



IMPACT OF COVID-19 ON CONSUMER FOOD WASTE AND HOME-GROWN FOOD: A CASE STUDY IN KALUTARA DISTRICT, SRI LANKA.

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INTRODUCTION

Covid-19 regulations and lockdowns caused major disruptions in the lives and incomes of the Sri Lankan people (Hettiarachchi et al., 2020). The social distancing measures and mobility restrictions imposed during the pandemic resulted in a disrupted food supply chain in Sri Lanka which affected the availability, pricing, and quality of food (FAO, 2020). Therefore, a fear occurred in peoples' minds regarding food shortages and this caused panic buying and stockpiling (Ben Hassen et al., 2020). This led people to overstock perishable food products regardless of their shelf life (Principato et al., 2021, Cequea et al., 2021a)). However, how these changes may influence the level of consumer waste in Sri Lanka is not clear. Some recent research done in other countries indicated that the economic downturn associated with the COVID-19 pandemic may lead to reduced levels of consumer food waste (Cequea et al., 2021, Pappalardo et al., 2020, Jirabi et al.). Therefore understanding food waste at the consumer level in Sri Lanka is important since food waste reduction is important for improving food security, and strengthening the economic, social, and environmental performance of Sri Lankan people. On the other hand, during the pandemic, the demand for food items increased significantly due to panic buying and hoarding of food, thereby limiting access to food. (FAO, 2020) As the food supply chain is in poor condition, it has created a strong movement to promote home gardening in Sri Lanka (FAO, 2020; Dissanayake and Dilini, 2020). The Sri Lankan government also encouraged the public to engage in home gardening and launched several programs such as Haritha Lanka program, Api Wawamu-Rata Nagamu and Saubagye Gewatha program which focused on harvesting and cultivation as a mean of ensuring the food security in Sri Lanka (Ginigaddara, 2019). These initiatives are important not to ensure food security but also to support home gardening and thus strengthen family bonds, contribute to better mental health and , health safety and make an overall contribution to the well-being of the people while creating green and healthy natural spaces (Weerakoon, Wehigaldeniya and Charikawickramarathne, 2021). Understanding the impact of Covid-19 on consumer food waste generation and home gardening is important because it contributes to strengthening the economic, social, and environmental performance of the food value chain, and to improving food security. Thus, this research identifies how consumer food waste generation and self-food growing practices have changed during the Covid- 19 pandemic compared to before the pandemic situation in the Kalutara district of Sri Lanka. The Kalutara district is one of the districts that were most seriously affected by the pandemic and was also chosen because it was convenient to access respondents in the Kalutara district.

METHODOLOGY

The study was based on a survey in the Kalutara district of Sri Lanka through a questionnaire made available to respondents in both Sinhala and English languages from November 9 to November 24, 2021, during the third wave of Covid-19. The questionnaire made available to respondents via in-person interview, telephone conversation and internet platform. The simple random sampling method was adopted to select 264 respondents. Data analysis was done using descriptive statistics, Chi-square tests, and Wilcoxon Signed Ranked test (IMB SPSS, version 16). The questionnaire consisted of one option, multiple choice questions, and one open-ended question structured in 4 sections. (1) socio-demographic data; (2) extent of consumer food waste before and during covid-19; (3) the consumer food waste behaviour changes during covid-19; (4) effect of Covid-19 on consumer attitudes and extent of self- grown food.



RESULTS AND DISCUSSION

The sample consisted of 264 participants from various regions of the Gampaha district, representing a variety of ages, numbers of family members, academic levels, employment levels and income levels. The majority of the respondents were female (74.6%) and the majority were within the age range of 18-29 (52.3%). Further the majority of participants earned between Rs 50,000 and 100,000 per month (34.8%). 70.8% of the respondents stated that there is a reduction in their income due to Covid -19.

