

## **6 a day Denmark**

### **Increasing availability of and access to fruit and vegetables**

Robert Pederson  
Hanne Vig Flyger  
6 a day - Research  
c/o Danish Cancer Society  
Strandboulevarden 49  
DK - 2100 Copenhagen  
Email: rop@6omdagen.dk

#### **Background**

In 1998, the Danish Veterinary and Food Agency in co-operation with the Danish Heart Association, Danish Cancer Society, and National Board of Health published recommendations for daily intakes for fruit and vegetables. In this report, it is recommended that all persons over 10 years of age eat 600 grams fruit and vegetables daily (1) and a review of recent prospective studies was undertaken in 2002, and confirmed this recommendation (2). It is estimated that an increase in fruit and vegetable intake to 600 grams daily would reduce the risk of cancer and Ischemic Heart Disease by 15 – 30% (1,2). At the time of the recommendation fruit and vegetable intake within the general population was 280 g/day (3).

Prior to this a variety of campaigns, and general information have contributed to increasing the level of health knowledge in Denmark, resulting in 99% of the adult population is aware that fruit and vegetables are healthy in 1995 (4). Other studies show that especially those responsible for meal planning and preparation in families with children are motivated to prepare food with more fruit and vegetables (6,7). In addition, the 1995 national dietary survey and analysis of data from Denmark's Statistical Bureau, suggests that knowledge and motivation are not sufficient to increase fruit and vegetable intake in Denmark (3).

#### **Aims and objectives**

The 6 a day research project was initiated in 1999 with funding from the private sector and the Ministry of Food, Fisheries and Agriculture, with the aim of identifying effective methods for increasing sales and consumption of fruit and vegetables. The 6 a day project is a public-private partnership with partners from governmental food and health organisation, non-governmental health organizations and the fruit and vegetable industry.

3 key areas were identified as settings for this research: Schools, workplace and retail settings. Methods focused on increasing the availability of and access to fruit and vegetables in these settings, instead of health education. In 2000, these activities were supplemented by campaign activities, aimed at increasing awareness of the 6 a day message and communicating the findings of the research project.

The interventions included:

- Fruit and vegetable subscription scheme for school children
- Worksite fruit schemes
- Worksite Canteen Model Project
- Retail project in the town of Soenderborg

- Weekly drop-box schemes

## Results

### *School fruit and vegetable scheme*

After initial difficulties in recruiting schools to participate in the project, children at 4 schools were offered fruit and vegetable subscriptions at a price of app. 0.4 Euro/day (1 pc. fruit/day). Fruit and vegetable intake was measured at baseline using a validated 24h recall prior to scheme and follow-up 5 weeks after scheme start at intervention 4 schools and 4 control schools. Control schools were chosen from certain demographic criteria. Results showed that children at intervention schools ate more fruit. Surprisingly, a significant increase in fruit intake was shown in *both* subscribers (0.4 portions/day) and non-subscribers (0.3 portions/day), compared to control schools (8).

### *Workplace fruit schemes*

Workplace fruit schemes covers a wide variety of schemes, ranging from extra fruit supplied to employees by canteens to private wholesale companies delivering ready to eat fruit in decorative baskets. Financing of schemes ranged from 100% employer paid schemes to 50/50 financing schemes paid for by individual employee to. F&V intake was measured at 5 intervention and 7 control worksites at baseline (n=283) and follow-up (n=248) using a modified 24 h recall instrument. The results showed, a significant increase of 70 g fruit per day for employees at intervention workplaces, concurrently male employees had a 50% decrease in candy and sweet snacks (9).

### *Demonstration personnel restaurants and canteens*

5 demonstration canteens worked with increasing the amount of fruit and vegetables served in canteens. Personnel and management were involved in defining the scope of activities and implementation, and canteen personnel worked closely with the project team. Intake was measured by weighing fruits and vegetables served minus waste at baseline, during intervention and 1 yr follow-up. Significant increases in fruit and vegetable intake were shown at all 5 demonstration canteens, on average 70 g/day/customer, and had increased to 95 g/customer at follow-up (10)

### *Retail project in Soenderborg*

The town of Soenderborg was chosen as test area because its relative isolation, demographic criteria (i.e. degree of urbanization) and number of retail outlets. Interventions were chosen by storeowners in cooperation with the project team and implemented over a 2 yr. period from March 2000. Telephone interviews using a modified Food Frequency Questionnaire (FFQ) were administered at baseline and quarterly during the intervention period (7 surveys total). Results showed that inhabitants in Sonderborg, increased their intake of fruit and vegetables during the intervention period, but that intake was lower than the national average. However, the most noteworthy effect of the intervention seems to be increased awareness of 6 a day, with awareness being equal to national average at intervention start rising to a level significantly higher than national average, 55% and 36 % respectively.(11).

### *Weekly drop-box schemes*

Weekly drop box (fruit and vegetable subscription) schemes are a form of direct distribution of fruits and vegetables to consumers. The project team, in close cooperation with the largest distributor of drop boxes, measured the effect that direct distribution had on total F&V intake. Results of the FFQ showed, that the intervention (n=353) did not have a significant effect on total F&V intake, but did seem to have an effect on men's intake of prepared/cooked vegetables (12).

## Applications

Interventions that address increasing availability of and access to fruit and vegetables are an effective tool for changing F&V intake in a positive direction. This may be especially true in populations where knowledge of health benefits of F&V is high. All methods showed strengths and weaknesses, both in terms effect, underlying processes that facilitated interventions and cost of large scale implementation. School fruit schemes, Company fruit schemes, and Model Canteen Projects all showed promising results. Weekly drop box schemes did not show a significant effect on total f&v intake, but showed promise in increasing intake of vegetables among men, where school fruit and company fruit schemes were successful in increasing fruit intake between meals.

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