The Effect of China’s Family Structure on Household Nutrition

Yan Wang, Thomas I. Wahl, Junfei Bai, James L. Seale, Jr.

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The Effect of China’s Family Structure on Household Nutrition

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North Dakota State University, China Agricultural University, and University of Florida

Presented at IATRC, Washington DC 12/5/17
Introduction

• 1.3 Billion population
• China’s growing economy and emerging middle class
• Urban vs. rural
• 40% of income on food
Introduction

• Eating too much?
• Unhealthy diet?
China's one-child policy and emphasis on the family
• More or “better” food?
• Little Kings?
• Extended family?
Research Questions?

Are Chinese consumers eating healthy?

Does having a child or seniors in the HH affect the type and amount of food consumed?
Healthy Eating

Develop a measure of eating healthy

• Eating Healthy Index (EHI)

Household survey data
Data

- Diary-based household survey, 2007-2012
  - 11 cities
  - Approximately 200 households from each city
  - 3-meal/7-day diary record
  - 2342 households
China’s Compilation of Food-Based Dietary Guidelines

Chinese Nutrition Society recommendations
• Eat a variety of foods
• Consume milk, beans or dairy- or bean-products every day
• Consume vegetables, fruits and tubers
• Consume appropriate amounts of fish, poultry, eggs and lean meat
## Chinese Dietary Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>Recommended</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>50g-75g</td>
<td>62.5</td>
</tr>
<tr>
<td>Fruit</td>
<td>200g-400g</td>
<td>300</td>
</tr>
<tr>
<td>Vegetables</td>
<td>300g-500g</td>
<td>400</td>
</tr>
<tr>
<td>Seafood</td>
<td>75g-100g</td>
<td>87.5</td>
</tr>
<tr>
<td>Dairy</td>
<td>≥300g</td>
<td>300</td>
</tr>
<tr>
<td>Grain</td>
<td>250g-400g</td>
<td>325</td>
</tr>
<tr>
<td>Eggs</td>
<td>25g-50g</td>
<td>37.5</td>
</tr>
</tbody>
</table>
Eating Healthy Index, $S_i$

$$EH\text{I}: S_i = \alpha |Q_i - M_i| + \beta$$

Where:

$Q_i$ = household consumed and

$M_i$ = mean of the standard range

$\alpha$ = scaling coefficient

$\beta$ = constant
Eating Healthy Index

Quantity

Under-consumption  Recommended  Over-consumption
Results

Meat

Seafood
Results

Fruit

Grain
Results

Dairy

Eggs
Results

Vegetables
Factors affecting EHI

- Child
- Seniors
- Regional effect
- Household income
- Wife’s education
- Wife’s age
- Household size
<table>
<thead>
<tr>
<th></th>
<th>Grain</th>
<th>Meat</th>
<th>Seafood</th>
<th>Eggs</th>
<th>Veg</th>
<th>Fruit</th>
<th>Dairy</th>
</tr>
</thead>
<tbody>
<tr>
<td>HH Inc_L</td>
<td>4.16E-05</td>
<td><strong>0.205</strong>*</td>
<td><strong>0.078</strong>*</td>
<td>0.017</td>
<td>0.002</td>
<td>0.022</td>
<td>0.013</td>
</tr>
<tr>
<td>HH Size_L</td>
<td>-0.333***</td>
<td><strong>0.712</strong>*</td>
<td>-0.022</td>
<td><strong>-0.213</strong></td>
<td><strong>-0.358</strong>*</td>
<td><strong>-0.448</strong>*</td>
<td><strong>-0.352</strong>*</td>
</tr>
<tr>
<td>Child_L</td>
<td>0.093</td>
<td>-0.092</td>
<td>-0.018</td>
<td><strong>0.544</strong>*</td>
<td><strong>0.400</strong></td>
<td><strong>0.390</strong>*</td>
<td><strong>0.450</strong>*</td>
</tr>
<tr>
<td>Senior_L</td>
<td>-0.02</td>
<td>-0.136</td>
<td><strong>-0.250</strong></td>
<td><strong>-0.272</strong></td>
<td><em>0.234</em></td>
<td>0.004</td>
<td>0.046</td>
</tr>
<tr>
<td>HH Inc_M</td>
<td>0.031**</td>
<td><strong>0.148</strong>*</td>
<td>0.039</td>
<td><strong>0.094</strong>*</td>
<td><strong>0.036</strong></td>
<td><strong>0.103</strong>*</td>
<td>-0.018</td>
</tr>
<tr>
<td>HH Size_M</td>
<td><strong>0.955</strong>*</td>
<td><strong>2.714</strong>*</td>
<td><strong>2.332</strong>*</td>
<td><strong>1.877</strong>*</td>
<td><strong>1.121</strong>*</td>
<td><strong>1.945</strong>*</td>
<td><strong>2.562</strong>*</td>
</tr>
<tr>
<td>Child_M</td>
<td><strong>-0.473</strong>*</td>
<td><strong>-1.665</strong>*</td>
<td><strong>-1.293</strong>*</td>
<td><strong>-1.097</strong>*</td>
<td><strong>-0.503</strong>*</td>
<td><strong>-1.037</strong>*</td>
<td>-1.039</td>
</tr>
<tr>
<td>Senior_M</td>
<td>0.029</td>
<td><strong>0.333</strong>*</td>
<td>0.08</td>
<td>0.048</td>
<td>0.089</td>
<td>0.055</td>
<td>0.227</td>
</tr>
<tr>
<td>HH Inc_H</td>
<td>-0.004</td>
<td><strong>-0.041</strong>*</td>
<td><strong>-0.089</strong>*</td>
<td><strong>-0.041</strong></td>
<td><strong>-0.057</strong>*</td>
<td><strong>-0.054</strong></td>
<td></td>
</tr>
<tr>
<td>HH Size_H</td>
<td><strong>-0.832</strong>*</td>
<td><strong>-0.130</strong></td>
<td><strong>0.375</strong>*</td>
<td><strong>-0.827</strong>*</td>
<td><strong>-0.831</strong>*</td>
<td><strong>-0.667</strong>*</td>
<td></td>
</tr>
<tr>
<td>Child_H</td>
<td><strong>0.754</strong>*</td>
<td><strong>0.277</strong>*</td>
<td>-0.348</td>
<td><strong>0.666</strong>*</td>
<td><strong>1.159</strong>*</td>
<td><strong>0.563</strong>*</td>
<td></td>
</tr>
<tr>
<td>Senior_H</td>
<td>-0.108</td>
<td>0.01</td>
<td>0.079</td>
<td>-0.048</td>
<td>-0.073</td>
<td>-0.074</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grain</td>
<td>Meat</td>
<td>Seafood</td>
<td>Eggs</td>
<td>Veg</td>
<td>Fruit</td>
<td>Dairy</td>
</tr>
<tr>
<td>----------------</td>
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<td>-----------</td>
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<td>---------</td>
</tr>
<tr>
<td>W City</td>
<td>0.212**</td>
<td>-0.376***</td>
<td>-0.433***</td>
<td>0.095</td>
<td>-0.031</td>
<td>0.059</td>
<td>1.028***</td>
</tr>
<tr>
<td>E City</td>
<td>0.322***</td>
<td>-0.597***</td>
<td>0.945***</td>
<td>0.104</td>
<td>0.113</td>
<td>-0.009</td>
<td>0.427***</td>
</tr>
<tr>
<td>Wife’s Edu</td>
<td>0.043</td>
<td>0.006</td>
<td>0.161***</td>
<td>0.053</td>
<td>0.025</td>
<td>0.017</td>
<td>0.255***</td>
</tr>
<tr>
<td>Wife’s Age</td>
<td>0.0021</td>
<td>0.012**</td>
<td>0.004</td>
<td>0.005</td>
<td>-0.002</td>
<td>-0.002</td>
<td>0.028***</td>
</tr>
<tr>
<td>R²</td>
<td>0.6711</td>
<td>0.5987</td>
<td>0.3801</td>
<td>0.7339</td>
<td>0.684</td>
<td>0.7125</td>
<td>0.1713</td>
</tr>
</tbody>
</table>

Note: confidence level *10% ** 5% *** 1%;
Results for Low EHI

• Consumption less than recommended levels
• Children in HH have a positive effect for all but meat and seafood
• Seniors have a positive effect on veggies, fruit, and dairy
• HH size has a negative effect
Results for Medium EHI

• Consumption at recommended levels
• Positive effects for HH size, and seniors
• Children have a negative effect
Results for High EHI

• Consumption above recommended levels
• Negative effects for HH size
• Positive effect for children, except seafood
• Negative effect for seniors except for meat and seafood
Conclusions

• HH with children and seniors tend to eat healthier

• Children may be an investment in the future? Little kings....

• Seniors may eat healthier and thus influence the family’s diet
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