Food expenditure and nutritional quality over the Great Recession

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Long run and recent changes

Real expenditure per 1000 calories (2005 £)


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Background

• Recession led to fall in incomes:

<table>
<thead>
<tr>
<th>Change in median real net income 2007-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households with dependent children</td>
</tr>
<tr>
<td>Households without dependent children</td>
</tr>
<tr>
<td>Pensioner households</td>
</tr>
</tbody>
</table>

• Rise in the price of food relative to other goods
UK food prices rise
UK food prices rise

[Graph showing the relative price of food in OECD and UK from January 2005 to January 2011. The graph indicates an increase in prices over the years, particularly around January 2009.]
UK food prices rise
What we do

- Focus on food purchases brought into the home: accounts for over 86% of total calories purchased in 2005-7
- Use detailed data on the food purchases of a representative panel of 15,850 British households
- These data allow us to follow the same households over time
Real food expenditure falls

![Graph showing real food expenditure before, during, and after a recession. The graph indicates a significant drop in expenditure during the recession period.]
What we show

- Real food expenditure falls
- Changes in:
  - number of calories purchased
  - the cost of calories
  - the nutritional quality of calories
Calorie purchases decline
Biggest declines in calorie purchases for households with children

% change in calorie purchases
(from before to after the recession)

-12 -10 -8 -6 -4 -2 0 2

All households
Single non-pensioners
Single pensioner
Couple non-pensioners
Couple pensioner
Multi adult
Single parents
2+ adults, young children
2+ adults, older children

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Biggest declines in calorie purchases for households with children

% change calorie purchases
(from before to after the recession)

-12 -10 -8 -6 -4 -2 0 2

- All households
- Single non-pensioners
- Single pensioner
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What we show

• Fall in number of calories households buy
• Reduction in calories less than the reduction in real expenditure:
  • households have switched to cheaper calories
Change in cost of calories varies by household type

% change in real expenditure per calorie
(from before to after the recession)

-10 -8 -6 -4 -2 0

- All households
- Single non-pensioners
- Single pensioner
- Couple non-pensioners
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Calorie density of food bought increases

- Calorie density (kcals per 100g) of food purchased has increased
  - most of the increase in calorie density can be attributed to households changing the types of food they were purchasing (e.g. from fruit and vegetables to processed food),
  - rather than changing the products they bought within each food type

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Changes in nutritional quality

- The nutritional quality of diet is hard to measure
- We use a variety of measures:
  - changes in nutrient intensity (sugar, saturated fat)
  - change in the calorie share of fruit and vegetables
  - two one-dimensional measures of nutritional quality (Healthy Eating Index and Nutrient Profiling Model)

- Consider whether the changes were due to households switching between food groups, or to different products within food groups
Saturated fat (g per 100g) increases

Change in saturated fat intensity (g per 100g) from before to after recession

All households
Single non-pensioners
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Couple pensioner
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Change in sugar intensity (g per 100g)
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Shifts away from fruit and vegetables

Percentage point change in calorie share of fruit and veg from before to after recession

-1.4 -1.2 -1 -0.8 -0.6 -0.4 -0.2 0

All households
Single non-pensioners
Single pensioner
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Couple pensioner
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Single parents
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Healthy Eating Index

1. Healthy Eating Index (HEI) - see Guenther et al (2005):
   - used by the US Department of Agriculture to measure compliance with the US government’s recommendations for healthy diet
   - constructed based on the quantity of different food types (e.g. fruit, vegetables, meat etc.) and nutrients (e.g. salt, saturated fat) purchased per 1000 kcals
Biggest declines in nutritional quality for pensioners and single parents
Nutrient profiling model (NPM) - see Rayner et al (2009):

- used by the UK government to assess the healthiness of food products
- depends on a product’s energy density, saturated fat, sodium, sugar, protein, fibre and fruit and vegetable content
- we construct an average for each household in each month across all products purchased
Biggest declines for pensioners, single parents and households with young children
Changes in nutritional quality

- Nutritional quality declined across a range of measures:
  - was it mainly due to switching across food types i.e. from fruit and vegetables to processed food?
  - or to substitution to less nutritious food products within food types i.e. to ready meals that are higher in saturated fat?

- Food groups (used by the USDA):

  - fruit; vegetables; grains; dairy and fats; red meat; poultry and fish; milk; soft drinks; processed sweet; processed savoury; alcohol

- Look at the change in the average NPM score that is due to households switching between food groups, and the change that is due to households substituting within food groups
Households switched to less healthy food groups
Households switched to healthier products within food groups
Changes in purchases of processed food

- A large part of the switching across food groups was towards processed food
- Did households that switched more towards processed food buy more or less healthy food products within that group?
- Look at the change in the calorie share of processed food and the change in the saturated fat and sugar content of processed food
Biggest increases in share of processed food for pensioners and single parents
Single parents reduced saturated fat intensity of processed food, pensioners increased it.
Summary

- From 2005-12 households’ food spending patterns changed substantially, countering long-run trends:
  - households substituted towards cheaper calories
  - households increased the calorie density of the food they purchased
- Nutritional quality of foods changed:
  - the saturated fat and sugar intensity of food increased
  - households substituted towards processed food and away from fruit and vegetables
  - these changes were largest for pensioner households, single parents and households with young children
## Healthy Eating Index

