Economic and Environmental Impacts of Sugar Consumption in the United States

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The World Health Organization (WHO) recommends that the daily intake of free sugars for adults and children should be less than 10% of the total energy intake. However, data from the Food and Agriculture Organization (FAO) reveals that the daily sugar intake per person in the United States exceeds the WHOâ€™s recommended limit by nearly 5%. This highlights the concern over excessive sugar consumption in the United States.

The excessive consumption of sugars not only affects health through the overproduction and consumption of sugar but also has the potential to impact the environment through the sugar supply chain. The Industrial Decarbonization Roadmap in 2022, published by the United States Department of Energy, states that the sugar sector is one of the energy-intensive sub-sectors.

Furthermore, the Intergovernmental Panel on Climate Change (IPCC), in its Sixth Assessment Report, stated that to achieve the 1.5-degree target of the Paris Agreement, a 60% reduction in greenhouse gas (GHG) emissions is necessary by the year 2035. Particularly, the oversupply of food is causing excessive CO2 emissions throughout the supply chain of the food industry. To reach the 1.5-degree target, it is imperative to consider specific measures within global food plans to reduce CO2 emissions.

To the best of our knowledge, few studies have estimated the amount of CO2 emitted from the excessively sugared supply chain. This study serves as a first step in examining sustainable food supply plans by focusing on sugar consumption in the United States. The novelty of this study is to estimate the economic and environmental impacts on the sugar supply chain. The study aims to provide policy recommendations for an ideal sugar supply plan in the United States.

To estimate the sugar demand for each industrial sector in the United States, we created a Hybrid Supply-Use Table (SUT) that includes the sectoral supply and use of sugar in physical terms (in tons). In this calculation, we incorporated the final demand (in US dollars) for the â€œSugar and confectioneryâ€• sector from the Input-Output table and used the 2019 data on sugar consumption in the United States. The sugar consumption in the United States is based on the data published by the United States Department of Agriculture (USDA) for the year 2019 and the Use Table from the Bureau of Economic Analysis (BEA), as published in 2017.

The results from the estimation of the physical amount of sugar demand show that the gross sugar demand in the United States was approximately 11 million tons. The sector with the highest value is the Personal consumption expenditures (7.84 million tons), representing 71% of the domestic annual consumption. Subsequently, the processed food industry, including sectors such as the Sugar and confectionery product manufacturing (1.35 million tons), the Bread and bakery product manufacturing (0.37 million tons), and the Cookie, cracker, pasta, and tortilla manufacturing (0.34 million tons), exhibited high values.

The sectors with higher direct input coefficients for sugar have also been identified. The sector with the highest value was the Sugar product manufacturing (36.4 tons/USD) sector. Subsequently, industries with high sugar consumption, Cookie, cracker, pasta, and tortilla manufacturing (13.1 tons/USD), the Breakfast cereal manufacturing (8.7 tons/USD), the Bread and bakery product

manufacturing (8.6 tons/USD), also revealed significant direct input coefficients.

Based on the above results, it has become evident that essential daily consumed foods at home, such as bread, pasta, and breakfast cereals, contain a significant amount of sugar. Importantly, we conducted a hypothetical extraction analysis of reducing a hybrid input coefficient of specific sugar-intensive food products by 5%, recommended by the WHO, and estimated a reduction potential of CO2 induced by household consumption of food products in the United States. We found that the Cookie, cracker, pasta, and tortilla manufacturing sector had a considerable CO2 reduction impact by reducing its sugar use.

Therefore, the reduction in sugar consumption necessary for food products remarkably contributed to human health in the U.S. people as well as the CO2 mitigation. The government needs to assess the excessive addition of sugar in the production processes of these foods. This reassessment of the sugar industry supply chain can also be effective in reducing CO2 emissions.