

NEW RESEARCH POSSIBILITIES FOR FEEDBACK ON THE DAIRY PRODUCT' MARKET

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Abstract

The increasing of milk and consumption is one of the world's leading problem in food and nutrition policy, whose eating has an irreplaceable health benefit. For this reason, feedback of customer preferences is needed for obtaining the data, if the consumption of milk and dairy products increase/decrease. Several surveys show that a customer, when he/ she enters to a shop does not have a clear idea, what to buy. To influence the consumer's shopping process directly in the store on the basis of various impacts and impulses is the role of merchandising and in-store communication. A key aspect is the effectiveness and efficiency of these communication tools, which can be achieved not only by conscious but also by ignorant feedback from both current and potential consumers. The paper theoretically presents the new research possibilities and survey' technologies and underlines the growing need for their implementation in the form of innovative research solutions, which are required in verification of effectiveness of all spectrum of communication tools on the dairy products 'market. These devices make it possible to examine the satisfaction (emotions, visual attention) as well as environmental factors, not only with the consciousness of the respondent (research vest, modified shopping trolley) but also without its full consciousness (interactive automated self-service kiosks, reaction time' questionnaires). The interpretation of obtained data provides new opportunities for firms, which make business and sale of dairy products and offers new opportunities in design proposal and implementation of communication strategies.

Keywords: consumer's decisions making, dairy products, emotions, innovative research tools, technologies

JEL Classification: *M31, M39, M81*

1 Introduction

Nowadays, a food market is influenced by the new trends connected with healthy lifestyle, animal welfare, ethical consumption etc. In addition, the level of income has a certain influence on consumption patterns, the dairy segment is not an exception (Šedík, Šugrová, Horská & Nagyová, 2017). Milk is produced in every EU member state without exception, for the EU is a milk the most important product in terms of approximately 15 % of agricultural production. The European Union is a major player on the world market for milk and dairy products as an exporter of many dairy products, most of which are cheeses.

1.1 An Overview About Dairy Products' Production and Consumption in Europe

The total EU-28, the milk production is estimated in around 159 million tons per year in 2016. The main EU producers are Germany, France, Great Britain, Poland, the Netherlands and Italy, accounting for almost 70 % of EU production (Poľnohospodárstvo a rozvoj vidieka, 2016). A quarter of 24.3 % of the estimated 30.4 million tons of drinking milk is produced in the EU-28 countries in 2016 comes from the UK, which represents only about one-tenth of the EU-28 milk produced for the state. This was also noticed in other dairy products, such as Germany, Italy and the Netherlands, where they accounted for nearly three quarters of 70.3 % of 5.5 million tons of cheese produced throughout the EU-28 in 2016 (Kubicová et al., 2017). Whole milk is used in the EU-28 (Table 1) mainly for production of cheeses (36 %), butter (29 %), cream for direct consumption (13 %), drinking milk (11 %) and others (Eurostat, 2016).

Table 1 Dairy Products Made from Milk in 1 000 Tones, 2014, Country Ranking

	Drinking milk	Cream for direct consumption	Dry milk	Butter	Cheese
<i>Belgium</i>	718	219	200	30	-
<i>Bulgaria</i>	67	2	-	1	2
<i>Czech Republic</i>	624	54	39	22	13
<i>Denmark</i>	504	61	129	43	6
<i>Germany</i>	-	567	580	441	1 893

