2550 Wesbrook Mall
Vancouver, B.C VGT 1X7

April 10th, 2019

David Yu
Store Manager
Shoppers Drug Mart
7538 120 Street
Surrey, B.C V3W 3N1

Dear Mr. Yu:

As you know, food expiry management is difficult to maintain in a grocery store and even more so when there are few management strategies in place. To assist you with maintaining a high standard of inventory and focussing on sustainability please accept this formal report investigating new methods for food expiry management.

This report includes data from you and 15 Shoppers Drug Mart employees indicating a greater need for cost and time-effectiveness as well as waste management in maintaining expiries. This report then concludes with cost feasible recommendations for managing expiries through technology and for diverting expiries from landfills.

 Thank you for your support and assistance throughout this investigation. I have enjoyed my work thoroughly. If you have any questions or would like to discuss specific details of the report, please contact me at jasminsenghera@gmail.com or at 604-678-8988 after 5pm.

Sincerely,

Jasmin Senghera

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

For David Yu
Store Manager
Shoppers Drug Mart
Surrey, British Columbia

by
Jasmin Senghera
English 301 Student

April 10th, 2019

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Abstract

A survey of 15 Shoppers Drug Mart employees and an interview with the manager of the 2235 location were initiated to determine their thoughts about the current expiry management system. Another survey of 20 grocery store customers was conducted to determine the consumer response to expiries. The surveys and the interview were conducted during the last week of February 2019. Data generated by the surveys and the interview was analyzed for this report.

The results of the employee surveys and the interview show that the current expiry management methods can be improved by increasing productivity and subsequently decreasing food waste. The results of the consumer surveys depict that customers feel distrust when unknowingly purchasing expired food items.

Research following the surveys and interview reveals that tech-based management tools such as excel and DateCheckPro can assist with increasing efficiency. An interview with a waste to energy plant expert and research on charities indicates that food can be diverted to these sustainable outlets instead of to the landfill to reduce food waste.

Proposed recommendations are:
- Adopting excel to manage expiries if an inexpensive and simple method is favourable
- Adopting DateCheckPro to manage expiries if an expensive but efficient method is favourable
- Implementing more frequent and focussed inventory management
- Donating to-be expired non-perishable food items to the food bank
- Sending expired food items to the waste to energy plant

Introduction

Purpose

The Shoppers Drug Mart management is interested in learning about new methods for managing expiries. This interest is in response to the high volume of expiries found recently. By improving the FEFO method and implementing waste management, Shoppers Drug Mart will feel confident that expiries are kept off the shelves and out of landfills. Additionally, these improvements will allow employees to allocate more of their time to other tasks. Thus, this report has been prepared for the management to provide insight on the costs and benefits of sustainable strategies for managing expiries.

Methodology

Fifteen Shoppers employees from the 2235 location responded to a short survey designed to gather data on the current expiry management system and provide suggestions for improvement (Appendix I). An interview with the Shoppers manager from the 2235 location was also conducted to determine suggestions for improvement (Appendix II). Twenty grocery store customers within Surrey responded to another survey implemented to retrieve data on the consumer response to expiries (Appendix I).

From analyses of the survey and interview data, technology-based expiry management methods such as DateCheckPro and excel were researched to determine the cost and time-effectiveness of these methods. Secondary research on the Vancouver Food Bank was then conducted to investigate the feasibility of donating expired or to-be expired food items. Additionally, an interview with a waste to energy plant expert was organized to also investigate

the feasibility of donating expired food items (Appendix II). The surveys, interviews, and

research were all administered during the last week of February 2019.

Scope

To fulfill the purpose this report addresses the following questions:

- 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?
- Do charities accept non-perishable expired or to be expired items?

Conclusion

The survey and interview data show that the employees of Shoppers alongside the manager

were not fully aware of other expiry management methods. Due to this, they felt that the

current expiry system could not be improved. However, analysis of secondary research and an

interview leads to the conclusion that technology-based management methods alongside

alternate outlets for expiry disposal are viable.

Data Section

A) Outcome and Outlook of Current Expiry Management

Economic Loss

From the results of an interview 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 represented 56% of the total expired items in the entire store in 2018. The results

in Table 1 subsequently depict that the top four expired food items with the greatest economic

loss in 2018 were bagged salads, packaged meat, baby formula, and boxed chocolates. Through

further 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 have earlier expiry dates.

