

# The cost of food consumption across socioeconomic groups in Switzerland: estimation of the price of a healthier diet and its impact on nutritional inequality

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## Key words

Food consumption, diet costs, nutritional value, socio-economic status

## Aim of the study

The principal objective of the project is to estimate the relationship between the financial cost of food consumption and nutritional quality of diets across socio-economic groups in Switzerland.

## Material and methods

We first conducted a systematic overview of the scientific literature (Medline, Embase and Econlit from 1990 to January 2018) on the relationship between diet quality and diet cost in the fields of public health, nutrition science and health economics.

We estimated the cost of diets using data from the Consumer Price Index Retail Scanner dataset (CPI) and the Swiss Household Budget Expenditure Survey (SHBES), linked these data to menuCH dietary intake data and subsequently analyzed the relationship between food expenditures and nutritional quality across socioeconomic status (SES) groups in Switzerland. We assessed diet quality using the Swiss Food Pyramid Score and the Healthy Eating Index (HEI).

Using menuCH, CPI and SHBES datasets, we conducted a policy simulation for a sugar-sweetened beverage (SSBs) tax in Switzerland. We exploited annual fluctuations in prices and associated demand responses in consumption to estimate the price elasticity of demand of SSBs amongst Swiss households.

We exploited the large exchange rate shock that occurred on January 15th, 2015 following a decision by the Swiss National Bank as a natural experiment to investigate the causal relationship of an increase in purchasing power on changes in individual food consumption and on the nutritional quality of diets. A large proportion of the Swiss population lives near the border hence cross border shopping is relatively easy. We exploited individual-level dietary data collected before and after the shock within menuCH in a regression-discontinuity design framework with time to the exchange rate shock as the running variable.

## Results and significance

The systematic overview of the literature (based on 139 articles) showed that there is a positive association between diet cost and diet quality in the public health literature, with evidence coming mainly from observational studies conducted in high-income countries and with substantial heterogeneity across studies. This finding, combined with the body of evidence coming from economics, in particular the results of quasi-experimental studies, suggests a causal relationship. Studies in economics provide a broader view of cost than just food prices and consider time costs of searching for and preparing foods, as well as availability barriers, as important factors influencing food choices.

We found a non-linear relationship between food expenditure and diet quality in Switzerland when combining menuCH data with CPI and SHBES datasets. At lower levels of daily expenditure, there is significant scope to increase daily expenditure and time cost on food to improve diet quality. We find that close to 40% of the population would increase the quality of their diet by increasing their daily expenditure over to 17 CHF per day, using the HEI as diet quality measure. After the turning point, at higher levels of daily expenditure, increasing daily expenditure on food has a detrimental impact on diet quality. We found that household net income had no direct impact on diet quality and that larger households tended to have lower daily food expenditure.

A tax on SSBs in Switzerland would substantially reduce SSBs consumption. Our results suggest that a relatively large increase of 25 percentage points may have a substantial effect on population weight.

While such tax would be perceived as affecting the whole population, heavy consumers of SSBs would be the ones that would benefit the most from the reduction of SSBs intake.

The exchange rate shock had mixed effects on diet quality. Sodium intake was significantly lower, but the other changes in dietary intakes were not statistically significant (decreases in total calories fiber, vegetable and processed meat intakes, increases in SBB consumption, red meat intake and healthy eating index) likely due to a lack of power. A significant price reduction across all foods did not appear to significantly increase the consumption of healthier foods. These results therefore suggest that multi-sectoral policies may be required to improve nutritional quality in Switzerland.

Our results suggest that the relationship between food cost and diet quality is complex and that there might not be a one-size fits all policy option to address the public health and equity consequences of unhealthy diets.

#### **Publications, posters and presentations**

The results have not yet been published. Presentation at the Doctoral Workshop de la Swiss Society of Health Economics in Luzern in 2018.

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