**Supplementary Table 1:** Summary of the reviewed studies on the effect of snack-based FV distribution interventions outcome summary (*n=47*)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Author (s), year, program name, country | Participants | Study Design | Intervention group (s)  | Data collection  | Findings |
| Study Quality (*n=12*; Strong) |
| \*Bere et al. (2005), Norwegian National School Fruit Scheme (NSFS)Norway | 700 children, aged 11-13 years old | CT | Group I: Free FV provisionGroup II: Subsidized FV provision Control: no intervention Length (12 months)Follow-up (None) | 24-hour dietary recall completed by children; FFQ completed by parents  | An increase in FV consumption at school: [0.8 portions (free); 0.1 portions (subsidized); -0.1 portions (control]; No significant effect in FV consumption all day: [0.2 portions (free); -0.3 portions (subsidized); -0.8 portions (control)] at post-intervention. However, free group showed a significant effect in terms of reduced rates of soda/candy/chip consumption. |
| \*Bere et al. (2006a), Fruits and Vegetables Make the Marks (FVMM)Norway  |  369 children, aged 11-13 years old | RCT | FV provision; nutrition education; and parental involvement Control: no intervention Length (12 months)Follow-up (12 months) | 24-hour dietary recall completed by children, FFQ completed by parents  | No effect on FV consumption at post-intervention and at one-year follow-up. However, children’s awareness of the five-a-day recommendation had increased. |
| \*Bere et al. (2006b), Norwegian National School Fruit Scheme (NSFS)Norway | 517 children, aged 11-13 years old | RCT | FV provision; and nutrition education Control: no intervention Length (12 months)Follow-up (12 months) | 24- hour dietary recall completed by children; FFQ completed by parents  | An increase in FV consumption of 0.6 portions/day. This effect fell at 1-year follow- up at school and all day with effect size of 0.2 and 0.5 portions for free group. An increase of 0.4 portions at school at post-intervention for subsidized group. |
| Ransley et al. (2007), School Fruit and Vegetable Scheme (SFVS),UK | 3693 children,aged 4-6 years old | CT | FV provision; and nutrition education Control group: no intervention Length (8 months)Follow-up (None) | 24-hour dietary recall completed by parents (home) and research staff (school) | An increase in F consumption of 0.5 to 0.7 portions across all age groups at 3 months and 0.2 to (-0.2) portions with no changes in V consumption at 7-months. Also, no associations were observed between SFVS and macro and micronutrients intake.  |
| \*Tak et al. (2007), Schoolgruiten,Netherlands | 959 children, aged 9-10 years old | CT | FV provision; and nutrition education Control group: no intervention Length (12 months)Follow-up (None) | FFQ completed by parents and children | An increase in F and V consumption of 0.23 pieces/day and 20.7 grams/day in one subgroup at post-intervention. Also, no effect on knowledge of recommended FV intake was noted. |
| \*Te Velde et al. (2008), Pro Children, Norway, Netherlands, and Spain | 1472 children, aged 10-13 years old | RCT | FV provision; nutrition education; parental involvement; and mediaControl group: no intervention Length (12 months)Follow-up (12 months) | 24-hour dietary recall completed by children | An increase in FV consumption of 56.9 grams/day in Norway, Netherlands and Spain compared to the control group at post-intervention. At 1-year follow-up, the intervention effects were significant only in Norway with 91.5-g/school day intake of FV than the control group. |
| Coyle et al. (2009), The Mississippi Fresh Fruit and Vegetable program (MFFVP)USA | 191 children, aged 10-14 years old  | Before/after | FV provision Control: NoneLength (12 month)Follow-up (None) | 24-hour dietary recalls completed by research staff | An increase in F consumption of 0.34 servings/school day and 0.61 servings/day with no effect on V consumption. However, an increase in rate of children asking their parents to buy FV. |
