PRODUCT PROFILE: APPROACH AND METHODS

I. INTRODUCTION

The ATNI Global Index, which rates 25 of the world’s largest food and beverage (F&B) manufacturers' policies, practices and disclosure on nutrition, was published in March 2013. In parallel to the Global Index, ATNI has piloted three country-level (or ‘Spotlight’) indexes for India, Mexico and South Africa that assess the ten largest F&B manufacturers in each of these markets. The approach used to select the companies is set out in Annex 1 of the ATNI Global Index report. Given the distinctive characteristics of each of these markets and the varied stakeholder and policy environments in each, ATNI is not making the findings public in this pilot phase.

In the Spotlight countries, in addition to assessing companies’ business practices, ATNI worked with a team from the University of Oxford’s Nuffield Department of Population Health to develop an approach to assessing the nutritional quality of each company’s products in each Spotlight market. This analysis is called the Product Profile. This paper sets out the proposed approach and methods, the results that can be generated, and the strengths and limitations of the approach. It is accompanied by a paper that set out the results for Mexico, on an anonymised basis, to illustrate the outputs and analysis that the method generates.

During 2012, a team led by Dr. Mike Rayner conducted pilot research using the approach set out here.

II. METHODS

Product Profile analysis was carried out for all three ATNI Spotlight countries. The goal of the analysis was to assess and compare the nutritional quality of the products of each of the ten selected companies. These companies included both national and multinational businesses.

The specific questions the Product Profile analysis focused on were:

• What is the average nutritional quality of each company's product portfolio in each Spotlight country and how do they compare?
• Which companies offer the highest proportion of ‘healthier’ products in each country?
• How does the nutritional quality of companies’ products differ within specific product categories and sub-categories in each country?

Note that this type of analysis is not designed for, and so does not include, an assessment of whether products have been fortified with micronutrients and are suitable for those with micronutrient deficiencies.

The analysis was undertaken in seven stages:

1) Selecting the nutrient profile models used to analyse the nutritional quality of products;
2) Specifying the population of foods and beverages to analyse;
3) Sampling from this population of foods and beverages;
4) Obtaining nutritional information for the sampled foods and beverages;
5) Selecting product categories and sub-categories for analysis;
6) Applying the nutrient profile models;
7) Selecting the outputs for the analysis.

Various assumptions made throughout the research process are described in the following sections, as are some of the limitations.
Stage 1: Selecting the nutrient profile models to analyse the nutritional quality of products

Nutrient profile models classify or rank products according to their nutritional composition. Many different nutrient profile models have been developed by academics, government departments, health-related charities and the food industry for a variety of different purposes, to underpin food labelling, regulate advertising of products to children and regulate health and nutrition claims, among other things.

ATNI started from the position that at least two models should be used to assess products, because all models generate slightly different definitions of more and less healthy products and there is no international consensus around the superiority of one particular model. This is partly because they have been developed for different purposes and in different contexts.

Nutrient profile models from a catalogue prepared for the WHO in 2011 were assessed against several criteria, with the guidance of the ATNI Expert Group:

- Developed independently of industry but through consultation with industry in their development
- Cover the majority of categories of processed food and beverage products
- Include positive and negative nutrients
- Not designed solely to address school foods as ATNI is assessing foods on the general market
- Developed with extensive stakeholder consultation
- Well-validated with results published in the peer-reviewed literature demonstrating that the models produce internally consistent classifications of ‘healthy’ and ‘unhealthy’ foods that are consistent with general nutrition principles
- Enable differentiation of nutritional quality within and between categories on a spectrum from most to least healthy, i.e. a ‘scoring’ model
- Be applicable in the context of the Spotlight Index countries
- Algorithm in the public domain so as to be able to access and apply it

Of the 54 models included in the catalogue, only two met these criteria: the Nutrient Profiling Scoring Criteria (NPSC) and the SAIN-LIM model. Table 1 sets out some of the key characteristics of each model.