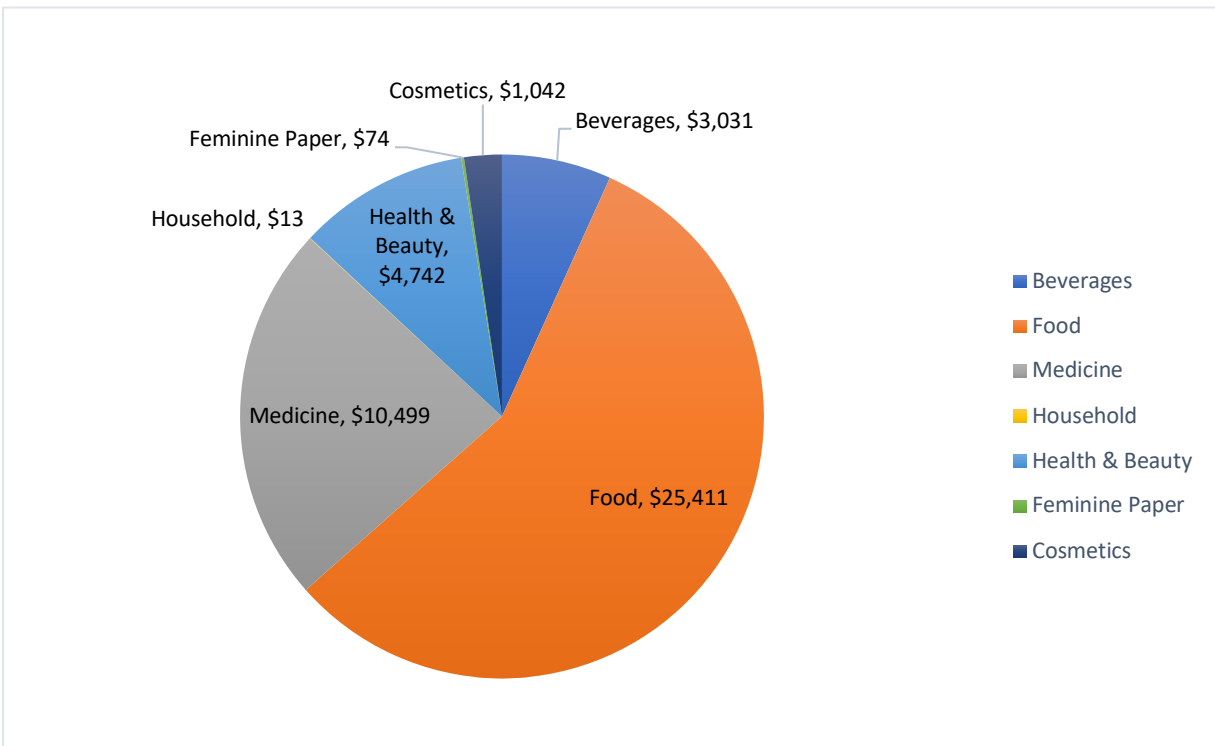**Figure 1.** Economic Loss of Shoppers Drug Mart Items Based on Expiries

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

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 something customers want to experience when purchasing food. Thus the consumer response must be analyzed in conjunction with the current economic statistics. A survey of 20 grocery store consumers revealed that 16 of these individuals had at some point unknowingly purchased an expired food item. As can be seen in Table 2, all 16 individuals felt distrust and annoyance in response to purchasing the expired food item. Furthermore, all of these individuals agreed that they would 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

While, the FEFO method is highly reputable and inventory management occurs regularly in Shoppers, there can be improvements made to ensure that Shoppers can minimize these expiries for greater customer service and reduced economic loss. This is especially important given that food items such as baby formula and packaged despite being popular, still inundate a large revenue loss. Technology-based solutions can aid in this case by eliminating room for error and ensuring that every item is accounted for. Yet, inventory management can also be altered to occur on a more frequent basis such as over every 2 days instead of every week. Furthermore, inventory management can be focussed towards the areas of the store that are experiencing greater losses due to expiries.

Environmental Impacts.

Figure 1 and Table 1 demonstrate that expiries are a huge part of the economic loss in a grocery store. But alongside the money lost, there is also the aspect of waste as all these expired food items are thrown away into the garbage which is transferred to a landfill site. The issue with this is that in the process of the 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. These gases contribute to the greenhouse effect by trapping heat in Earth's atmosphere causing the Earth to become warmer and the likelihood of extreme weather events to increase. Thus, reducing waste can aid in mitigating these climate change effects.

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 indicate that B.C

produced close to 2 million tonnes of solid waste (Statistics Canada). This number does include

waste other than food, but this large number is still quite concerning.

