

## **Dietary intake among adolescents in Sweden, with focus on sugars intake and effects of health promotive efforts**

A poor diet is one of the main impacts on the global burden of disease, associated with obesity and diet related non-communicable diseases. Previous research suggests that food habits adopted in childhood and adolescence track into adulthood, thus health promotion regarding food habits should be directed towards children and adolescents to prevent diet-related diseases later in life.

In Sweden, dietary intake of adolescents is unsatisfactory in relation to dietary guidelines. Insufficient intakes of vegetables and fruits have been shown and conversely excessive intakes of foods such as sweets, cookies, snacks and sugary drinks contributing with high energy and low nutritious content. Whether sugars intakes among adolescents are in accordance with current recommendations have been difficult to evaluate as there are no established methods in Sweden to discretize the sugars to limit (added or free sugars) from naturally occurring sugars. Apart from worrisome dietary intake among the general Swedish' adolescent population, disparities in dietary habits between people according to their socioeconomic status (SES) have been observed, where adolescents in families with lower SES have less healthy dietary habits and are more prone to a worsened health compared to individuals with higher SES.

As diet is a preventable risk factor, actions can be taken to aid more healthful dietary habits and counteract inequalities in diet, where health-promoting strategies can assist to facilitate healthy lifestyles. A strategy to promote healthy eating is to use nutrient profiling (NP), i.e. categorizing of foods according to their nutritional composition. The use of NP is common in nutrition labelling, where front-of-pack labels (FOPL) assist the consumer towards making healthier food choices. A FOPL widely recognized in Sweden is the Keyhole symbol. However, the nutritional impact of shifting to a Keyhole compliant diet on adolescents' dietary intake have never previously been investigated.

The overall aim of this doctoral thesis is to study dietary intake among adolescents in Sweden, with focus on sugars intake and effects of health promotive efforts. Specific objectives are: (I) to describe food habits and perceived health of adolescents living in a multicultural area characterized with low SES in comparison with a representative national sample of adolescents of the same age, and to examine the effects on food habits after a two-year empowerment based health promotive school intervention; (II) to refine and develop a procedure to estimate added and free sugars content in food items, to implement this to all food items used in a Swedish national dietary survey on adolescents, and further to describe sugars intake among Swedish adolescents; (III) to investigate how much sugars adolescents with different SES consume, distinguished between added sugars, free sugars and total sugars respectively. Furthermore, to examine the main food sources of added, free and total sugars and consumption differences between SES groups as well as to illuminate foods with high contents of the sugars; and (IV) to investigate the effectiveness of the FOPL Keyhole symbol on nutritional quality in adolescents.

In paper I, data from a prospective empowerment based school intervention study, i.e. 'How-to-Act?', with data (n=135) collected 2014-2016 is used, together with the national representative adolescent sample from the 'Health Behavior in School-aged Children' (HBSC) cross sectional study (n=2292), data collected 2014. The previously collected dietary data of a national representative sample of adolescents (n=3099) in Swedish' school years 5, 7-9 and 11 ('Riksmaten Adolescents 2016-17') is furthermore used in paper II, III and IV. Ages covered are ranging between 11-19 years old.

This thesis will contribute with new understandings of dietary intakes among adolescents in Sweden, and evaluate current intakes in relation to present recommendations. The results will provide guidance for future development of recommendations concerning diet and health promotive efforts.