| \*Olsho et al. (2015), Fresh Fruit and Vegetable Program (FFVP)USA | 4696 children, aged 9-11 years old  | CT | FV provision Control: no intervention Length (12 month)Follow-up (None)  | 24-hour dietary recall completed by research staff | An increase in FV consumption of 0.23 cups/day (0.25 in school and 0.07 outside of school) at post-intervention.  |
| Methner et al. (2016), European School Fruit Scheme (SFS) Germany | 499 children, aged 6-11 years old | CT | FV provisionControl: no intervention Length (12 month)Follow-up (None) | 24-dietary recall completed by children | An increase in FV consumption of 0.76 times/day at post-intervention.  |
| Gold et al. (2017), Fresh Fruit and Vegetable Program (FFVP)USA | 662 children, aged 8-9 years old  | CT | Group I: FV provisionGroup II: FV provision and nutrition education Group III: FV provision; nutrition education; and taste testing Control: no intervention Length (1.5 month)Follow-up (None) | FFQ completed by children | An increase in F consumption of 3.7 times/day with no effect on V consumption. |
| Roccaldo et al. (2017), School Fruit Scheme (SFS),Italy | 494 children, aged 8-10 years old | CT | FV provision; and nutrition education Control group: FV provisionLength (1.5 month)Follow-up (None) | Questionnaire completed by research staff | An increase in F consumption of 12.4% in children consuming 1 or 2 servings/day.An increase in V consumption of 10.7% in children consuming 1 serving/day; and 5.8% in children consuming >1 serving/day at post intervention. Also, 10% of children reduced their frequency of sweets and candy consumption (p=0.016). |
| Ovrebo et al. (2019), School Fruit and Vegetable Program, Norway | 982 children, aged 10-12 years old 14-year follow-up (26 year old) | CT | FV provision; and nutrition educationControl I; no interventionControl II: Free FVLength (12 month)Follow-up (14 years) | 24-hour recall completed by children and parents | No effect of the educational program alone or combined with FV provision on children and parents’ consumption of FVs.  |
| Study Quality (*n=12*; Moderate) |
| \*Reinaerts et al. (2007), Free FV distribution pilot program, Netherlands | 766 children, aged 4-12 years old | RCT | Group I: FV provision Group II: Nutrition education; and parental involvement Group III: no intervention Length (12 month)Follow-up (None) | 24-hour dietary recall completed by children, and FFQ completed by parents | An increase of 0.2 portions/day in F consumption in both programs. However, the distribution program was more effective (+22-32%) in increasing children’s consumption of V intake at home although no efforts were made to increase their intake.  |
| Reinaerts et al. (2008), Free FV distribution pilot program,Netherlands | 436 children, aged 4-12 years old | RCT | Group I: FV provision Group II: Nutrition education; and parental involvement Group III: no intervention Length (12 month)Follow-up (12 month) | 24-hour dietary recall completed by children, FFQ completed by parents | An increase of V (3.25g/day) consumption and F (0.09 portions/day) at follow-up II for free distribution program. As for follow-up I, F intake was similar as of Reinaerts et al. (2007) 0.21 portions/day and 6.45 g/day for V. |
| \*Tak et al. (2008), Schoolgruiten, Netherlands | 769 children, aged 9-11 years old | CT | FV provision; and nutrition education Control group: no intervention Length (12 month)Follow-up (12 month) | FFQ completed by parents and children | An increase of F consumption at 0.15 servings per day. However, no significant effects on V consumption were observed. Increased awareness of the knowledge of recommended intake levels and children appreciation of the program. |
| Clarke et al. (2009), Free Fruit and Vegetable initiative (FFVI)Scotland | 878 children, aged 4.5-12 years old | Before/after | FV provision; peer modelling; and rewards Control group: NoneLength (0.75 month)Follow-up (None)  | Questionnaire completed by children | An increase in FV consumption of 5 portions or more at school while home consumption remained stable. Also, the program increased parents’ FV consumption.  |
