

Supermarket Shopping and Nutritional Outcomes: A Panel Data Analysis for Urban Kenya*



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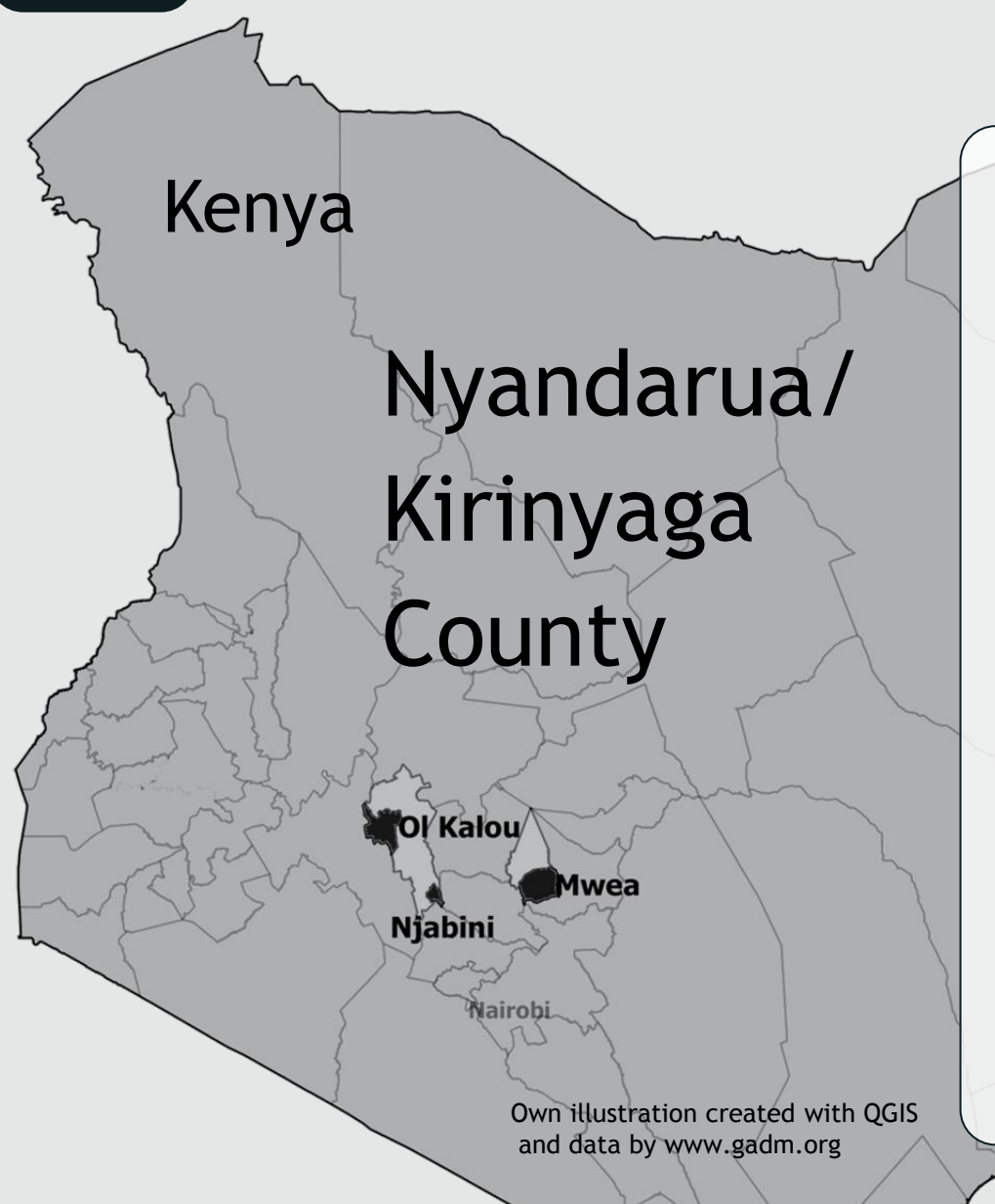
INTRODUCTION

- Overweight and obesity are growing health problems in many developing countries ^[1,2]
- Modernizing food retail environments were identified to play a role in changing lifestyles and people's diets ^[3-6]
- Concrete evidence about the effects of supermarkets on consumer diets and nutrition is thin and so far only based on cross-sectional survey data.

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What are the effects of supermarkets shopping on body mass index (BMI), as well as on dietary indicators such as the consumption of processed food?

