

# Formation of dietary habits in childhood: A field experiment with low income families

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## Abstract

This paper evaluates with a field experiment the extent to which dietary habits are malleable early on in childhood and later in life. 285 low income families with young children were assigned either to a control group or one of two treatments, each of them lasting for 12 consecutive weeks.

In the **first treatment**, families received food groceries at home for free for 12 weeks and were asked to prepare five specific healthy meals per week. In the **second treatment**, families were simply asked to reduce snacking and eat at regular times. We collected a range of measures of food preferences, dietary intake, as well as BMI and biomarkers based on blood samples. We find some evidence that children's preferences have been affected by both treatments, and we find that their BMI distribution shifted significantly relative to the control group, i.e. they became relatively "thinner". On the other hand, we find little evidence of any effects on adults and these effects are not consistent with adopting a healthier diet. We conclude that exposure to a healthy diet and regularity of food intake possibly play a role in shaping dietary habits, but influencing dietary choices in the short and long run remains a major challenge.

## Description of the Experiment

We evaluate two types of interventions targeting dietary habits of young children and their families.

• **Treatment 1 (Meal)** Families are asked to prepare and eat 5 specific meals per week. They receive food and recipes at home each week for 12 weeks



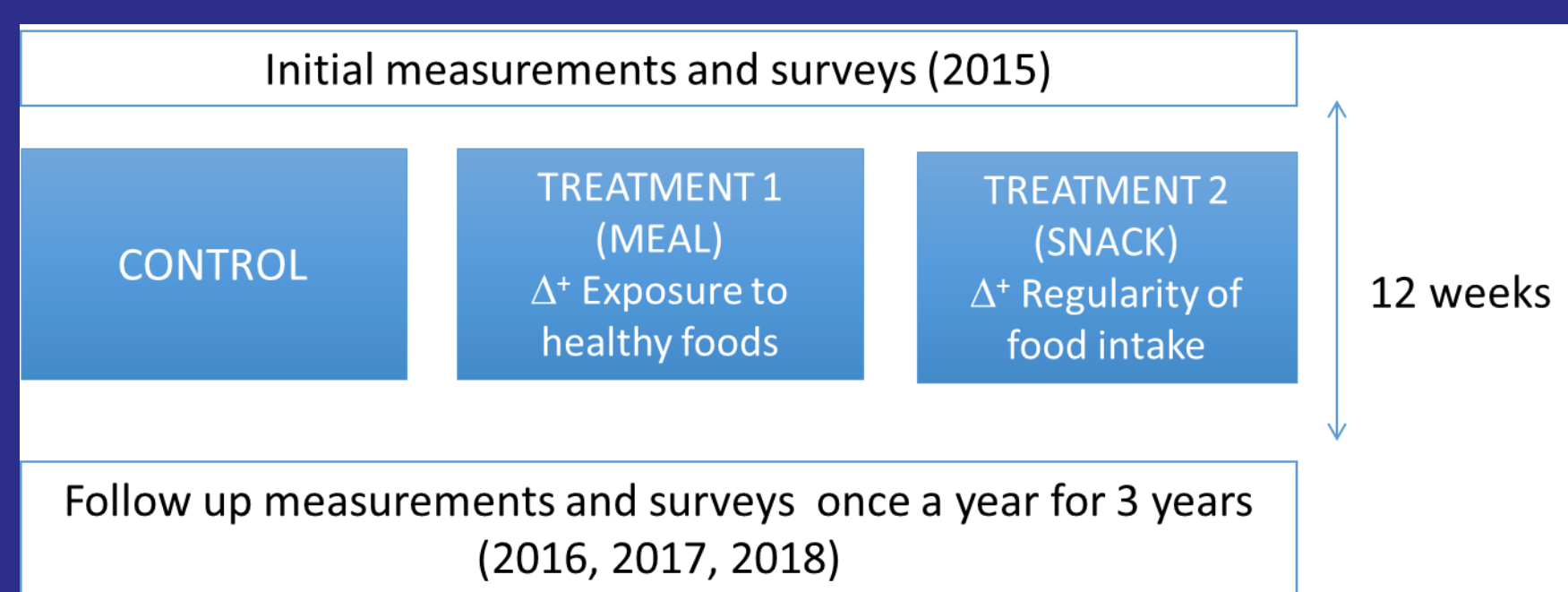
• **Treatment 2 (Snack)** Families are requested to eat 3 meals per day at regular times (+ 2 snacks for children) and avoid other snacks in between.