| \*Bere et al. (2010) Norwegian National School Fruit Scheme (NSFS)Norway | 1339 children, aged 11-13 years old | CT |  FV provisionControl group: no intervention Length (12 month)Follow-up (None)  | 24-hour dietary recall completed by children, and FFQ completed by parents | An increase in F consumption at school of 0.49, 0.29, and 0.18 portions for free, subsidized or control. An increase in F consumption all day of 0.74, 0.39 and 0.16 portions for free, subsidized or control. No effects were observed for V consumption. |
| Hughes et al. (2012), School Fruit and Vegetable Scheme (SFVS)UK | 2306 children, aged 6-7 years old  | Before/after | FV provision Control group: NoneLength (12 month)Follow-up (None) | CADET completed by parents at home and researchers at school | The mean daily frequency of FV consumed were 5.1 in Northern England, 5.2 in Midlands and 5.7 in the South. However, the impact was greatest in the Northern part of England (deprived regions) where the SFVS increased the frequency of FV portions consumed per day by 0.8. |
| Tussing-Humphreys et al. (2012), The School Kids Access to Treats to Eat (SKATE), USA | 214 children, aged 9-11 years old  | Before/After | FV provision Control group: NoneLength (1.5month)Follow-up (None) | WillTry survey completed by children | The overall mean proportional intake of all snacks combined was 67% (54-98% for F; 49-50% for V). |
| Ovrum et al. (2013), National School Fruit Scheme (NSFS), Norway | 1423 children, aged 6-13 years old | RCT | FV provision Control group: no intervention Length (12 month)Follow-up (None) | Questionnaire completed by parents | An increase of 0.36 portions of F per day compared to children in control schools. Also, parents of children who receive the program eat on average 0.19 more F portions per day than parents of children in control schools.No significant associations were found between the NSFS and the V intakes of children and their parents. |
| \*Naylor et al. (2014), BC Fruit and Vegetable Scheme (BCFVS), Canada | 668 children, age 10-12 years old  | CCT | FV provisionControl group: no interventionLength (4 month)Follow-up (None)  | 24-hour recall and FFQ completed by children  | No significant differences in FV intake were found between the intervention group (3.75) and control group (3.77) servings/day. Also, no significant differences in knowledge or self-efficacy between groups. |
| Jorgensen et al. (2015), BOOST, Denmark | 995 children, aged 13 years old | Before/After | FV provision; parental involvement; and nutrition educationControl group: NoneLength (12 month)Follow-up (None) | 24-hour dietary recall completed by children | FV intake was significantly associated with medium curricular activity (31g FV intake) and high curricular activity (51g FV intake) compared to students at schools with low curricular activities dose delivered. Association between the dose of curricular activity delivered and FV intake was not different by family occupational or educational level.  |
| Jorgensen et al. (2016), BOOST, Denmark | 347 children, aged 13 years old  | Before/after | FV provision; and parental involvement Control group: NoneLength (12 month)Follow-up (12 month) | 24-hour dietary recall completed by children; and questionnaire completed by parents | An increase in FV consumption of 16.8g/day from baseline to follow-up. Also, 83.5% of parents appreciated the intervention.  |
| HaB et al. (2018), School Fruit Scheme (SFS), Germany  | 664 children aged 7-10 years old | RCT | FV provision Control group: no intervention Length (12 month)Follow-up (None) | 3-day FIR completed by children | An increase in FV intake of 0.96 frequency/day for 3x/week delivery and 0.75 frequency/day for 2x/week delivery compared with the control group.  |
| Study Quality (*n=23*; Weak) |