A large majority (65.0%) of the respondents stated that no food was discarded during the pandemic. But a majority (48.48%) declared that before the Covid-19 they usually discard about half of the food they prepared for consumption. A Wilcoxon signed rank test confirmed that there is a median difference between the amounts of food wasted before the pandemic and during the pandemic ($p = 0.001$). Recent studies done in several other countries also showed that there was a reduction in food waste generation between pre-and post-COVID-19 (Laila *et al.*, 2021, Qian, Javadi and Hiramatsu, 2020 and Pappalardo *et al.*, 2020)). According to the Chi- square test, there was a significant association between the amount of food wasted before pandemic based on age ($p=0.009$), number of family members ($p=0.003$) and average income ($p=0.000$). Moreover, there was a significant association between amounts of food wasted during the pandemic with age ($p=0.037$). In our study the food waste is slightly increased when the number of family members in the family increases ($p= 0.003$). This is because small families have a better understanding of domestic food waste than larger families, and larger families tend to buy more food than smaller families (Cequea *et al.*, 2021b). The Covid-19 has led to a change in the amount of food waste. 59.09% respondents declared that the amount of food waste was reduced, while only 6.44% declared that the amount of food waste had increased. The increase in the food waste could be due to the increased amount of food stocks at home, panic buying, increased the amount of fresh food purchases such as fruits and vegetables, increased the amount of food purchased, and increased amount of food cooked. (Pappalardo *et al.*, 2020b)

Respondents were also asked to estimate the total percentage of food thrown away by categories, expressed as a percentage of the total of the items purchased. Figure 1 and figure 2 compare the food waste generation in those food categories before and after the pandemic. Vegetable was the most wasted food group both before and during the pandemic. This could be due to the improper storage, packaging, and short shelf life of vegetables (Diekmann and Germelmann, 2021). The percentage of food thrown away was reduced in several food categories during the pandemic. According to the Wilcoxon Signed Ranked test it was confirmed that there was a median difference of food waste before and during pandemic in food categories such as in cereal(rice, noodles)($p=0.000$), bread and baked goods ($p=0.000$), vegetables($p=0.000$), fruits($p=0.001$), root and tubers($p=0.003$), fish and fish products($p=0.000$), meat and meat products($p=0.002$), and confectionery($p=0.001$).

In this study, the majority of the participants (87.3%) use some strategies to reuse their leftovers or their food waste. Only 12.7% of respondents declared that they discard their leftovers. Previous studies have shown that the Covid-19 epidemic has led to a positive behavioural change in food waste and improved household skills and management practices (Jirabi *et al.*, 2021, Roe *et al.*, 2020). According to survey result as shown in figure 3 a majority of respondents (31.3%) claimed that the reason for food waste was cooking in excess. Only 5.4% percent of the respondents claimed over-buying as the main reason for food waste. This was related to the deliberate over-provisioning of perishable food items during the Covid-19 lockdown. (Jribi *et al.*, 2020)

According to the Wilcoxon Signed Ranked Test there is a significant median difference in the location for grocery shopping before and during the pandemic ($p=0.000$). The use of online shopping and home delivery increased during the pandemic. Previous studies showed that this can be due to the travel restrictions, social distancing measures, and the closure of markets and shops



(Schmitt et al., 2021). Our results showed an impact of the Covid-19 pandemic on the decrease in the amount of food purchased (63.6%), decrease in the food expenses (53.8%), and decrease in the frequency of shopping (57.6%). Moreover, according to the Chi-square test there was a significant association between the changes in the amount of food wasted and the amount of food purchase ($p=0.000$), frequency of shopping ($p=0.012$) and food expenses ($p=0.001$).

Of the 264 participants, only 73.86% were engaged in home food gardening. Among them, 33.8% started growing food at home as a result of the Covid-19 pandemic. People have started spending time outside due to safety measures such as social distancing. So they spend more time engaged in gardening (Dissanayake and Dilini, 2020). The majority of home food gardeners are women (56.8%). This could be because our sample contained more females and also possibly because male members may be busy with their jobs and therefore they may not be interested in gardening. However, previous research found that both men and women members have been enthusiastically engaged in home gardening (Dissanayake & Dilini, 2020). According to Chi-square test there was a significant association between engaging in home gardening during the pandemic with age ($p=0.000$), education ($p=0.000$), number of children ($p=0.019$) and family income ($p=0.000$). The majority of respondents (42.6%) use their backyards for gardening purposes.

The primary reason for home gardening is to access fresh food (30.6%), followed by mental and physical well-being (21.1%). Other than that, enjoyment, financial benefits, getting a new experience and social influences are some other prominent reasons for growing food at home as shown in Figure 4. These reasons were more or less consistent with previous findings (Perera, Wickramaarachchi, and Karunarathne, 2020, Corley *et al.*, 2021, Dissanayake and Dilini, 2020, Mullins *et al.*, 2021). A majority of the respondents who do gardening (74.2%) consume harvest by themselves because, people were discouraged from buying fruits due to health concerns (Dissanayake and Dilini, 2020). Further 21.1% of the respondents had a sufficient harvest to even share among friends and neighbors. Recent findings show that harvest sharing was promoted during the pandemic situation (Perera, Wickramaarachchi and Karunarathne, 2020, Dissanayake and Dilini, 2020). A majority of home food gardeners (54.4%) obtained 10% of their monthly household produce from their home gardens. According to Chi-square test there was a significant association between the length of gardening and the monthly produce consumption from home gardening ($p=0.040$). The most important revelation is that 75.3% of respondents hoped to continue gardening even after the pandemic.