## Sample

- 285 low SES families with a child between 2 and 6
- Recruited in Edinburgh and Essex
- Payment of £350 (Edinburgh) and £400 (Essex)

## Timeline



## Empirical Strategy

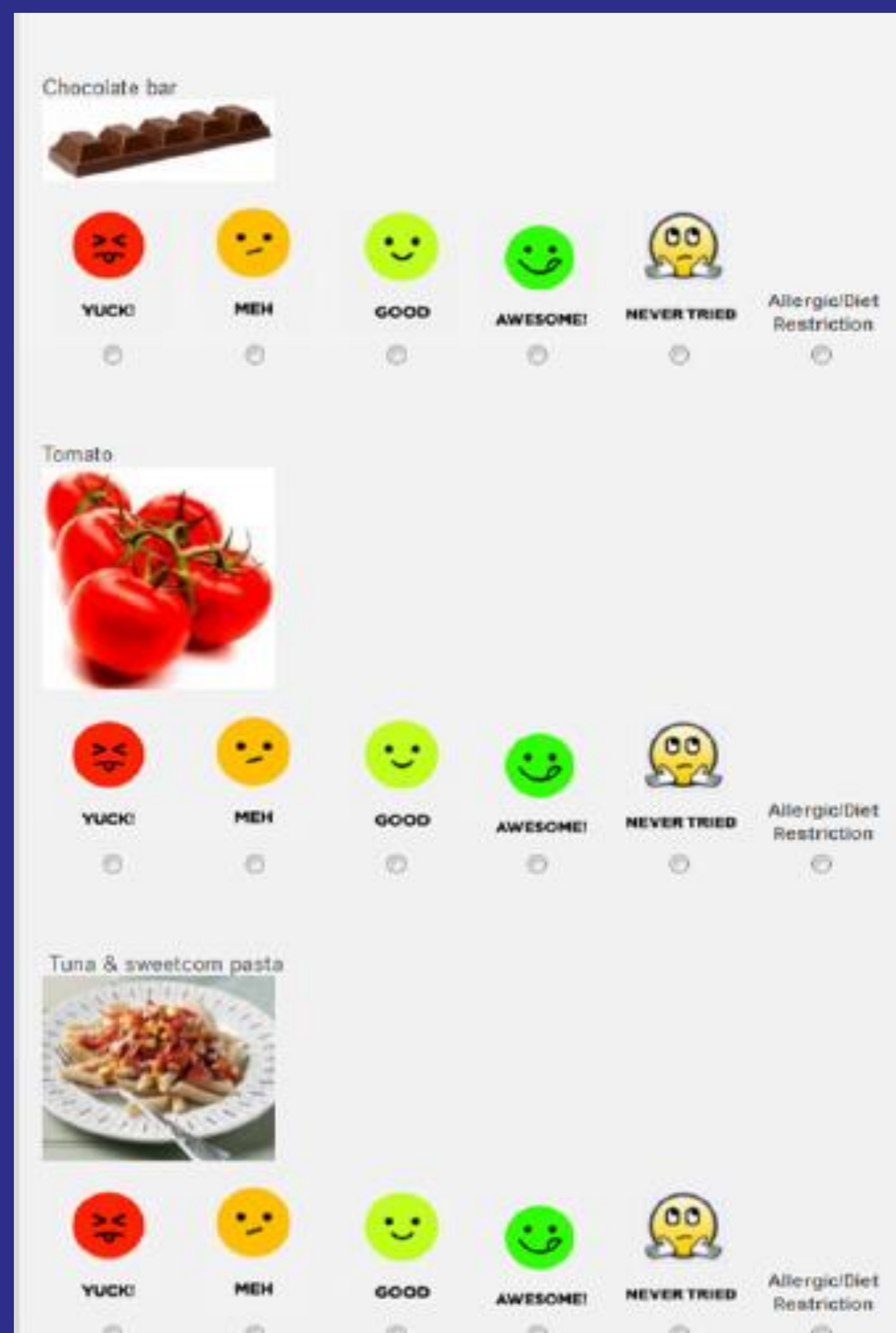
Difference in Differences strategy:

$$Y_{it} = \beta_0 + \beta_1 M_{it} + \beta_2 S_{it} + \beta_3 \text{After}_{it} + \beta_4 \text{1year}_{it} + \beta_5 M_{it} \cdot \text{After}_{it} + \beta_6 S_{it} \cdot \text{After}_{it} + \beta_7 M_{it} \cdot \text{1year}_{it} + \beta_8 S_{it} \cdot \text{1year}_{it} + \gamma_i + \varepsilon_{it}$$

## Outcomes of interest

1. Food preferences
2. Food intake (24 h dietary recall)
3. BMI
4. Incentivized food task (adults)
5. Blood biomarkers (adults)

