COORDINATED SAMPLING PROJECT 22 (PART B) -

Frozen Slush Drinks Follow-up

Conducted January 2020 with Local Governments across Western Australia

Local Health Authorities Analytical Committee

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Abbreviations & Acronyms

ASC	Actual Sugar Content
CSP	Coordinated Sampling Project
LGA	Local Government Authority
LHAAC	Local Health Authorities Analytical Committee
NATA	National Association of Testing Authorities
Part A	Coordinated Sampling Project 22 – Part A
Part B	Coordinated Sampling Project 22 – Part B
SSC	Stated Sugar Content
WHO	World Health Organization

Executive Summary

This survey followed-up on the data collected in Coordinated Sampling Project 22 – Part A. The purpose of Part B was to measure the accuracy of the stated sugar content for frozen slush drink products available from major fast food outlets and large convenience store vendors, in order to identify where a review of the nutrition information may be required. Additionally, this project aimed to investigate the actual sugar content of frozen slush drinks to inform future initiatives that aim to promote healthier lifestyle choices.

The Local Health Authorities Analytical Committee worked with Western Australian Local Government Authorities to execute this project. Environmental Health Officers submitted samples for assessment to Agrifood Technology or Analytical Reference Laboratory, the two appointed analysts to the Local Health Authorities Analytical Committee, through January 2020. At the end of the sampling period, 7 Local Government Authorities had submitted a total of 63 product samples to the laboratories. Of the 63 samples, 43 qualified as valid submissions for analysis. All samples were measured for actual sugar content and test results were compared against the value listed in the nutrition information as stated by each vendor.

Sugar content between frozen slush drink products ranged from approximately 3.8 g/100mL (0.9 tsp/100mL) to 15.6 g/100mL (3.7 tsp/100mL), with an average value across submissions of approximately 9.7 g/100mL (2.3 tsp/100mL).

When compared against vendor stated sugar content, test results indicated that approximately 81.4% of submissions would be in deviation of a ±20% theoretical tolerance. The products that were most often associated to be outside of this variance were Frozen Coke, which accounted for approximately 40.0% of samples in excess, followed by Mountain Dew Freeze at 28.6%.

Approximately 18.6% of submissions were recorded to be within the ±20% theoretical tolerance when compared against vendor stated sugar content. The products that were most often associated to be within this variance were Frozen Coke, which accounted for 37.5% of samples within the theoretical tolerance, followed by Pepsi Freeze and Slurpee Cola, which both accounted for approximately 25.0% respectively.

The results from this CSP suggested that the sugar content in frozen slush drink products may be inconsistent with the values stated by a vendor's nutrition information. Furthermore, there may be higher than expected sugar content in frozen slush drink products. Therefore, it could be argued that vendor stated sugar content may not be a reliable source of information for the consumer.

Local Government Authorities were requested to review results and further investigation or action by the appropriate Local Government Authority was undertaken where necessary.

1.0 Introduction

This survey (Part B) followed-up on the data collected in the Local Health Authorities Analytical Committee (LHAAC) Coordinated Sampling Project 22 (Part A). Part A was a project that was designed to assist LiveLighter in their 'Don't Be Sucked In' initiative which promoted healthier lifestyle choices and aimed to raise public awareness about sugary drinks in Australia.

Frozen carbonated beverages are a common soft drink variation. Produced using a combination of water, flavoured syrup and carbon dioxide, they are frozen in a dedicated slush drink machine before being dispensed using an automated process [2]. Though there has been a marked reduction in the amount of Australians who consume frozen slush drink products in recent years, sugar sweetened beverages continue to be the leading contributor of added sugars in Australian diets, with over half of the population exceeding the daily sugar intake recommended by the World Health Organization (WHO) [3, 4].