While, sending expired food items to the landfill is a much more universal and simple process,

there are other methods that are just as efficient. Adapting to this era of accelerating climate

change is difficult but it is important to prioritize. Many grocery stores across Canada are now

moving towards "no waste" in terms of expiries, by diverting non-perishable foods to charities

and by composting perishable foods (McLean). Given that Shoppers has a large amount of non-

perishable food items, donating those that are within their expiry date to the Vancouver food

Bank will reduce waste and aid in food security. The items that have already expired can then

be sent to energy to waste plants.
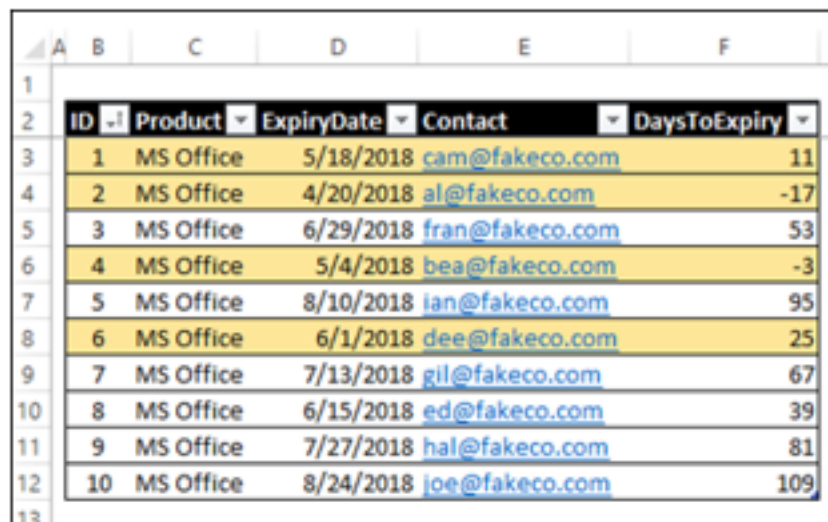
B) Methods for Reducing Inefficiency in Expiry Management

Cost-Effectiveness Analysis of An Excel-Based System

An excel-based expiry management system will involve an employee manually entering each

item in stock based on their unique SKU code and batch code. The expiry dates will 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, excel is useful as there

are spreadsheet templates for expiry management already available as shown in Figure 2 (*Excel*

vs Business Intelligence Software).

A	B	ID	Product	ExpiryDate	Contact	DaysToExpiry
		1	MS Office	5/18/2018	cam@fakeco.com	11
		2	MS Office	4/20/2018	al@fakeco.com	-17
		3	MS Office	6/29/2018	fran@fakeco.com	53
		4	MS Office	5/4/2018	bea@fakeco.com	-3
		5	MS Office	8/10/2018	ian@fakeco.com	95
		6	MS Office	6/1/2018	dee@fakeco.com	25
		7	MS Office	7/13/2018	gil@fakeco.com	67
		8	MS Office	6/15/2018	ed@fakeco.com	39
		9	MS Office	7/27/2018	hal@fakeco.com	81
		10	MS Office	8/24/2018	joe@fakeco.com	109

Figure 2. An Excel Expiry Management Spreadsheet (*Monitor Expiry Dates in Excel*).

The accessibility and simplicity of excel's system makes it efficient to use for any employee. Yet,

there appears to be some hesitance to work with excel. 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

potentially become time-consuming as spreadsheets become complex with the aggregation of

data over time and as there is no way of tracking who has made changes and what those

changes are.

Therefore, excel has its merits in the sense that it is inexpensive and easily understandable. On

the other hand, excel can be inefficient in terms of time and complexity. Thus, excel is

promising option for a business looking to digitalize expiry management with no financial costs.

For someone who is looking to reduce the time of expiry management altogether, excel will not

be the best choice as it will require a lot of time to manually update the spreadsheet. However,

overtime the issue of time can be reduced with 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

their location in the store. Food items only need to be scanned once to be tracked. Once items

expire, DateCheckPro provides a full list of expiries as indicated by Figure 3.
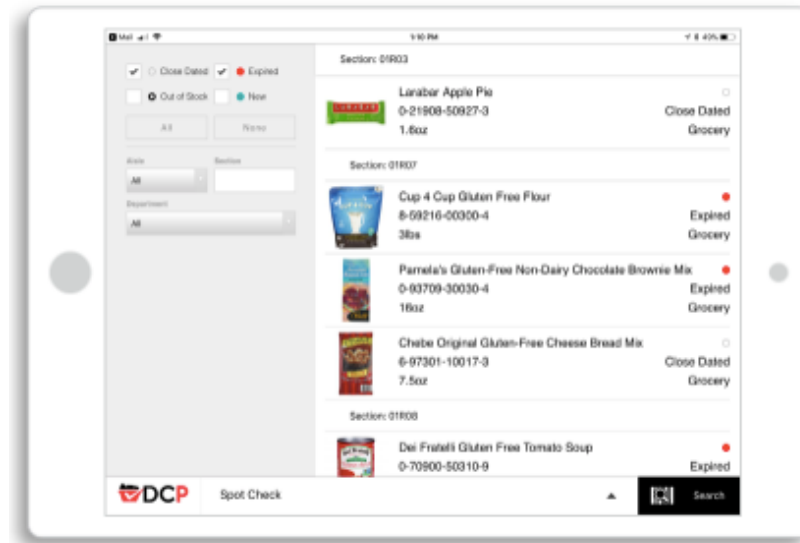
Figure 3. The DateCheckPro Expiry Management Interface (*DateCheckPro*).

