MINIMISING WASTE IN A SOCIAL ENTERPRISE – A COMPREHENSIVE ASSESMENT OF SOLLOS' ECOLOGICAL FOOTPRINT

Emily Wium, Martine Barnes, Emily Eden, Phoebe Sutherland

GEOG309

Table of Contents:

Executive Summary (Emily Wium)

Sollos is a home and giftware store which seeks to minimise waste wherever possible by sourcing locally and stocking ethical and environmentally friendly products. As environmentally orientated individuals, along with our community partner and founder of Sollos, Jason Pemberton, we undertook this research to assess how successful Sollos is at minimising waste in comparison to big box retailers. Our research question is, “By considering the entire life cycle of their products, can Sollos further minimise their waste and ecological footprint when considering consumer perceptions and behaviours?”. Our chosen methodology came in the form of a survey as well as undertaking product comparisons. In order to determine if Sollos is currently minimising more waste than big box retailers, we compared four of Sollos’ top selling products with more commercially available alternatives. Our survey asked a variety of questions that helped us further understand customer perceptions of environmentally friendly products.

Our research presented us with some key findings; firstly that, when compared, Sollos’ products had less associated waste and therefore it is likely that they have a smaller ecological footprint than bigger businesses. Secondly, and perhaps more importantly, we found that in order for Sollos to further lower their ecological footprint, they need to better understand consumer perceptions and the best approach to help customers be conscious consumers is to provide learning resources on waste minimisation.

Throughout our research we encountered multiple limitations arising from situations beyond our control. We adapted our research to accommodate the shortcomings, however it certainly impacted the accuracy of our results. There are identifiable areas for future research that would be beneficial for Sollos. Further studies into customer perceptions of environmentally orientated products would be beneficial as well as more research into the supply chain of Sollos and how to minimise waste through the entirety of their supply chain.

Introduction (Emily Wium)

This report assesses how successful Sollos, an artesian homewares store, is at minimising waste in comparison to big box retailers. It also discusses any practises that could be implemented by Sollos to further minimise waste, primarily focusing on the role that Sollos' consumers have in the big picture of their waste minimisation. Our research question was adapted throughout our research but was finalised to be the following; By considering the entire life cycle of their products, can Sollos further minimise their waste and ecological footprint when considering consumer perceptions and behaviours? The objective of this report is to both assess the current ecological footprint of Sollos as well as use the knowledge gained throughout this project to recommend ways in which Sollos can further reduce their environmental impact.

This topic is of extreme relevance in today's society, making it of high interest. In this rapidly growing world, waste is steadily increasing in both volume and complexity and its management is one of the main issues that is faced by modern society (H.Brunner & Rechberger, 2015). This is both a local and global issue; in New Zealand alone we discard 15.5 million tonnes of waste each year. These statistics highlight the importance of this topic as well as the responsibility every individual has to be a conscious consumer.

This report starts by giving an overview of relevant literature. We will then outline the methods used to gather our information and answer our research question. Following this, the results from our data collection will be analysed and any limitations of our research identified. Finally, we will discuss the significance of our results and whether or not we have successfully answered our research question.

Literature Review (Emily Eden)

Sollos were interested in looking at how successful they are at minimising waste in comparison to other retailers. In order to combat answering our research question, we chose five sub headings to break our research into and base each literature review on, these being - packaging, ingredients, recycling, benefits of sourcing locally and customer perception. This allowed us to gain a better understanding of past research in regard to each topic, help solidify ideas or perceptions we already had and provide - helping us combat Sollos' interest of knowing how successful they are in minimising waste. However we found there to be a lack of

information in some areas, with the majority of past research focusing on food products rather than products such as homewares and artesian goods that are sold in Sollos.

Through our literature reviews we were able to conclude that waste is a topic of importance, which led us to create a research question that had high relation to this topic. H.Brunner & Rechberger (2015) was a good representation of the general view of academia in regard to this topic. Summarising that in this rapidly growing world, waste is steadily increasing in both volume and complexity and its management is one of the main issues that is faced by modern society.

