Perception of Local Food
Labelling by generation Z: Eye-Tracking Experiment

Abstract

The subject of this research is to reveal the customer’s approach towards local food in general and to explore what is the impact of its labelling on perceiving them by the consumers. The main objective is to find out if an eco-label, a local-label or a bio-label has an impact on a consumer behaviour. Following methods were used during the research: eye-tracking technology, in-depth interviews, A/B testing method, non-parametric Mann-Whitney test and non-parametric Kruskal-Wallis test for testing hypothesis. Data were collected from eye-tracking device on December 2015 and additionally revised for higher validation. In total, the observation contains 121 respondents (63 participants in reference group - A, and 58 participants in control group - B). Participants are defined as generation Z. It is assumed, that presence of the label on a product has an effect on consumer behaviour. The experiment itself was taking place at eye-tracking laboratory at Faculty of Business and Economics at Mendel University in Brno.

Keywords: consumer behaviour, eye-tracking, local products, labelling

JEL codes: M300, M310
1. Introduction

1.1. Local food

Whereas the Czech Ministry of Agriculture clearly defines the term “Local food”, there is no existence of standards defining it in the United States. US market characterised by one of the biggest demand for alternative food (bio and regional food) among countries. This is the main reason why we mention some data in our study. According to Czech Ministry of Agriculture, local food product stands for the product that was produced in certain region and was made from ingredients that were grown in the same region. The local product in the United States has to be grown within county or neighbouring countries, or within a state (United States Department of Agriculture, 2012, Regionální potravina, 2016).

Recently, the demand for local (and organic) products tends to continue to rise as consumers are increasingly more interested in a healthy lifestyle. In a proof of it, dates from 2012 can be mentioned. Almost 2, 0 billion Czech crowns were spent for local and organic food on the retail market in the Czech Republic, meaning an annual increase of 6.7% (FiBL, IFOAM, 2016). But it is not just a question of the one country. According to National Geographic, GlobeScan (2014), there has been an improvement in interest of people in a local and organic food in 12 countries since year 2012.

A wish for living a healthier lifestyle is not the only factor that has been driving consumers to include local products into their daily menu, but also a strong indicator is a demand for diverse range of quality food products that consumers are taking into account. Furthermore, it seems, that people are taking methods of production and food processing more serious than ever before (Moudrý, 2002).

Purchasing local products has become inseparably associated with responsible consumption, which has ethic and social background (de Pelsmacker, Driesen, Rayp, 2005; Fon, Newholm, & Shaw, 2005).

As already mentioned, there is a lower occurrence of supplier exploitation due to existence of local food, food without chemicals and additives, reduced amount of packaging, and other positives that local-food-consumption benefits from (McEachern et al., 2010).

Apart from food quality and impact on environment leading consumers to buy local products, there are also other reasonable factors motivating to do so. According to COI (2007), it is for instance supporting local farmers and local business, cutting down the pollution and reducing the purchase power from the side of supermarket chains. On the other hand, according to Lithuanian research people do not believe that buying eco-friendly products can make a difference in the influence on the environment (Kavaliauske et al., 2013).

Besides an Institute of Grocery Distribution (IGD) reported (2005) that many people still do not know about the impact and benefits from buying local products. Lack of awareness of local production, ignorance of positives by taking part in healthy style and supporting local environment and business are considered to be the the main boundaries preventing potential consumers from buying local food.
1.2. Labelling of organic products

According to recent studies, eco-labelling is a significant factor that occurs in promoting sustainable consumption patterns (Horne, 2009). Agenda 21 in connection with the Earth Summit in Rio in 1992 recognized the value of placing local-labels as an indisputable factor in terms of promoting the consumption of products, which have an obvious impact on local environment (Goethe Institution, 2006).

As many science, political and social debates supported by mass media spread around an importance of focusing on reducing global warming and “saving” global climate in general, the interest in the value of eco-labelling can be seen as a hope to achieve bigger participation in purchasing eco-friendly products by the general public (Horne, 2009).

Researches and papers, which were recently conducted around the world, has proven an importance of labelling, resulted in an evident finding. Placing labels (eco, local and bio) definitely plays certain role in marketing communications aimed at consumers with sense for sustainable environment and eco-friendly production. Therefore, placing labels should be included when influencing the eco-friendly consumer purchase intentions. (Chow, Tang, Fryxell, 2003; Grankvist, Biels, 2007; Horne, 2009, Dočekalová, Straková, 2011).

According to Atkinson and Rosenthal (2014) the presence of the eco-label on the product makes product look more trustworthy, but it does lead a consumer to the purchase by itself. There are needed other factors, like price, taste and others. The influence on the purchase is indirect. On the other hand, the eco-label effect, as it is determined by Sörqvist et al. (2015), can have a direct influence on purchase of the product. For some samples (mostly fruit) was measured that respondents were more willing to buy a product with an eco-label because they thought it tastes better.

