

A whole school approach to promoting children's dietary behaviour and health through school meals interventions: a review of the evidence

Transitioning to a sustainable food system and delivering on the SDGs - The potential of school meals - 21st March 2022

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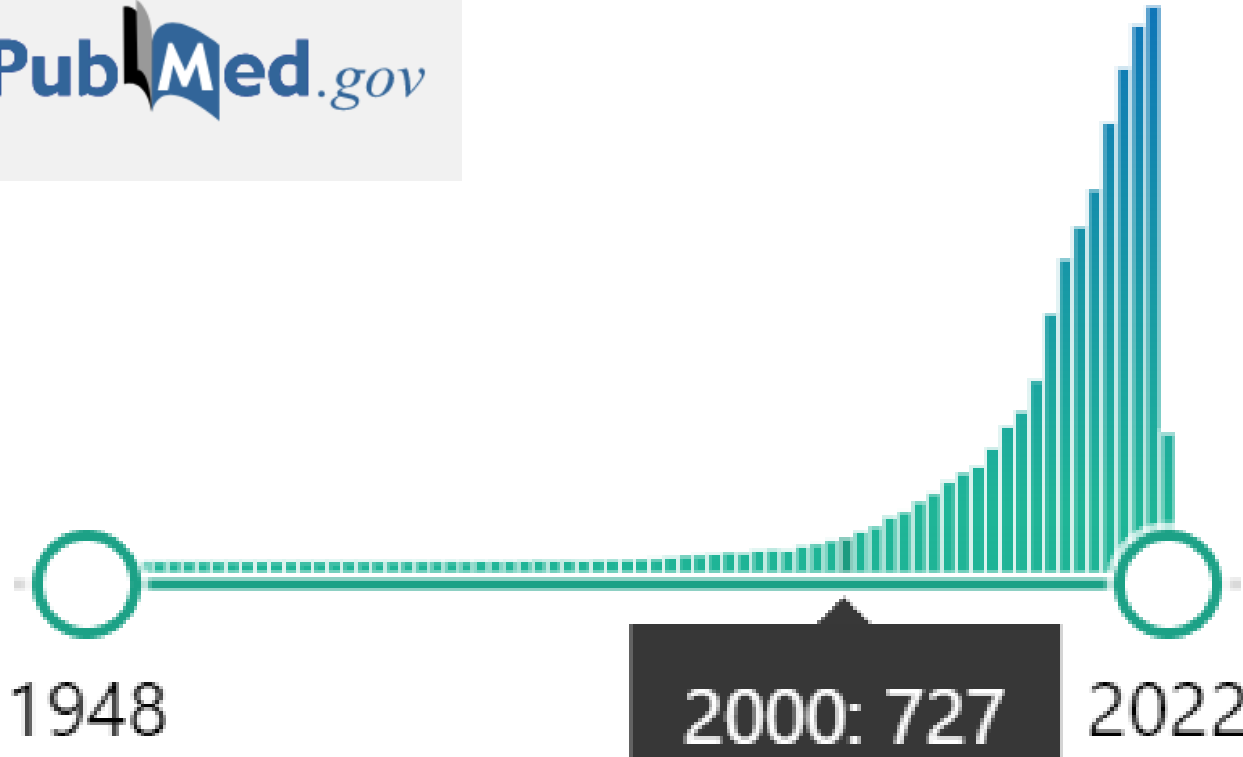
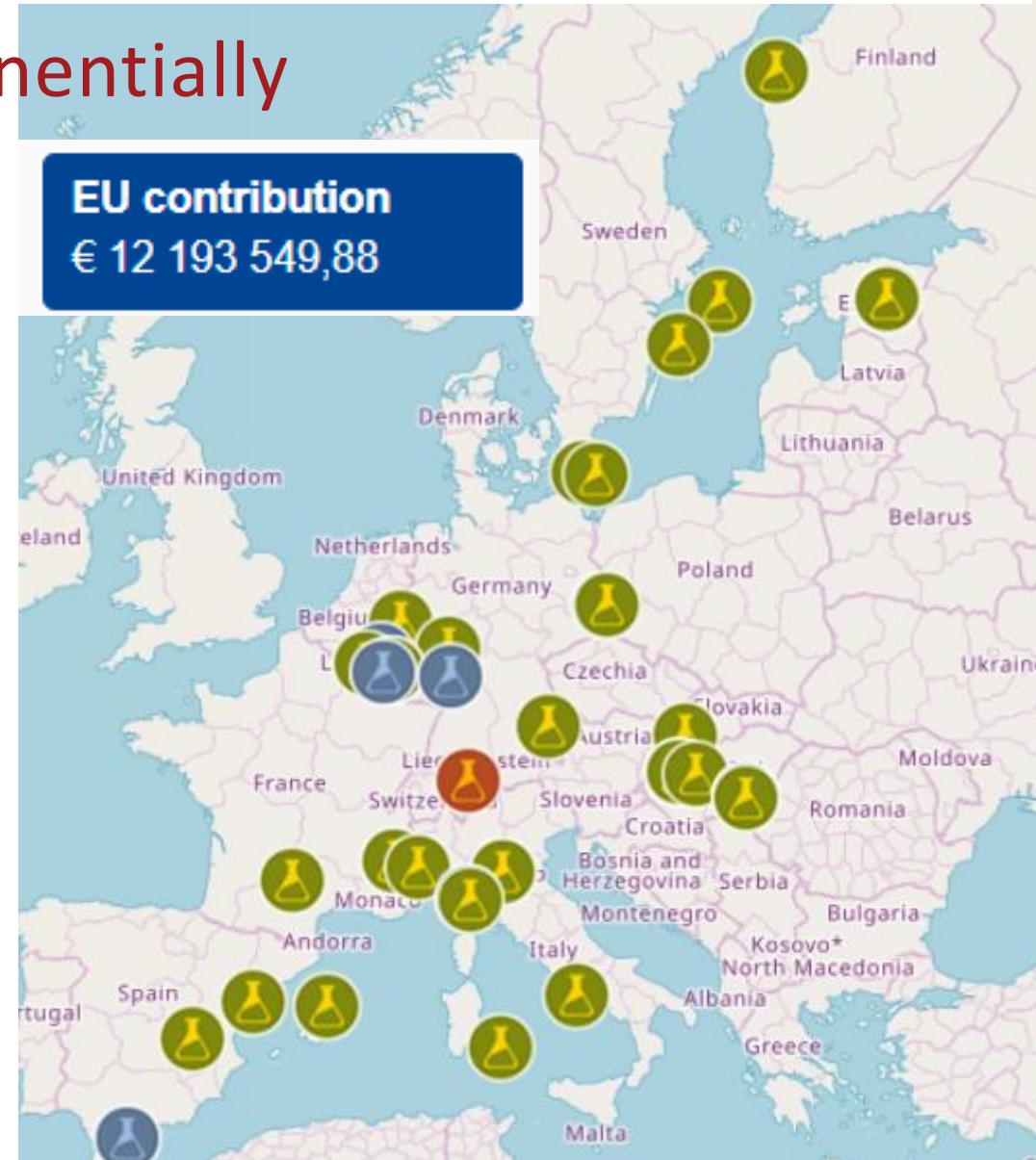
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School Meal Programs a research field that has grown exponentially