Sourcing locally was identified as one of our most important sub topics. Understanding the research behind it and establishing the limitations meant we could relate it back to Sollos to further benefit their unique market. Jason acknowledged at the start of the project the value he has for products in his store that were sourced locally. The literature that was reviewed for this sub topic relates directly to Sollos, which helped us gain a better understanding of why sourcing locally is important. Albrecht & Smithers (2017), identified three key positive results about sourcing locally. These results relate to the economy, environment and the relationship between the producers and consumers. Although these results seem apparent, Albrecht & Smithers (2017) discusses in detail how sourcing locally is a crucial element to waste management. Understanding this in greater depth allowed us to think how Sollos could improve their sourcing to ensure their waste and ecological footprint is minimised.

When reviewing literature in regard to customer perception each separate study undertaken showed that on a whole consumers perceive eco friendly packaging and environmentally friendly products on a whole as being important when purchasing a product, however it was concluded that consumer knowledge is important for companies to reap the benefits of selling these products. Orzan G et al. (2018) study summarised this, showing that people want to be aware and informed about organic packaging as they want to buy these products.
This subtopic stood out to us as through this research we were able to gain clarity on how essential customer perception is on waste minimisation, leading us to use surveying as a research method, therefore contributing to the design of our project, particularly the methodology we undertook.

From the literature reviewed in regard to the sub topic ‘recycling’ there were general themes evident. Firstly it was made clear of the importance of recycling. Hopewell et al.,(2009) stated

that recycling is a significant factor in environmental preservation as it minimises other processes that come from having to deal with high amounts of waste. Secondly, when done correctly recycling is efficient and can lead to the minimisation of waste, however it has been demonstrated that people either simply do not recycle correctly or lack knowledge of how to. This was similarly talked about in other academic work that was reviewed, helping us come to the realisation that although stores such as Sollos have a strong focus on stocking products that minimise waste this may not be of benefit if consumers do not recycle correctly.

Through the literature reviewed in regard to packaging we were able to gather that the quantity of waste produced by a product is heavily impacted by the packaging. This research allowed us to gain a better understanding in regard to how although the disposal of the packaging itself creates waste, the creation of the packaging can create immense amounts of waste. This showed the extent of how the waste process. The concept of LCA's (life cycle assessments) ws brought to light by several different readings. Varun, Sharma & Nautiyal (2016) stated that if done correctly it can provide an accurate representation of the amounts of waste generated from all parts of a products life cycle, however it is near impossible to gain an accurate representation of waste generated through packaging due to the lengthy process of mitigating a comprehensive life cycle assessment. Despite this it helped reinforce our methodology approach as it was evident the extent packaging has on waste levels. We focussed a large part of our project on product comparison, looking at the packaging of each product in depth. Although Sollos' ethos is based around the environment and minimising waste there could be a larger focus on packaging as this is not a main priority, the literature solidified the importance of understanding packaging.

Methods (Phoebe)

Our objective was to find out how Sollos can further minimise their waste and ecological footprint when considering consumer perceptions and behaviours. For research purposes, a consumer was defined as any person who purchases goods for personal use. Two online surveys were conducted, each with slightly different questions. The questions of the two surveys were different as Jason wanted questions that were more suited towards customer satisfaction. A survey was the most appropriate and effective choice of method based on our research question. It allowed us to gather differing perspectives on consumer behavior regarding waste minimisation and assess statistical relationships between variables. A survey also allowed us to reach a much larger audience than interviews or focus groups. Based on our research question,

a large number of respondents were needed to get an accurate representation of data and to make valid conclusions. For research purposes, the two separate surveys will be labeled ‘survey one’ and ‘survey two’

Survey one was sent out to our family and friends with the aim for it to reach a diverse range of people (18 to 70 year olds). The consumer for this survey did not have to have been to Sollos. This was to ensure we had a wide range of people who hold differing perspectives on ethically and sustainably sourced products. This survey had four multi choice questions and one open-ended question with a small text box for elaboration. Consumers completing the survey were not given a time limit, however it was estimated to take 1-2 minutes to complete. 54 consumers responded, however 1 respondent was under the age of 18, which meant 53 survey results were used in data analysis.

