

The Impact of U.S. Free Trade Agreements on Calorie Availability and Obesity: A Natural Experiment in Canada

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Introduction: Globalization via free trade and investment agreements is often implicated in the obesity pandemic. Concerns center on how free trade and investment agreements increase population exposure to unhealthy, high-calorie diets, but existing studies preclude causal conclusions. Few studies of free trade and investment agreements and diets isolated their impact from confounding changes, and none examined any effect on caloric intake, despite its critical role in the etiology of obesity. This study addresses these limitations by analyzing a unique natural experiment arising from the exceptional circumstances surrounding the implementation of the 1989 Canada–U.S. Free Trade Agreement.

Methods: Data from the UN (2017) were analyzed using fixed-effects regression models and the synthetic control method to estimate the impact of the Canada–U.S. Free Trade Agreement on calorie availability in Canada, 1978–2006, and coinciding increases in U.S. exports and investment in Canada’s food and beverage sector. The impact of changes to calorie availability on body weights was then modeled.

Results: Calorie availability increased by $\cong 170$ kilocalories per capita per day in Canada after the Canada–U.S. Free Trade Agreement. There was a coinciding rise in U.S. trade and investment in the Canadian food and beverage sector. This rise in calorie availability is estimated to account for an average weight gain of between 1.8 kg and 12.2 kg in the Canadian population, depending on sex and physical activity levels.

Conclusions: The Canada–U.S. Free Trade Agreement was associated with a substantial rise in calorie availability in Canada. U.S. free trade and investment agreements can contribute to rising obesity and related diseases by pushing up caloric intake.

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INTRODUCTION

The escalating global prevalence of overweight and obesity, or “globesity,” is often described as a pandemic.¹ Worldwide, it is estimated that rates of overweight and obesity combined rose by 27.5% for adults and 47.1% for children between 1980 and 2013.² Globalization via free trade agreements (FTAs) is often implicated in this pandemic because of its role in spreading high-calorie diets rich in salt, sugar, and fat.³ These concerns have become increasingly prominent in recent years, as new FTAs have been negotiated at an unprecedented rate, rising from 22 active FTAs in 1990

to more than 270 in 2016.⁴ They include the Transatlantic Trade and Investment Partnership, a potential agreement between the U.S. and the European Union,

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0749-3797/\$36.00

<https://doi.org/10.1016/j.amepre.2018.02.010>

and a possible United Kingdom–U.S. deal.⁵ Public health specialists have argued that new FTAs could worsen diets and exacerbate rising rates of obesity.³

However, a recent systematic review showed that evidence of a link between FTAs and unhealthy diets and obesity was methodologically and substantively limited.⁶ Methodologically, previous studies have not addressed critical challenges to causal inference when analyzing the impact of FTAs. One challenge is that FTAs are often implemented in response to major macroeconomic crises or alongside market-oriented policies, such as deregulation.⁷ These transformations can also influence diets, making it difficult to isolate the impact of FTAs.⁸ In addition, there is often a delay of several years between when an FTA is agreed upon and when it is implemented, making it difficult to identify the appropriate pre- and post-FTA cut off.⁹ Previous studies were unable to disentangle this complexity.

Substantively, previous analyses of FTAs and diets focused on a narrow range of outcomes: high-fructose corn syrup supply and sugar-sweetened beverage sales.^{9–12} However, whether or not FTAs contribute to rising obesity depends, in part, on whether they increase peoples' net caloric intake (i.e., caloric intake less caloric expenditure), as this plays a critical role in the etiology of obesity.¹³ FTAs may do so by facilitating trade in the food and beverage sector as they reduce trade barriers, such as tariffs (a type of trade tax) and non-tariff barriers, such as differences in technical or quality standards. FTAs can also boost domestic food and beverage production when barriers (such as a lack of investor protection) to foreign investment are removed.^{3,14} These changes can, in turn, lead to lower prices; greater availability; and greater marketing of food, beverages, and their ingredients. These three factors can alter diets, as they affect the composition and quantity of food and beverage production and consumption.³

Whether or not these changes encourage higher caloric intake is likely to vary according to the partner country, and U.S. FTAs are especially likely to encourage elevated caloric intake because of the highly competitive processed food and caloric beverage industry in the U.S.¹⁵ Processed food and caloric beverages play an important role in increasing caloric intake, as they are often calorie dense, leading people to unknowingly consume too many calories, and highly palatable, encouraging further consumption. In addition, drinking caloric beverages can contribute to increased caloric intake, as it is rarely compensated for by an equivalent reduction in food consumption.^{16–18}

This study addresses these gaps by analyzing a unique natural experiment, the Canada–U.S. Free Trade Agreement (CUSFTA) in 1989. This study tests the hypotheses

that CUSFTA increased caloric intake in Canada and that these changes corresponded with increased U.S. exports and investment in the Canadian food and beverage sector.

Dunning¹⁹ identifies three criteria that characterize a natural experiment. First, exposure to the intervention (here the FTA) and control must be as-if random. In this way, it simulates a randomized trial, although assignment of the intervention is outside the researchers' control. Second, the statistical models must be credible so that differences between intervention and control groups are not attributable to confounders, and third, the case must have substantive relevance.¹⁹ The following section describes how CUSFTA meets these criteria.

On January 1, 1989, CUSFTA came into force. CUSFTA reduced barriers to trade and investment between the U.S. and Canada in most sectors of the economy, including the food and beverage industry, as summarized in [Appendix 1](#) (available online). CUSFTA was subsumed by the North American Free Trade Agreement on January 1, 1994, which changed few trade arrangements between the U.S. and Canada, as these were covered by CUSFTA.

CUSFTA is in many ways a unique natural experiment. First, CUSFTA is substantively relevant, as it was a blueprint for later FTAs.²⁰ Second, CUSFTA was not part of a larger package of reforms or implemented in response to a macroeconomic crisis so, unlike most FTAs, it is not confounded by these changes.⁷ Third, the pre- and post-FTA periods are clearly demarcated, and fourth, CUSFTA was unanticipated. This is because the fate of CUSFTA was decided by the Canadian general election in 1988. This so-called Free Trade Election was very closely contested and centered on whether to implement CUSFTA.²¹ One side was pro-CUSFTA and the other against. No one could be certain who would win—and so whether CUSFTA would be implemented—until the outcome of the election in November 1988. This created a distinct pre- and post-FTA cut off and addresses issues created by potential anticipatory effects.

Fifth, CUSFTA's implementation was as-if random. CUSFTA's implementation was contingent on the outcome of the 1988 election. But the victory of the pro-CUSFTA party was a quasi-random event: most Canadians voted for parties that opposed CUSFTA, but the pro-CUSFTA party secured a marginal victory and implemented the FTA, as they won a majority of votes in two provinces that, because of Canada's electoral formula, elected more seats than the remaining eight Canadian provinces combined.²² In addition, CUSFTA was implemented almost immediately after the election on January 1, 1989. Thus, CUSFTA was not implemented

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