Due to limited evidence at the time of publication, the 2013 Australian Dietary Guidelines did not make suggestion as to an acceptable intake of added sugars. However, it was generally recommended that intake of sugars be restricted, noting evidence collected from the 2003-2006 National Health and Nutrition Examination Survey, which suggested that an intake of added sugars above 5-10% of total energy consumption may affect absorption of essential nutrients [4]. Some international agencies have developed more specified guidelines, such as the 2015-2020 Dietary Guidelines for Americans which suggested that individuals should limit their intake of added sugars to less than 10% of total energy consumption [3]. Similarly, based on evidence from observational studies, the WHO strongly recommended to limit intake of added sugars to less than 10% of total energy consumption, with some evidence from ecological studies supporting a further recommendation to limit intake to 5% or less [5]. This was consistent with the UK Scientific Advisory Committee on Nutrition who also stated that intake of added sugars should not exceed 5% of overall energy consumption [3].

Over consumption of sugar sweetened beverages, such as frozen slush drink products, has been associated with an increased risk of dental caries and weight gain in Australian adults and children [3]. Obesity rates in Australia are on the rise, with prevalence in 2014-2015 increasing to 63.4% [3]. There is limited evidence to suggest a direct link between excess intake of added sugars and the development of non-communicable diseases. However, consumption of sugar sweetened beverages has been shown to be associated with increased rates of obesity in Australia, with evidence to support a direct correlation between obesity and chronic illnesses such as type 2 diabetes, coronary heart disease, stroke and some cancers being vast and well documented [3, 5].

The purpose of Part B was to measure the accuracy of stated sugar content (SSC) for frozen slush drink products available from major fast food outlets and large convenience store vendors, in order to identify where a review of the nutrition information may be required. Additionally, this project aimed to investigate the actual sugar content (ASC) of frozen slush drinks to inform future campaigns from organisations such as LiveLighter in initiatives to promote healthier lifestyle choices. These objectives

were achieved by assessing ASC results against vendor SSC, sourced from publicly available nutrition information at the time of analysis.

2.0 Methodology

In this Coordinated Sampling Project (CSP), sampling instructions were supplied to a limited number of Western Australian Local Government Authorities (LGA), who also participated in Part A. Only metropolitan LGAs were encouraged to participate in this CSP since frozen slush drink products are typically most prevalent in these areas.

The sampling instructions requested that each participating LGA collected three of the same products per submission over the space of a 48-hour period in order to assess consistency between results. The sampling instructions also included a schedule of the results from Part A. LGAs were asked to collect the same slush drink products that they had collected in Part A to ensure that a variety of products were included for analysis. Ultimately, the overall number of submissions were determined by each LGA with consideration of their own sampling allowance and other activity planned or anticipated for the financial year.

Samples of frozen slush drink products from across the metropolitan area of Perth were submitted by Environmental Health Officers to either Agrifood Technology or Analytical Reference Laboratory, the two appointed analysts to the LHAAC, in January 2020. The minimum cup size for submission to the analysts was ‘Small’. LGAs were instructed if samples were submitted to the analyst on the same day of collection, freezing would not be required. However, if submission was going to be delayed, samples should be frozen immediately upon collection, and supplied chilled to the analyst. Each laboratory conducted their analysis of the samples utilising National Association of Testing Authorities (NATA) accredited methods (Appendix A).

At the time of writing this report, Australian legislation had not established a specific set of guidelines to quantify the accuracy of sugar content in food and beverage products. However, a ±20% leeway is often allowed in other countries [2, 6]. With this in mind, results were reported on as if a ±20% theoretical tolerance applied. Due to the everchanging nature of SSC, ASC was assessed against the values declared on vendors’ websites at the time of data analysis. As this survey was purely investigatory, measurements of testing uncertainty were not allowed for in the reporting of results.

Upon completion, LGAs were requested to review the results. Recommended follow-up actions were provided to each LGA within the sampling instructions.

3.0 Results

By the end of the sampling period, 7 LGAs had submitted a total of 63 samples to the approved laboratories. Of those samples, 43 had corresponding nutrition information publicly available, which deemed these submissions valid for analysis against vendor SSC.

