

Changing dietary behaviour in schools – what does the evidence show?

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Presentation Outline



Background – what is the problem?



Evidence from existing interventions



Using incentives to promote behaviour change



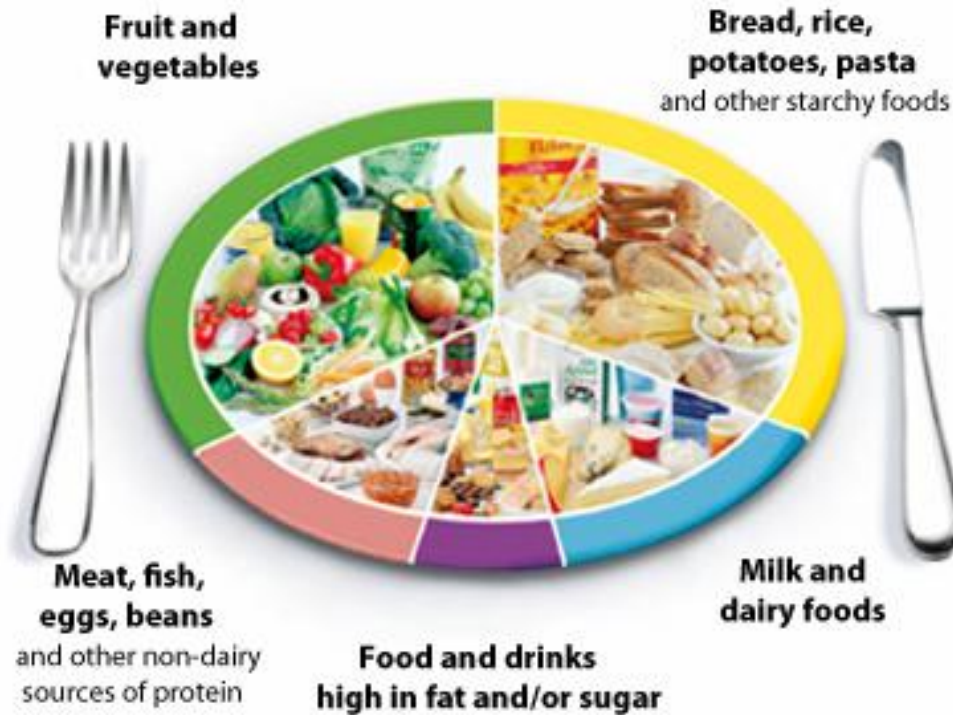
Future directions



BACKGROUND

WHAT IS THE PROBLEM?

Dietary Recommendations for Children



Current Eating Habits (Younger Children)

Fruit and vegetables:

Fruit 108 g/day
Veg 97g/day
(≤ 10 year olds)



Fibre:

11.1-11.8g
(4 - 18 years)



Oily fish:
Below recommendations



Sugar:

exceeded
requirements
(4-10 years)



 Public Health
England

 Food
Standards
Agency
food.gov.uk

National Diet and Nutrition Survey
Results from Years 1, 2, 3 and 4
(combined) of the Rolling Programme
(2008/2009 – 2011/2012)

A survey carried out on behalf of Public Health England
and the Food Standards Agency

Vitamins:

from food were
close to/above
requirements



Total fat:
met requirements



Saturated fat :

exceeded requirements
(4-10 years)



Minerals:

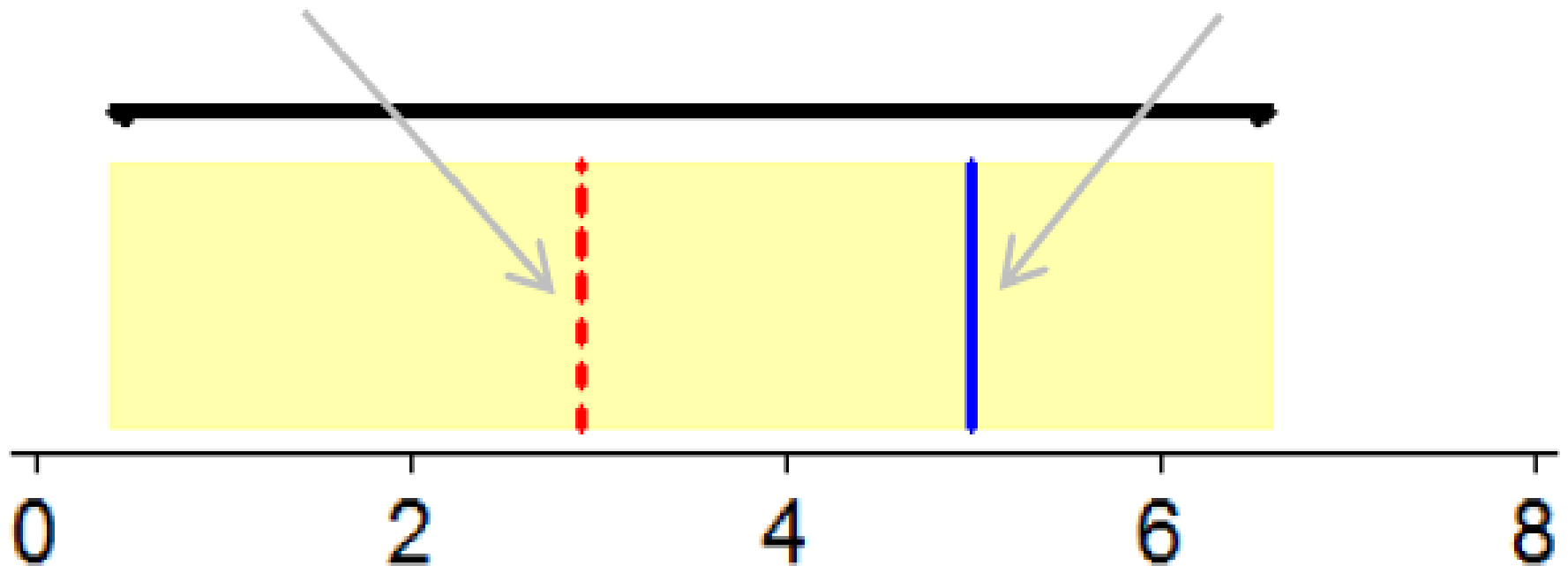
Mean intakes close
to/above requirements
(≤ 11 year olds)



Current Eating Habits (Older Children)