Survey two was sent out by Jason to his mailing list of customers. Survey two was originally planned to be more beneficial for our research, as it was directly targeted at Sollos customers. This survey had three multi choice questions, two rating-scale questions and one open-ended question with a small text box for comments. Again, consumers were not given a time frame to complete this survey. 13 consumers responded all within the ethically correct age range.

Secondary research was also conducted from data available on the internet. This data was used to compare four of Sollos top selling products against similar products that were more commercially available. The products we researched for comparison were: Trade Aid Chocolate, Whittakers Chocolate, Silvan Made Timber Frames, The Warehouse Picture Frames, Luxi Buff Strawberries & Cream Soap, Ecostore Rose & Almond Oil, Boughmans Beeswax Wraps and Compostic. For all eight of these products, a lot of required data was not readily available online for public access. All the data we used was published after 2017, to ensure it was accurate and up to date.

Results (Phoebe)

As consumers completed survey one, the results were readily available online for us to access. We converted the data into excel and produced two separate graphs as seen in Figure 1, 2 and 3. Each figure accurately represents the results from survey one. One participant was excluded due to not being in the ethically correct age range. The results from survey two are from the

mailing list of Sollos customers. They can be seen in two separate graphs as seen in Figure 3 and 4.

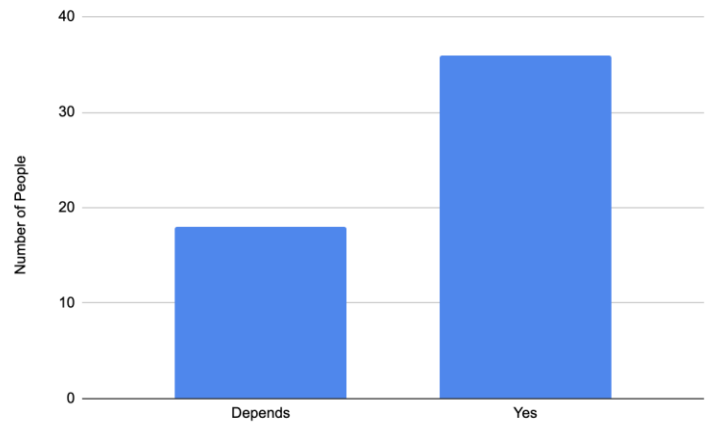

Figure 1. Count of Survey one data of people that are willing to pay more for products that are ethically and sustainably sourced.

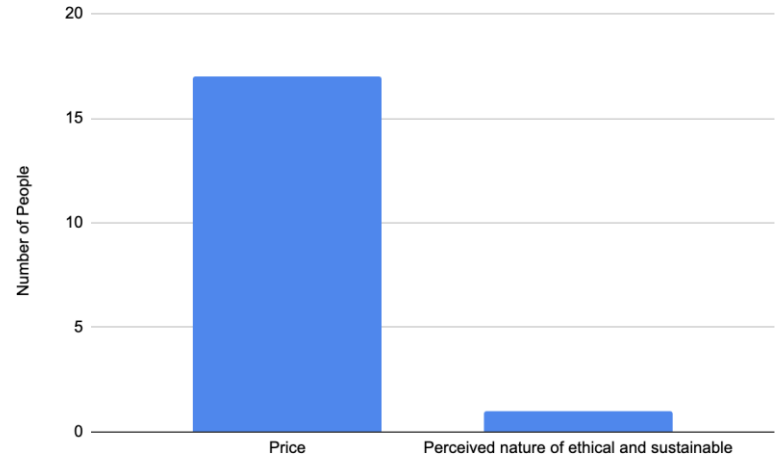

Figure 2. Count of Survey one data for people who stated ‘Depends’ in figure 1.