Samples were collected from a variety of major fast food outlets as well as large convenience store vendors. Submission distribution indicated that 39.5% (*n* = 17) of products were Frozen Coke; 25.6% (*n* = 11) were Mountain Dew Freeze; 18.6% (*n* = 8) were Pepsi Freeze; 14.0% (*n* = 6) were Slurpee Cola; and 2.3% (*n* = 1) was Frozen Fanta Mango (Figure 1.). Each submission was measured for ASC and test results were compared against the sugar content listed in each product's nutrition information as stated by the vendor.

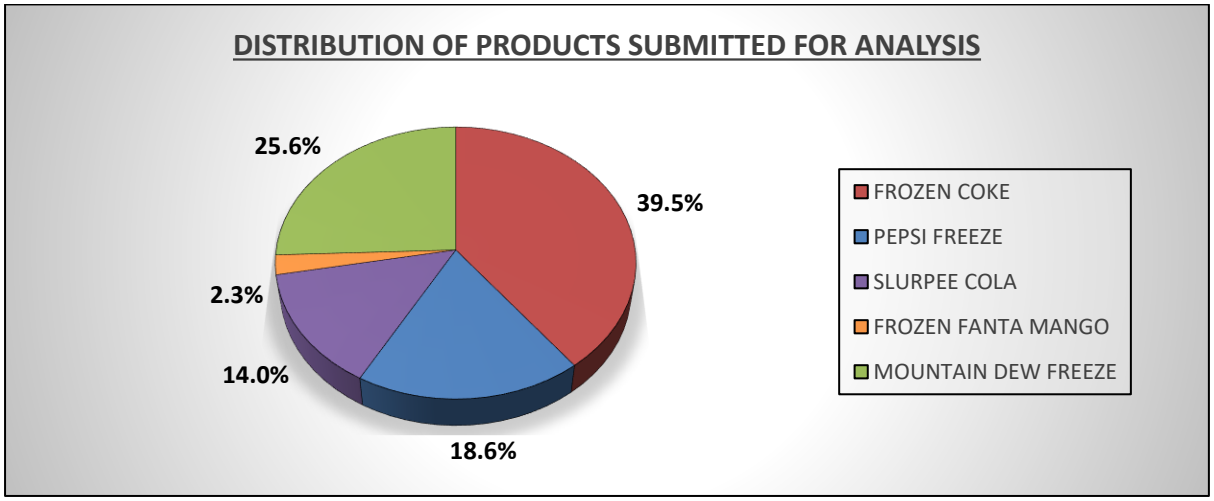

Figure 1.

Test results reflected the ASC across products to range from approximately 3.8 g/100mL (0.9 tsp/100mL) to 15.6 g/100mL (3.7 tsp/100mL), with an overall average sugar content across submissions of approximately 9.7 g/100mL (2.3 tsp/100mL) (Figure 2.).