## Food preferences



	Fruits (1)	Vegetables (2)	Meat/Fish/Eggs (3)	Processed (4)	Sweets (5)	Bread (6)	Cheese (7)
After	0.1* (0.1)	-0.1 (0.1)	0.0 (0.1)	0.1 (0.1)	-0.1** (0.1)	0.1 (0.1)	0.2** (0.1)
1-year follow up	0.0 (0.1)	-0.0 (0.1)	0.2 (0.1)	0.1 (0.1)	-0.1 (0.1)	-0.0 (0.1)	0.0 (0.1)
Meal x After	-0.1 (0.1)	0.0 (0.1)	-0.1 (0.1)	-0.2*** (0.1)	0.2** (0.1)	-0.2* (0.1)	-0.3*** (0.1)
Meal x 1year	-0.0 (0.1)	0.0 (0.1)	-0.1 (0.1)	-0.1 (0.1)	0.1 (0.1)	-0.1 (0.1)	-0.1 (0.1)
Snack x After	0.0 (0.1)	0.1 (0.1)	-0.1 (0.1)	0.0 (0.1)	0.2** (0.1)	0.2 (0.1)	-0.2 (0.1)
Snack x 1year	0.2 (0.1)	0.1 (0.1)	-0.3 (0.1)	0.0 (0.1)	-0.0 (0.1)	0.2 (0.1)	-0.1 (0.1)
Constant	3.2*** (0.0)	2.6*** (0.0)	2.7*** (0.0)	3.4*** (0.0)	3.5*** (0.0)	3.5*** (0.0)	3.3*** (0.0)
# Obs	700	700	699	700	695	697	692

## Dietary intake

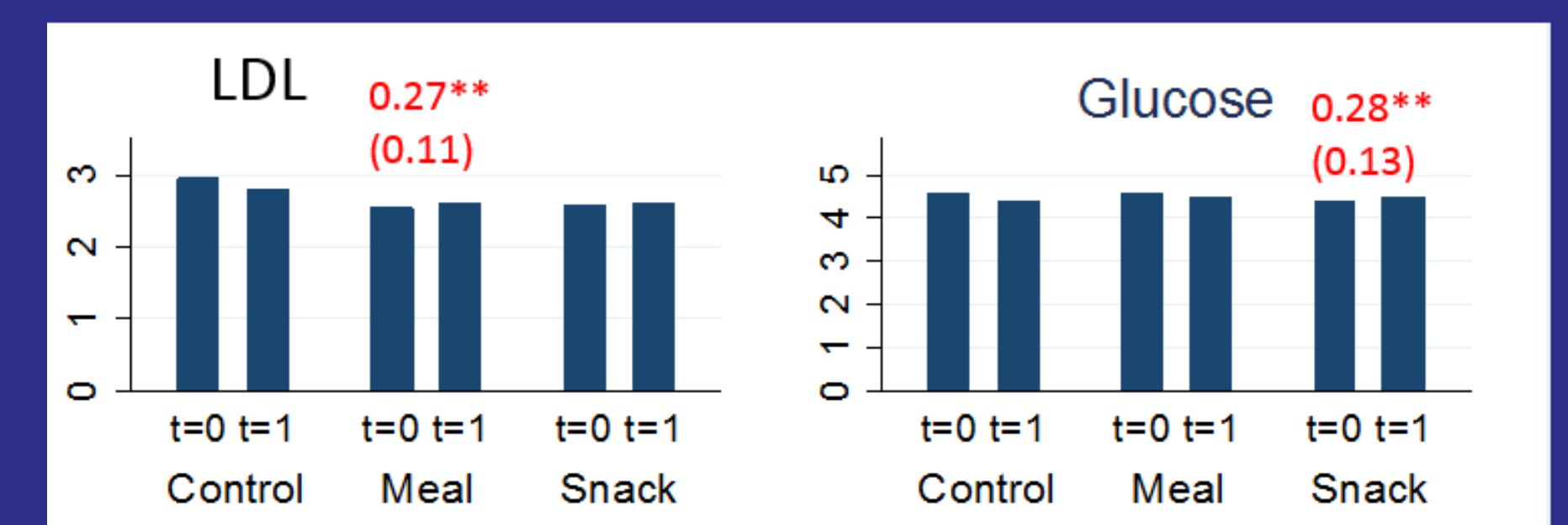
	(1) Energy (Kcal)	(2) Fr. & Veg (g)	(3) Total Fat (g)	(4) Saturates (g)	(5) Carbs (g)	(6) Protein (g)	(7) Sugars (g)	(8) Sodium (g)
After	-67.6 (51.3)	14.5 (15.3)	-2.6 (2.6)	-13.7 (8.4)	1.6 (2.2)	-1.6 (1.2)	-8.6 (5.5)	-79.8 (84.3)
1 year follow-up	128.8* (74.3)	137.7*** (35.3)	0.3 (3.2)	32.6*** (11.8)	2.7 (3.1)	-1.6 (1.4)	23.2*** (7.3)	158.9 (112.0)
Meal x After	-37.2 (70.2)	-17.2 (21.2)	-4.1 (3.7)	-4.3 (10.8)	-3.6 (3.4)	-2.4 (1.8)	-0.4 (7.8)	-61.1 (114.3)
Meal x 1 year	-127.8 (106.4)	57.8 (81.7)	-7.1 (5.3)	-12.2 (15.6)	-4.8 (4.4)	-3.5 (2.5)	-17.1* (10.1)	-104.0 (159.4)
Snack x After	-53.1 (75.1)	-23.0 (26.8)	-3.5 (4.1)	0.3 (11.6)	-4.7 (3.4)	-1.3 (2.1)	-2.1 (7.3)	-120.6 (137.6)
Snack x 1 year	-147.4 (99.4)	-30.6 (56.8)	-3.4 (4.8)	-23.9 (14.9)	-6.7 (4.2)	-1.5 (2.4)	-14.8 (10.0)	-159.3 (173.9)
Constant	1,417.2*** (18.8)	118.7*** (6.6)	56.7*** (1.0)	187.4*** (2.8)	49.4*** (0.8)	24.5*** (0.5)	92.3*** (2.0)	1,565.4*** (31.0)
# Obs.	804	656	804	804	804	804	804	804