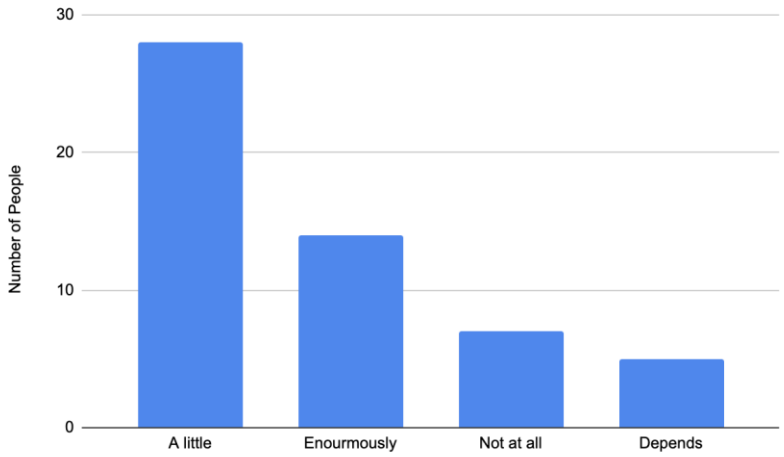

Figure 3. Count of Survey one data of how the packaging/ waste of a product affects whether it is purchased or not.

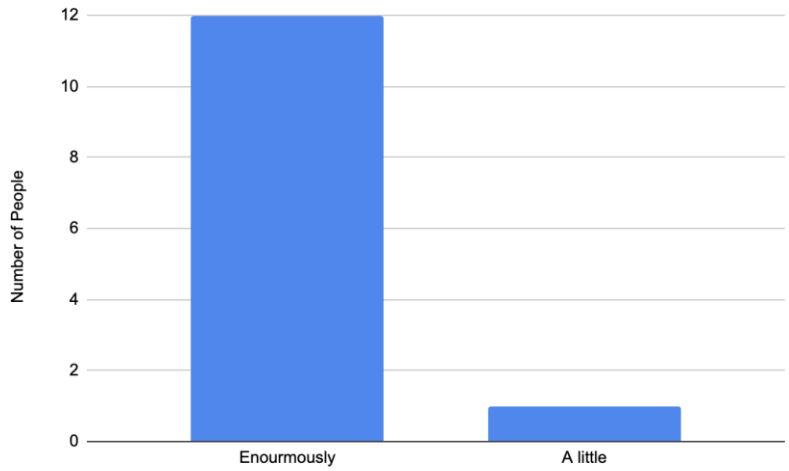

Figure 4. Count of Survey two data of how the packaging/ waste of a product affects whether it is purchased or not.

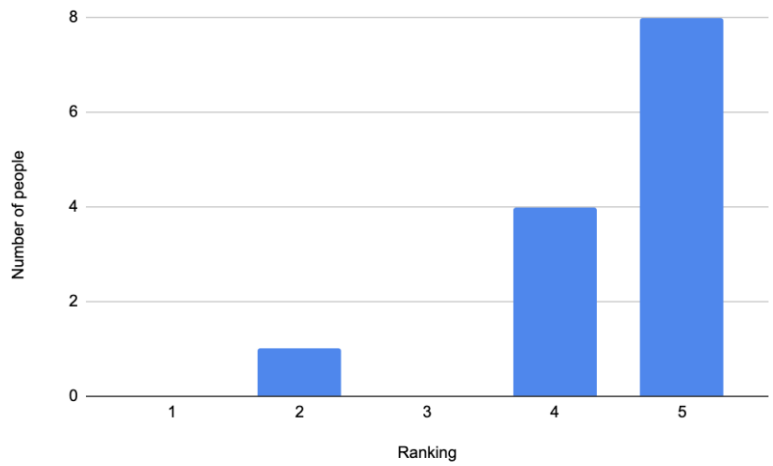

Figure 5. Count of Survey two data of the extent that Sollos attempts to provide ethically and sustainably sourced products. Ranked from 1 (lowest extent) to 5 (highest extent).