Shifting school meals and schools into a new paradigm by addressing public health and territorial, social and environmental resilience

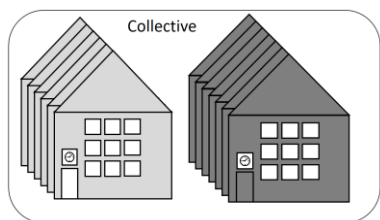
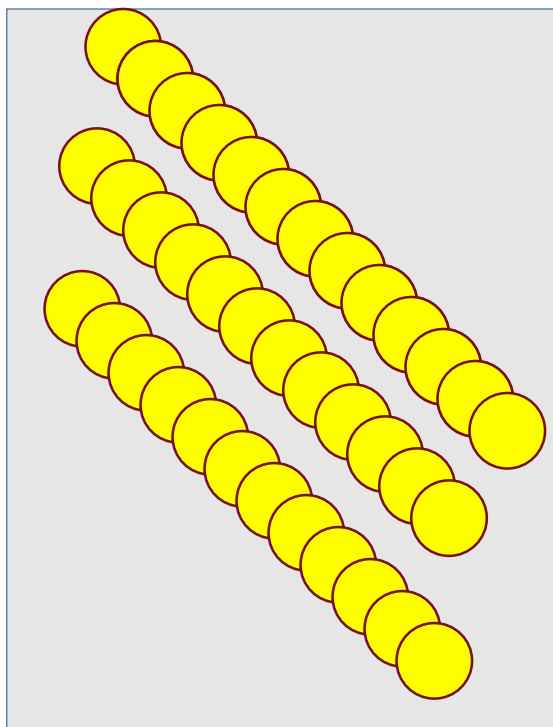


Studying School Meal Prog

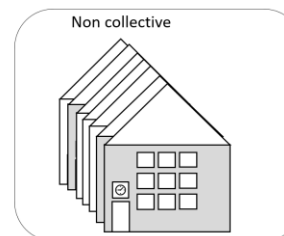
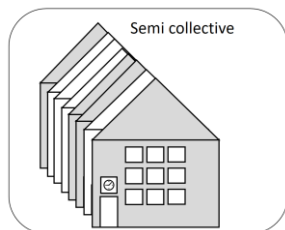
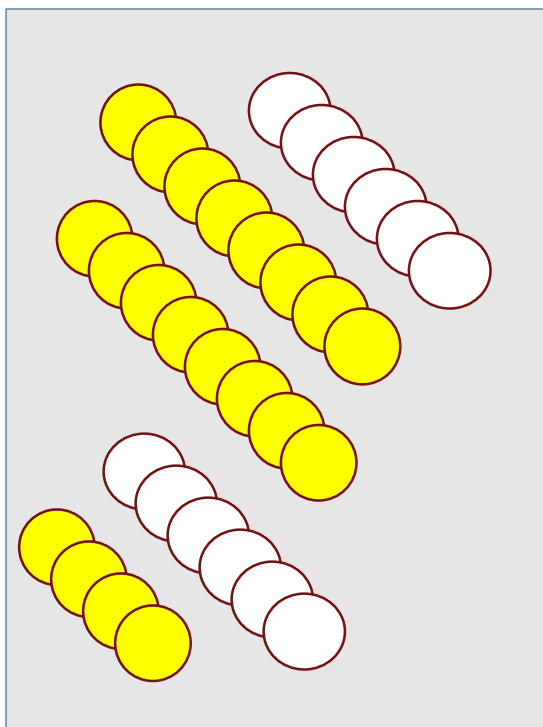
A methodological challenge




Country	Happiness Rank ▲	Happiness Score	2022 Population
Finland	1	7.769	5,554,960
Denmark	2	7.6	5,834,950
Norway	3	7.554	5,511,370
Iceland	4	7.494	345,393
Netherlands	5	7.488	17,211,447
Switzerland	6	7.48	8,773,637
Sweden	7	7.343	10,218,971
New Zealand	8	7.307	4,898,203
Canada	9	7.278	38,388,419
Austria	10	7.246	9,066,710

Collective



Semi-Collective



-  Institutions with meal provision for all
-  Institutions with no meal provision
-  Institutions with meals for some