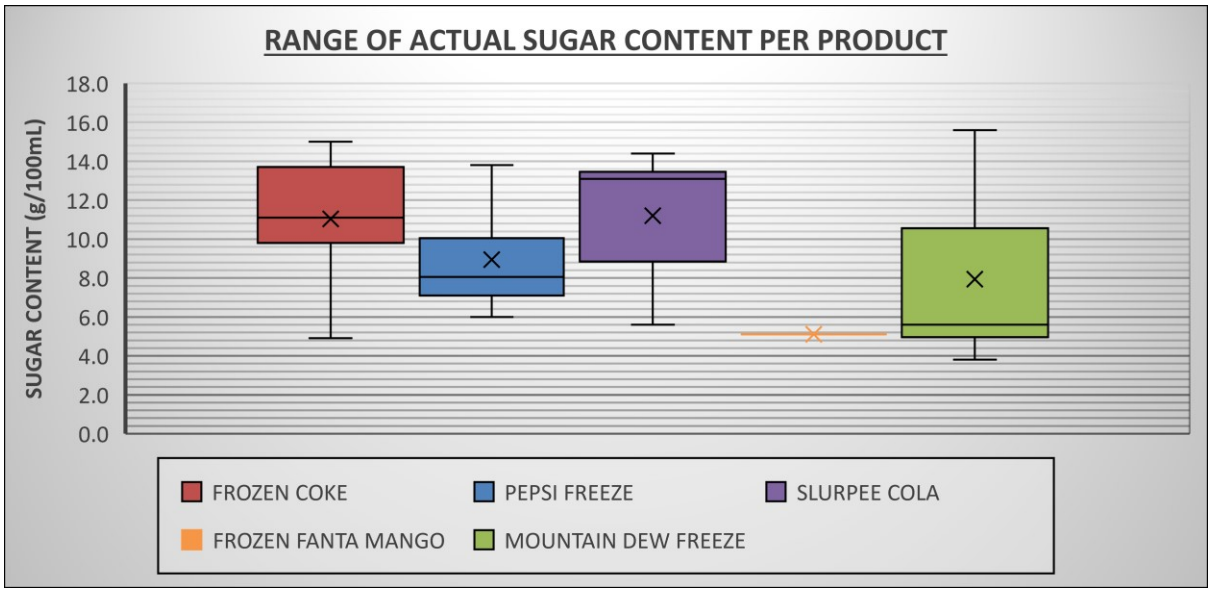

Figure 2.

Data indicated that approximately 81.4% (*n* = 35) of samples recorded an ASC variance when compared against the ±20% theoretical tolerance, with approximately 44.2% (*n* = 19) of samples found to exceed SSC by greater than 20% and 37.2% (*n* = 16) of samples found to contain less than -20% (Figure 3.). All five products were recorded as contributing factors (Table 1.). The products that were most often associated to be outside of the theoretical tolerance were Frozen Coke, which accounted for approximately 40.0% (*n* = 14) of samples in excess, followed by Mountain Dew Freeze at 28.6% (*n* = 10).

Approximately 18.6% (*n* = 8) of samples were recorded to be within the ±20% theoretical tolerance (Figure 3.). Four products were recorded as contributing factors (Table 1.). The products that were most often associated to be within this variance were Frozen Coke, which accounted for 37.5% (*n* = 3) of samples within the theoretical tolerance, followed by Pepsi Freeze and Slurpee Cola, which both accounted for approximately 25.0% (*n* = 2) respectively.