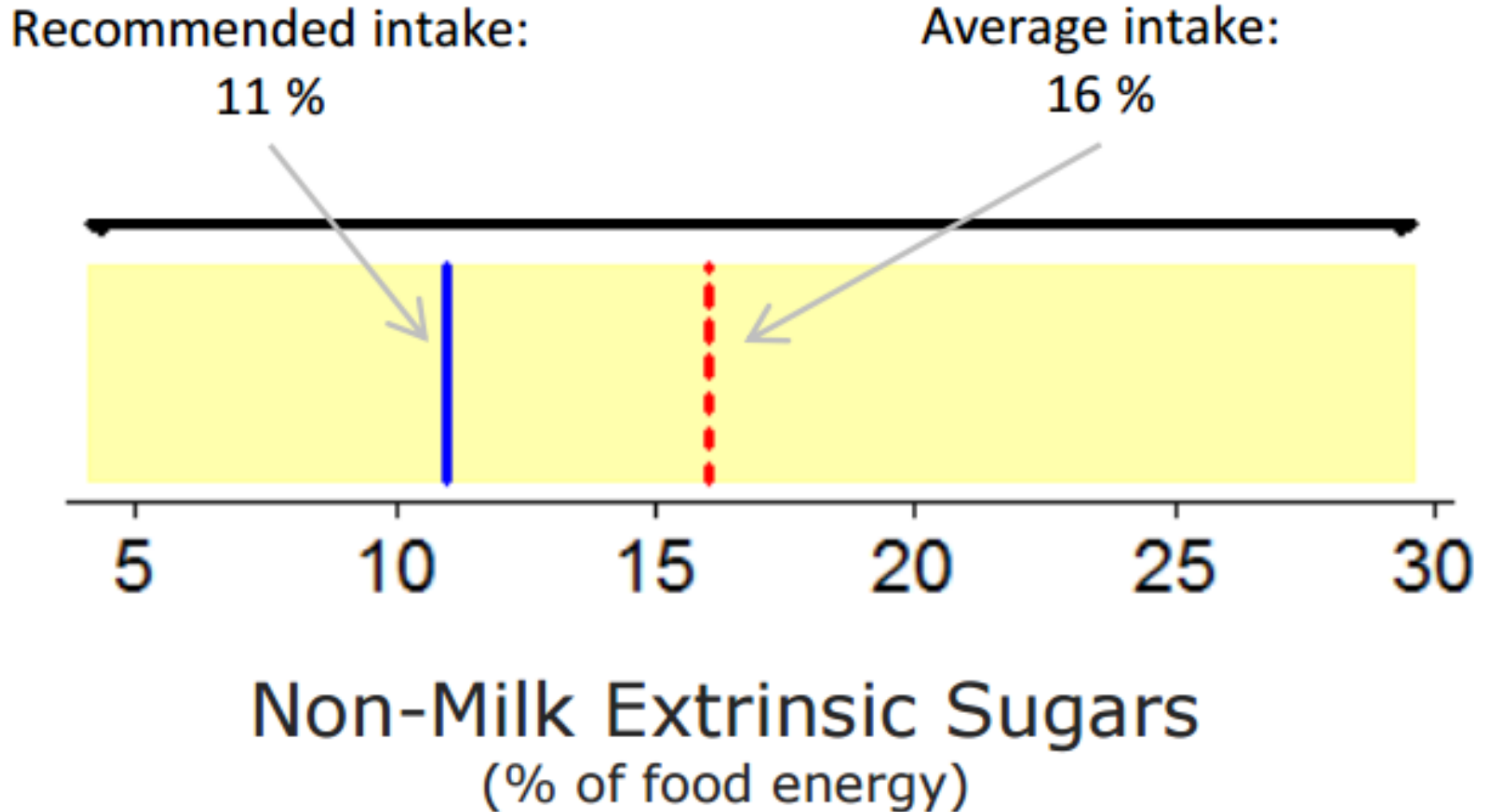
Average intake:
2.9 portions

Recommended intake:
5 portions



Fruit & vegetables

Current Eating Habits (Older Children)



Impact of Poor Diet in Early Life

Now...



- Childhood obesity
- Childhood Type 2 diabetes
- Cognitive impairment
- Psychological problems

Later...