## Incentivized measure (adults - Essex)

Choice	Value in £	Value in £
Choice 1	£2.75	£2.00
Choice 2	£2.50	£2.00
Choice 3	£2.25	£2.00
Choice 4	£2.00	£2.00
Choice 5	£1.75	£2.00
Choice 6	£1.50	£2.00
Choice 7	£1.25	£2.00

	# healthy choices
After	0.1 (0.2)
Meal*After	-0.9*** (0.3)
Snack*After	-0.7* (0.3)
Constant	4.4*** (0.1)
# Obs.	505
# ind.	268
R-squared	0.1

## Blood biomarkers (adults – Edinburgh)



N=106  
Diff-in diff estimates with FE.

	(1) NEFA	(2) Insulin	(3) Triglycerine	(4) Glucose	(5) HDL	(6) LDL	(7) CRP	(8) TAS
After	-0.05 (0.05)	0.83 (2.18)	-0.09 (0.09)	-0.19** (0.08)	-0.00 (0.03)	-0.17* (0.08)	-2.10 (1.36)	0.07 (0.05)
Meal*After	0.01 (0.06)	-1.71 (2.98)	-0.04 (0.12)	0.11 (0.11)	0.01 (0.04)	0.27** (0.11)	1.15 (1.86)	-0.03 (0.07)
Snack*After	-0.04 (0.08)	4.76 (3.67)	0.05 (0.15)	0.28** (0.13)	0.03 (0.05)	0.20 (0.14)	-0.89 (2.29)	-0.14* (0.08)
Constant	0.45*** (0.02)	11.75*** (0.92)	1.13*** (0.04)	4.53*** (0.03)	1.46*** (0.01)	2.70*** (0.04)	4.02*** (0.58)	1.52*** (0.02)
Observations	195	195	195	195	195	195	195	195

## Body Mass Index

	Adults		Children			
	(1) BMI	(2) Overwt and obese	(3) Overwt and obese	(4) Perc. Ht	(5) Perc. Wt	(6) Perc. BMI
After	0.09 (0.15)	-0.00 (0.02)	0.01 (0.03)	-0.01 (0.01)	0.01 (0.01)	0.02 (0.01)
1 year follow up	0.28* (0.16)	-0.00 (0.02)	-0.05 (0.03)	0.03* (0.01)	0.01 (0.01)	-0.00 (0.01)
Meal x After	-0.01 (0.22)	-0.01 (0.03)	-0.05 (0.05)	-0.00 (0.02)	-0.04** (0.02)	-0.05** (0.02)
Meal x 1 year	0.04 (0.23)	-0.01 (0.03)	0.02 (0.05)	-0.01 (0.02)	-0.04** (0.02)	-0.06*** (0.02)
Snack x After	-0.15 (0.25)	0.02 (0.04)	-0.07 (0.05)	-0.00 (0.02)	-0.03 (0.02)	-0.06*** (0.02)
Snack x 1 year	-0.05 (0.27)	0.04 (0.04)	0.08 (0.06)	-0.02 (0.02)	-0.05** (0.02)	-0.04* (0.02)
Constant	28.21*** (0.07)	0.63*** (0.01)	0.20*** (0.01)	0.55*** (0.01)	0.63*** (0.01)	0.63*** (0.01)
Observations	1,020	1,026	764	790	798	786

## Conclusion

Both treatments appear to have had some effect on children, but not on adults.

We conclude that exposure to a healthy diet and regularity of food intake may possibly play a role in shaping dietary habits.

## Acknowledgements

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Check our website at: <https://www.nudge-it.eu/>