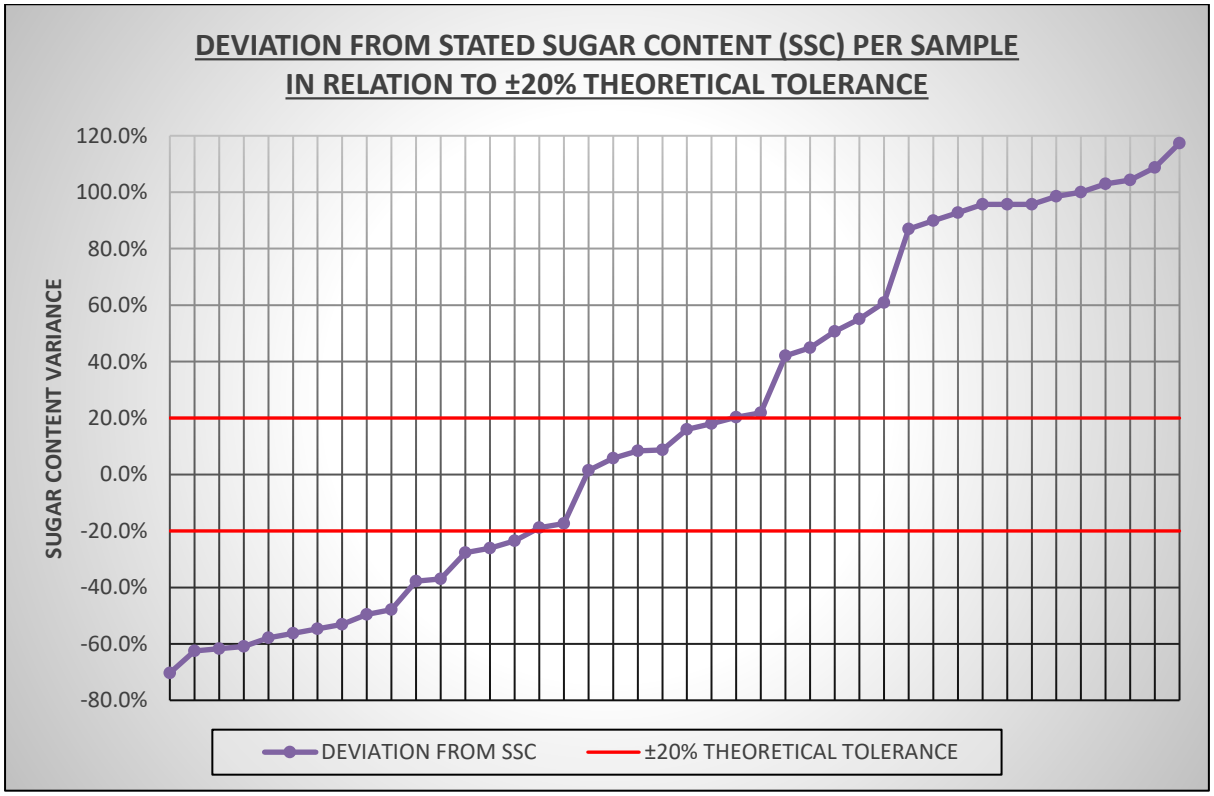

Figure 3.

Table 1. Actual Sugar Content (ASC) per product in relation to ±20% theoretical tolerance.

PRODUCT	ASC GREATER THAN +20% THEORETICAL TOLERANCE	ASC WITHIN ±20% THEORETICAL TOLERANCE	ASC LESS THAN -20% THEORETICAL TOLERANCE
Frozen Coke	13	3	1
Pepsi Freeze	0	2	6
Slurpee Cola	4	2	0
Frozen Fanta Mango	0	0	1
Mountain Dew Freeze	2	1	8
TOTAL	**19**	**8**	**16**

4.0 Discussion

A significant percentage (44.2%) of samples submitted in this report recorded an ASC greater than 20% above SSC. While it can be stated that the percentage of submissions with less than -20% of vendor SSC was also significant (37.2%), the percentage of submissions within the ±20% theoretical tolerance was relatively low (18.6%). Additionally, sugar content within product categories was inconsistent and greatly varied. For example, one of the products recorded to be most often associated to have an ASC within theoretical tolerance was Frozen Coke, which was also a product that was most often associated to have an ASC in excess of the theoretical tolerance.

Most, if not all, of the products tested in this survey were produced using an automated process which relied on a machine to add a preprogramed amount of ingredients to the cup. Unidentified anomalies relating to the machine, or machine operator, could be a potential influencing factor on resulting sugar content. Additionally, due to the purely investigative nature of this survey, measures of uncertainty were not allowed for in its design. This limitation may have contributed to minor inconsistencies in test results and should be considered by future users of the data.

Overall, the relatively high percentage (81.4%) of products that recorded a variance in comparison to the theoretical tolerance indicated a low accuracy of vendor SSC. This makes informed product decisions more difficult for consumers and brings the reliability of the remaining nutrition values into question. The data collected in this survey may provide justification for an overall review of frozen slush drink nutrition information panels in the future.

Comparison to CSP 22 (PART A)

LGAs collected a total of 63 samples in Part B, 43 of which had corresponding nutrition information publicly available, which deemed these submissions valid for analysis against vendor SSC. Comparatively, in Part A, LGAs collected a total of 87 samples, 54 of which had corresponding nutritional information publicly available for analysis against vendor SSC.

Part B saw 5 different frozen slush drink products tested, compared to the 8 products tested in Part A. 4 of the 5 frozen slush drinks tested in Part B were products that were also tested in Part A (Table 3.). These products included Frozen Coke, Mountain Dew Freeze, Pepsi Freeze and Slurpee Cola.

