard to consumer response, a survey was conducted of 20 grocery store consumers. Of these 20 individuals 80% had at some point unknowingly purchased an expired food item. As can be seen in Table 2, of these 16 individuals from several options of emotions in respond to the expiry purchase, all of them concluded on distrust and annoyance. Furthermore, all of these individuals agreed to return to the store and ask for compensation.

|  |  |
| --- | --- |
|  | Emotional Response |
|  | Sadness | Anger | Annoyance | Surprise | Distrust | Disgust | Other |
| 1 |  | √ | √ | √ | √ |  |  |
| 2 | √ |  | √ |  | √ | √ |  |
| 3 |  |  | √ |  | √ |  |  |
| 4 |  |  | √ | √ | √ |  |  |
| 5 |  |  | √ |  | √ |  |  |
| 6 |  | √ | √ |  | √ |  |  |
| 7 |  | √ | √ |  | √ | √ |  |
| 8 |  |  | √ |  | √ |  |  |
| 9 |  |  | √ |  | √ |  |  |
| 10 | √ |  | √ |  | √ | √ |  |
| 11 |  |  | √ | √ | √ |  |  |
| 12 |  |  | √ |  | √ |  |  |
| 13 |  |  | √ |  | √ |  |  |
| 14 |  |  | √ |  | √ |  |  |
| 15 |  |  | √ |  | √ | √ |  |
| 16 |  | √ | √ |  | √ | √ |  |

**Table 2** Customer Emotional Response to Unknowingly Purchasing Expired Food Items

Based on these findings, there needs to be more focussed inventory management that targets specific areas, that are causing greater economic downfall, of the store more frequently. At the same time, there needs to be more consideration on the outcome of having expiries on the shelves for customers to purchase. This could result in a loss of business and degrading reputation. Thus, more methods need to be implemented to eliminate error in removing expiries off the store shelves.

**Environmental Impacts**. As can be seen from Figure 1 and Table 1, expiries are a huge part of the economic loss in a grocery store. But alongside the money lost, there is also an aspect of waste as all these expired food items are thrown away into the garbage. This garbage is then transferred to a landfill site. The problem with this is that in the process of this garbage being degraded, landfill gas is released (Scheutz et al. 409). This gas is composed of methane and carbon dioxide which are volatile greenhouse gases. Essentially these gases contribute to the greenhouse effect by trapping heat in Earth’s atmosphere (Scheutz et al. 409). The result is that Earth is getting warmer over time and so is the likelihood of extreme weather events. Thus, it is extremely important to reduce as much waste as possible to aid in mitigating these climate change effects. In grocery stores, especially waste reduction needs to be a greater priority.

In a survey conducted with 15 Shoppers Drug Mart employees, it was determined that all of these individuals consider the current expiry management system to be wasteful. 70% of these individuals agreed that the wastefulness of the current system would be something they would like to improve. While, there hasn’t been a statistical analysis of food waste produced by Shoppers Drug Mart, statistics of waste from the commercial sector in 2008 indicates that B.C produced close to 2 million tonnes of solid waste. This number does include waste other than food, but this large number is still quite appalling.

With these findings in mind, the expiry management system needs to evolve to account for effective waste management, especially in an era of accelerating climate change with the onset of GHG emissions. Many grocery stores in Canada are now moving towards no waste in terms of expiries, by diverting edible perishable food to charities and by composting inedible perishable foods (McLean). Thus, when looking towards new methods of expiry management, Shoppers Drug Mart should explore these options.

**Methods for Reducing Inefficiency in Expiry Management**.

The time-consuming essence of the current expiry management system is of great concern based on surveys and personal experience. What lacks is the element of efficiency. Unfortunately it is not economically feasible to have multiple employees overseeing inventory management. In addition to this, the manual process is very error prone and inconsistent. To target this inefficiency, technology in the form of excel or third-party software could be of good use.

**Cost-Effectiveness Analysis of An Excel-Based System.** An excel-based expiry management system would involve an employee manually entering every single item that is in stock based on their unique SKU code and based on their batch code. The SKU code identifies each unique item, while the batch code groups several unique items based on the fact that they were ordered together and have the same expiry date. The expiry dates will have to also be manually inputted. Formatting in excel or expiry templates will then allow for batches of items with upcoming expiry dates to be highlighted based on the reference days to expiry chosen (*Monitor Expiry Dates in Excel*).

Excel is a highly useful tool in the realm of business. Not only is it free, but it also allows one to easily manipulate formulas and inputs. In terms of expiry management in particular, excel is useful as there already spreadsheet templates available that enable expiry management (*Excel vs Business Intelligence Software*). The accessibility and simplicity of excel’s system makes it efficient to use for any employee. Yet, there isn’t a desire for the implementation of excel in Shoppers Drug Mart. Based on a survey conducted of 15 Shoppers Drug Mart employees, 80% of these individuals agreed that they would not be open to using excel to manage expiries. When asked to specify why, the unanimous result was that it would be too complicated. Similarly the manager of Shoppers Drug Mart, was also opposed to using excel. This clear opposition can be understood in the context that utilizing excel will be time-consuming, spreadsheets will get complex with the aggregation of data, errors can be easily made, and there is no way of tracking who has made changes.

Therefore, excel has its merits in the sense that it is inexpensive and easily understandable. Yet, on the other hand, excel is also inefficient in terms of time and complexity. Excel might be a promising option for someone who is looking to digitalize their expiry management system with no extra costs. For someone who is looking to reduce the time of expiry management altogether, excel might not be the best choice as it will require a lot of time to manually update the spreadsheet. However, overtime this could be reduced once there is a better familiarity with the system.