Figure 1 shows that 36 consumers said ‘Yes’ they are willing to pay more for products that are ethically and sustainably sourced, while 18 consumers said it ‘Depends’. From Figure 2, we can see of the 18 consumers who said it ‘Depends’, 17 of them gave price related answers, while only 1 consumer said it depends on the ‘perceived nature of ethical and sustainable’. Figure 3 and Figure 4 are different graphs of the same question. Figure 3 shows the results from survey one, that 28 consumers said the packaging/ waste that comes from a product ‘a little’ bit affects whether they purchase it or not. This corresponds to 51.9% of consumers that took survey one. From Figure 4, we can see that only 1 consumer from survey two answered ‘a little’ to the same question. This corresponds to 7% of consumers that took survey two. 12 (93%) consumers from survey two said that the packaging/ waste that comes from a product ‘enormously’ affects whether they purchase it or not. Figure 5 shows that 8 consumers surveyed (61.5%), believe that Sollos attempts to provide ethical and sustainable products to the fullest extent possible. 5 consumers believe that Sollos does not do this to the fullest extent possible and that there is room for improvement. The separate results from survey one and survey two convey very different results. It is observed that the results from survey one show lower levels of efforts towards waste minimisation when compared to the results of survey two.

We were able to find some trends across the four different Sollos products. When comparing the ingredients or materials used in the products Sollos’ typically contained more natural

ingredients. For the chocolates, the main difference in the ingredients was Trade-Aid used sunflower lecithin rather than soy lecithin, the production and use of soy traditionally has negative impacts on the environment, Trade-Aid cocoa and sugar were also certified organic. For the Luxi Buff soaps, they did not contain any preservatives, and all the ingredients were organic. Ecostore soaps contain palm oil, another traditionally harmful ingredient. With the picture frames, Sollos' are extending the life cycle of the reclaimed wood, which is superior to the MDF used by The Warehouse. The Beeswax wraps are entirely organic and can be composted at their end of life. Whilst compostic can be composted it is made from biopolymers and has a much shorter lifespan in terms of use.

Almost all of the products that we looked at are from New Zealand and all of Sollos' were made in Christchurch. The comparison products were generally made in the North Island, so had to travel slightly further. Not much else was significantly different about the source. Many of the products use imported ingredients and further information about where they were imported from was often not available.

The packaging of the products was another category that had some variations, and Sollos' products tended to have less waste. This was most noticeable with Luxi buff soaps, as they do not come in any packaging. Trade Aid chocolates come in a compostable wrapper. The raw ingredients and distribution of the bars is entirely recyclable or in some cases reusable materials. Whittaker's chocolate only has 76% of their packaging recyclable. Compostic wrap is entirely recyclable or compostable, much like the beeswax wraps. However, because the wraps have a longer life span, a total less packaging would be produced. The frames were the least sustainable, as they use bubble wrap and cardboard.

Limitations (Emily E)

Throughout our project and within our research process we experienced a reasonable amount of limitations which meant we have tried to adapt our aims and overall research process so it is accurate and of benefit to Sollos.