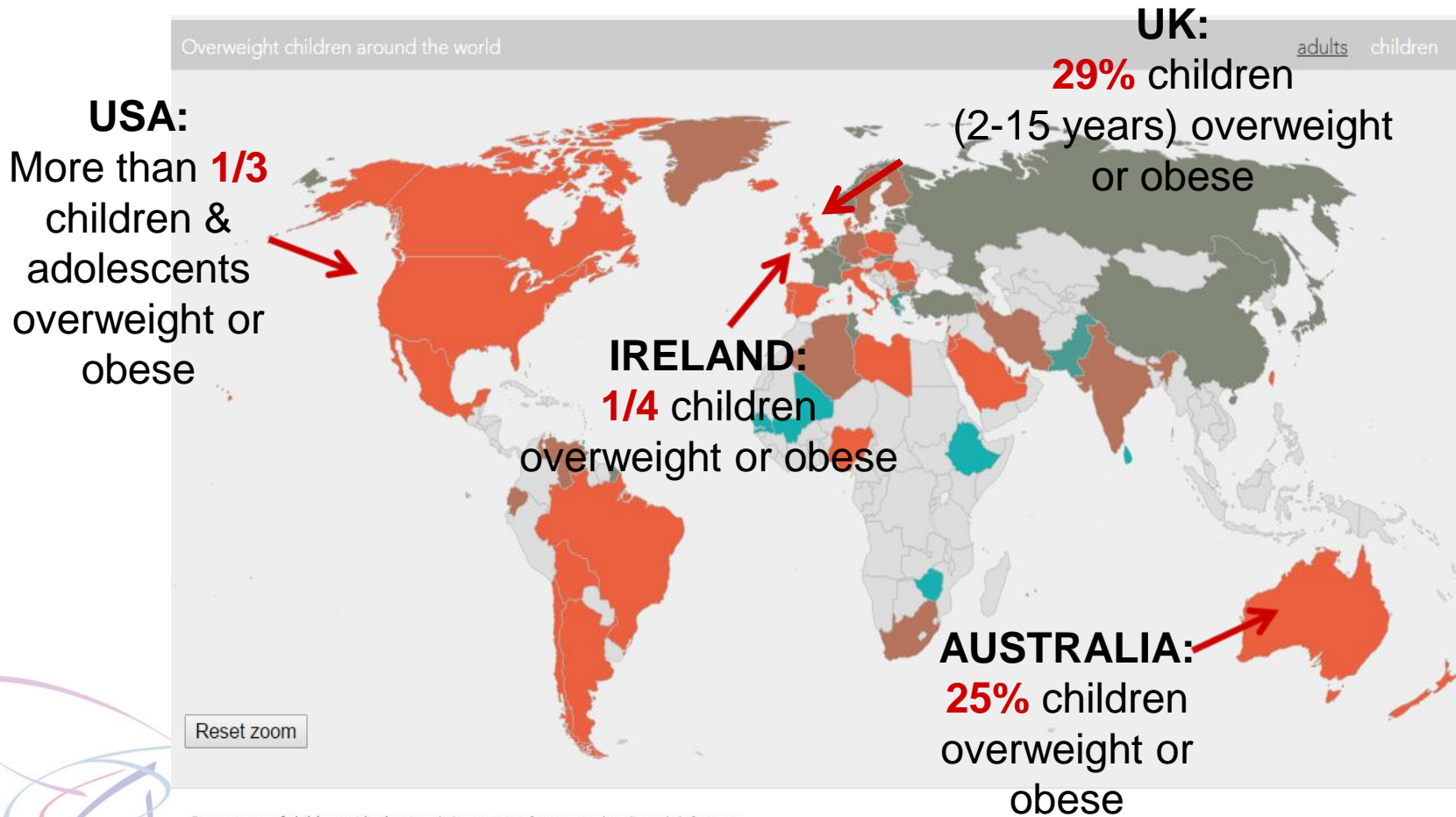


- Obesity
- Type 2 diabetes
- Heart disease
- Hypertension
- Some cancers

And more...



Childhood Obesity

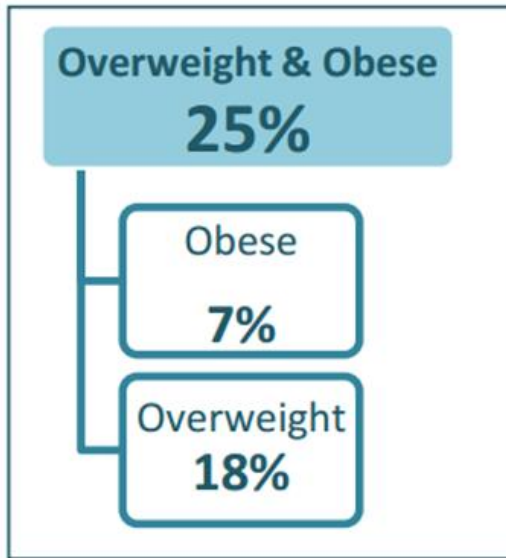


Sources:

- http://www.noo.org.uk/NOO_about_obesity/child_obesity/UK_prevalence
- <http://www.cdc.gov/healthyyouth/obesity/facts.htm>
- <http://www.safefood.eu/Childhood-Obesity/Facts.aspx>
- <http://www.aihw.gov.au/overweight-and-obesity/>

Childhood Obesity – NI

CHILD OBESITY



Source: Health Survey Northern Ireland: First Results 2014/15

25% of children were classed as overweight or obese.



