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Supports the

INTERNATIONAL YEAR OF
FRUITS AND VEGETABLES
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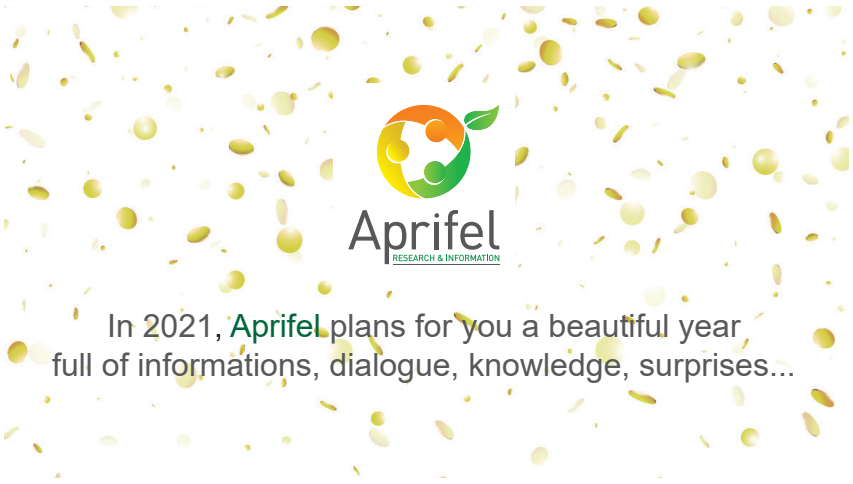
ACTIONS AND INTERVENTIONS TO INCREASE FRUIT AND VEGETABLES CONSUMPTION

2021, as the International Year of Fruit and Vegetables, represents explicit support of the highest level for the fruit and vegetable sector (F&V), and offers an unprecedented opportunity for entities around the world that work tirelessly to promote F&V consumption, improve food security and highlight the relevance of F&V in healthier and more sustainable food systems. Actions and interventions to facilitate access to nutritious, safe and tasty F&V must be integrated into public health policies to create healthy food environments, where healthy food is available, accessible and affordable, for all, leaving no one behind depriving them of the opportunity to achieve the highest level of health possible. F&V are much more than the sum of their nutrients, as demonstrated by the work of Taylor C. Wallace, *et al.*, who assesses the protective effects of daily F&V consumption on numerous health outcomes, hence supporting public health polices to promote F&V consumption. School setting offers an ideal framework to carry out this type of interventions. Holly R. Wethington *et al.*, identify as effective those that are based on school meals or F&V served as snacks, reporting an increase of up to 20 %. On the other hand, the last review on the effectiveness of workplace health promotion interventions summarized by Jean-Michel Lecerf and Suzanne Lanckriet, concluded that actions focused on physical activity and diet, where F&V are essentials, can have a positive impact on body weight related outcomes.

Happy International Year of Fruits and Vegetables! Your dietary essentials.

Manuel Moñino
AIAM5 Coordinator
Global Alliance for the Promotion of Fruit and Vegetable Consumption "5 a day", SPAIN



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Umbrella review on health benefits of fruits and vegetables and recommendations for enhanced public policy to improve their intake

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Promoting the consumption of fruits and vegetables (F&V) is the cornerstone of global nutrition policies. Fruits and vegetables are nutrient-rich foods with low energy density and a diverse array of dietary bioactive compounds that have been shown to prevent the development and progression of various chronic diseases. The 2020-2025 U.S. Dietary Guidelines for Americans recommend that F&V constitute half of the plate at each meal.

However, only about 15 % of U.S. population meets daily fruit recommendation and only 10 % meets the recommendation for vegetables[1,2]. The current servings are closer to 3/day as opposed to 5/day.

This narrative umbrella review summarizes systematic reviews of both clinical and observational evidence (PubMed database, from inception until May 21, 2019; n=96 systematic reviews) on the potential health benefits of F&V so that public health messaging is reflective of current science.

Effects of fruit and vegetable consumption on health outcomes

Cardiovascular diseases (CVD)

Current evidence suggests that F&V have the strongest effects in relation to prevention of CVD. At least 16 systematic reviews to date have assessed the effect of fruits and/or vegetables on cardiovascular outcomes or intermediate outcomes. The most recent high-quality systematic review by Aune *et al.* (2017) found nonlinear dose-response relationships between fruit and vegetable intake of up to 800 g per day and reduced risk of coronary heart disease, stroke, and CVD.

Hundreds of epidemiological analyses have provided consistent longitudinal evidence that F&V have a protective effect against CVDs.