Research question

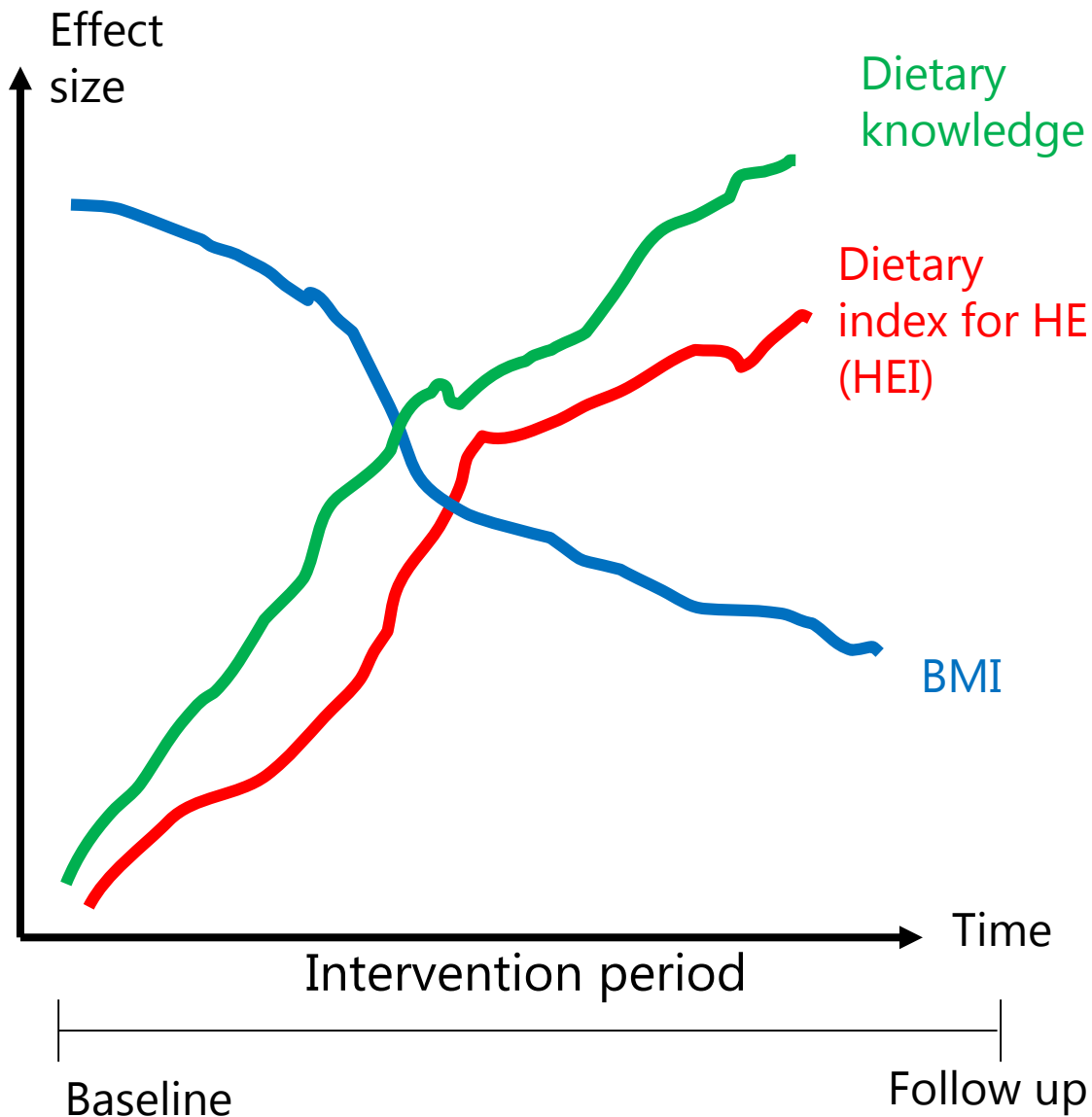
RQ: Can School meals contribute to improving the nutrition and health status as well as knowledge and skills related to food.

