

## « F&V INTAKE AND CONSUMPTION OF UNHEALTHY SNACKS »

### Editorial

#### Side effects of fruit and vegetable promotion

In this issue of the IFAVA newsletter three short papers are presented focussing on possible positive 'side effects' of promoting fruit and vegetable intakes. Because children across Europe eat fewer fruits and vegetables than is recommended by health authorities, interventions to promote fruits and vegetables among youngsters are developed and implemented in many countries in Europe. Such interventions include health education efforts and fruit and vegetable schemes aiming to make these foods more available and accessible.

It has been argued that increasing fruits and vegetables may also contribute to preventing overweight and obesity in children. But this can only be the case if increased fruit and vegetable consumption is compensated by lower intakes of other foods that are higher in calories.

Dr. Elling Bere from the University of Agder, Kristiansand, describes results from the Norwegian free school fruit program. Fruit and vegetable schemes in Norway have been accompanied by good-quality scientific research in the development, implementation and dissemination phases, and Norwegian school fruit programs are therefore among the best researched school health promotion efforts.

In one of these studies it was analysed if the free school fruit had dietary effects beyond increasing fruit and vegetable intakes. Bere reports that the free fruit program resulted in lower consumption of unhealthy snack foods, and these effects were still apparent one year after the intervention had ended; and some evidence for effect was even observed at three years follow-up. Further analyses indicate that these effects were especially present among children from lower socio-economic backgrounds. This is very encouraging, because most health promotion interventions are more effective in high socio-economic status groups, leading to larger health disparities instead of helping to decrease the socio-economic health gap. The Norwegian school fruit scheme may be an exception to the rule, and may indicate that interventions focussing on improving availability of healthy foods, rather than mere education, have potential in contributing to reducing health disparities.

Dr. Nannah Tak and colleagues from the VU University Medical Center in Amsterdam present similar results. In their study of a Dutch fruit and vegetable scheme it was found that children participating in the free fruit and vegetable scheme were less likely to bring unhealthy snack foods to school. This study further supports that fruit and vegetable promotion may have valuable 'side effects' on unhealthy snacking.

The third paper in this newsletter, by Dr. Gomes from the National Cancer Institute of Brazil argues that fruit and vegetable promotion should be part of, or accompanied by, discouraging consumption of unhealthy snack foods. However, Dr. Gomes argues that such unhealthy snack foods are more interesting to the food industry. He also claims that the industry's efforts to contribute to higher intakes of fruit and vegetables, by bringing new products on the market that contain fruit and vegetable-ingredients, may have negative side effects. Such products may lead to reductions in real fruits and vegetables, and thus contribute to lower intakes.

These three IFAVA newsletter papers build a case for promotion of the "real thing" - fruits and vegetables - and if successful, this may even contribute to somewhat lower intakes of less healthy snack foods.

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# The effects of a fruit and vegetable program on unhealthy snacks during mid-morning school breaks

## Results of the Dutch Schoolgruitem Project

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In the Netherlands, the Schoolgruitem (a Dutch acronym for 'school fruits and vegetables') Project was developed to promote fruit and vegetable (F&V) intake among primary schoolchildren<sup>1,2</sup>. The main strategies within this project targeted availability, accessibility and exposure of F&V at school through a F&V scheme. The children in the intervention group received a piece of fruit or ready-to-eat vegetables for free twice a week. The health enhancing effects of increased F&V intake would, however, be even more apparent if the increased F&V intake additionally led to a lower intake of unhealthy, high calorie snacks. Interventions that shift choice from high calorie snacks to healthier lower calorie snacks (i.e. F&V) can reduce caloric intake, thereby enhancing the efficacy of obesity prevention and treatment. However, little is known about whether interventions aimed at increasing F&V intake result in a lower intake of unhealthy snacks.

Therefore, the aim of this study was to investigate if the Dutch Schoolgruitem Project could additionally reduce the intake of unhealthy, high calorie snacks during mid-morning school breaks.