	Drinking milk	Cream for direct consumption	Dry milk	Butter	Cheese
<i>Estonia</i>	91	27	6	4	41
<i>Ireland</i>	494	24	-	166	188
<i>Greece</i>	449	17	-	1	190
<i>Spain</i>	3 521	142	30	-	48
<i>France</i>	3 535	417	428	365	135
<i>Croatia</i>	294	27	-	4	33
<i>Italy</i>	25 478	131	-	100	1 176
<i>Cyprus</i>	67	3		-	20
<i>Latvia</i>	-	36	-	7	35
<i>Lithuania</i>	97	3	33	16	103
<i>Luxemburg</i>	-	-	-	-	-
<i>Hungary</i>	433	6	-	4	75
<i>Malta</i>	-	-	-	-	-
<i>Netherlands</i>	526	9	289	-	772
<i>Austria</i>	743	70	10	32	39
<i>Poland</i>	285	248	188	148	44
<i>Portugal</i>	832	20	20	-	-
<i>Rumania</i>	250	49	4	-	75
<i>Slovenia</i>	155	12	-	-	17
<i>Slovakia</i>	287	32	6	7	33
<i>Finland</i>	728	63	-	49	-
<i>Sweden</i>	827	105	94	17	5
<i>GB</i>	7 410	307	173	-	378
<i>Norway</i>	424	26	10	17	-
<i>Switzerland</i>	471	87	99	48	185
<i>Montenegro</i>	8	1	-	-	-
<i>Turkey</i>	1 326	31	129	46	631

Source: Authors' own processing, data downloaded from Eurostat, 2016. [online]. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/File:Production_and_use_of_milk_EU-28,_2014.png.

The following Table 2 illustrates the production of cheeses in 1 000 tons in individual European countries. The largest producer in recent years is France, Germany and Italy. In Slovakia, 33.27 tons of cheese are produced in 2016.

Table 2 Cheese Production in 1 000 Tons, in 2016

	Cheese Production in 1 000 t		
<i>Belgium</i>	84.8	<i>Lithuania</i>	103
<i>Bulgaria</i>	77.4	<i>Luxemburg</i>	-
<i>Czech Republic</i>	116.6	<i>Hungary</i>	75
<i>Denmark</i>	368.9	<i>Malta</i>	-
<i>Germany</i>	1 892.8	<i>Netherlands</i>	771.9
<i>Estonia</i>	40.5	<i>Austria</i>	172.4
<i>Ireland</i>	118.4	<i>Poland</i>	743.7
<i>Greece</i>	190	<i>Portugal</i>	73.4
<i>Spain</i>	388	<i>Rumania</i>	74.6
<i>France</i>	1 949	<i>Slovenia</i>	16.6
<i>Croatia</i>	32.2	<i>Slovakia</i>	33.3
<i>Italy</i>	1 176	<i>Finland</i>	217.3
<i>Cyprus</i>	20	<i>Sweden</i>	88.1
<i>Latvia</i>	34.7	<i>GB</i>	378

Source: Authors' own processing, data downloaded from Eurostat, 2016. [online]. Available at: <http://ec.europa.eu/eurostat/tgm/mapToolClosed.do?tab=map&init=1&plugin=1&language=en&pcode=tag00040&toolbox=-types#>.

Available processed data from Eurostat or Statista portals present, the cheese consumption in EU countries is slowly rising, the curve has an ascending character from 2007 until to 2016 in 17.1 kg of cheese eating per person in 2016. European cheese production is considerably higher than consumption between 2000 and 2016, an increase of more than 156 % since 2009. The percentage of cheese production is on the export 'increase. In EU-28, 8 % of cheese production was exported in 2016. This share grows slowly from 6 % up to 8 % (Kubicová, Kádeková & Dobák, 2014). The largest consumers of cheeses were Greece, Luxembourg, France, Germany and Italy with more than 22 kg/ per person in 2014. On the other hand, Romania, Bulgaria, Ireland, Spain, Malta, Portugal, Slovenia and Slovakia consume less than 10 kg/ per person in 2014. The current statistic

(Table 3) shows per capita consumption of cheese by country in 2016. Denmark had the highest per capita consumption in the EU-28 in the year 2016. For a contrast, in Iceland, the consumption was 27.7 kg, the lowest world consumption was in Asian countries (f.e. in China 0.1 kg), in Middle East (f.e. in Turkey 7.8 kg) or in Africa (f.e. in South Africa 1.9 kg) (Statista, 2017).

