Self-defined vegetarian status: usefulness and validity

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EPIC-Oxford questionnaires

• Do you eat any meat (including bacon, ham, poultry, game, meat pies, sausages)?

• Do you eat any fish?

• Do you eat any dairy products (including milk, cheese, butter, yogurt)?

• Do you eat any eggs (including eggs in cakes and other baked goods)?
EPIC-Oxford diet groups

- Meat-eaters
  - Any meat - irrespective of what else they eat
- Fish-eaters
  - No meat, any fish
- Vegetarians
  - No meat or fish
- Vegans
  - No meat, fish, dairy products or eggs

- We can consider further subdivisions or different groupings
  - e.g. subdivide meat-eaters
## Diet baseline vs 5 years follow-up

<table>
<thead>
<tr>
<th>Diet at baseline</th>
<th>Meat</th>
<th>Fish</th>
<th>Vegetarian</th>
<th>Vegan</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>18570</td>
<td>622</td>
<td>140</td>
<td>8</td>
<td>18</td>
<td>19358</td>
</tr>
<tr>
<td>Fish</td>
<td>978</td>
<td>3877</td>
<td>456</td>
<td>24</td>
<td>9</td>
<td>5344</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>508</td>
<td>1036</td>
<td>8005</td>
<td>321</td>
<td>29</td>
<td>9899</td>
</tr>
<tr>
<td>Vegan</td>
<td>43</td>
<td>52</td>
<td>224</td>
<td>912</td>
<td>5</td>
<td>1236</td>
</tr>
<tr>
<td>Total</td>
<td>20099</td>
<td>5587</td>
<td>8911</td>
<td>1265</td>
<td>61</td>
<td>35837</td>
</tr>
</tbody>
</table>
## Diet baseline vs ~5 years and ~15 years follow-up

<table>
<thead>
<tr>
<th>Diet at baseline</th>
<th>Meat</th>
<th>Fish</th>
<th>Vegetarian</th>
<th>Vegan</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat</td>
<td>96%</td>
<td>3%</td>
<td>1%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Fish</td>
<td>18%</td>
<td>73%</td>
<td>9%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>5%</td>
<td>10%</td>
<td>81%</td>
<td>3%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Vegan</td>
<td>3%</td>
<td>4%</td>
<td>18%</td>
<td>74%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

**Top row - diet at 5 years – 35,837 subjects**

**Bottom row – diet at 15 years – 30,590 subjects**
Diet group characteristics
Serum vitamin B12 in EPIC-Oxford

Mean (95% CI) serum vitamin B12 (pmol/L)

- Meat-eaters: 0%, 689 men with 226 meat-eaters
- Vegetarians: 7%, 689 men with 231 vegetarians
- Vegans: 52%, 689 men with 232 vegans

‘Deficiency’ < 118 pmol/L

Diet group and body mass index, men

Mean BMI kg/m², adjusted for age

- Meat 100+
- Meat 50-99
- Meat <50
- Fish
- Vegetarian
- Vegan
Diet group and body mass index, women

Mean BMI kg/m², adjusted for age
Diet group and total cholesterol, men

Mean plasma cholesterol mmol/l, adjusted for age
Diet group and total cholesterol, women

Mean plasma cholesterol mmol/l, adjusted for age
Grouping vegans with vegetarians – not always sensible: uric acid concentrations by diet group and sex

Adjusted for age, BMI, alcohol and calcium intake

Schmidt J.A. et al. (2013) PLOS ONE 8(2): e56339
Which comparison to make?

• Vegetarian versus non-vegetarian
  – Simple – but some non-vegetarians don’t eat meat
• Non-meat versus meat
  – Simple – but non-meat group are not all vegetarians
• Four diet groups
  – Good – but often too few vegans
• Five or six diet groups - subdividing meat-eaters
  – Can be most convincing analysis
  – But reference group is high meat-eaters