**Cost-Effectiveness Analysis of a Software-Based System.** Currently there is a large variety of expiry management software companies that cater towards grocery stores. These companies use a variety of software to keep expiries in check. DateCheckPro is one such company that uses software to manage expired products based on location in the store. Items are only required to be inputted into the system via scanning once. In addition to this, the company includes features such as analytics on sales data and expiries to determine how much the product should be marked down and it includes an individual team that can manage expiries for the grocery store (*DateCheckPro*).

DateCheckPro as a third-party software has both its benefits and its downfalls. It’s advantageous for a company to incorporate DateCheckPro because it allows for easier automation and quicker expiry management. Only having to scan the items once in the beginning makes detecting expiries become a much simpler process. Furthermore, the fact that DateCheckPro allows for an option where it’s team handles the expiries also makes the process much more efficient. Thus, this software is definitely time-effective. The downfall of this system lies in the fact that it is costly. Their site indicates that the pricing of this software starts at $2700 a year and then increases with added features as well as with square footage of the store (*DateCheckPro*). Thus, this could make a software like this to be extremely costly as time goes again.

In short, DateCheckPro is quite an innovative software system. Not only does it handle expiries with little time costs, but it also allocated them in the system based on their location and it informs of markdown prices. The costliness of this system, however, may make it less appealing especially as these costs rack up with features and over time. But, based on a return on investment calculator over time, DateCheckPro reveals how much money it can save a store on reduction of expiries. Thus, it might be economically feasible to implement it.

**Methods for Reducing Waste in Expiry Management**

Waste production is a major issue in the face of climate change in this day and age. Thus, it is extremely relevant at this time to work on reducing it. Grocery stores in particular are prone to producing large amounts of waste. Reducing expiries would be one way to combat the issue of rising waste as it would mean that less food items are thrown away. Subsequently less items would be sent to the landfill where they will contribute to greenhouse gas emissions.

**Feasibility of Sending Expiries to Energy to Waste Plants**. Energy to waste plants essentially convert solid waste into electricity or even heat in a way that is environmentally protective and economically feasible (*How waste-to-energy works*). In Metro Vancouver, there is an energy to waste facility located in Burnaby that has been operating for the last 30 years (*About Metro Vancouver’s Waste-to-Energy Facility*). This facility handles approximately 300,000 tons of solid waste every year and converts into 170, 000 mega-watt hours of electricity (*Covanta Burnaby*). The method to handle this waste involves mass-burning which results in dissipating of any toxins or pollutants (*About Metro Vancouver’s Waste-to-Energy Facility*).. In addition to this, there is considerable on-site equipment that works to monitor pollutants and to capture problematic gases.

This kind of facility has huge implications for the future of waste, because instead of the waste contributing to the negative effects of climate change, it works to provide energy in a non-invasive and economically feasible way. Thus, Shoppers Drug Mart could even send all their waste including expiries to this facility to mitigate anthropogenic environmental harm.

**Feasibility of Sending to Be Expired Items to Charities.** To prevent soon to be expired items from remaining unsold, Shoppers Drug Mart implements coupon reductions on these items. The issue is that often these items do remain unsold as consumers aren’t always likely to purchase soon to be expiring items. This is exemplified by a survey conducted of 20 grocery store consumers, of which all indicated that they were not likely to purchase soon to be expired items. A means to mitigate this, would be to instead of marking down prices, to donate these items to a food bank or a charity.

The Food Bank of Greater Vancouver accepts donations of several types of non-perishable foods such as canned vegetables, canned fish, dried lentils, nuts, powdered skim milk, and canned beans. They ask that expired food items not be donated. But if they are within their expiry date, then they are acceptable donations (*Greater Vancouver Food Bank*). Thus, instead of letting canned foods sit on the shelf at a lower price for a month, it would be more sustainable to donate it to the food bank to prevent food waste and to provide for people who are struggling with food security.

**CONCLUSION**

**Summary and Interpretation of Findings**

The findings in this report were that food expiries in this Surrey Shoppers Drug Mart Location have an economic cost of about $25,000 based on the year of 2018. These expiries consist of mainly food items with short expiry dates. It is also important to note that these expired items are contributing to the onslaught of greenhouse gas emissions by adding to landfill. This large number of expiries can then be attributed to insufficiencies in the process of inventory management and inconsistent time allocated to inventory management. Furthermore, the large amount of waste produced is evident of a lack of a waste reduction initiative.

To combat the inventory management gap, software such as excel or DateCheckPro can be implemented. Excel has the benefit of being inexpensive and easily implemented, but it can be hard to maintain with excessive data and it can be. Date Check Pro on the other hand makes expiry management much less time consuming and more appealing with notifications of expiries based on location. Yet this software isn’t economically feasible. To target waste reduction, donation of to be expired food items can be made to foodbanks, while food waste that would be thrown into the garbage can be sent to waste to energy plants.

**Recommendations**

Based on the findings of this report, it is recommended that a software like DateCheckPro be implemented to maintain expiries as it is extremely efficient and timely. While it may be costly at the start, the reduction of expiries allowed for by this software will account for that cost. Then to reduce waste, it is recommended that soon to be expiring food items be sent to charities instead of being marked down for reduction and that any expired food items be donated to a waste to energy plant. In addition to these implementations, it is recommended that expiry management should become more consistent and occur on a daily basis with the help of DateCheckPro. Lastly it is recommended that soon to be mark down perishable foods be donated to food banks and expired food items be sent to energy plants instead of the landfill.

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