MATERIALS AND METHODS



① Purposeful selection of 3 urban towns with different supermarket availability

Quasi-experimental setting



OL KALOU

MWEA

NJABINI

② Random selection of 432 households & 601 adults

2012

③ Follow-up of 219 households & 286 adults

2015

④ Random selection of 211 households & 312 adults as replacements

2015

⑤ Total of 1,199 adults included in unbalanced panel data analysis

2012/15

Statistical analysis using fixed and random effects:

$$[1] \quad N_{it} = \beta_0 + \beta_1 S_{it} + \beta_2 X_{it} + \varepsilon_{it}$$

$$[2] \quad D_{it} = \beta_0 + \beta_1 S_{it} + \beta_2 X_{it} + \varepsilon_{it}$$

N_{it} : Nutritional outcome (BMI) for individual i at time t
 D_{it} : Dietary indicator of individual i at time t
 S_{it} : Dummy variable indicating shopping in supermarket within last 30d
 X_{it} : Vector of control variable characteristics (age, gender, marital status, physical activity ratios, economic status)

RESULTS

Effects of supermarket shopping on BMI and dietary indicators

	BMI (kg/m ²)		% Energy from highly processed foods		Energy consumption from different food groups (kcal/AE/day)									
	FE	RE	FE	RE	Unprocessed staples		Fruits and vegetables		Meats and fish		Dairy and egg		Vegetable oils	
Shopping in supermarkets (1,0)	0.64*	0.61**	3.07***	0.45	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE
Hausman test χ^2	(0.38)	(0.29)	(1.13)	(0.87)	-111.61*	-22.43	-124.30**	-16.53	5.70	24.17***	7.88	8.94***	9.03	59.81***
	58.43***		23.10***		(59.27)	(30.58)	(56.82)	(21.34)	(11.28)	(7.30)	(6.16)	(3.45)	(27.39)	(15.31)
					4.23		21.42***		6.41		5.75		8.43	

Coefficient estimates are shown with standard errors cluster-corrected at household level in parentheses. No. of observations for all models = 1,199. AE, adult equivalent; BMI, body mass index; FE, fixed effects; RE, random effects. Not shown control variables: being married, physical activity ratio, being female, age, expenditure pc, town and year dummy variables. * Significant at 10% level; ** Significant at 5% level; *** Significant at 1% level.

Shopping in supermarkets increases ↑

- Body mass index by 0.6 kg/m²
- The share of energy from processed foods by 3 percentage points
- The energy consumption of meats/fish (24 kcal/AE/day), dairy/eggs (9 kcal/AE/day) and vegetable oils 60 kcal/AE/day

Shopping in supermarkets decreases ↓

- The energy consumption of unprocessed staples (112 kcal/AE/day) and fruits/vegetables (124 kcal/AE/day)

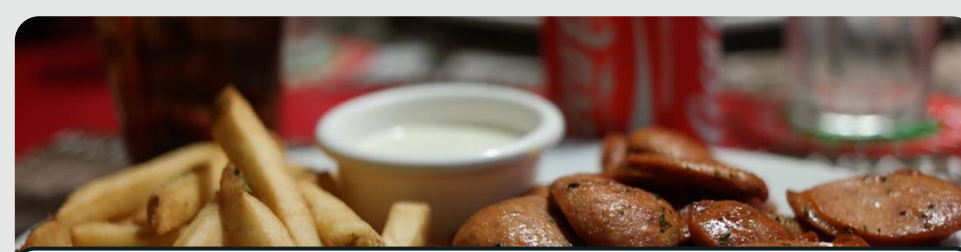
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Shopping in supermarkets significantly increases BMI and contributes to dietary changes and hence, also to the nutrition transition. But supermarkets are not the only symptom of this transition. A modernizing retail sector should not be condemned, as it can also have important positive effects.

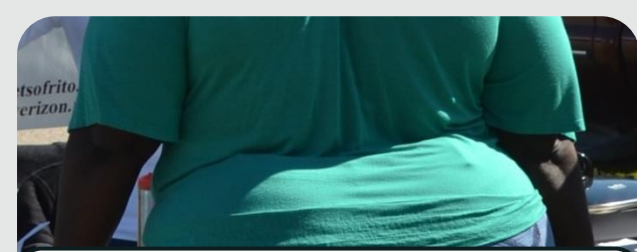
DIETARY CHOICES / FOOD ENVIRONMENT



Nutrition transition



- ↑ Energy consumption
- Changing level of processing



↑ Body weight

Speed up



Changing retail environment (Supermarkets)

- Bigger range of products and product sizes
- Lower prices
- Shopping atmosphere

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