

## COMPLETION REPORT

### **Analysis of Sugar Composition in Malaysia: Contribution Toward the Harmonisation of the Database for Asian Nutrition and Food Culture Research Center, Japan**

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**Introduction:** Sugars are important ingredients for the sugar sweetened beverages (SSBs) and snacks industries. All sugars provide sweet taste, but the intensity, quality and temporal profile of the sweeteners varies by type of sugar.

**Objective:** The aim of this study was to determine sugar and composition (glucose, fructose, sucrose, galactose, lactose and maltose) in selected sugar sweetened beverages (SSBs) and snacks in Kota Bharu, Kelantan.

**Methodology:** Enzymatic technique was used to determine sugar and composition in SSBs and snacks, where combination of enzyme in sequential was used. **Result:** The results showed that the sucrose was the major component of total sugar in all of the sugar sweetened beverages (SSBs) and snacks samples. However, the amount of isomerized sugar was found predominant in some beverages such as mixed tropical fruit juice, blackcurrant drink, mango drink, lemon carbonated drink, strawberry carbonated drink, lychee drink, flavored energy drink, soda drink and berries juice. It is also found in pudding, gummy and *kacang gula* of snacks samples but in small amount. The galactose levels in all sample was found to be very little. The maltose level was the highest in instant chocolate malt drink and ground peanut cookies for SSBs and snacks, respectively. Lactose content was high in dairy products and snacks samples such as chocolate coated, chocolate spread, chocolate nugget, chocolate coated wafer, milk chocolate coated wafer and chocolate rice cereal. The highest total sugar was found in instant coffee milk for SSBs and milk chocolate coated with  $60.65 \pm 3.13$  and  $63.69 \pm 2.25$ , respectively. Apart from that, the intake of sugar-sweetened beverages (SSBs) and snacks have changed and has associated with weight gain in children. However, it is challenging to measure the consumption of SSBs and snacks due to the limitation of existing tools. Beverages & snack questionnaire for children (BSQ-C) was developed and validated to assess the intake of SSBs and snack among schoolchildren. In testing for internal consistency, the value of Cronbach's alpha indicated that more than 0.70 is considered an acceptable internal consistency. In conclusion, the BSQ-C developed is valid and reliable to measure the pattern and behaviour of SSBs and snacks intake among schoolchildren. **Conclusion:** These finding provides further support for accurate nutrition labelling of commercial SSBs and snacks apart from sugar composition database for Malaysian food item and beverages. The BSQ-C developed is valid and reliable to measure the pattern and behaviour of SSBs and snacks intake among schoolchildren.

Publication of the Results of Research Project:

**Paper publication**

- 1) Noor Fadzlina Hamid, Rohana Abdul Jalil, Roziyani Hashim, Amira Suryati Mohd, Wan Rosli Wan Ishak, Nyi Nyi Naing, Chanida Pachotikarn, Lukkamol Prapkree, Narisa Ruengsari & Shigeru Yamamoto. Determination of sugar composition of selected sugar sweetened beverages (SSBs) and snack foods in Kelantan, Malaysia. (2018). *Malaysia Applied Biology*: 47(4):45-52. (Scopus index)
- 2) Noor Fadzlina Hamid, Nyi Nyi Naing, Rohana Abdul Jalil & Shigeru Yamamoto. Development and validation of the beverages and snacks questionnaire for Malaysian schoolchildren (BSQ-C). (2019). *Environment -Behavior Proceeding Journal*. 4: 12 (Clarivate Analytics Web of Science Index)
- 3) Noor Fadzlina Hamid, Nyi Nyi Naing, Rohana Abdul Jalil, Wan Rosli Wan Ishak & Shigeru Yamamoto. Consumption of Sugar-Sweetened Beverages (SSBs) and Snack and Its Association with Nutritional Status Among Malaysian School Children Aged 10 to 11years old. *School Health Journal* (Ready to be submitted)(Web of Science Index)

**Verbal Presentation** (Date, Venue, Name of Conference, Title of Presentation, Presenter, etc.)

- 1) Laboratory determined sugar content and composition of selected sugar sweetened beverages(SSBs) and snacks in Kelantan. Paper presented at *International Food Science and Agrotechnology Conference 2018*, August, 7<sup>th</sup> to 9<sup>th</sup>, 2018, Universiti Malaysia Terengganu
- 2) Sociodemographic, nutritional status and intake of sugar sweetened beverages (SSBs) among schoolchildren in Kota Bharu, Kelantan. Paper presented at *Malaysian Association Study of Obesity Conference 2019*, October, 15<sup>th</sup> to 16<sup>th</sup>, 2019, Istana Hotel, Kuala Lumpur
- 3) Development and validation of the beverages and snacks questionnaire for Malaysian schoolchildren (BSQ-C). paper presented at *8<sup>th</sup> Asian Conference on Environment-Behavior Studies*, 2019, Hilton Hotel, Langkawi Island, Malaysia.

**Thesis** (Name of Journal and its Date, Title and Author of Thesis, etc.)

Author of theses: Noor Fadzlina Hamid (Master Science candidate)

Title of theses: Consumption of Sugar-Sweetened Beverages (SSBs) and Snack and Its Association with Nutritional Status Among School Children Aged 10 to 11 in Kota Bharu, Kelantan.

Year of graduation : 2020

**Book** (Publisher and Date of the Book, Title and Author of the Book, etc.)

Title of Book : Food Album of Sugar Sweetened Beverages & Snack for Children.

Publisher : Universiti Sains Malaysia

Author : Rohana Abdul Jalil, Noor Fadzlina Hamid & Shigeru Yamamoto