Cancers

The review by Aune *et al.* (2017) showed that each 200 g/d increase in fruit and vegetable consumption was associated with a 4% reduction of all-cause cancer risk. At least 44 systematic reviews have assessed F&V intake and site-specific cancers. According to WCRF/AICR 2018, strong evidence exists to support a beneficial role of F&V in reducing aerodigestive and some other cancers (aggregated).

Other health outcomes

Small randomized controlled trials have shown that specific F&V can influence the risk of type 2 diabetes, obesity, immunity, mental health, chronic kidney disease, etc. However, more research is needed to fully elucidate the role of specific F&V in the development of precise disease prevention strategies.

The report supports intake certain subcategories of F&V, specifically cruciferous vegetables, citrus fruits, dark-green leafy vegetables, and dark-colored berries to have superior effects on certain biomarkers, surrogate endpoints, and outcomes of chronic disease.

Behavioral strategies and environmental changes to improve fruit and vegetable consumption

The scientific evidence for providing public health recommendations to increase F&V consumption for prevention of disease is strong. The most compelling evidence related to the pronounced effects of F&V in the prevention of CVDs.

According to the European Food Information Council (EUFIC), there are multiple drivers of food choice. These include biological (hunger, appetite, taste), economic (cost, income, availability), physical (access, education, cooking skills, time), and psychological (culture, family, peers, meal patterns) factors that have an influence over an individual's food choices[3].

These findings highlight the necessity of behavioral science research to fully elucidate effective strategies to motivate individuals to adopt and improve their lifestyle behaviors.

The environment in which food preferences are learned and expressed, particularly during childhood, can also have a central role in determining future food choice. Parental feeding practices and behaviors, together with the availability of F&V in the household can influence F&V consumption in later life.

Strategies to help ensure that public health messaging is reflective of current science:

- Large, long-term clinical trials on diverse populations and their health outcomes are needed to affirm the collective and individual effects found in observational studies;
- Precise measures for intake (grams instead of serving) can help scientists better compare data across various studies;
- Continued improvement in the accuracy and precision of food composition databases will allow researchers to better monitor intakes of F&V products and assess effects of new product innovations.

Citation: Wallace TC., et al. Fruits, vegetables, and health: A comprehensive narrative, umbrella review of the science and recommendations for enhanced public policy to improve intake. Critical Reviews in Food Science and Nutrition, 2020;60:13, 2174-2211.

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School interventions for healthier food and beverages consumption: four systematic reviews

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Disclaimer: The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention

In the United States (U.S.), approximately 1 in 5 school-aged children suffer from obesity[1], with most youth not meeting recommendations for healthy eating[2,3,4]. Therefore, promoting healthy eating during childhood is critical for reducing the risk of obesity and also for optimal growth[2]. Children consume approximately half of their daily calories at school[5,6], highlighting the importance of changing the school food environment to increase the availability of healthy foods and beverages to support healthier choices[7].

This report includes 4 systematic reviews of the Community Preventive Services Task Force (CPSTF) examining the effectiveness of school-based interventions supporting the intake of healthier foods and beverages. The findings of this review inform researchers, school administrators and decision makers about effective healthy eating and obesity prevention interventions.

Review 1: Interventions based on school meals or fruit and vegetables served as snacks

This first review, published in 2020, included 27 studies with interventions taking place in elementary, middle, and high schools in the U.S., Europe, Australia, Canada, Taiwan and the United Kingdom.

Dietary effectiveness was assessed by fruit and vegetables intake. A total of 8 studies reported a median relative increase of 20 % for fruit and vegetables intake per day following interventions based on school meals or fruit and vegetables served as snacks.

Regarding weight-related outcomes:

- 3 studies reported BMI z-score with a median increase of 0.01.
- 5 studies reported a decrease of 9.6 % in the prevalence of overweight and obesity combined.

The CPSTF recommends school meal or fruit and vegetable interventions on the basis of improvements in fruit and vegetable consumption and no increase in weight status among school-aged children.

Review 2: Interventions offering healthier snack foods and beverages

The review, published in 2020, included 13 studies, all conducted in the U.S. in elementary, middle and high schools.

Dietary effectiveness was assessed by sugar-sweetened beverage (SSB) intake per day, which was reported by 7 studies. Three of these studies reported a median increase of 0.03 servings of SSB per day, while the other 4 studies reported mixed results.

In addition, a total of 3 studies reported overweight or obesity prevalence according to the CDC definition. One study reported a significant decrease of the probability of being overweight (but no association with obesity) in states having strong laws for the nutrition content of foods and beverages sold in schools. A second study reported that strong laws at the elementary school level were associated with reduced odds of obesity compared with states with no laws (OR=0.57). The third study showed no changes in odds of overweight and obesity combined in students living in states with strong school competitive food and beverage laws compared with those in states with no laws.

