BACKGROUND

- Obesity has become a global health problem (WHO, 2017) and it is a result of an energy imbalance that develops when energy intake exceeds energy expenditure (Hill et al., 2009).
- Foods that increase satiation and satiety may be beneficial to reduce food and energy intake (Hetherington & Cunningham, 2013).
- Dietary fibre affects satiety in many ways, depending on its characteristics such as solubility, viscosity and fermentation (Slavin & Green, 2007).
- β-glucan, abundant in oat, has been shown to increase satiety-related hormones as well as reduce energy intake and body weight (Huang et al., 2011; Lin et al., 2013) besides improving cholesterol and glucose metabolism.
- Capsaicin, a major pungent compound in red chilli peppers, possesses anti-obesity properties (Yoshioka et al, 2001) by enhancing anorexigenic sensations, including satiety and fullness (Smeets et al., 2013).

Study Aims
The study aims to test the hypothesis that oat fibre and chilli may interact to affect satiety in humans.

RESULTS

Study Design
Randomised crossover design
Meal
150 g noodle (0, 10 or 20% oat fibre) in 125 mL broth (0 or 0.3% chilli powder)
Measurement Scale
Labelled category scale for hunger and fullness attributes completed before and after meal
Study Population
12 adult volunteers
Ethics Approval
University of Leeds MEEC 16-040 (5 Oct 2017)

Table 1
Comparisons between the control condition (no added fibre and no chilli) and various experimental conditions for hunger and fullness attributes. The difference is based on the difference of mean estimate scores of after and before meal for control minus experimental condition (for hunger attribute) and vice versa for fullness attribute.

<table>
<thead>
<tr>
<th>Oat Fibre</th>
<th>Chilli</th>
<th>Hunger</th>
<th>Fullness</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Present</td>
<td>Diff 1</td>
<td>Effect size 2 (d)</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>-0.17</td>
<td>-0.40</td>
</tr>
<tr>
<td>10%</td>
<td>None</td>
<td>0.25</td>
<td>0.60</td>
</tr>
<tr>
<td>10%</td>
<td>Present</td>
<td>-0.08</td>
<td>-0.20</td>
</tr>
<tr>
<td>20%</td>
<td>None</td>
<td>0.50</td>
<td>1.19</td>
</tr>
<tr>
<td>20%</td>
<td>Present</td>
<td>0.87</td>
<td>1.99</td>
</tr>
</tbody>
</table>

Diff 1 = difference between Least squares mean (Lsmeans) estimates between the control (no fibre and no chilli) and the experimental variation
Effect size 2 (d) = Cohen’s d using individual standard deviations
p-value 3 = p-value for Cohen’s d
95% CI 4 = 95% confidence interval of Cohen’s d

Addition of chilli and 20% oat fibre significantly affect satiety with large effect size in hunger and fullness scores compared to control (no chilli/no fibre). Fibre alone at 20% also promotes satiety by affecting hunger significantly.

Acknowledgements
The authors also gratefully acknowledge Swedish Oat Fiber (Naturex), Sweden, for providing oat fibre and the Ministry of Higher Education, Government of Malaysia for financially supporting this work through a PhD scholarship (Hanis Gani).

Bibliography