Table 3 Cheese Consumption/ Per Capita in 2016, in kg

	Cheese Consumption in 1 000 t		
<i>Belgium</i>	15	<i>Lithuania</i>	17.4
<i>Bulgaria</i>	15.6	<i>Luxemburg</i>	5.2
<i>Czech Republic</i>	17.6	<i>Hungary</i>	13.2
<i>Denmark</i>	28.1	<i>Malta</i>	2.2
<i>Germany</i>	24.7	<i>Netherlands</i>	21.6
<i>Estonia</i>	20	<i>Austria</i>	21.1
<i>Ireland</i>	8.6	<i>Poland</i>	17.3
<i>Greece</i>	19.7	<i>Portugal</i>	8.7
<i>Spain</i>	9	<i>Rumania</i>	14.1
<i>France</i>	27.2	<i>Slovenia</i>	11.7
<i>Croatia</i>	13	<i>Slovakia</i>	14
<i>Italy</i>	21.5	<i>Finland</i>	27.3
<i>Cyprus</i>	26.7	<i>Sweden</i>	20.5
<i>Latvia</i>	19.8	<i>GB</i>	11.7

Source: Authors' own processing, data downloaded from Statista, 2017. [online]. Available at: <https://www.statista.com/statistics/527195/consumption-of-cheese-per-capita-worldwide-country/>. Canadian dairy information center, 2017. Online. Available at: http://www.dairyinfo.gc.ca/index_e.php?s1=dff-fcil&s2=cons&s3=consglo&s4=tc-ft.

1.2 Neuroscience in Marketing Research

New discoveries in the neuroscience represent the revolution of the 21st century and marketing is not an exception. Marketers are more and more skeptical of using traditional research methods because they represent a limitation of an effective measurement of internal reactions to external stimuli. Consumer's neuroscience is increasingly becoming a field of interest both for researchers and for

the business area, because it provides additional, better information than the traditional marketing methods; it also proves useful and effective in understanding the consumer behavior and reasoning whenever making decisions. Neuromarketing emerged on the background of traditional marketing methods' not being deemed satisfactory any more, not only by scientists, but also by the business area (Vlăsceanu, 2014). Neuromarketing, mainly acts as a promise, for it conjures up visions of startlingly new insights into consumers' minds and a grand unification of disparate approaches to the research of consumer behavior. Neuromarketers believe that their instruments allow for the direct observation of brain processes, with the brain acting as the organ of (buying) decision-making (Schwarzkopf, 2015). Final state that people experience cannot be measured adequately by self-reported verbal indicators, because of their complexity and non-propositional structure. (Davidson, 2004). It is concluded from many researches that threshold of human conscious perception starts to be fully active 300 ms after the stimuli what means that most of activities lasting less cannot be adequately and verbally evaluated (Libet, 2004). The base for the neuromarketing research is a finding that 95 % of human thinking and activities are happened in the subconscious (Kozel et al., 2011), what adds the fact that sophisticated brain imaging and biometric methods can penetrate into the subconscious consumer processes and are being brought to the foreground.

1.3 Methods of Measurement of Biometric Signals

Neuromarketing singularly privileges data derived from neurophysiological measurement devices. At its heart are techniques that record electrical activities in the body (mainly electroencephalogram or EEG, and galvanic skin response or GSR), metabolic activities (positron-emission-tomography or PET, functional magnetic resonance imaging or fMRI) and finally psychophysiological processes such as eye movements, heart rate, breathing frequency and the activity of facial muscle (Schwarzkopf, 2015). Biometrics is a universal term which represents measurement of physiological responses of a body - not brain directly - to external stimuli perceived via senses. From the point of view of neuromarketing, one of the most used biometric measurements is the heart and breathing activities, eye movements, blinking, galvanic skin resistance (GSR), mimics and body movements. Some biometric measurements are limited to purposes of neuromarketing research because they are delayed indicators (indirect measurements) of primary brain activity while brain can give an order to body ahead enough of a physiological effect. An ideal case is a finding when the brain gives the order not only when it is being conducted (Pradeep, 2010).