The Role of Schools

- Crucial role in improving health
- Ideal setting for public health interventions
- Policy and research



School Food Policies

Nutritional standards for
school lunches

A guide for implementation



school
food **top marks**

Every School a Good School

Healthy
Food For
Healthy
Outcomes

Food in Schools Policy

Department of
Education
www.dem.gov.uk
DOICEN
Oideachais
Máistir na
Lear

Department of
Health, Social Services
and Public Safety
www.hsspsps.gov.uk

September 2013



INTERVENTIONS

WHAT DOES THE EVIDENCE SHOW?

Types of Interventions



**Educational
(classroom-based
activities)**

AND/OR



**Environmental
modifications**



Educational Interventions

- 20 primary schools in Italy
- Educational board game
- Improvements in nutritional knowledge, Adolescent Food Habits Checklist and BMI-z scores

Eur J Pediatr (2015) 174:217–228
DOI 10.1007/s00431-014-2381-8

ORIGINAL ARTICLE

Kaledo, a board game for nutrition education of children and adolescents at school: cluster randomized controlled trial of healthy lifestyle promotion

Alessandro Viggiano · Emanuela Viggiano · Anna Di Costanzo · Andrea Viggiano ·

Primary care

Cite this article as: BMJ, doi:10.1136/bmj.38077.458438.EE (published 27 April 2014)

BMJ

BMJ 2014;348:g3256 doi: 10.1136/bmj.g3256 (Published 27 May 2014)

Page 1 of 13

Preventing childhood obesity by reducing consumption of carbonated drinks: cluster randomised controlled trial

Janet James, Peter Thomas, David Cavan, David Kerr

Abstract

Objective To determine if a school based educational programme aimed at reducing consumption of carbonated

considered to be important in obesity in children determine if a school based educational programme aimed at reducing consumption of carbonated drinks could reduce excessive weight gain in children.

Effect of intervention aimed at increasing physical activity, reducing sedentary behaviour, and increasing fruit and vegetable consumption in children: Active for Life Year 5 (AFLY5) school based cluster randomised controlled trial

OPEN ACCESS

Ruth R Kipping research fellow in epidemiology and public health¹, Laura D Howe research fellow^{1,2}, Russell Ross professor of paediatric physical activity and public health³, Ross Campbell professor

Environmental Interventions

OPEN ACCESS Freely available online

PLOS ONE

Gamification of Dietary Decision-Making in an Elementary-School Cafeteria

Brooke A. Jones^{1*}, Gregory J. Madden¹, Heidi J. Wengreen², Sheryl S. Aguilar³, E. Anne Desjardins⁴

¹Department of Psychology, Utah State University, Logan, Utah, United States of America, ²Department of Nutrition, Dietetics, and Food Sciences, Utah State University, Logan, Utah, United States of America, ³Center for Human Nutrition Studies, Utah State University, Logan, Utah, United States of America, ⁴Bear River Charter School, Logan, Utah, United States of America

International Journal of Behavioral Nutrition and Physical Activity



BioMed Central

Open Access

Research

Free school fruit – sustained effect three years later

Elling Bere^{*1,2}, Marit B Veierød³, Øivind Skare^{3,4} and Knut-Inge Klepp¹

Address: ¹Department of Nutrition, Institute of Basic Medical Sciences, University of Oslo, Norway, ²Department of Public Health, Erasmus University Medical Centre Rotterdam, the Netherlands, ³Department of Biostatistics, Institute of Basic Medical Sciences, University of Oslo, Norway

- Norwegian elementary schools
- 9 intervention, 29 control
- Free school fruit (1 yr)
- Increased fruit intake, some of effect sustained 3 years later
- No effect on intake of other foods

Multi-component Interventions



British Journal of Nutrition (2008), 99, 893–903
© The Authors 2007

doi: 10.1017/S0007114507

Effects of a comprehensive fruit- and vegetable-promoting school-based intervention in three European countries: the Pro Children Study