| Eriksen et al. (2003), 6-a-day program,Denmark | 445 children, aged 6-10 years old | CCT | FV provision Control group: no intervention Length (1.25 month)Follow-up (None) | 24-hour dietary recall completed by children; FFQ completed by parents | An increase in F intake of 0.4 pieces per school day and no change in V intake or total FV intake among subscribers.An increase in F intake of 0.3 pieces per school day and total FV intake of 0.4 pieces/day, mainly from F intake as no change in V intake was observed among non-subscribers. |
| Horne et al. (2004), Food Dudes program, UK | 749 children, aged 5-11 years old | CCT | FV provision; peer modelling; and rewards Control group: FV provision Length (5 month)Follow-up (4 month)  | Weight measure of FV completed by researchers; parental 24-hour food recall of home consumption completed via interviews by researchers  | Snack-time intake of F increased from 75% (baseline), 87% (intervention) to 76% (follow-up).Lunchtime consumption of FVs in the experimental school was substantially higher at intervention and follow-up than baseline. |
| Lowe et al. (2004), Food Dudes Program,UK | 402 children, aged 4-11 years old | Before/after | FV Provision; peer modelling; and rewards Control group: NoneLength (0.75 month)Follow-up (None) | Weight measure of FV completed by researchers; parental 24-hour food recall of home consumption via interviews by researchers | An increase in consumption of FV as a snack during the intervention with 0.41 portions per day. |
| Wells et al. (2005), The National School Fruit Scheme (NSFS), UK | 1492 children, aged 4-6 years old | CCT | F provision Control group: no intervention Length (12 month)Follow-up (None) | 24-hour dietary recall completed by parents | F consumption in receiving free F group was 117g/day compared with 67 g/day not receiving free F (50 grams difference excluding FV juice; 20 grams difference including FV juice). The consumption of children at the age of 7-8 years who had received free F at the age of 4-6 did not differ from those who had not at the control group (83 g/day vs. 86 g/day). |
| White et al. (2006), School Fruit Scheme (SFS), UK | 55 schools, aged 4-6 years old  | Before/After | FV provisionControl group: NoneLength (12 month)Follow-up (None) | CADET completed by children | At three months, children ate 0.37 portions more than at baseline (3.26). At seven months, further decline in F consumption. Improved children knowledge, attitude and awareness of F.  |
| Yeo et al. (2006), School Fruit Scheme (SFS), UK | 46 children, aged 4-6 years old  | CS | F provisionControl group: NoneLength (0.25 month)Follow-up (None) | Weighing completed by researchers | Grapes had the highest percentage of consumption (89%), followed by apples (69%), oranges (67%), banana (66%) and pears (64%). Children and teachers reacted very positively to the program.  |
| Bere et al. (2007), Norwegian National School Fruit Scheme (NSFS), Norway | 1925 children, aged 11-13 years old | CCT | FV provision Control group: no intervention Length (12 month)Follow-up (3-years) | 24- hour dietary recall completed by children; FFQ completed by parents  | An increase in boys’ FV consumption at school and at all day by 0.13 and 0.38 portion/day. As for girls’ FV consumption, an increase by 0.15 and 0.44 portion/day for at school and all day. No sustained effect of reduced rates of unhealthy snack consumption. |
| Fogarty et al. (2007), National School Fruit Scheme (NSFS), UK | 3382 children, aged 4-6 years old | RCT | F provision Control group: no intervention Length (12 month)Follow-up (3 years) | Questionnaire completed by parents | An increase in F consumption in the intervention region by 4.8 pieces/a week than in the control regions. However, after ceasing to be eligible for the NSFS, F intake in intervention region fell to a 12 pieces per week, lower than that in the control region (14 pieces per week). |
| Al Ashfield-Watt et al. (2008), School Fruit Scheme (SFS), New Zealand | 1923 children, aged 7-11 years old  | RCT | F provision Control group: no intervention Length (2.5 months)Follow-up (1.5 months) | 24-hour dietary recall completed by children | An increase in F intake by 0.39 pieces/school day and no change in F outside of schools. This increase was not sustained and F intake fell below baseline levels at follow-up.  |