2 Data and Methods

This paper is based on the study of existing knowledge in the following areas:

- traditional vs. innovative research tools;
- market research by using of biometric methods;
- new possibilities gathering the feedback from customers;
- distribution and placing of various research methods and developing of patent technology;
- the need for the implementation of consumer neuroscience in market research and decisions making.

The result of the study finalizes the definition of main reasons needed to implement innovative market research methods to increase the denunciation of these studies, to evaluate their use in marketing management and to obtain feedback from real conditions. All these tools and methods could be used by measurement of dairy products from the various view and research plans. The data for this paper was drawn from authors' own development and are basically primary data developed for innovative research activities.

3 Results and Discussion

The luxury brand *Bentley* developed an application to help them to solve the problem of selecting the right model of the *Bentayga SUV* based on facial expressions. The "*Inspirator*" application, which is not available at this moment, has then scanned the face of potential prospects while watching various video stimuli for wheel, color, and interior adaptation. Simply put, the aim was to choose the best possible performance of the aforementioned car by subconscious perception. While the app was the best and fun tool for those who could afford to purchase a car in \$ 300,000 (244 379,28 €), it was not mean as a science-based method for recognizing true preferences and emotions. Nonetheless, the technologies that can read the human emotions are becoming increasingly widespread and the marketers are aware of them because emotions play an important role in making a purchase decision, so emotional analyzes are added value for marketers and people working in the marketing sphere. Despite the fact that 95 % of purchasing decisions take place in subconscious mind, the understanding of this process is of key importance for any business. Putting digitized surveys directly at the point of sale or in the business is not a revolutionary novelty and is quite often used. Their automation and expansion of biometric feedback (by monitoring the face expression) is a matter of the present time. The reason is that people often do not

think about the question in answering in various surveys or questionnaires and give a response only on the basis of convenience (such as a button that's within reach, smiley coloring) or simply are not in the mood to think over the question as to the number of tasks and duties that they have to deal with in everyday life.

Propose of device with a function of attract an attention, distant gesture control, recognition of selected aspects and micro emulsions available on the dairy market

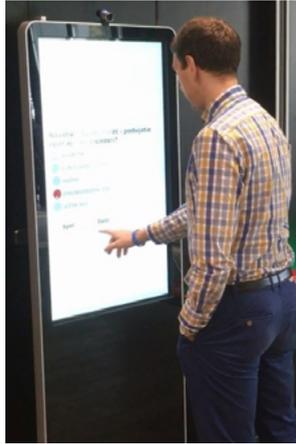
The modified panel/ kiosk can scan people who are in the sales department of milk and dairy products through the Kinect One device, see Figure 1.

Figure 1 **Kinect One Device**



Source: Čížek, 2017. [online]. Available at: <https://www.zive.cz/bleskovky/kinect-definitivne-konci-microsoft-oznamil-zastaveni-dalsi-vyroby/sc-4-a-190163/default.aspx>.

If no persons are present in this sales area, the device is in offline mode, possibly can display/ record a universal stimulus aimed at increasing the consumption of milk products (Figure 2).

Figure 2 Special Modified Kiosk Without Kinect One Device

Source: Authors' own processing.

If the device detects nearby the person, for example, in 4-8 meter then it launches the action of attracting attention. Attraction of attention can be achieved by displaying the personality of a human on the display of the panel/ kiosk and adding a graphic element (e.g. a t-shirt with a dairy motive, a cap in a cheese type) to portray a passing man. Likewise, the device can trigger the projection of floor graphics (various floor graphics related to milk issues) in the space in front of the panel/ kiosk with the capture of the respondent's position within the presented graphic points in order to trigger the interaction. At the same time, the device can trigger a sound condition such as "cow sound" (not active) or pre-recorded talk, aromatization (flavored milk scent) or change the color of LEDs (see Figure 3). The interaction itself may also be that the device asks the passer-by for an interaction (asking for a smile if it is frowning, or asking for a mood that is expressed in a smile). While the panel/ kiosk attracts attention, it records information about gender, muscular activity, age, attitude, and possibly emotion (if the majority of people adapt to prevalence (e.g. 3 males and 2 females = males or 4 adults and 1 child = adult).