School meal intervention studies a basic recipe

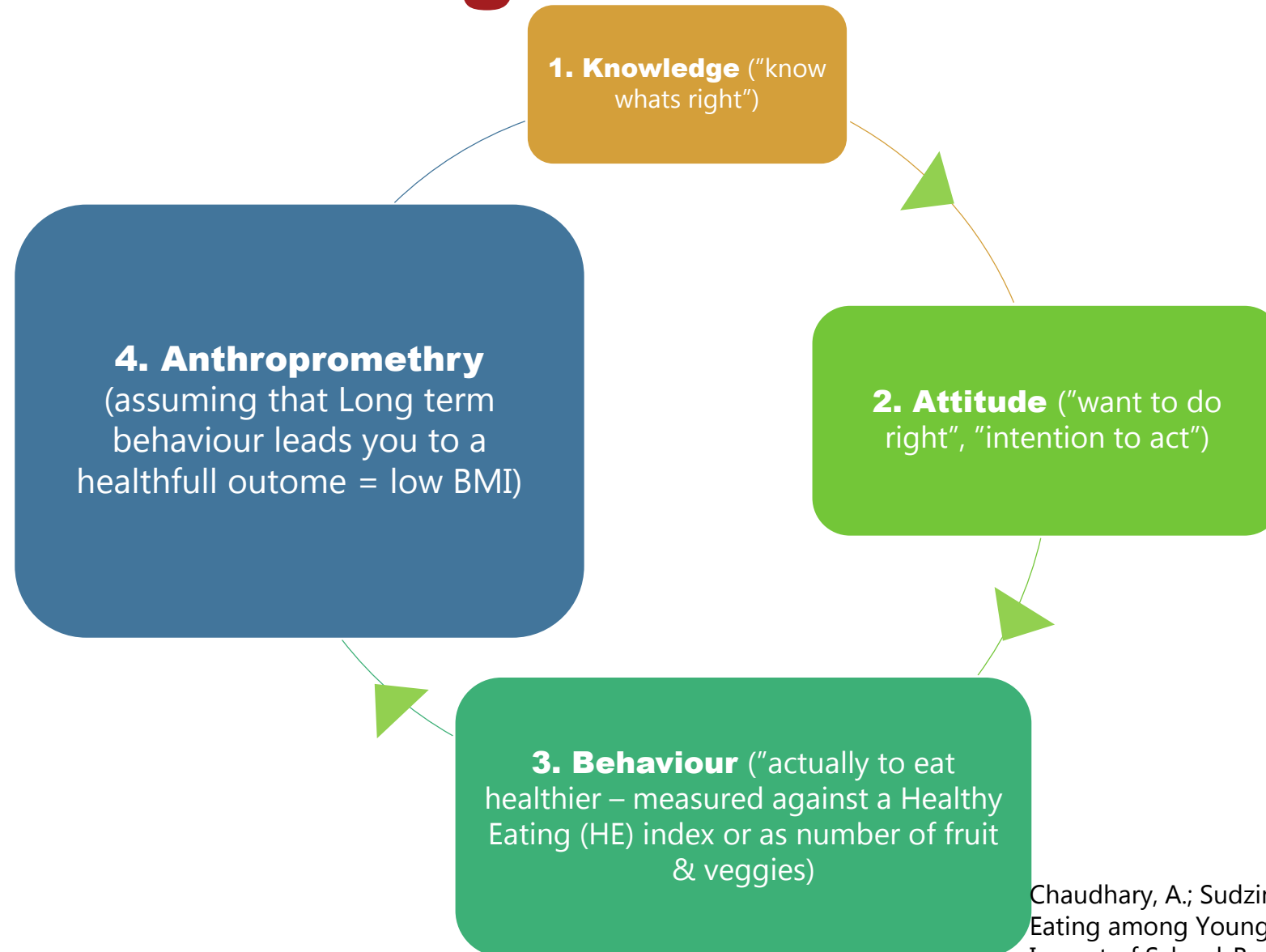
Single or multicomponent

PA Physical activity
FSI Food Service Intervention
FCI Family Community Intervention
BH Behavioural Modification
NE Nutrition Education