Ideally, we would've liked to survey Sollos customers in store, however despite our efforts we could not make this happen. This was due to our community partner preferring to use an online method which consisted of a survey sent through email to their customer database. This survey

was sent out slightly too late for us to use the results in our presentation and it had an extremely small response rate which would not have been of benefit. This meant we had to settle on creating an online survey to send to our own wider circles. Many participants had not visited Sollos and majority fitted under the same age demographic - 68.5% of participants being aged between 19 and 25. This may have caused a bias within our results which meant they were not as representative as we would've liked due to the fact we had to compromise our target audience. However, this could have also worked in our favour, allowing participants to feel as though they could be more honest with their answers due to it being anonymous and not face to face. We found that in regard to the products we focussed on from Sollos and comparable products often lacked information available for consumers or we were unable to get in touch with suppliers, which limited the data we could use when analysing the products. We found our project to be different in the sense that there was not a direct community group to take into consideration and it would have been unbeneficial for us to try and engage with a community group.

We also found that the majority of research in regard to customer perception, recycling, packaging, ingredients and benefits of sourcing locally was in regard to food products rather than the products that Sollos stocks - making it harder to obtain information that directly related to our research, potentially limiting the amount of secondary research we were able to incorporate.

We had a group member withdraw from the course in recent weeks. We were able to re-divide the workload so it was manageable for us, however it meant we had to come up with a slightly different way of tackling the research and overall design of the project.

Discussion (Martine)

Products:

The physical attributes of Sollos' products naturally play a significant role in the ecological footprint of the company. The comparison of Sollos' products to mainstream products mostly provided expected results, but these results may have been skewed due to research limitations. Regardless of the limitations, the patterns that were noticed are telling about Sollos' overall footprint. The research focused on the ingredients/materials, packaging and location/source of

the products. This was done to narrow the scope of the research and allow for greater focus on these main areas.

Ingredients:

It was expected that the ingredients used by Sollos' suppliers would typically have a smaller ecological footprint. Literature was used to determine the different ecological footprints of ingredients. This is where the limited resources available had a large impact on the accuracy of our research. Despite these variations, our research showed that the products stocked by Sollos tended to have a smaller ecological footprint. This was important to confirm as ingredients can make a significant difference to ecological footprints (World Wildlife Fund, 2020). It is also a key area that Sollos can make an impact as changes in ingredients/ stocked products can be driven by the store rather than the consumer.

Packaging:

Packaging was another section that the expected results were received, as typically less packaging was used by Sollos' suppliers. However, there was a wide variety in information available which made it more difficult to truly know what packaging was involved in each product. Packaging is an important aspect of waste, thus any information around what suppliers use can provide clarity on how waste can be minimised or better managed. Any waste minimisation in this sector must consider that packaging exists to protect the product and act as a form of marketing (Kartick Samanta, Basak & Chattopadhyay, 2016). Thus, approaches to minimise waste must meet these requirements. However, the current tact of recycling is not the ideal way to reduce waste. The entire life cycle of a product must be considered when considering how to minimise packaging. This is because there are many stages involved in the production of goods, many of which require transport and thus packaging. Packaging of products is an area of waste minimisation where the onus to reduce waste is on the consumer (Sustainability Exchange, 2020). We believe, however, that this is an area of importance for Sollos. They should continue to source products that have minimal packaging and try use packaging that is reusable rather than recyclable.

Location/ Source:

Given that part of Sollos' ethos is sourcing from local small business' the results from our comparisons were, once more, expected. All of Sollos' products were made in Christchurch and the comparison products were made more generally in New Zealand. However, it was

unintentional that the comparison products were all from New Zealand companies. Local sourcing has a large impact on the environment and is often considered an important step when reducing environmental harm (Albrecht & Smithers (2017)). This is largely due to transport and associated energy uses. In New Zealand we pride ourselves on the use of renewable energy, thus there was an assumption that New Zealand factories would use less fossil fuel than international factories. New Zealand's transport system, however, still uses significant amounts of fossil fuel (Ministry of Transport, 2019). This would exasperate the differences between the carbon footprints of products produced in Christchurch and those produced in the North Island. Another issue that is highlighted with the lack of information available was the use of imported ingredients. It was occasionally unclear what ingredients were imported, and what sources they were imported from. Some products, such as cocoa, were expected to be imported from overseas, thus there was minimal assumed difference in ecological footprint. This information has reinforced that Sollos' actions are making a difference, and their enthusiasm for sourcing locally is correctly placed.