Children and parents were both involved in this study. The study applied a longitudinal design with a baseline and two follow-up measurements (one year and two years later). Separate questionnaires for children and their parents were developed, both based on the validated Pro Children questionnaires<sup>3</sup>. Participating children (mean age 9.9 years at baseline) and their parents completed the questionnaires at all three measurements, allowing data analyses based on child as well as parent-reports. The amounts of F&V and unhealthy snacks for consumption at school during the mid-morning break were measured using a single item question included in these questionnaires. Finally, 771 children and 435 parents were included for this study. Multilevel autoregressive logistic regression models with a three-level structure (school, child and time) were used to assess the effect of the intervention on both F&V and unhealthy snack consumption.

**Children of the intervention group brought more often F&V and fewer unhealthy snacks from home to school than the children of the control schools.**

Most children brought no F&V or unhealthy snacks from home to school to be consumed during the mid-morning break. The percentage of children in the intervention group that brought F&V from home to school was somewhat higher than the percentage in the control group for all three measurements.

Based on the child-reported data, no significant associations were observed between the number of F&V and the number of unhealthy snacks brought from home to school for the three measurement times (baseline  $X^2=0.084$ ;  $p=0.772$ , first follow-up  $X^2=0.028$ ;  $p=0.867$ , second follow-up  $X^2=1.333$ ;  $p=0.248$ ).

According to child-reported data, the children of the intervention group

brought F&V from home to school at follow-up significantly more often than the children of the control schools (OR=1.41, 95% CI=1.04–1.90). The results of the parent-reported data supported this observation (OR=1.58, 95% CI=1.10–2.28). Adjusting for the amount of unhealthy snacks brought from home did not influence the results. According to child-reported data, the children of the intervention schools brought fewer unhealthy snacks from home to be eaten in the mid-morning break at follow-up (OR=0.56, 95% CI=0.34–0.92), which was also unaffected by the adjustment for the number of F&V snacks brought from home.

**The Schoolgruitem intervention is an effective way to increasing F&V consumption and decreasing consumption of unhealthy snacks in the mid-morning break among primary schoolchildren.**

The results of this study indicated that children in the intervention group more often brought F&V and less often brought unhealthy snacks from home to school. Based on the parents' reports, only significant positive effects were found on the amount of F&V brought from home, and no effect on the number of unhealthy snacks. This might be partly because of power issues since parent-report data were available for fewer children.

It is often assumed that increasing F&V intake would almost automatically result in a decrease in the intake of other foods, such as unhealthy snacks. Few studies, however, have actually assessed whether this is the case, and this lack of compensation could lead to a higher calorie intake and contribute further to unnecessary weight gain. No significant associations were found between the amount of F&V and the number of unhealthy snacks, and the results showed that no effects on the number of snacks brought from home could be explained by the amount of F&V and vice versa. This might indicate that F&V and unhealthy snack consumption are not strongly associated, nevertheless increasing F&V was moderately associated with a decrease in the unhealthy snacks.

The behaviour choice theory<sup>4</sup> might help explain the results of this study. This theory is designed to understand how people allocate choices among alternatives. People can choose an alternative for a preferred product when the availability of this product is constrained. In this intervention, it might have been that access to snacks was constrained because parents were influenced by the subscription program and provided fewer unhealthy snacks to be consumed during the mid-morning break. Another solution to restricting access to unhealthy snacks might be school policy. This suggests that (primary) schools should introduce a restrictive snack policy as part of a multi-faceted approach to improve children's diet quality.

Despite the fact that the intervention was not primarily developed to decrease the amount of unhealthy snacks, this study provides some evidence that the Schoolgruitem intervention was effective in increasing F&V consumption and decreasing consumption of unhealthy snacks during the mid-morning break. It further indicates that restricted access to unhealthy snacks can play an important role in reducing snack intake during school breaks.