<table>
<thead>
<tr>
<th>Component</th>
<th>Max score</th>
<th>Lower limit (per 1000 kcals unless stated)</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total fruit</td>
<td>5</td>
<td>0</td>
<td>120g</td>
</tr>
<tr>
<td>Whole fruit</td>
<td>5</td>
<td>0</td>
<td>60g</td>
</tr>
<tr>
<td>Total vegetable</td>
<td>5</td>
<td>0</td>
<td>165g</td>
</tr>
<tr>
<td>Dark green/orange veg</td>
<td>5</td>
<td>0</td>
<td>60g</td>
</tr>
<tr>
<td>Total grains</td>
<td>5</td>
<td>0</td>
<td>75g</td>
</tr>
<tr>
<td>Whole grains</td>
<td>5</td>
<td>0</td>
<td>32.5g</td>
</tr>
<tr>
<td>Milk</td>
<td>10</td>
<td>0</td>
<td>260g</td>
</tr>
<tr>
<td>Meat</td>
<td>10</td>
<td>0</td>
<td>70g</td>
</tr>
<tr>
<td>Oils</td>
<td>10</td>
<td>0</td>
<td>12g</td>
</tr>
<tr>
<td>Saturated fat</td>
<td>10</td>
<td>&gt;15% energy</td>
<td>&lt;7% energy</td>
</tr>
<tr>
<td>Sodium</td>
<td>10</td>
<td>&gt;2g</td>
<td>&lt;0.7g</td>
</tr>
<tr>
<td>Calories from SoFAAS</td>
<td>20</td>
<td>&gt;50% energy</td>
<td>&lt;20% energy</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Nutrient Profiling Model

<table>
<thead>
<tr>
<th>Points</th>
<th>Energy (kJ)</th>
<th>Saturated fat (g)</th>
<th>Total sugar (g)</th>
<th>Sodium (mg)</th>
<th>Fruit, veg nuts (%)</th>
<th>NSP fibre (g)</th>
<th>Protein (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>≤ 335</td>
<td>≤ 1</td>
<td>≤ 4.5</td>
<td>≤ 90</td>
<td>≤ 40</td>
<td>≤ 0.7</td>
<td>≤ 1.6</td>
</tr>
<tr>
<td>1</td>
<td>&gt; 335</td>
<td>&gt; 1</td>
<td>&gt; 4.5</td>
<td>&gt; 90</td>
<td>&gt; 40</td>
<td>&gt; 0.7</td>
<td>&gt; 1.6</td>
</tr>
<tr>
<td>2</td>
<td>&gt; 670</td>
<td>&gt; 2</td>
<td>&gt; 9.0</td>
<td>&gt; 180</td>
<td>&gt; 60</td>
<td>&gt; 1.4</td>
<td>&gt; 3.2</td>
</tr>
<tr>
<td>3</td>
<td>&gt; 1005</td>
<td>&gt; 3</td>
<td>&gt; 13.5</td>
<td>&gt; 270</td>
<td>−</td>
<td>&gt; 2.1</td>
<td>&gt; 4.8</td>
</tr>
<tr>
<td>4</td>
<td>&gt; 1340</td>
<td>&gt; 4</td>
<td>&gt; 18.0</td>
<td>&gt; 360</td>
<td>−</td>
<td>&gt; 2.8</td>
<td>&gt; 6.4</td>
</tr>
<tr>
<td>5</td>
<td>&gt; 1675</td>
<td>&gt; 5</td>
<td>&gt; 22.5</td>
<td>&gt; 450</td>
<td>&gt; 80</td>
<td>&gt; 3.5</td>
<td>&gt; 8.0</td>
</tr>
<tr>
<td>6</td>
<td>&gt; 2010</td>
<td>&gt; 6</td>
<td>&gt; 27.0</td>
<td>&gt; 540</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>7</td>
<td>&gt; 2345</td>
<td>&gt; 7</td>
<td>&gt; 31.0</td>
<td>&gt; 630</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>8</td>
<td>&gt; 2680</td>
<td>&gt; 8</td>
<td>&gt; 36.0</td>
<td>&gt; 720</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>9</td>
<td>&gt; 3015</td>
<td>&gt; 9</td>
<td>&gt; 40.0</td>
<td>&gt; 810</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>10</td>
<td>&gt; 3350</td>
<td>&gt; 10</td>
<td>&gt; 45.0</td>
<td>&gt; 900</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
</tbody>
</table>

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## Food groups

<table>
<thead>
<tr>
<th>Food type and main items</th>
<th>Calorie share</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit</strong>: fruit, including fruit juices</td>
<td>5.9%</td>
</tr>
<tr>
<td><strong>Vegetables</strong>: fresh, canned or frozen vegetables</td>
<td>6.8%</td>
</tr>
<tr>
<td><strong>Grains</strong>: flour, cereals, pasta, rice, breads</td>
<td>16.8%</td>
</tr>
<tr>
<td><strong>Dairy, cheese and fats</strong>: cream, cheese, oils, butter, margarine</td>
<td>13.6%</td>
</tr>
<tr>
<td><strong>Red meat</strong>: beef, lamb, pork, nuts, eggs</td>
<td>8.5%</td>
</tr>
<tr>
<td><strong>Poultry and fish</strong>: poultry, seafood</td>
<td>3.9%</td>
</tr>
<tr>
<td><strong>Milk</strong>: milk, yogurt</td>
<td>7.95%</td>
</tr>
<tr>
<td><strong>Drinks</strong>: fizzy drinks, tea, coffee, water</td>
<td>2.0%</td>
</tr>
<tr>
<td><strong>Prepared (sweet)</strong>: ice cream, cakes, cookies etc.</td>
<td>18.7%</td>
</tr>
<tr>
<td><strong>Prepared (savoury)</strong>: ready meals, soups, snacks</td>
<td>14.6%</td>
</tr>
<tr>
<td><strong>Alcohol</strong>: wine, beer, spirits</td>
<td>5.2%</td>
</tr>
</tbody>
</table>