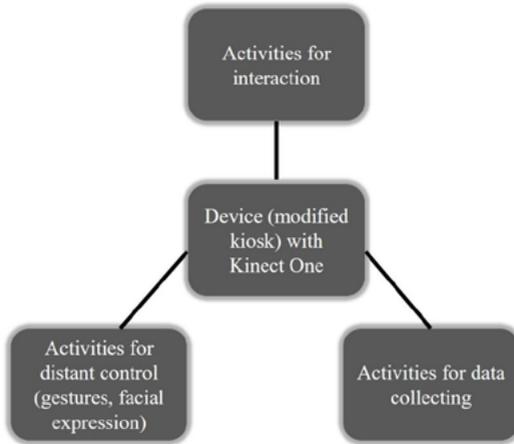
Figure 3 **Monitoring of Skeleton, Orientation and Virtual Functions**

Source: Authors' own processing.

Based on these aspects, the device then assigns pre-arranged and prepared marketing incentives and surveys. This means that after a successful interaction, the device associates or displays a stimulus (video, image, animation, research) for a particular gender (male or female). In the same way, consideration is given to age (child vs. adult) or emotions (happy, angry). The device may also receive additional information, e.g. the weather from the internet or other sensors needed to illustrate the situation (side sensors, etc.). In this context, it is also necessary to consider several modes (e.g. in the morning the device collects information such as the perception of advertising of acid-milk products, on the lunch about the ad of cheeses and on the dinner about a milk). Once the stimulus is triggered, the device will automatically start recording the face expression, recording the exact start and end time of the recording (start & end time). The device must be modifiable if the device uploads the entire video while viewing a stimulus or only takes a photo at the beginning (e.g. one photo when viewing a picture and other photo when viewing a single-question questionnaire or one video when viewing an ad and one video when filling out a more-questions questionnaire). Eventually, the device can also add information about the nervousness of the participant (not moving and looking at the concentric vs. still rotating in front of the panel) or the pulse activity (for the future) of the video (in the time database with the exact video designation), see the Figure 4. If a person leaves during the playing a marketing stimulus before leaving for 10 seconds (ideal playable), this video / photo will not be saved. It is also necessary for the device to send or not sent a questionnaire. It is needed if the participant persists, for example, only when watching the ad and

not by survey, this fact must be mentioned in a document with information about time, nervousness, etc. At the same time, it is necessary for the panel/ kiosk to react to the fact that if one to see the stimulus in question and possibly a poll), not to offer the same scenario, but alternatives.

Figure 4 Overview of Main Functions of Panel



Source: Authors' own processing.

In the future, it is also planned the possibility of response by means of gestures (e.g. the imaginary like-ing or virtual marking of the right answer or smile). In practice, this means that a person does not have to approach the device at all and can do anything in the range of 1-8 meters. The question responded in this way is answered based on the above-mentioned facts (gender, 1 / more people, emotions, etc.).

4 Conclusion

Based on biometric face detection, we can determine the relevancy of the response, especially from the point of view of the attention, the perception of the question itself and the corresponding answers (e.g. a positive answer with a disgusting facial expression). By using such results, this new technology helps to make better decisions and eliminate the shortcomings of traditional research tools. In addition to the level of attention / activity, the device can also recognize the emotional tune of a person (positive, neutral or negative), which is important to watch, for example, when different ads, interesting pictures, infographics, or

animations are displayed on the presentation device. In this case, it is possible to monitor the overall emotional behavior of the person standing in front of the panel and looking at the given stimulus. Even though neuromarketing and modern information technology have become increasingly popular over the past decade in gaining feedback from customers, many companies still rely on classical surveys and written feedback to better understand their customers, but they may not provide relevant information about their true preferences.

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