Based on: Tak et al. *J Hum Nutr Diet*. 2010 23(6): 609-615

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# Free school fruit in Norway – decreased consumption of unhealthy snacks

— Elling Bere —

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Children in Norway eat too little fruit and vegetables, and they eat too much unhealthy snacks. The national Norwegian authorities have made a considerable effort to increase school children's fruit and vegetable intake at school. A subscription program for grades 1-10 was initiated in 1996 and made nation-wide in 2003 in collaboration with the Norwegian Marketing Board for Fruits and Vegetables. In this program the schools initially choose to participate or not, and then the pupils at the participating schools can decide to subscribe or not. The cost for the parents is currently NOK 2.50 per school day (approximately EUR 0.30). The pupils who subscribe receive a piece of fruit or a carrot each school day, usually in connection with their lunch meal. The program is subsidized by the Norwegian Government with NOK 1.00 per pupil per school day.

The subscription program, and a free pilot version of the same program (without parental payment), were evaluated in the research project Fruits and Vegetables Make the Marks (FVMM). In a school randomized trial including 38 schools, a cohort of 1,950 pupils (initially in 6th and 7th grades) was followed from school year 2001-02 to school year 2004-05. The results reported were that both programs increased FV intake, but that the free program was much more effective than the subscription programme (effect sizes were 0.9 and 0.2 portions/day on FV intake at school, respectively, compared to control schools)<sup>1</sup>, and that one year of free school fruit also had a positive long term effect on adolescents' FV intake both one<sup>2</sup> and three<sup>3</sup> years after the end of the free fruit intervention (effect sizes were about 0.5 and 0.4 portions/day, respectively, compared to control schools).

Interesting effects of the free school fruit program were also seen on consumption of unhealthy snacks (scale of soft drinks, candy and potato chips). The free fruit program resulted in a decreased consumption of unhealthy snacks measured both while the programme was running<sup>1</sup> and one year after the end of the intervention<sup>4</sup>. An interaction between socio economic status (SES, indicated by parental college/university education or not) and the intervention was found, and an effect of the intervention on unhealthy snacks were only seen among low SES pupils; effect size was 1.0 times/week while the program was running and 1.2 times/week a year later (Figure I). Low SES pupils also consumed considerably more unhealthy snacks than high SES pupils at baseline (Figure I). Also three years after the end of the intervention, the intervention group ate less unhealthy snacks than the control group<sup>3</sup>, however, the difference was not statistically significant.

From fall 2007, an official free school fruit program (without

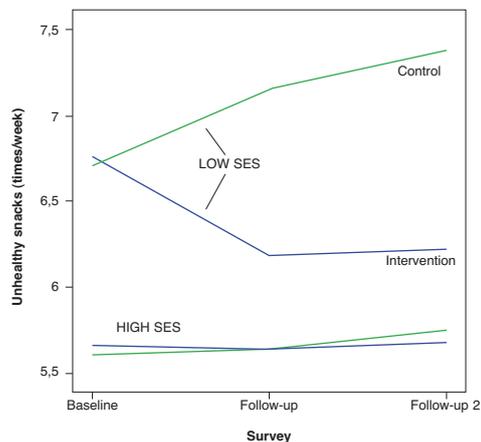
parental payment) was implemented in all secondary elementary schools (grades 8-10) and all combined schools (grades 1-10) in Norway. A new repeated cross-sectional survey at the same schools was conducted within the FVMM project in 2008, making it possible to evaluate the effect of this nation-wide implementation of the free school fruit program.

The increase in fruit intake from 2001 to 2008 at schools taking part in the official school fruit program from 2007 (i.e. schools with grades 1-10) was much greater than at schools not getting free fruit (i.e. schools with grades 1-7) (effect size was 0.74 portions/day)<sup>5</sup>. No effect was observed for vegetable intake. However, again a decrease in consumption of unhealthy snacks was observed at the schools enrolling in the free fruit program, compared to the control schools, and again it was only observed among children of parents without higher education (unpublished data).

In conclusion, these evaluations of free school fruit in Norway clearly indicates that increased intake of fruits decreased the consumption of unhealthy snacks; at least for low SES children with a high consumption of unhealthy snacks (i.e. those that need it the most).

Figure I

Consumption of unhealthy snacks in intervention and control groups before the intervention (baseline), while the free fruit intervention was running (follow-up) and one year after the end of the intervention (follow-up 2). Mean values, stratified on SES.