Intervention component



From knowledge to health



Chaudhary, A.; Sudzina, F.; Mikkelsen, B.E. Promoting Healthy Eating among Young People—A Review of the Evidence of the Impact of School-Based Interventions. *Nutrients* **2020**,

School meal intervention programs

systematic reviews

<i>ID</i>	<i>Acronym</i>	<i>Full name</i>	<i>Focus</i>	<i>Country</i>
18	"Sandy Lake"	Sandy Lake First Nation School Diabetes Prevention Program	DB2	CAN
19	Vida Healthy Schools Chile	School based obesity prevention	OO	CHI
20	The Chillan Program	Nutrition education in elementary school		CHI
21	TEENS	Teens Eating for Energy and Nutrition at School	Cancer	USA
22	TACOS	Trying Alternative Cafeteria Options in High Schools - Twin Cities St. Paul Minneapolis	OO	USA
23	Cafeteria Power Plus	5-A-Day in Cafeterias in Minnesota Schools	FV	USA
24	"The Nebraska school project"	Nutrition and physical activity program to attenuate obesity and promote physical and metabolic fitness in elementary school children	CHD,D B2	USA
25	CATCH	Children and Adolescent Trial for Cardiovascular Health	CVD	USA
26	Eat well & keep moving	The Harvard SPH Baltimore City Pub Schools		USA
27	Planet Health	The Harvard Study		USA
28	Pathways	Program to prevent obesity in American Indian schoolchildren.	OO	USA
29	M-SPAN	San Diego Middle School Physical Activity and Nutrition program	HF PA	USA

Healthy Eating Indexes

an example

Alternate Healthy Eating Index (AHEI) scores by AHEI components in subjects

	Criteria for minimum score of 0	Criteria for maximum score of 10	(n = 110)
Vegetables, servings/d	0	5	7.2 ± 2.5
Fruits, servings/d	0	4	3.0 ± 3.1
Nuts and soy protein, servings/d	0	1	5.5 ± 4.7
Ratio of white to red meat	0	4	4.2 ± 4.6
Cereal fiber, g/d	0	15	0.7 ± 0.6
Trans fat, % of energy	≥4	≤0.5	10.0 ± 0.2
P:S	≤0.1	≥1	8.2 ± 2.8
Duration of multivitamin use*	2.5	7.5	0.4 ± 1.0
Alcohol, servings/d	Men 0 or >3.5	Men 1.5-2.5	0.2 ± 1.3
	Women 0 or >2.5	Women 0.5-1.5	
Total score, range	2.5	87.5	39.4 ± 8.9

Rewieving School meal intervention programs an example



nutrients

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Article Overview

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Open Access **Review**

Promoting Healthy Eating among Young People— A Review of the Evidence of the Impact of School- Based Interventions

by  **Abina Chaudhary**¹ ,  **František Sudzina**^{2,3,*}   and  **Bent Egberg Mikkelsen**⁴  

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Rewieving School meal intervention programs an example

Table 1. Coding table for study designs. The table shows the types of studies examined in the review and the power assigned to them.

Code	Design	Power
PP	Pre-Test/Post-Test	1
OBS	Observational	1
CT	Controlled Trial	2
RCT	Randomized Controlled Trial	3
RCCT	Randomized Controlled Cluster Trial	3

Chaudhary, A.; Sudzina, F.; Mikkelsen, B.E. Promoting Healthy Eating among Young People—A Review of the Evidence of the Impact of School-Based Interventions. *Nutrients* **2020**,