| Jamelske et al. (2008), Wisconsin Fresh Fruit and Vegetable Program (FFVP), USA | 120 children, aged 9-14 years old  | CCT | FV provision and nutrition education Control group: no intervention Length (12 months)Follow-up (None) | 3-day FIR completed by children | An increase in FV intake of 62.8% in intervention school children compared to only 47.1% of control school children (P=0.13) at school, but not at home. Also, children were more willing to eat FV and to try F/V at home in intervention schools compared to control schools. |
| Horne et al. (2009), Food Dudes Program, Ireland | 435 children, aged 4-11 years old | RCT | FV provision; peer modelling; and rewards Control group: FV provision Length (0.75 months)Follow-up (None) | Weight measure of FV completed by researchers. Children’s consumption at school and packed lunches was observed by teachers | Consumption of school-provided FV increased during the intervention in the experimental school, whereas it declined in the control group (47 g compared to 36 g of F and 20 g compared to 7 g for V).Control schools showed a decline in consumption of both FV over the same time period (25 g compared to 29 g at baseline (F) and 5 g compared to 7 g at baseline (V).At 12-month follow-up, parents in the experimental school provided their children more lunchbox FV and juice (103 g) relative to baseline (61g) and control school (71g).Children increased lunchbox FVJ consumption in intervention at follow-up (71g) compared to (41g) at baseline. |
| He et al. (2009), Northern Fruit and Vegetable Pilot Program (NFVPP), Canada | 695 children, aged 9-13 years old | RCT | Group I: FV provisionGroup II: FV provision; and nutrition education Control: no intervention Length (5 months)Follow-up (None) | 24-hour dietary recall completed by children | An increase in FV intake of 0.49 servings/ school day in NFVPP combined with nutrition education and 0.42 servings/ school day at school (without nutrition education). Also, children in the provision and nutrition education group started liking V that were not offered at the program. |
| Ransley et al. (2010), School Fruit and Vegetable Scheme (SFVS), UK | 2530 children, aged 6-7 years old  | CS | Group I: FV provision and gardening Group II: FV provision and parental involvement Group III: FV provision; gardening; cooking; and catering; parental involvement; and lessons Length (12 month)Follow-up (None) | CADET completed by parents (home) and National Foundation for Educational Research-trained administrators (school) | In schools running a gardening club in addition to SFVS, children ate more V (120g/day) compared with those that did not (99.3g/day).In schools where parents were involved in addition to SFVS, children’s intake of V was higher (117g/day) compared with parents of children who were not involved (105g/day).In schools with gardening, cooking, catering, parental involvement and lessons in addition to SFVS, children ate more V (123 g/day) compared with those that did not (97.7g/day).No effect on F intake.  |
| Gates et al. (2011), School Snack Program, Canada | 27 children, aged 11-13 years old  | Before/after | FV provision; nutrition education; and parental and community involvement Control group: NoneLength (12 months)Follow-up (None) | KSIQ completed by children  | An increase in children’s intake of FV from 28.9 (pre-program) to 31.6 (post-program). |
| Bica et al. (2012) Wisconsin Fresh Fruit and Vegetable Program (FFVP)USA | 129 children, aged 9-10 years old | CCT | FV provisionControl group: no intervention Length (12 months)Follow-up (6 months) | 3-day FIR completed by children | An increase in F intake of M=0.59g at posttest was higher than the pretest M=0.01g or control M=0.00g. No posttest statistical test was run for V intake because no V were served through the FFVP during posttest period and no students reported eating V. An increased rate of children asking their parents to buy FV in intervention schools. |
