

Persuading more school children to eat fruit and vegetables

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Credit: Cecilie B. Høstmark, UiO

Twenty years ago, 4 out of 10 European children ate fruit and vegetables daily. Today, the proportion is the same, in spite of schemes to provide children with fruit at school. Why hasn't there been more improvement?

A [school](#) decides to start serving their pupils [fruit](#). "Now children will eat more fruit every day," the school and authorities think happily, as

they hand out the fruit. After a while, parents think: "It's really great that the children are given fruit at school, that means we don't have to think so much about it." Next time they do their shopping, they stop putting fruit in their trolley.

After some time, it becomes clear that the children are still eating less than the recommended amount of fruit.

This example comes from professor Nanna Lien at the Department of Nutrition at the University of Oslo. She has carried out two large-scale projects in order to examine how system dynamics can be used to understand the way in which various factors are connected with [public health policies](#), and to evaluate such policies. The results are published in *Obesity Reviews* and the *European Journal of Public Health*.

Complex to establish healthy eating habits

"Researchers have traditionally developed and evaluated interventions where the goal has been to influence factors that the researchers believe directly promote or inhibit intake of fruit, or that reduce the proportion with overweight. However, this type of study does not take into consideration that these factors are not always connected in a linear chain of causes. They may also be connected by causal loops linked to one another in a system," she says.

In a linear causal approach, we assume for example that if only people know what is healthy to eat, they will adopt a positive attitude to [healthy eating](#) and will then eat healthily.

This is where Nanna Lien believes that we have not realized how complex it is to establish healthy eating habits.

Experiences with school fruit schemes

The European school fruit and vegetable scheme provides [school children](#) with free fruit and/or vegetables. In addition, the pupils participate in some educational activities on the subject of fruit and vegetables and information about the scheme is disseminated amongst the general population.

"In spite of all this, the proportion of school children who eat fruit every day has remained at 40% for the last 20 years. In our European Policy Evaluation Network (PEN), we examined reports from the countries participating in the school fruit scheme and also [scientific publications](#) about the scheme and publications about other measures linked to school fruit. Then we drew up a map showing the mechanisms and systems that affect children's intake of fruit and vegetables," explains Lien.

If too few children actually eat the fruit, the scheme can have the opposite effect

The map shows that eating fruit and vegetables together with other school children can be an important trigger for establishing good eating habits. But at the same time, this causal loop must be driven in the right direction in order to have the desired effect.

"If the offer of fruit is there, but few children actually eat it, fewer children will be exposed to others who communicate positive attitudes about eating fruit; they won't think about trying fruit or eating it every day. The end result can then be the opposite—more and more children drop eating fruit and vegetables because doing so is not part of a joint, positive activity. The map includes several other of these feedback loops, which either drive the system in the desired direction or counteract or balance the changes in an attempt to maintain the status

quo," says the professor.

According to the Lien, the map opens up new possibilities that schools and the authorities should consider in order to get the greatest effects from school fruit schemes.

Adolescents and researchers looked at policy proposals to prevent obesity

In the EU project CO-CREATE, [adolescents](#) from five European countries collaborated with Lien and the research team to develop policy proposals for obesity prevention. One in seven 15-year-olds in Europe is overweight or obese. This number is expected to increase to one in five by 2025.

"Some of the adolescents suggested giving all young people one hour of physical activity for free each week. They also wanted good and practical education about food and nutrition, and school canteens serving healthy food so that dietary knowledge could be translated into healthy habits such as eating fruit and breakfast. Other suggestions were introducing a tax on [sugary drinks](#) and banning all marketing of unhealthy foods targeted at [children](#) under 18 years old," says Lien.

Lien points out that there are large variations between countries. Amongst boys and those coming from a low socio-economic background, there is a higher proportion with overweight and obesity than amongst girls and those from a high socio-economic background.

Pressure at school can also play a role in obesity

As part of the study, the adolescents drew up a map showing the factors they thought were causing this. Lien and her colleagues used the maps to

develop a model that can simulate the effect of different combinations of policies.

"We used system dynamics to achieve this, and ran the simulations across 24 cases. They showed that implementing policies targeted at exercise, eating fruit, life dissatisfaction, school pressure and skipping breakfast seemed to have the greatest potential across all 24 cases," says Lien.

Professor Lien points out that exercise, fruit and breakfast match the policy proposals that the adolescents themselves prioritized the highest. The adolescents did include life dissatisfaction and school pressure as important factors in the system maps in all the countries. Nevertheless, they had not prioritized [policy](#) proposals on these factors.

"It is therefore especially exciting to note that the simulation model indicates that policies directed at life dissatisfaction and school pressure can have an effect on prevalence of overweight. This hypothesis do require further research, though," says Lien.

More information: Eduard Romanenko et al, Assessing policies to reduce adolescent overweight and obesity: Insights from a system dynamics model using data from the Health Behavior in School-Aged Children study, *Obesity Reviews* (2022). [DOI: 10.1111/obr.13519](https://doi.org/10.1111/obr.13519)

Mahshid Zolfaghari et al, Applying a systems perspective to understand the mechanisms of the European School Fruit and Vegetable Scheme, *European Journal of Public Health* (2022). [DOI: 10.1093/eurpub/ckac054](https://doi.org/10.1093/eurpub/ckac054)

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