Does taste matter? The importance of taste in the valuation of EU mandatory nutritional and health claim labelling program in Spain

Petjon Ballço
Center of Investigation and Agro-Food Technology of Aragon, Zaragoza - Spain
INTRODUCTION

- Food quality, healthiness, safety and taste – a public debate lately

- Eating behaviors have dramatically changed. Consumers today, demand not only good prices of the food they purchase but they also demand high quality, healthy, safety and most importantly tasty food products

- Attracted by such changes in demand, food companies have introduced a large number of food products with functional properties marketed as healthier alternatives, however many of these functional foods were not based on scientific evidence, resulting to consumer mistrust.
In this regard, to ensure food safety and trustworthy information, the European Food Safety Authority has introduced a standardized list of authorized nutritional and health claims (NHCs) with the main objective of being based only on scientific evidence.
• Previous research[1] – NHCs healthier alternatives compared to conventional food – lead to healthier diets

• However, when it comes to “taste” there is a common believe that “healthy” in most cases equals to less tasty food products.

Material and Methods

Investigate the importance of taste in the valuation of NHCs on healthy food products.

To respond the main objective:

• Analyze consumers’ personal factors that influence the decision to purchase food products with NHCs
  o Previous literature review
    Health and taste

• Analyze the local market situation
  o A database of food products with NHCs

• Measure the effects of these factors in the final decision to purchase
  o Discrete choice experiment
  o Sensorial analysis (taste)
Material and Methods

Where: Zaragoza – Spain
When: 2016

• Product: Yogurt (n=408) - package (4x125 g)
  How: Created databased of food products with NHCs
  o 261 yoghurts with 1 nutritional claim (NC) on the FOP
  o 67 yoghurts with 1 health claim (HC) on the FOP

• Attributes NHCs: 6 NCs & 8 HCs
  How: Referenced (EC) No 1924/2006 and (EC) No 432/2012
  o Previous literature\(^2\) reports that HCs are not fully understood by the “average consumer”. Therefore, we used a focus group of 15 individuals of different ages and educational levels.
Material and Methods

Following previous studies on food products\textsuperscript{[3]} we used a DCE without the price attribute. Instead participants used own prior purchase reference price.

- Full crossing design (44 choice sets: 4 blocks of 11 choice sets). Each choice set included 3 alternatives (A, B and no-buy).

Table 1 – Levels of NHCs used. Note: * Defines that a HC has not yet being introduced to the local market - absent (A).

<table>
<thead>
<tr>
<th>Nº</th>
<th>NC levels</th>
<th>Presence (%)</th>
<th>HC levels</th>
<th>Presence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1º</td>
<td>Fat-free</td>
<td>42.78</td>
<td>Reducing consumption of saturated fat contributes to the maintenance of normal blood cholesterol levels (A)*</td>
<td>-</td>
</tr>
<tr>
<td>2º</td>
<td>Source of calcium</td>
<td>21.25</td>
<td>Calcium is necessary for maintaining bones under normal conditions</td>
<td>2.17</td>
</tr>
<tr>
<td>3º</td>
<td>Plain - Full fat (Baseline)</td>
<td>12.26</td>
<td>Calcium contributes to normal muscle function (A)</td>
<td>-</td>
</tr>
<tr>
<td>4º</td>
<td>Low sugars</td>
<td>11.99</td>
<td>Consumption of food containing sweeteners instead of sugar induces a lower blood glucose (A)</td>
<td>-</td>
</tr>
<tr>
<td>5º</td>
<td>Source of vitamin B6</td>
<td>10.63</td>
<td>With vitamin B6 that helps your defenses and reduces fatigue</td>
<td>10.33</td>
</tr>
<tr>
<td>6º</td>
<td>Source of fiber</td>
<td>1.09</td>
<td>Vitamin B6 contributes to the normal functioning of nervous system (A)</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fiber contributes to an acceleration of intestinal transit</td>
<td>3.80</td>
</tr>
</tbody>
</table>