Customers/ Consumers:

Our research and literature review largely had the same findings, consumers are willing to act environmentally friendly if they are properly educated about the product and that it is still convenient for them. The factor of convenience was not significantly highlighted in our research, due to survey questions focusing more on price points and the end of life of products. Our research has shown that if the consumer is well educated, they are willing to purchase a product that is less convenient if it is better for the environment. However, an alternative product cannot be considered too inconvenient or expensive as it will not be perceived as advantageous to the consumer. If consumers are properly educated, they will process their waste correctly, thus it would be logical for Sollos to stock packaging that consumers regularly come across and know how to manage. This approach would still be flawed as research has clearly shown that reduction and reuse is the best way to minimise waste.

Our surveys showed that regardless of age consumers were willing to pay more for goods that they knew were ethically and environmentally sourced. This once more highlights the need for education and advertisement about Sollos' products. Consumer's want to be environmentally friendly and the perceived increase in costs is not always a barrier. The younger demographic was shown to be less willing to pay more for environmentally friendly products. This was likely due to the lower income of this group, as most that wouldn't necessarily pay significantly more

cited the need to pay rent as a priority. Whilst consumers were willing to pay more, the increased cost could not be significantly higher as it would push the product into a different price range. This information is useful to Sollos as it confirms that their highest selling products are in the ‘sweet spot’ of an increased price but not significantly more expensive than a more commercially available product.

Customers were generally not too concerned about the packaging involved in a product. This is likely because the packaging of a product is designed to make a product seem more desirable (Kartick Samanta, Basak & Chattopadhyay, 2016). There is the potential that consumers do not see it as waste that needs to be managed, but rather an extension of the product. This finding is of particular use to Sollos, as it highlights the need to limit the waste that leaves the store with the consumer.

Recommendations (Emily Wium)

As we have identified in our results, managing the after-life of products is incredibly important when it comes to overall waste minimisation. We recommend that the best way forward for Sollos, to further reduce their ecological footprint and minimise more waste, is to utilise the store to provide more educational and convenient opportunities for waste disposal and management.

The first recommendation that we have is to increase the product information in store with any purchase. We recommend that with every product purchased, a form of recourse such as a pamphlet is available which details information on what is in the product, where it is from and sustainable ways to manage the associated waste. A study done overseas showed that the main reason the surveyed population did not recycle or reuse their waste was due to the lack of education and information regarding waste management and the impact that this waste would have on the environment if not disposed of consciously (Kristina, Christiani, & Jobiliong, 2018). Therefore we believe that providing resources like this will result in Sollos having less of an ecological footprint.

The second recommendation that we have for Sollos is to provide recycling stations in store for customers. Lack of accessibility to recycling facilities is one of the primary reasons for plights in waste recycling (Lupi, V.Joshi, & F.Sidique, 2010). Providing more convenient access to a

recycling station will hopefully decrease the amount of waste that leaves Sollos. Keeping waste internal means Sollos have more control over the after-life of any recyclable product waste.

The final recommendation that presented as an opportunity for significant social change is to utilise the space in Sollos to hold workshops on how to best deal with waste. According to an overseas study, minimisation behaviour is primarily impacted by the following two factors: education and skill in waste minimisation (Liu, Gong, Wang, Lai, & Zhu, 2019). Sollos could further minimise their ecological footprint and waste by holding these workshops, adding to people's existing knowledge on the best ways to deal with waste. Sollos could focus these workshops specifically on waste that is associated with in store products, giving consumers more knowledge specific to Sollos.