The company includes features such as analytics on sales data and expiries to determine how

much items should be marked down based on their expiry date. Their service can also provide

an individual team that manages expiries for the grocery store (*DateCheckPro*).

DateCheckPro as a third-party software has both its benefits and its downfalls. It would be

helpful 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 disadvantage of this is it's

costliness. 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*).

In short, DateCheckPro is quite an innovative software system. Not only does it handle expiries

with little time costs, but it also allocates them in the system based on their location with a

single scan. 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, the DateCheckPro management reveal that their costs can be balanced by the

money they save the store on expiries. Based on these projections, it might be economically

feasible to implement it.

C) Methods for Reducing Waste in Expiry Management

Feasibility of Sending Expiries to Energy to Waste Plants

Energy to waste plants convert solid waste into electricity or heat in a way that is

environmentally safe 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 it into 170, 000 mega-watt

hours of electricity (*Covanta Burnaby*). The method to handle this waste involves mass-burning

which results in the dissipation of any toxins or pollutants (*About Metro Vancouver's Waste-to-
Energy Facility*). This kind of facility has huge implications for the future of waste, because it is

kept out of landfills where it would contribute to to the negative effects of climate change.

Thus, Shoppers Drug Mart can divert all waste including expiries to this plant to move towards

environmental sustainability.

Feasibility of Sending to Be Expired Items to Charities

As you know, to prevent soon to be expired items from remaining on shelves, Shoppers Drug Mart implements a coupon reduction on these items. However in a survey, 20 grocery store consumers revealed that they would not purchase soon to be expired items. While this cohort is not representative of all customers, it does indicate that there are customers unlikely to purchase these items. To mitigate this, these food items can be donated 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 require that expired food items not be donated. But if the food items 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

This study showed that food expiries in the 2235 Shoppers Drug Mart Location had an economic loss of about $25,000 based in the year of 2018. These expiries consisted of 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. While there has been an emphasis on expiry management, greater emphasis needs to be put into making it

more efficient. Surveys conducted with employees and customers revealed that there should

be a focus on waste and economic loss.

To make expiry management more efficient, 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. DateCheckPro on the other hand makes expiry

management much less time consuming and more appealing with notifications of expiries

based on location. But this software can be expensive.

To target waste reduction, donation of to be expired food items can be made to foodbanks

such as the Food Bank of Greater Vancouver. This food bank only accepts non-perishable food

items within their expiry date. Additionally, expired food items can be sent to a waste to energy

plant. This ensures that the waste is being utilized to create energy rather than contribute to

greenhouse gas emissions.

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 perishable 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 inventory management

should also occur more frequently and be focused on high expiry volume areas throughout the

store.

Appendix I: Surveys Questions

Shoppers Drug Mart Employee Survey

1. Is the current expiry management system effective? In other words, does it do its' job?
   Yes No

2. Is the current expiry management system quick and efficient?
   Yes No

3. What components of the current expiry system would you improve? Select all that apply.
   a) The FEFO method
   b) The inventory management
   c) The wastefulness
   d) Other

4. Would you be open to using excel or software to manage expiries?
   Yes No

Customer Survey

1. Have you unknowingly purchased an expired food items from a grocery store?
   Yes No

2. If you answered yes to the question prior, what emotions did you experience after realizing it was expired? Select all that apply.
   a) Sadness
   b) Anger
   c) Surprise
   d) Distrust
   e) Disgust
   f) Other

3. Do you purchase soon to be expired food items?
   Yes No

4. If you had unknowingly purchased an expired item from a grocery store, what would you do? Select all that apply.
   a) Return to the store
   b) Ask for compensation
   c) File a complain
   d) Do nothing
   e) Other

Appendix II: Interview Questions

Shoppers Manager Questions

1. Which products are frequently thrown out due to expiration?

2. Which products are most susceptible to expiring?

3. What is the economic loss due to expiries on a yearly basis?

4. How would you rank the current expiry management system: rank 1-5

5. How efficient is the current expiry management system: rank 1-5

6. Have you used excel-based or software-based expiry management systems? yes/no

7. Have you donated expired or to be expired food items to reduce waste? yes/no

Waste to Energy Plant Expert Questions

1. How does the waste to energy system work?

2. What food items can be used in the process?

3. Is this process financially costly?

4. What kind of environmental impacts does this system have?

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