An assumption was formulated following to the mentioned information that presence of a label on product has an impact on consumer behaviour. According to that, two hypothesis were formulated. Hypothesis #1: There is not a relationship between presence of the label and percentage Dwell Time of the brand and hypothesis #2: There is not a relationship between the attitude of the respondents to the regional products and percentage Dwell Time [%] of the label.
2. Methodology and data

Two research methods were used to gain trustworthy data. In the first part of the research, the technology of eye tracking was used and in the second part, in-depth interviews with all participants were concluded.

The SMI RED 250 eye-tracker was used within this research and the SMI Experiment Centre software helped us with designing an experiment. SMI BeGaze software and SPSS program was additionally used for analysis, export and appraisal of the collected data. For the experiment the remote eye-tracker was used - it was affixed to the bottom edge of a monitor which had a diagonal size of 22” with a 16:10 aspect ratio. The respondent’s viewing distance was about 60 cm.

The research was conducted on December, 2015 and involved 121 respondents (63 participants in reference group and 58 participants in control group). Origin number was higher, but some respondents had to be eliminated. The reason was different eye-handicaps which disturb the exactness of the measurement. Age of the respondents was 18-26 years, generation Z.

The experiment was designed as an A/B test, whereby one group of the respondents (A group or reference group) was shown the modified stimulus of the stimulus and the second group (B group or control group) the original version. Reference group saw an experiment with chosen labels on products and control group saw products without a label on it. The aim was to prove an influence of label on a consumer. Original labels were additionally added in Zoner Callisto graphics program.

Process of work with eye-tracking technology has its specifics. At the beginning of experiment, the researcher has to instruct a participant how to behave during the trial. It is very important for validity of the data. For example, participant cannot look away from the monitor, shake his/her head extremely and similar movements.

When respondents finished the first part of the research, in-depth interview could begin. Aim of the second part of the research was to support the data from eye-tracker and fully understand thinking of participants. Questions were related to participant’s consumer behaviour and to the factors that have a particular influence on them during a purchase of mentioned products and their relationship towards local labels on products.

In-depth interviews itself lasted around 15-20 minutes each and the questions were thoroughly prepared before. These questions were given to the respondents to answer during interviews and the answers were written down to prepared paper sheets. Due to the possibility of losing the papers or overhearing the answers, all the interviews were recorded on voice recorder.

2.1. Eye-tracking

Eye-tracking technology is actively used as part of the neuromarketing methods for analysing customer behaviour. It is based on tracking of respondent’s pupils during the
presentation of various stimulus. Tracking allows to get closer to consumer behaviour due to objective data uninfluenced by consumers. As a result, in combination with other neuromarketing methods, it is be possible to gain more complex view on consumer’s psychological processes (Zurawicki, 2010).

On the contrary, some restrictions that has to be taken into account when concluding researches based on eye-tracking technology are also worth mentioning. On one hand, we are able to discover level of label visibility and perceiving, whether consumers pay attention to the certain elements on the internet or on the shelf. Nevertheless, not all of this information depict the actual relationship between consumer and element precisely. Due to this fact, some additional research method should be included (Turpault, 2014).

2.2. **Tested products**

Eight products were tested during the experiment: apple juice, cream, cucumbers, flour, children’s snack (Hamánek), mead, paprika and yogurt.

![Product images](source-image)

Figure 1: Cucumbers – differences between reference and control group, Regionální potravina
Source: Zelenina-znojmia.cz, Own work in Zoner Callisto program; Regionalnipotravina.cz

Chosen products were photographed and the label of regional product was added. The primary aim of the research was to find out if labels have some influence on a consumer behaviour. Figure 1 shows the original package of the tested product (left) and edited one (right). In this case, local label: Regional Food (Regionální potravina) was used and it was placed next to the description of the product (see Fig. 1 right).

2.3. **Statistical testing**

Because an output from eye-tracker has a different than normal distribution, the non-parametric tests were used, Mann-Whitney U test for hypothesis #1 and Kruskal-Wallis test for testing hypothesis #2.
Some authors say that non-parametric test has less explanatory power than the parametric ones. The other option is to normalize the data and use parametric test, like t-test. But for the purpose of this paperwork non-parametric tests were used. For the hypothesis #1 was chosen Mann-Whitney U test, as equivalent of parametric t-test. Hypothesis #1 was formulated to find the differences between reference and control group. An issue was, that the number of participants was not same across the groups. The Mann-Whitney U test was used because the comparison of two different groups and possibility to use it for data without assumed normal distribution. The null hypothesis is that distribution of the independent variable is same across categories. The significance level of the alfa is 0.05. As a result, if the significance level is lower than 0.05, than we can say that there are differences between the groups (reference and control group), as it is assumed. (Field, 2009)

For hypothesis #2 was used Kruskal-Wallis test. In this case was not the objective to find differences between control and reference group, but to find differences between four smaller groups in reference group according to their attitude to the eco, bio and local-label. Similar to the hypothesis #1 the groups have different numbers of respondents. Groups were ranked from 1 to 4 depends on their attitude to the mentioned labels:

- 'I believe them, they present quality and eco-friendly production =’4’
- 'I perceive them, they play an important role when I am deciding in the shop =’3’
- 'I do not have an opinion on them, I have neutral attitude =’2’
- 'They have negative influence on me, they dissuade me from purchasing =’1’