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# Snack healthy or unhealthy, but snack: the snack barrier to increase fruits and vegetables consumption in Latin America.

— Fabio S Gomes —

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Despite the increasing recognition of relevance and the commitment to promote fruits and vegetables (FV) consumption in Latin-America and worldwide as a main marker of health and adequate eating, a very low consumption persists, followed by several barriers including the advance of competing foods that undermine good eating practices.

Obesity-related diseases and obesity epidemic have reached almost homogenously most countries in most continents, people from all ages, genders, and socioeconomic status<sup>1</sup>, and the need to stop the advance and reverse this is becoming more pressing year by year. The source of these problems include high energy-dense foods, such as sugary breakfast cereals, cookies, fast-food and sugary drinks; all of which can act as causes of weight gain, overweight, and obesity<sup>2</sup>, which in turn leads to recommendations for restriction.

On the other hand, it is recommended that menus should preferably include low energy-dense foods such as FV as probable protectors against weight gain, overweight, and obesity, several types of cancer, and other non-communicable diseases<sup>2</sup>. However it is noteworthy that the protective effect from FV against obesity is achieved when FV are able to dislocate high energy-dense foods and sugary drinks from the daily menu of consumers. That clearly indicates that the promotion of FV consumption cannot be conceived apart from the regulation of competing foods.

## Competing recommendations

One of the reasons for the consumption of FV to be far below the World Health Organization (WHO) recommendation, is the existence of other recommendations that are pushing the consumption of other foods - which are high energy-dense, and high in sugar, salt and fats - rather than FV. While on one hand the WHO recommends the daily consumption of at least 400g of FV<sup>3</sup>, on the other hand, food manufacturers recommend push the consumption of high energy-dense, salty and sugary foods and drinks by means of advertisements and marketing practices, without advising any restriction.

In Latin-America the absence of regulations to restrain or reduce the demand for unhealthy foods is markedly worse than in the European Union and North America. Multinational food companies' act much more aggressively in emerging markets, such as the ones found in Latin-America, and the main reason is

the remaining major share of traditional foods in these populations' diet. In Brazil, for instance, only one fifth of population's diet come from ultra-processed products (ready-to-eat or ready-to-heat)<sup>4</sup>, so from the big snack industry perspective there is a major opportunity for their products. This contrasts to other countries where this share is already high and there is a small margin available. In the Latin-American scenario any sort of regulation that could impede the advance of ready-to-eat or ready-to-heat products over traditional foods including FV is not welcomed by the manufactured food industry.

## Snack healthy or unhealthy

Big snack companies care about their images and do not want to be associated with a problem such as the obesity epidemic. These companies have now started investing in the reformulation of their own products, reducing sodium, sugar and fats and identifying them as healthier alternatives. This approach can be potentially harmful if not associated with regulatory measures for the commercial promotion of these products, since the issue is not only about food itself but about diet and ways of eating.

Advertisements of ultra-processed products such as a cracker named as 'healthier' because of salt reduction, can promote the overeating of this product, hence promoting an unhealthy eating of a so called 'healthy' product. Even the healthy image of FV is being used to subvert the unhealthy image of ultra-processed products. Freshfel Europe have shown in the 'Where is the fruit?' study that half of the 207 products analysed had no fruit, or else contained less than 10 per cent fruit<sup>5</sup>. By adding very little percentage of fruits to the product, but highlighting the image of fruits on packaging, companies are able to provide the product with a healthier status in the eyes of consumers<sup>6</sup>.

The discussion on the reformulation of products and the definition of healthier and unhealthier ultra-processed products provide an ongoing focus on the snack way of eating. What matters most for the big snack industry is for people to snack and even help them to have 'healthier' snacks since they keep snacking. While this discussion goes on and on, the scope is moved away from really healthy foods such as FV, and from healthy ways of eating such as sharing the same food with family or friends. Instead of investing time and money promoting fresh and minimally processed foods and healthy ways of eating, the focus is driven to the transformation of unhealthy food products into healthier products, keeping eating practices locked inside the snack world.

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