1) The NPSC were proposed by the Australian and New Zealand Governments in 2007 to define which foods would be eligible to be considered to carry a health claim. (This nutrient profile model is a modification of the one used by Ofcom, the UK communications regulator, to regulate advertising of foods to children). In 2013, a new law was passed by the Australian and New Zealand Governments (Standard 1.2.7) to regulate the use of health and nutrition claims. The NPSC are used to evaluate products’ suitability to carry a health claim, i.e. they provide minimum thresholds products have to meet before the authorities consider the merits of the claim a company is seeking approval for.

The model splits products into three categories: i) beverages; ii) fats, oils and cheeses, and; iii) all other foods. A different threshold is used for each category. The model allocates negative points based on the energy, saturated fat, sugar and salt content of a product, and positive points for fibre, protein, fruit and vegetable content. These scores are combined to give an overall score.

The SAIN-LIM model was developed by the French Food Safety Agency in 2008 and has been proposed for use in regulating health claims. However, it is not currently used to regulate health claims or for any other purpose except consumer education. The model produces two different scores: the SAIN (‘healthy’) score and the LIM (‘limit’) score. The final categorisation of a product is based on both scores. The model uses data on monounsaturated fat, α-linolenic acid, protein, fibre, vitamins C, D and E, iron, calcium, saturated fat, added sugars and sodium.

For this exercise, the overall scores generated by both models have been converted to a scale from 1-100, where 100 is most healthy. For the NPSC, the different scores for beverages, fats, oils and cheeses, and other products, were linearly modified so that they appeared on the same 0-100 scale. (This had the effect of homogenising the results for the three different categories, so that products from the different categories can be directly compared with each other.) As the SAIN-LIM model is a composite model of two different scores (described above), a combined version was constructed where LIM scores were subtracted from the SAIN scores.

Table 1: Comparison of the NPSC and SAIN-LIM models

<table>
<thead>
<tr>
<th>Model component</th>
<th>NPSC</th>
<th>SAIN LIM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scoring method</strong></td>
<td>Negative nutrients’ score is combined with the positive nutrients’ score to arrive at a final score</td>
<td>Mean percentage of dietary reference intakes for positive nutrients (SAIN) and of maximum recommended intakes for negative nutrients (LIM)</td>
</tr>
<tr>
<td><strong>Positive nutrients:</strong></td>
<td>Protein Fibre Fruit and vegetables</td>
<td>Protein Fibre Monounsaturated fats α-linolenic acid* Vitamins C, D and E* Iron* Calcium*</td>
</tr>
<tr>
<td><strong>Negative nutrients</strong></td>
<td>Energy Saturated fat Total sugars Sodium</td>
<td>Saturated fat Added sugars Sodium</td>
</tr>
<tr>
<td><strong>Original scoring system of model and thresholds for suitability for a health claim</strong></td>
<td>Suitability for a health claim: Fats, oils, cheeses = 27 points or less Other foods = 3 points or less Beverages = 0 points or less</td>
<td>The SAIN score is plotted on a graph against the LIM score. There are four possible outcomes: 1. High SAIN – low LIM = Foods recommended for health (and suitable for a health claim) 2. High SAIN – high LIM = Foods recommended in small quantities 3. Low SAIN – low LIM = neutral foods 4. Low SAIN – high LIM = Foods to avoid or limit</td>
</tr>
</tbody>
</table>

*Optional nutrients

Stage 2: Specifying the population of foods and beverages to analyse

For the purpose of the Product Profile, the population of foods and beverages was defined as ‘all foods and beverages manufactured by the ten companies included in each ATNI Spotlight Index and that were available for purchase within each Spotlight country’

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A food or beverage was considered a unique item within this population if the brand name and description was consistent, irrespective of serving size and packaging (e.g. cola sold in 330ml cans was considered to be the same food item as the same cola sold in 750ml bottles).