If the significance level is lower than 0.05, there are differences between the groups from 1 to 4 in reference group. (Field, 2009)
3. Results

Two hypothesis were formulated for statistic testing. To verify the relationship between the presence of the label (Regional Food) and the time (Dwell Time [%]) of observation of the brand of the product the hypothesis #1 was used. Hypothesis #1: There is not a relationship between presence of the label and percentage Dwell Time of the brand. Percentage Dwell Time was used because all participants had a possibility to watch the picture as long as they wanted. The hypothesis was tested for every product individually. Non-parametric Mann-Whitney U test was chosen for testing. The confirmation of the null hypothesis in this case means that Dwell Time [%] of the brand is same in reference and control group and presence of the label has no effect on the dwell time of the brand.

<table>
<thead>
<tr>
<th>Name of product</th>
<th>Mann-Whitney U test</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple juice</td>
<td>0.468</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Cream</td>
<td>0.084</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>0.725</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Flour</td>
<td>0.864</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Hamánek</td>
<td>0.564</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Mead</td>
<td>0.230</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Paprika</td>
<td>0.593</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Yogurt</td>
<td>0.267</td>
<td>The null hypothesis retains.</td>
</tr>
</tbody>
</table>

Table 1 Results of testing hypothesis #1
Source: Output from SPSS

Hypothesis #1 retained for all researched products. Cream was the closest to the significance level with the value 0.084, followed by mead with the value 0.230. The rest of the products did not even get closer. According to these results we can say that consumers are not more interested in the brand of the product just because of the Regional Food label placed on it. The biggest disagreement with hypothesis was measured at the flour with the value 0.864.

Within the experiment the respondents were asked to rank their attitude toward products with Regional Food labelling. To verify the existence of a relationship between the evaluation of attitude to the regional products and the attention to this label the Hypothesis #2 was formulated: There is not a relationship between the attitude of the respondents to the regional products and percentage Dwell Time [%] of the label. In this case the non-parametric Kruskal-Wallis Test was chosen. The verification of the null hypothesis for this test means that Dwell Time [%] of the label is same in reference and control group and respondent’s attitude to the regional food labelling has no effect on it.
Table 2 Results of the testing hypothesis #2

<table>
<thead>
<tr>
<th>Name of product</th>
<th>Kruskal-Wallis test</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple juice</td>
<td>0.440</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Cream</td>
<td>0.969</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Cucumbers</td>
<td>0.133</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Flour</td>
<td>0.673</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Hamánek</td>
<td>0.373</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Mead</td>
<td>0.469</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Paprika</td>
<td>0.136</td>
<td>The null hypothesis retains.</td>
</tr>
<tr>
<td>Yogurt</td>
<td>0.029</td>
<td>The null hypothesis is rejected.</td>
</tr>
</tbody>
</table>

Source: Output from SPSS

The null hypothesis was rejected only in case the yogurt stimulus as you can see from the Table 2. There we can say that participants who care about the origin of the products did watch the label longer than those who do not recognize mentioned labels on products. For the rest of products, the null hypothesis retained. Participants who perceive eco-labels better did not focused on labels on chosen products any longer than those who do not.

Within an experiment heatmaps of eye movement were also revisited. The heatmap shows places on the product on which participants were looking the most.
Source: Output from SMI BeGaze

The difference between tested groups is apparent in the Figure 2. Control group (on the right) without the label spent more time on the description of the product and on the brand. Reference group (on the left) decomposed their focus more on stimulus including added label.

Within this paperwork were also provided results of heatmaps only for stimulus paprika, but the results are valid for all tested products.
4. Conclusion

The eye-tracking technology brings us relatively new interesting way of looking at consumers’ habits during the purchase.

Presence of mentioned labels on products have no influence on the Dwell Time [%] of the brand in all cases as was found out during the research. Respondents were not more interested in the brand of the products just because of the presence of the label as was firstly thought. There are probably other factors that should be taken into account and considered.

On the other hand, participants who have a positive relationship to labels of origin are focusing more on these labels on a package of the yogurt than on other products which were tested. This could be a consequence of a different attractiveness of the label in comparison with the rest of the products. There are probably differences between labels on different types of food or different colours of the package. The yogurt was the most successful from this selection. Label on other products was not so attractive for respondents.

Results from heat maps show that participants did notice the label, but in final result it has only small or zero effect on their consumer behaviour.

There is a chance that the measurement was distorted by age of the respondents (18-26 years). Participants in this age are not economically active in all cases, so the selection between variants of the products can be done by their parents. This could be an impulse to continue in the experiment with different age categories.

We can find very similar conclusion to other researches that were also realized with help of eye-tracking technology. According to study focused on perception of wine labels (Mokrý & col., 2016) the present of a sticker or awards had a greater degree of observation than the others monitored attributes. Furthermore, the present of award/sticker/ also, as in our study, did not automatically translate to a better perception or did not lead to higher Dwell time.
References