According to the CPSTF, evidence on snack foods and beverages interventions is inconsistent.

Review 3: Multi-component interventions to increase availability of healthier foods and beverages

The review, published in 2020, included 12 studies conducted in the U.S., Canada and the United Kingdom, in elementary, middle, and high schools.

Dietary effectiveness was assessed by fruit and vegetable and SSBs. 4 studies reported a relative median increase of 15% for fruit and vegetable intake per day, with 1 additional study reporting an increase in number of times per day consuming fruit and vegetable. Two studies showed a decrease in SSBs [range: -0.3, -0.2], and 1 study reported a slight increase in odds of consuming SSBs

A decreased BMI z-score of 0.01 was found in one study, while a different study reported no change. Overweight and obesity prevalence combined were examined in 4 studies: Two among them noted a population-level improvements in overweight and obesity trends (data not shown).

Moreover, one study found a 1% decrease in obesity prevalence while another one reported reduced odds of being overweight (OR=0.85) or obese (OR=0.92).

The CPSTF recommends multicomponent healthier meal and snack interventions on the basis of evidence of maintaining weight status among school-aged children.

Review 4: Interventions to increase access to water

The review, published in 2020, included only two studies conducted in the U.S. and Europe, one at the elementary level, the other spanned elementary, middle, and high school. One study showed an increase of 1.1 glasses of water per day with no change in soft drink consumption. Both studies reported a small decrease in BMI z-score and overweight and obesity prevalence combined.

Due to the small number of studies available for water access intervention, no recommendation was made by CPSTF to support this type of intervention. The CPSTF stated more research is needed in this area.

Based on: Wethington HR et al. Healthier Food and Beverage Interventions in Schools: Four Community Guide Systematic Reviews. Am J Prev Med 2020;59(1):e15–e26.

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Physical and mental health at work: which interventions are beneficial and to what extent?

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Apart from sleeping time, the time spent at work exceeds the time spent at home. Making use of this time to stay healthy and even improve health status is an ever-increasing challenge, especially since with growing life expectancy, more and more people are affected by chronic diseases, and for longer periods of time.

Beyond this health aspect, employers also benefit from having healthy employees because they take less sick leave, have greater motivation, work harder and thus perform better. Furthermore, the quality of life of employees themselves may be improved by adopting healthy habits, which will have an influence on all spheres of their lives.

The promotion of health is increasingly becoming a peripheral, yet significant concern for companies. Workplace health promotion requires holistic preventive measures encompassing diet, lifestyle, physical activity, correct posture and attitude, stress, sleep and reducing sedentary behaviours. However, assessing the effectiveness of these measures is essential.

This Dutch article is a literature review of studies on workplace interventions published between 2009 and 2018. A search for studies of risk factors for type 2 diabetes and cardiovascular disease, and mental or musculoskeletal health was performed.

Twenty-three reviews were identified, 9 of which were of high quality based on the AMSTAR* quality score.

Favourable effects of interventions on body weight outcomes

Fourteen reviews focused on weight, 3 of which were of high quality. These 3 studies[1,2,3] showed favourable effects on weight outcomes (body weight, body mass index and body fat percentage) for workplace interventions promoting healthy lifestyles, including diet and physical activity.

Inconclusive results on the effectiveness of interventions targeting the risk of metabolic disease

Five reviews focused on metabolic disorders (diabetes) and cardiovascular risk factors (serum lipids and blood pressure) but they were not of sufficient quality, which could explain why the results were inconclusive.

Effectiveness of e-health and cognitive-behavioural therapies on mental health

Six reviews focused on mental health, one of which examined occupational stress. Positive outcomes were observed in 2 high-quality studies, including for well-being, anxiety, depression and stress[4,5]. Methods based on e-health and cognitive-behavioural therapies seemed to be the most effective.

Benefits of resistance training and exercise on musculoskeletal health

Six reviews, including 4 of high quality[6,7,8,9] focused on the prevention of musculoskeletal disorders. A benefit was observed in 75% of the high-quality studies on prevention, particularly in those focusing on instances where resistance training and exercise were offered.

The authors conclude that in general, preventive health interventions in the workplace are useful, but the quality of the studies evaluating them is insufficient to properly identify all the success factors. Prevention cannot be improvised; it must be prepared and its effectiveness assessed.

*A MeaSurement Tool to Assess systematic Reviews

Adapted from: Proper K.I., Van Oostrom S.H. The effectiveness of workplace health promotion interventions on physical and mental health outcomes - a systematic review of reviews. Scand J Work Environ Health 2019;45(6):546-559

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