The following products were excluded from analyses:

- Unprocessed meat, poultry, fish (excluded on the basis that companies do not have a significant role in determining the nutritional value of these products)
- Alcoholic beverages (excluded because these products are outside the scope of ATNI)
- Infant formulas, and baby food and drinks (excluded because these products are not consumed by the general population and the models used are not appropriate to evaluate these specialised products).
- Bottled water (excluded because water is nutritionally neutral),

This choice of population gives equal weight to all branded products made available for purchase by the companies within a country. If data had been available, products could have been weighed by their sales value to provide a better picture of their relative role in consumption. However, it was not possible to identify a data source that matched all of the products in the population with sales data. One of the strengths of omitting sales data was that all selected products offered by a company were assessed: weighting each product by sales in the market could potentially result in less popular, healthy products being overlooked due to the presence of popular, less healthy products.

Stage 3: Sampling from the population of products

A sampling frame was used to define a dataset of products representative of the population. An ideal sampling frame would have been to select at random a pre-determined number of products from a comprehensive list of all products available in each Spotlight country. However, no such comprehensive list as yet exists.

The method used to identify the product population was to use local company websites for the 30 companies assessed. These websites generally set out each company’s products. A pilot of the data collection procedures suggested that approximately 4,000 products would be found on these companies’ websites, but resources only allowed for data collection and analysis of approximately 50%, or about 2,000, of these products. These were selected by choosing every other product listed on each website – a simple way of generating a representative sample.

A limitation of this approach to data collection was that not all products available for purchase in each country are likely to have been listed on Spotlight company websites. There were also instances of parts of websites being unavailable for reasons such as site maintenance, company re-structuring etc., which meant that the full range of products could not be captured. This was the case with one company in each of South Africa, Mexico and India. In South Africa, one company used its corporate website solely as a homepage for a competition and did not list products, just dominant brands.

In addition, using websites is likely to have led to different results than using a comprehensive list of all products available in the country. It is likely that the nutritional quality of products displayed on websites was different to the nutritional quality of all products available from the companies (and it may be hypothesised that companies would choose to give greater prominence to their healthier products or those that sell best). However, no research is available to assess this.

Alternative methods of selecting the products would have been: i) to survey retail outlets in each country, but that was not feasible within the budget and time constraints available, or; ii) to request the full product offering, including necessary nutritional information from each company. This was also not possible for this first Index, where ATNI was not well known among companies in each country. However, it may be feasible in similar future exercises should the companies be willing to collaborate.

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6 Here, ‘local’ refers to the website of the company operating in the Spotlight country. With respect to multinationals, this means the subsidiary or local business in that country, not the global website.
Once data collection was complete, the final dataset consisted of 2,703 products. Thirty-eight products were then excluded from the analysis due to lack of product information or failure to find a suitable equivalent in the UK Nutrient Databank. Therefore, the total population of products analysed was 2,665. The largest number of products for any one company was 277 for Pioneer Food Group in South Africa and the smallest number of products per company was four collected for PepsiCo in South Africa.

Stage 4a: Obtaining nutritional information for the sampled products

For all of the products included in the dataset, nutritional information, where available, was obtained from the company website. No nutritional information was available for 1,819 (68%) of the products. For all products, the nutritional information necessary for analyses of nutrient quality using the selected nutrient profile models was incomplete. It was therefore necessary to supplement the nutritional information from websites from two other sources:

1) A food composition table of branded products developed by the Global Food Monitoring Project (GFMP). This provided nutritional information for 256 Indian products in the dataset. (The GFMP database does not yet contain nutritional information for South Africa or Mexico).

2) The UK Nutrient Databank (a dataset of approximately 8,000 products used for analysis of nutritional surveys in the UK).

Each product sold by the companies was matched with a similar product in the UK Nutrient Databank with energy content within 500kJ of the original content (where this was provided by the manufacturer). The two data sources where then merged, with the website/manufacturer's nutritional information taking precedence over the supplementary nutritional information taken from the UK Nutrient Databank, i.e. the supplementary nutritional information was only used when the information was not provided by the manufacturer. Table 2 summarises which different sources of information were available for each country.