| Gates et al (2012), School Snack Program, Canada | 43 children at 1-week, and 67 children at 1-year, aged 11-13 years old   | Before/after | FV provisionControl group: NoneLength (12 months)Follow-up (12 months) | KSIQ completed by children | An increase in FV servings from 2.2 at baseline to 2.7 at 1-week. However, this effect was not sustained with 1.1 serving at 1-year follow-up.  |
| Jamelske et al. (2012), Wisconsin Fresh Fruit and Vegetable Program (FFVP), USA | 258 children, aged 9-14 years old | CCT | FV Provision Control group: no intervention Length (12 months)Follow-up (2 months) | 3-day FIR completed by children | An increase in the incidence of F and V intake at intervention schools at both posttests by 0.39 (F) and 0.16 (V) from the pretest, compared to just 0.04 (F) and 0.01(V) for control group, but not at home.There was no significant difference between the schools in bringing home-provided FV on days when FFVP is not offered. |
| Skinner et al. (2012), School Snack Program, Canada | 2004 (63 students: 23 participants and 40 non-participants)2007 (50 students: 26 participants and 24 non-participants), aged 10-18 years old  | CCT | FV provisionControl group: no intervention Length (12 months)Follow-up (3 years) |  WEB-Q completed by children | Children participating in 2004 data collection had a higher mean intake of FV servings (7.5 vs 3.4 servings) than non-participants. However, the effect was not sustained in 2007 data collection. Participants in the snack program had higher mean intakes of servings of milk and alternatives food group in 2007 (3.3 vs 2.2 servings) than non- participants. |
| Jamelske et al. (2014), Wisconsin Free Fruit and Vegetable Program (FFVP), USA | 76 children, aged 9-10 years old | CS | FV provision Control group: NoneLength (12 months)Follow-up (None) | Teachers recorded children’s intake via observation  | An increased rate in F consumption with pear (0.68) and blueberry (0.64) the lowest, whereas the consumption rate of V was lower across all V, with carrots (0.80) and cucumber (0.72)- the only V eaten at a rate of at least 0.70. |
| Bere et al. (2015), Norwegian National School Fruit Scheme (NSFS), Norway | 320 children, aged 11-13 years old7-year follow-up (17 years old) | CCT | FV provision Control group: no interventionLength (12 months)Follow-up (7 years)  | 24-hour dietary recall completed by children; FFQ completed by parents  | A significant adjusted overall effect for FV intake (1.52 times/day) but this weakened over time. An average reduction of consumption (1.54) of unhealthy snacks a week and this became stronger over time. |
| Gates et al. (2016), School Snack Program, Canada | 49 children, aged 11-13 years old  | Before/after | FV provisionControl group: NoneLength (12 months)Follow-up (4 years) | 24-dietary recall completed by children  | An increase in FV consumption (p=0.048) after the intervention (3.5 servings) compared to baseline (2.3 servings). |
| Hector et al. (2017), Crunch & Sip, Australia | 55 classes, aged 3-6 years old  | Before/after | FV provisionControl group: NoneLength (2.5 months)Follow-up (None) | Survey completed by teachers | Children’s participation in the program increased from 46.7% to 92.0%. The proportion of children bringing FV from home increased from 45.7% to 54.0%. |
| Woodruff et al. (2019), Northern Fruit and Vegetable Program (NFVP), Canada | 4744 children, aged 9-13 years old  | CS | F provision Control group: NoneLength (5 months)Follow-up (3 years) | FFQ completed by children  | FV intake did not change over 3 years (P=0.135 for F, P=0.713 for V), yet FV preferences were rated higher for F offered (P<0.001) and V offered (P=0.001) and not offered by the program (P<0.001). |

RCT, Randomized Controlled Trial; CS, Cross-Sectional; F, Fruit; V, Vegetable; FV, Fruit and Vegetables; FIR, Food Intake Record; FFQ, Food Frequency Questionnaire; CADET, The Child and Diet Evaluation; KSIQ, Knowledge, Self-efficacy, and Intention Questionnaire; Web-Q: Waterloo Web-Based Eating Behaviour Questionnaire

**\***Studies Included in the quantitative synthesis (meta-analysis) (*n=10*).