The overall range of ASC between products was lower in Part B than in Part A. The minimum ASC recorded in Part B was approximately 3.8 g/100mL (0.9 tsp/100mL) compared to 7.5 g/100mL (1.8 tsp/100mL) in Part A; the maximum ASC recorded in Part B was approximately 15.6 g/100mL (3.7 tsp/100mL) compared to 18.5 g/100mL (4.4 tsp/100mL) in Part A; and the average ASC across products was approximately 9.7 g/100mL (2.3 tsp/100mL) in Part B compared to 13.4 g/100mL (3.2 tsp/100mL) in Part A.

Table 2. Range of Actual Sugar Content (ASC) per product – Part A compared to Part B

PRODUCT	PART A MIN. ASC (g/100mL)	PART B MIN. ASC (g/100mL)	PART A AVE. ASC (g/100mL)	PART B AVE. ASC (g/100mL)	PART A MAX. ASC (g/100mL)	PART B MAX. ASC (g/100mL)
Frozen Coke	10.2	4.9	14.0	11.0	18.5	15.0
Mountain Dew Freeze	7.5	3.8	11.3	7.9	15.8	15.6
Pepsi Freeze	7.6	6.0	14.0	8.9	17.2	13.8
Slurpee Cola	7.6	5.6	11.6	11.2	14.1	14.4

When analysed against vendor SSC, Part B saw more samples recorded to fall outside of the ±20% theoretical tolerance when compared to Part A overall (81.4% and 56.0% respectively). While the percentage of samples that recorded an ASC greater than 20% above vendor SSC was similar between Part B and Part A (44.2% and 43.0% respectively), the percentage of samples recorded to be less than -20% of SSC was significantly higher in Part B than in Part A (37.2% and 13.0% respectively). Overall, ASC within the theoretical tolerance was significantly lower in Part B than in Part A (18.6% and 44.0% respectively).

5.0 Conclusion

The purpose of this survey was to measure the accuracy of SSC for frozen slush drink products available from the major fast food outlets and large convenience store vendors, in order to identify where a review of the nutrition information may be required.

The variation from SSC when compared against ASC was found to be significantly greater in this report than in Part A. Indicating low accuracy of SSC, the overall majority of samples collected throughout this project were inconsistent with the sugar content claims made by the vendor's nutrition information. Sugar content in the frozen slush drink samples did not often match expected values. Therefore, it is questionable whether the consumer can rely on information made available by vendors regarding the expected sugar content in these types of beverages, making informed product decisions more difficult. Furthermore, the data collected in this survey brings the reliability of the remaining nutrition values into question and supports an overall review of frozen slush drink nutrition information panels in the future.

6.0 References

[1] *Slush Puppy.* [Art]. Clipart Library, 2019.

[2] Local Health Authorities Analytical Committee, “Coordinated Sampling Project 22 - Frozen Slush Drinks,” 2019. [Online]. Available: https://www.lhaac.org.au/the-sampling-program/the-sampling-results/. [Accessed 2020].

[3] Department of Health, “Policy context relating to sugars in Australia and New Zealand,” 2017. [Online]. Available: https://www1.health.gov.au/internet/fr/publishing.nsf/content/C6995F10A56B5D56CA2581EE00177CA8/$File/Policy%20Context%202017.pdf. [Accessed 2020].

[4] National Health and Medical Research Council, “Australian Dietary Guidelines,” 2013. [Online]. Available: https://www.eatforhealth.gov.au/sites/default/files/files/the_guidelines/n55_australian_dietary_guidelines.pdf. [Accessed 2020].

[5] World Health Organization, “Guideline: Sugars intake for adults and children,” 2015. [Online]. Available: https://www.who.int/publications/i/item/9789241549028. [Accessed 2020].

[6] S. Fabiansson, “Precision in nutritional information declarations on food labels in Australia,” *Asia Pacific journal of clinical nutrition,* vol. 15, no. 4, pp. 451-8, 2006.

Appendix A

Raw Data

For further questions or inquiries about raw data, contact LHAAC Coordinator Trevor Chapman:

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