Table 2: Source of nutritional information used

<table>
<thead>
<tr>
<th>Source of Information</th>
<th>India</th>
<th>Mexico</th>
<th>South Africa</th>
<th>Total dataset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total products analysed</td>
<td>701</td>
<td>880</td>
<td>1,084</td>
<td>2,665</td>
</tr>
<tr>
<td>Nutritional information for the ‘big 4’ nutrients available</td>
<td>292</td>
<td>295</td>
<td>453</td>
<td>949</td>
</tr>
<tr>
<td>Nutritional information for the ‘big 8’ nutrients available</td>
<td>2</td>
<td>189</td>
<td>347</td>
<td>538</td>
</tr>
<tr>
<td>Any nutritional information available (ranging from 1-8)</td>
<td>310</td>
<td>318</td>
<td>480</td>
<td>1,108</td>
</tr>
<tr>
<td>No nutritional information available on company websites</td>
<td>391</td>
<td>562</td>
<td>605</td>
<td>1,819</td>
</tr>
<tr>
<td>Data from GFMP</td>
<td></td>
<td></td>
<td>252</td>
<td></td>
</tr>
</tbody>
</table>

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7 Dunford E et al., International collaborative project to compare and monitor the nutritional composition of processed foods. *European Journal of Cardiovascular Prevention & Rehabilitation*, 2012 (in press).
9 The ‘big 4’ nutrients are; energy, protein, carbohydrate and fat.
10 The ‘big 8’ nutrients include the ‘big 4’ nutrients plus sugars, saturated fat, fibre, sodium/salt, also known as the ‘little 4’.
11 Global Food Monitoring Project (GFMP)
The main limitation to using the UK Nutrient Databank is that the supplementary information is for products available in the UK and their composition may well differ from products available in South Africa, Mexico and India. To address this point, the possibility of using local food composition databases to supplement the data was explored. However, composition databases with sufficient nutritional information are not currently available for the Spotlight countries.

However, internal validity assessments (comparing nutritional information from the websites with equivalent data from the UK Nutrient Databank) indicated that nutritional information provided by the manufacturer (via websites or on packets - the information collected for the GFMP is collected from packets) is well correlated with the matched products in the UK Nutrient Databank. Energy had the strongest correlation (0.98) followed by carbohydrate (0.92). Fibre and sodium had the weakest correlations (0.48 and 0.42).

Stage 4b: Categorising the sampled products

Products were then assigned to a category using the food categorisation system used by Datamonitor – a commercial company that monitors product sales globally\(^\text{12}\) and also categorised by whether the product was a food or a beverage.

Stage 5: Selecting product categories (and sub-categories) for assessment

The number of products in each product category varied widely; the range of categories the product population fell into, and the type of nutritional information available by product, is shown in Table 3.

Selecting categories

Categories were selected for analysis if two or more companies manufactured at least one product in that category and if there were five or more products in the category. Moreover, only those products for which companies provided Big 4 nutritional information were analysed (so as not to base this analysis entirely on supplementary nutritional information).

Selecting sub-categories

Sub-categories were selected for analysis on the same basis as the categories, i.e. if two or more companies manufactured at least one product in that sub-category and if there were five or more products in the sub-category. Only those products for which companies provided ‘Big 4’ nutritional information were analysed, for the reason noted above.

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\(^{12}\) Originally, the analysis was going to be based on Datamonitor’s nutrition composition data. But due to the poor quality of that dataset, that was not possible. However, the population of products had already been categorized using Datamonitor’s system which is widely used across the food and beverage industry.
Table 3: Number of products by category and nutritional information, by country

<table>
<thead>
<tr>
<th>Products by country and category</th>
<th>Nutritional information availability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>India</td>
</tr>
<tr>
<td>Bakery &amp; cereals</td>
<td>267</td>
</tr>
<tr>
<td>Canned food</td>
<td>0</td>
</tr>
<tr>
<td>Chilled food</td>
<td>1</td>
</tr>
<tr>
<td>Confectionery</td>
<td>38</td>
</tr>
<tr>
<td>Dairy food</td>
<td>110</td>
</tr>
<tr>
<td>Dried food</td>
<td>84</td>
</tr>
<tr>
<td>Frozen food</td>
<td>5</td>
</tr>
<tr>
<td>Hot drinks</td>
<td>22</td>
</tr>
<tr>
<td>Ice cream</td>
<td>52</td>
</tr>
<tr>
<td>Oils &amp; fats</td>
<td>10</td>
</tr>
<tr>
<td>Sauces, dressings &amp; condiments</td>
<td>23</td>
</tr>
<tr>
<td>Savoury snacks</td>
<td>14</td>
</tr>
<tr>
<td>Soft drinks</td>
<td>70</td>
</tr>
<tr>
<td>Spreads</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>701</strong></td>
</tr>
</tbody>
</table>