Conclusion (Emily Wium)

In conclusion, there were multiple main findings that presented as significant in our research. The first was that in regards to the products we compared it was evident that as a whole, the products sold in Sollos were considered as being better options in terms of waste minimisation and ecological footprints. However we discovered very early on that customer perceptions needed to be an increasingly influential focus of our research. We found through our survey that the price consumers are willing to pay for ethical and environmentally friendly products is dependent on the knowledge they have about the product. This therefore leads into our second main finding; the importance of consumer education. We found that the best way forward for Sollos to further minimise their waste is to make improvements to some of its practises. Sollos is doing a sufficient job in stocking products that are considered low waste and ethical, however things like increasing waste management information available, providing in store recycling/waste disposal, and running workshops to further educate consumers on how to deal with waste will create the most impact in terms of waste minimisation and decreasing any ecological footprint.

There is a need for further research to discover ways to minimise waste throughout the entirety of the supply chain. Ideally, waste can be reduced before it reaches Sollos, meaning that less waste is injected into society from the beginning of the process. More research into the best way to motivate consumers to be conscious consumers would also be of benefit. We must note that

we cannot be 100% confident when making our conclusions. A lot of information was not consistently available and there were also many factors that we did not include in the scope of the research, such as the energy used to create the goods and the environmental impacts of ethical sourcing. Not being able to survey our intended target audience also impacted the reliability of our survey and therefore our results considerably.

References:

Albrecht, C., & Smithers, J. (2017). Reconnecting through local food initiatives? Purpose, practice and conceptions of 'value'. Springer Science+Business Media, 67–81

H.Brunner, P., & Rechberger, H. (2015). Waste to energy – key element for sustainable waste management. *Waste Managament* , 3-12.

Hopewell, J., Dvorak, R., & Kosior, E. (2009). Plastics recycling: challenges and opportunities. Philosophical transactions of the Royal Society of London. Series B, Biological sciences, 364(1526), 2115–2126. https://doi.org/10.1098/rstb.2008.0311

Kartick, Samanta, K., Basak, S., & Chattopadhyay, S. K. (2016). Potentials of Fibrous and Nonfibrous Materials in Biodegradable Packaging. In S. S. Muthu (Ed.), *Environmental Footprints of Packaging* (pp. 75–113). Springer. https://doi.org/10.1007/978-981-287-913-4

Kristina, H. J., Christiani, A., & Jobiliong, E. (2018). Pattern of student education in realizing literacy of recycling's principle. *IOP Conf. Series: Earth and Environmental Science*, 1088-1755.

Liu, J., Gong, E., Wang, D., Lai, X., & Zhu, J. (2019). Attitudes and behaviour towards construction waste minimisation: a comparative analysis between China and the USA. *Environmental Science and Pollution Research*, 13681–13690.

Lupi, F., V.Joshi, S., & F.Sidique, S. (2010). Factors influencing the rate of recycling: An analysis of Minnesota counties. *Resources, Conservation and Recycling*, 242-249.

Ministry of Transport, 2019. Climate Change And Energy | Ministry Of Transport. [online] Transport.govt.nz. Available at: <https://www.transport.govt.nz/multi-modal/climatechange/> [Accessed 11 October 2020].

Orzan G, Cruceru A. F, Balaceanu C. T & Chivu R. G (2018) Consumers behaviour concerning sustainable packaging: an exploratory study on Romanian Customers, *Sustainability* doi:10.3390/su10061787

Sustainability Exchange. (2020). Waste Management Roles and Responsibilities. Retrieved October 11, 2020, from https://www.sustainabilityexchange.ac.uk/waste_management_roles_and_responsibilities

World Wildlife Fund. (2020). Reduce your impact. Retrieved October 11, 2020, from https://wwf.panda.org/get_involved/live_green/

Varun, Sharma, A., & Nautiyal, H. (2016). Environmental Impacts of Packaging Materials. In S. S.Muths (Ed.), *Environmental Footprints of Packaging* (pp. 115–137). Springer. https://doi.org/10.1007/978-981-287-913-4