CONCLUSIONS/RECOMMENDATIONS

Our study established that the Covid-19 outbreak lockdown caused respondents to strive toward reducing food waste and increasing home-grown food. Respondents have developed some positive behaviors to reduce the amount of food waste generation. Government should impose regulations at the household level and the state should impose penalties on those who violate those regulations in order to reduce food waste generation. Moreover, our survey has pointed out that there was an increase in the extent of home-grown food in the Kalutara district. Education and communication campaigns can be launched in order to improve the citizens' awareness of the benefits of food waste prevention and home gardening. These initiatives help to improve food security at the household level. Our study only focused on the Kalutara district. To arrive at a full understanding of the Sri Lankan scenario, it would be recommended that this study be expanded using a large sample including all the districts. Further, qualitative studies can be carried out regarding food waste and the amount of harvest obtained from gardens.

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ADDITIONAL DATA

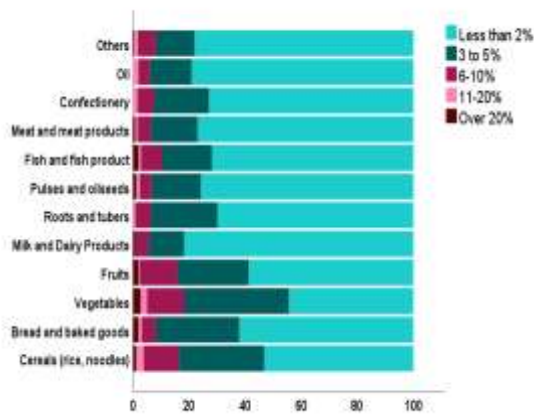


Figure 1: Self-reported ratio of thrown food per food category before COVID-19 lockdown, expressed as the percentage of purchased food items (n=264)

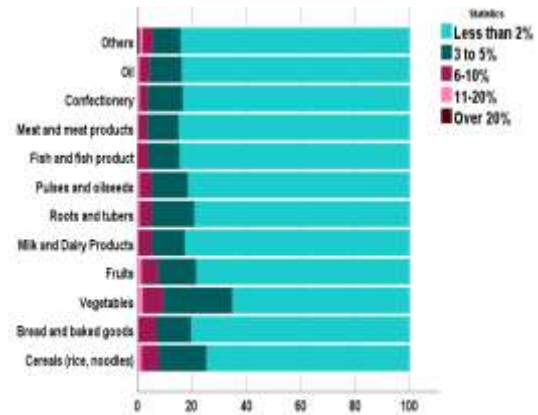


Figure 2: Self-reported ratio of thrown food per food category during COVID-19 lockdown, expressed as the percentage of purchased food items (n=264)

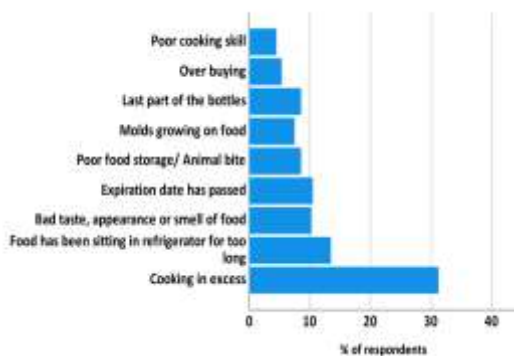


Figure 3: Self-reported reasons of leftovers wastage during COVID-19 lockdown, expressed as the percentage of respondents (n=264)

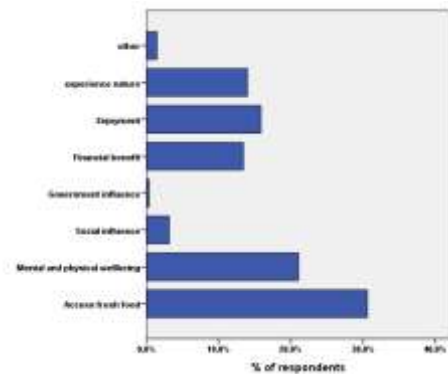


Figure 4: Self-reported reasons for growing food in home, expressed as the percentage of respondents (n=195)