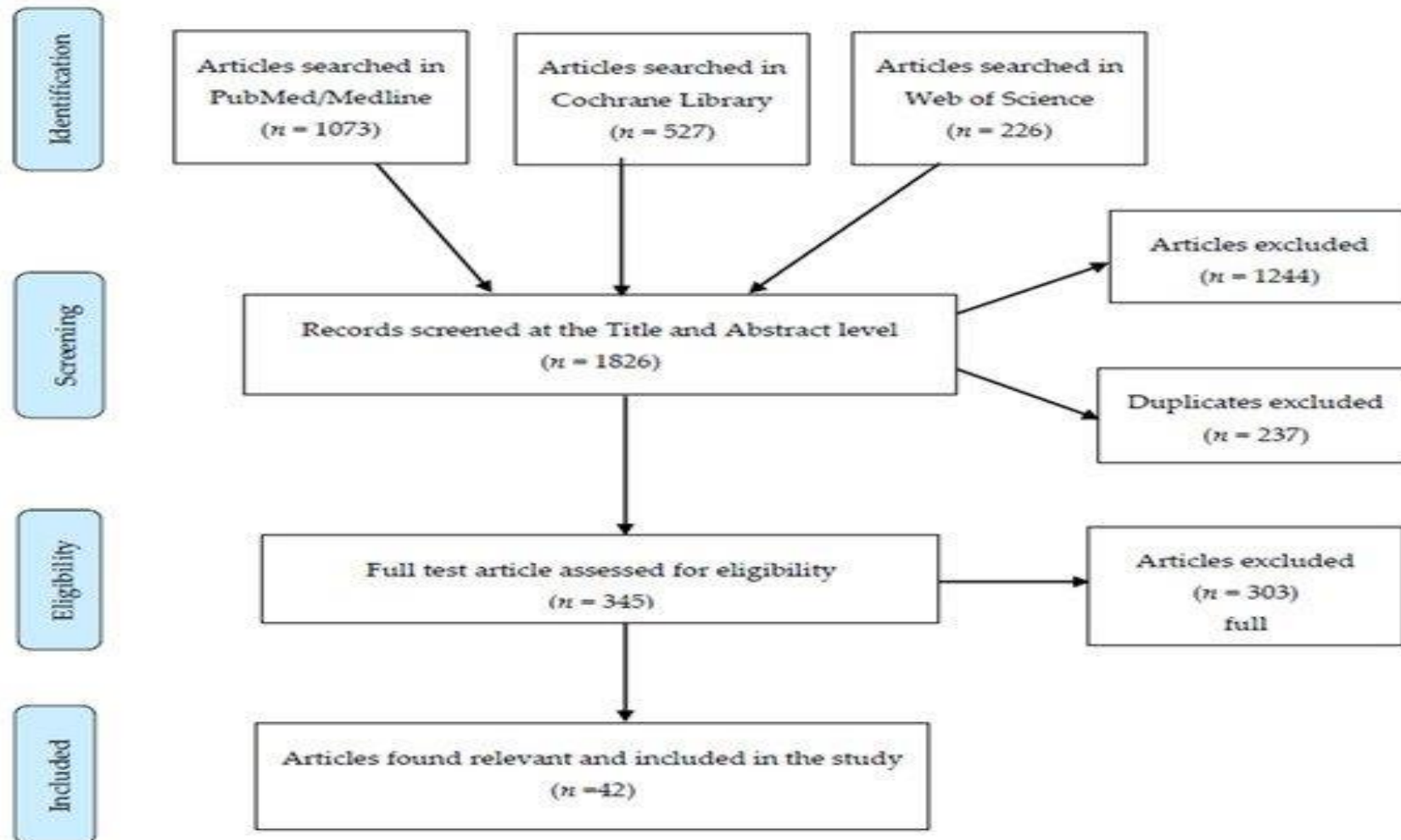
Reviewing School meal intervention programs an example

Table 3. The review sample-findings. The table shows the findings from the 43 studies of the review.