S. J. te Velde^{1*}, J. Brug^{1,2}, M. Wind^{2,3}, C. Hildonen³, M. Bjelland³, C. Pérez-Rodrigo⁴ and K.-I. K

¹Room D439, EMGO-Institute, VU University Medical Center, 1081 BT Amsterdam, The Netherlands

²Erasmus University Medical Center Rotterdam, Department of Public Health, Rotterdam, The Netherlands

³Department of Nutrition, Faculty of Medicine, University of Oslo, Oslo, Norway

⁴Department of Public Health, Community Nutrition Unit, Bilbao, Spain

- Pro Children study
- 10-11 years olds
- Aimed to increase fruit and veg intake
- 62 schools in Norway, the Netherlands and Spain
- Multi-component: classroom (computer tailored feedback tool), provision of fruit & veg, parent involvement
- Significant increases after 1 year
- After 2nd year impact only observed in Norway

Effects on Dietary Behaviour

British Journal of Nutrition (2010), **103**, 781–797
© The Authors 2009

doi:10.1017/S0007114509993370

Systematic Review

Effectiveness of school-based interventions in Europe to promote healthy nutrition in children and adolescents: systematic review of published and 'grey' literature

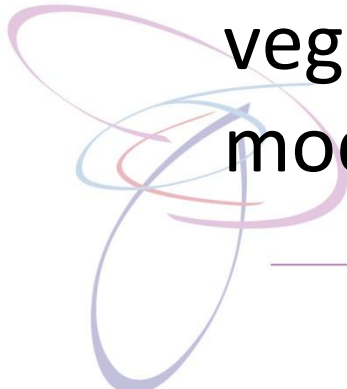
Eveline Van Cauwenberghe^{1*}, Lea Maes², Heleen Spittaels¹, Frank J. van Lenthe³, Johannes Brug⁴,

- **42** studies: 29 in children, 13 in adolescents
- **Children:** strong evidence for multi-component interventions on fruit and veg intake, but limited for educational (on behaviour) and environmental (on fruit and veg intake)
- **Adolescents:** moderate evidence of effect found for educational interventions on behaviour, limited effect for multi-component programmes on behaviour



Key Messages

- Dietary interventions *may* be effective in increasing fruit and vegetable intakes
 - More research on adolescents needed
 - Most studies have focused on fruit and vegetable intakes - limited evidence on modifying multiple dietary components
-



Effects on Obesity

obesity reviews

doi: 10.1111/j.1467-789X.2011.00947.x

Obesity Prevention

A synthesis of existing systematic reviews and meta-analyses of school-based behavioural interventions for controlling and preventing obesity

A. Z. Khambalia^{1,2}, S. Dickinson^{3,4}, L. L. Hardy², T. Gill³ and L. A. Baur^{2,3,5}

¹Clinical and Population Perinatal Research,
Kolling Institute of Medical Research;
²Prevention Research Collaboration; ³Boston

Summary

Schools are an attractive and popular setting for implementing interventions for children. There is a growing body of empirical research exploring the eff

¹ Department of Kinesiology and Health Promotion, College of Education, University of Kentucky
T. Brown¹ and

Key messages


- Intervention components: combined diet and physical activity, family involvement, larger & longer term interventions
- No 'one size fits all'
- Future research – study design, consider sustainability, evaluation.



What about the Impact of Nutrition Policies?

Preventive Medicine 48 (2009) 45–53

Contents lists available at ScienceDirect

 **Preventive Medicine** 

ELSEVIER journal homepage: www.elsevier.com/locate/ypmed

Review

Do school based food and nutrition policies improve diet and reduce obesity?

Patricia Constante Jaime ^{a,*}, Karen Lock ^b

^a Department of Nutrition, School of Public Health, University of Sao Paulo, Brazil
^b Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, University of London, UK

ARTICLE INFO ABSTRACT

- **18** studies
- Most effectiveness found for nutrition guidelines and price interventions on intake and availability of food and drinks
- Less on product regulation (e.g. limiting unhealthy foods)
- All USA/Europe based
- Many policies not evaluated!