Note: * Defines that a HC has not yet being introduced to the local market - absent (A).
Material and Methods

• Final sample consisted of 218 participants – 18 sessions – 10 to 12 people per session

• Respondents were stratified:
  o Age, gender and educational level
  o Had to be older than 18 old, be responsible for the food purchase in their household and consume yoghurts

• Experiment consisted of three task:
  o Sensorial analysis (taste or no-taste) - 6 plain yoghurts
    Taste valuation: 9-point scale ranging from “Like it very much” (9) to “Dislike it very much”
    Purchase valuation: 5-point scale “Definitely yes” (5) to “Definitely no” (1).
  o Discrete choice experiment
  o Brief questionnaire
    ▪ Sociodemographic characteristics
    ▪ Yogurt purchase and consumption habits.
Material and Methods

<table>
<thead>
<tr>
<th>Table 2 – Experimental treatments.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taste – DCE (n=115)</td>
</tr>
</tbody>
</table>

1. Sensorial analysis (NHCs) ¹

2. Discrete choice experiment

3. Questionnaire ²

Notes: ¹ Results from the sensorial analysis are not included in this paper. ² Results from the questionnaire are not included in this paper.
Model specification

• Split data approach (GMNL model for each treatment (taste and no-taste))
  Takes into consideration taste and scale heterogeneity

The utility in our GMNL model is given as follows:

\[
U_{njt} = OptOut + \left[ \sigma_n (\beta_1 ncfat_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_2 hcfat_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_3 ncsug_{njt} + \eta_n) \right] \\
+ \left[ \sigma_n (\beta_4 hcsug_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_5 ncfib_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_6 hcfib_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_7 hcafib_{njt} + \eta_n) \right] \\
+ \left[ \sigma_n (\beta_8 ncvit_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_9 hcpvit_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_{10} hcavit_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_{11} nccal_{njt} + \eta_n) \right] \\
+ \left[ \sigma_n (\beta_{12} hcpcal_{njt} + \eta_n) \right] + \left[ \sigma_n (\beta_{13} hcacal_{njt} + \eta_n) \right] + \epsilon_{njt}
\]

• OptOut = alternative-specific constant (no-buy) option
• \( \sigma_n \) = captures the scale heterogeneity
• \( \eta_n \) = captures taste heterogeneity
• \( t \) = number of choice set
• \( j \) = alternative (A, B or no-buy)
• \( n \) = individual
• \( \epsilon_{njt} \) = an observed random term distributed following an extreme value type (Gumbel) distribution
Table 3 – GMNL model estimates