Author	Year	Age	Age Coded			Sample Size, n	Time Duration/Month	Outcome Measures				Effectiveness Amoi		
			Years	EA	EML			EL	Anthropometry	HE/FV	Nutritional Knowledge	Attitude	Anthropometry	HE/FV
Harake et al. [35]	2018	6–14 years	x	x	x	183	6	x	x	x	x	3	3	4
Adab P, et al. [36]	2018	6–7 years	x			1392	12	x	x			1	1	
Harley A, et al. [37]	2018	11–13 years			x	248	1 and half		x	x			4	4

Chaudhary, A.; Sudzina, F.; Mikkelsen, B.E. Promoting Healthy Eating among Young People—A Review of the Evidence of the Impact of School-Based Interventions. *Nutrients* **2020**,

Reviewing School meal intervention program an example



Review Take home

From our study

- School meal intervention seem to work better among the youngest
- School meal Interventions can improve proxies of healthy eating (HEI)
- School meal Interventions only in few cases changes anthropometry
- The potential of SMP's to make a change is dependant on the "band width" – "the more you do the greater effect"

From other studies

- SMP's needs to include environmental components
- School meals can improve proxies of learning capacity, academic achievement, etc

Food at school

Both a practice AND a learning

- **Food Service (Canteen)**

SMP (school meal program)

SMP's

- School Fruit Scheme (SFS)
- School Milk Scheme (SMS)
- Breakfast Clubs (BC's)
- Tuck shops
- Competitive foods in food outlets adjacent to school

- **Curricular (Classroom)**

- Hands On Food Activity
- Home economics teaching (HEF)
- Food'n STEM activities
- On campus School garden
- Off campus School garden
- Cooking lesson activities
- Taste education (Sapere) activities
- Edible school yard activities
- Farm2School link activities

SESAM food education important features

- 6 schools
- 300 pupils
- 20 teachers
- 3 months of preparation
- Out of Class – Project Based Learning
- Construct. Build. Design. Engineer
- Using a STEAM approach
- Targeting 21st Century Skills
- 2 rounds: 2020 & 2021

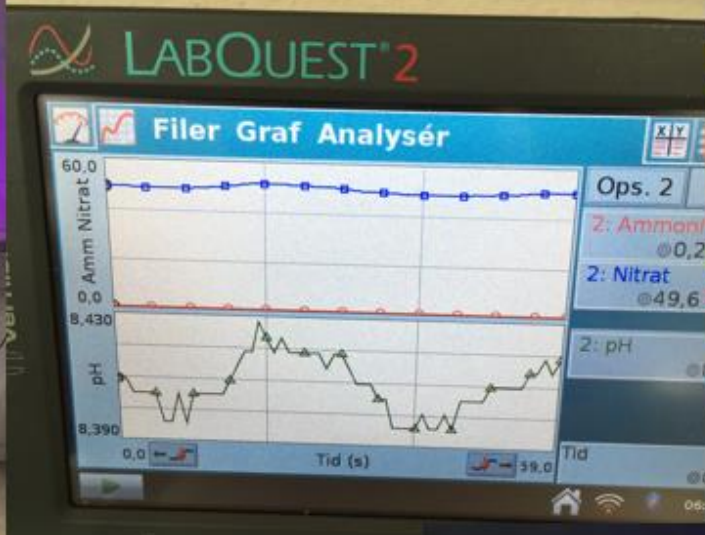
Engineering an indoor EduFarm

Read more on:

<https://ign.ku.dk/english/sesam/>

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Building an AquaPonics Vertical Farm



Coding the farmbot



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What do you want to do?

Get the scissor tool

Get seed tool

Get watering tool

Get camera tool

Get sensor tool

Empowerment & Education

youth as co-creators of tomorrow foodsystems

*How can we give **young people at school** the **tools, methods, knowledge, skills and capacities** that will enable them to **influence, change and design** better and more just **future food systems***

Thanks for your attention

Want to learn more about Education for Food Sustainability & Nutrition?

Generation Climate – empowering young
people for future food systems transformation

*Side Event World Food Summit,
May 3-4, 2022; Copenhagen*

<https://ign.ku.dk/english/sesam21/>