Stage 6: Applying the nutrient profile models

The dataset was analysed using the software called STATA – a statistical software package - and the two nutrient profile models were applied to the data set of nutritional information. As noted above, the original scoring scales of the two nutrient profile scoring systems was converted so that they ranked all products and drinks on a 0-100 scale, with 0 being of lowest nutritional quality or least healthy and 100 of highest nutritional quality or most healthy.

Stage 7: Selecting the outputs for the analysis

For each company, the following were calculated:

- Average nutrient profile score for the company’s products – for foods and beverages overall and within categories – as assessed by the two different nutrient profile models the NPSC and SAIN-LIM model.
- The percentage of the company’s products – both overall and within categories – that met the threshold for suitability to carry a health claim under the NPSC or the SAIN-LIM nutrient profile model.

Throughout the reporting of results, whenever an average or a proportion is reported it is accompanied by 95% confidence intervals. These were calculated using parametric estimates of standard errors, adjusted for the large sample size and small population size.

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13 i.e., the algorithms for the models were converted to STATA (version 11, StataCorp 2009; College Station, TX, USA) syntax files, checked by three researchers for veracity and applied to the merged nutritional information derived from the websites and the supplementary sources. The syntax files can be provided on request.
III. RESULTS

The results for Mexico were shared on an anonymised basis for review and feedback by companies and stakeholders. The results for India and South Africa have been reviewed by the research team but not written up as formal papers.

IV. STUDY EVALUATION

The ATNI Product Profile exercise is the first to assess the nutritional quality of a wide range of branded products available to consumers in three developing countries and to assess that nutritional quality by company. While the methods used have some weaknesses, described throughout the commentary, overall they are robust and the exercise makes a valid contribution to assessing the nutritional quality of products offered by major companies in these markets.

It is an entirely objective study with little likelihood of observer bias. The method used has been presented here to provide transparency – a central tenet of ATNI – facilitating its replication and critique so that it can be improved.

Several factors would facilitate more robust analysis for future product profiling exercises.

1. Greater and more reliable disclosure of nutritional content of products by F&B manufacturers

Analysis would be greatly facilitated if all companies published the full nutrition content of their products on their websites A validation exercise comparing foods that are shown on company websites and foods that are available for purchase in India, South Africa and Mexico would also be valuable, to establish how complete and/or representative the set of products displayed on the companies’ websites is.

2. Development of national food composition tables/databases for South Africa, Mexico, and India

Other than for some products in India, the analysis does not use ‘local’ food tables to supplement missing nutritional information and instead relies heavily on the UK Nutrient Databank. Although the nutritional information from comparable products in the UK Nutrient Databank generally correlates well with nutritional information from company websites for most nutrients, fibre and sodium are not as well correlated. The development of national food composition tables or databases for South Africa, Mexico and India, using the methods being developed and implemented throughout the GFMP would support this and similar evaluations in future.

3. Combining nutritional information with sales data

The approach used in this pilot product profile analysis measures the relative nutritional quality of products available to consumers, rather than the nutritional quality of the products most heavily consumed.

In future analyses, nutritional information could be combined with sales data. This would provide a different and possibly better understanding of companies’ performance in supplying foods of a good nutritional quality. However, as sales data is only available in proprietary databases, which is expensive to obtain, or from companies themselves, and is highly commercially sensitive, it will be difficult to do this exercise.

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14 Note that seven of the 30 companies assessed did not provide any nutritional information for their products; the nutrient profiling relied solely on the UK Nutrient Databank data.
4. Combining nutritional information with pricing and distribution data

An even fuller analysis would be possible by combining nutritional information and sales data with analysis of how products are priced and distributed. This would enable analysis of the relative affordability of individual products and accessibility of products via different distribution channels.

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