<table>
<thead>
<tr>
<th>Parameters</th>
<th>GMNL Model</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Taste</td>
<td>No taste</td>
<td>Taste</td>
<td>No taste</td>
<td></td>
</tr>
<tr>
<td></td>
<td>β</td>
<td>(z)</td>
<td>SD</td>
<td>β</td>
<td>(z)</td>
</tr>
<tr>
<td>Opt-out</td>
<td>-0.19*** (-2.22)</td>
<td>-</td>
<td>-0.21*** (-2.17)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nc(^1) fat</td>
<td>0.28 (1.25)</td>
<td>2.64*** (9.87)</td>
<td>0.14 (0.59)</td>
<td>0.05 (0.41)</td>
<td></td>
</tr>
<tr>
<td>Hc(^2) fat</td>
<td>2.65*** (11.87)</td>
<td>1.60*** (12.41)</td>
<td>3.37*** (8.89)</td>
<td>3.02*** (11.45)</td>
<td></td>
</tr>
<tr>
<td>Nc(^3) sug</td>
<td>-0.42* (-1.94)</td>
<td>1.23*** (4.18)</td>
<td>-0.85*** (-3.29)</td>
<td>1.62*** (7.33)</td>
<td></td>
</tr>
<tr>
<td>Hc(^4) sug</td>
<td>1.43*** (5.99)</td>
<td>2.75*** (12.25)</td>
<td>2.09*** (8.26)</td>
<td>2.69*** (13.66)</td>
<td></td>
</tr>
<tr>
<td>Nc(^5) fib</td>
<td>0.04 (0.28)</td>
<td>2.32*** (15.42)</td>
<td>0.50*** (3.40)</td>
<td>1.63*** (13.02)</td>
<td></td>
</tr>
<tr>
<td>Hc(^6) fib</td>
<td>1.44*** (11.84)</td>
<td>0.05*** (0.46)</td>
<td>1.89*** (12.70)</td>
<td>0.57*** (4.90)</td>
<td></td>
</tr>
<tr>
<td>Hca(^7) fib</td>
<td>0.36*** (2.86)</td>
<td>0.46*** (3.91)</td>
<td>0.01 (0.04)</td>
<td>0.22* (1.90)</td>
<td></td>
</tr>
<tr>
<td>Nc(^8) vit</td>
<td>-0.53*** (-3.57)</td>
<td>2.02*** (17.49)</td>
<td>-0.66*** (-4.18)</td>
<td>1.53*** (11.21)</td>
<td></td>
</tr>
<tr>
<td>Hc(^9) vit</td>
<td>2.24*** (14.09)</td>
<td>1.27*** (10.07)</td>
<td>2.44*** (12.58)</td>
<td>0.54*** (3.11)</td>
<td></td>
</tr>
<tr>
<td>Hca(^10) vit</td>
<td>1.48*** (9.63)</td>
<td>1.56*** (10.48)</td>
<td>2.11*** (13.51)</td>
<td>0.92*** (4.72)</td>
<td></td>
</tr>
<tr>
<td>Nc(^11) cal</td>
<td>-0.69*** (-4.85)</td>
<td>2.74*** (12.30)</td>
<td>-0.72*** (-4.77)</td>
<td>1.74*** (13.25)</td>
<td></td>
</tr>
<tr>
<td>Hc(^12) cal</td>
<td>2.05*** (15.40)</td>
<td>0.08 (0.68)</td>
<td>2.52*** (15.91)</td>
<td>0.11 (0.67)</td>
<td></td>
</tr>
<tr>
<td>Hca(^13) cal</td>
<td>1.54*** (13.03)</td>
<td>0.21** (2.33)</td>
<td>1.87*** (13.51)</td>
<td>0.12* (1.06)</td>
<td></td>
</tr>
<tr>
<td>T-scale</td>
<td>0.21*** (4.02)</td>
<td>0.39*** (9.15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>σ</td>
<td>0.99*** (4.83)</td>
<td>0.98*** (2.60)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>5060</td>
<td>4529</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log-lik</td>
<td>4598.00</td>
<td>-2870.52</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *, ** and *** indicate statistical significance at 10%, 5% and 1% levels, respectively. Nc means nutritional claim. Hc means health claim. Hc\(^3\) means health claims present in the local market. Hca means health claims absent from the local market.
Discussion and Conclusions

• We found no treatment effect on taste
  o Precisely, participants generated higher utility in the no-taste treatment. This means that their attach higher utility on the NHCs in yoghurt FOP when the taste of the product is perceived rather than experienced.
  o This result was expected because all yoghurts were plain with no fruits and flavors, therefore utility in our case was not affected by taste.

• HC outperformed (higher utilities) NCs
  o Therefore, combining NCs with their corresponding HC (i.e., Hcp_fat, Hcp_vit, Hcp_cal nutritional and health claims) which exactly defines the beneficial properties of that nutrient in our health, can be seen as a form of differentiation.
Thank You

Get in Touch
Petjon Ballço

CITA Aragon, Avda, Montañana 930, 50059, Zaragoza - Spain
pballco@aragon.es
+34 976716356