USE OF INCENTIVES

EXISTING & ONGOING RESEARCH



Using Incentives to Promote Behaviour Change



Appetite

www.elsevier.com/locate/appet

Appetite 45 (2005) 250–263

Research Report
“Kids Choice” School lunch program increases children’s fruit and vegetable acceptance

Helen M. Hendy^{a,*}, Keith E. Williams^b, Thomas S. Camise^c

^aPsychology Program, Penn State University, Schuylkill Campus, 200 University Drive, Schuylkill Haven, PA 17972, USA

^bFeeding Program, Department of Pediatrics, Penn State Hershey Medical Center

^cSchuylkill Haven Area Elementary Center, Schuylkill Haven, PA, USA

Revised 7 July 2005

Accepted 19 July 2005

European Journal of Clinical Nutrition (2004) 58, 1649–1660
© 2004 Nature Publishing Group All rights reserved 0954-3007/04 \$30.00
www.nature.com/ejcn



ORIGINAL COMMUNICATION

Increasing children’s fruit and vegetable consumption: a peer-modelling and rewards-based intervention

PJ Horne¹, K Tapper², CF Lowe^{1*}, CA Hardman¹, MC Jackson¹ and J Woolner¹



“Because they’re like encouraging people who don’t eat that much healthy food to eat more healthily”

HEALTH EDUCATION RESEARCH

Vol.29 no.5 2014

Pages 799–811

Advance Access published 22 May 2014

Adolescents’ views about a proposed rewards intervention to promote healthy food choice in secondary school canteens

C. T. McEvoy¹, J. Lawton², F. Kee¹, I. S. Young¹, J. V. Woodside¹,
J. McBratney³ and M. C. McKinley^{1*}

¹Centre for Public Health, Institute of Clinical Science B, Queen’s University Belfast, Grosvenor Road, Belfast BT12 6BJ, UK, ²Public Health Sciences, University of Edinburgh Medical School, Teviot Place, Edinburgh EH8 9AG, UK and ³Public Health Agency for Northern Ireland, Linenhall Street, Belfast BT2 8BS, UK

*Correspondence to: M. C. McKinley. E-mail: m.mckinley@qub.ac.uk

Received on October 10, 2013; accepted on April 17, 2014

“I think it’s good because it’s encouraging people to eat healthily”

The Eat4treats Scheme



Aim: to test the **feasibility** and **acceptability** of a food-based rewards system in secondary schools within Northern Ireland.



What does Eat4treats Involve?

- Multi-component intervention
 - Rewards for healthy eating
 - Other behavioural change techniques: goal setting, information (classroom lessons, website)



- Evaluation



**EAT4
TREATS**



POINTS BALANCE

0 0 0 0 0 0 0

Home

How it Works

Points

Rewards

Information

News

My Profile

Logout

MY PROFILE

Welcome **ciara!**

POINTS BALANCE

0 0 0 0 0 0 0 0

You currently don't have enough points for any of the rewards. Keep choosing healthy lunches and check back soon! You can see the current rewards [here](#).

CLAIMED REWARDS

You haven't claimed any rewards yet.

HAVE A SECOND?

Do you think you are now eating healthier food?

- Yes
- No

Vote

YOUR DETAILS

Name: Ciara Rooney

Email: c.rooney@qub.ac.uk

Another email address? :

Set it!

School: QUB

Getting the Scheme up and Running



MEAL OF THE DAY	SIDE SALAD
MISC	MILK
TRAY BAKES	ALL VEG AND RICE
CHIPS	PANINI

MEAL OF THE DAY Cottage pie	Pasta salad
Rice (white)	Panini – ham & pineapple
SS Milk (1/2 pint)	Broccoli
Flakemeal biscuit	Baked potato



FUTURE DIRECTIONS

WHERE TO NOW?



Future Directions

- More rigorous, well-designed studies needed
- Efforts needed to modify *whole* diet
- Sustainability?
- Home as well as school



Future directions

- More research needed into determinants of behaviours – which techniques work best?
- More objective measures of dietary intake
- Evaluation! Report on practicalities, cost-effectiveness etc. Conduct feasibility and pilot studies



THANK YOU FOR LISTENING
QUESTIONS?

