



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

## MEASURING THE COMMUNICATION EFFECTS OF SALES PROMOTION IN A FOOD COMPANY

*Ines Mesaroš<sup>1</sup>, Nenad Đokić<sup>2</sup>, Mirjana Penić<sup>3</sup>*

### Abstract

*Consumer targeted sales promotion activities, especially discounts and complimentary products, are frequently pursued in food industry. Their fundamental goal is to boost sales over a given period, with short-term effects. However, studying literature dealing with effects of sales promotion, one will find controversies not only concerning expected economic effects of sales promotion, but also regarding unexpected economic impact of sales promotion on brand image, which is the communication goal of promotion itself. If some of the brand damage effects suggested in one part of literature were accepted as possible, this would result in adverse effect of sales promotion in comparison to other marketing communication tools. All of the above warns of the need to very carefully plan sales promotion activities undertaken by a food company, which requires the possibility of measuring communication effects of sales promotion. This article presents a method of measuring communication effects of sales promotion using the metric conjoint analysis technique on the example of a dairy product.*

**Key words:** sales promotion, metric conjoint analysis, food company.

**JEL:** M31

### Introduction

Ever since the 1990s, marketing communication has been dominated by the integrated marketing communication trend, but ideas about the need for such marketing communication appeared as early as in the 1960s (Salai & Grubor, 2011). The fundamental idea is to view the product the way it is viewed by consumers, i.e. as information flow from indistinguishable

---

1 M.A., Faculty of Economics, Segedinski put 9-11, 24000 Subotica, Phone: +381 63 822 01 73, E-mail: [mines@ef.uns.ac.rs](mailto:mines@ef.uns.ac.rs)

2 M.A., Higher School of Professional Business Studies, Vladimira Perića-Valtera 4, 21000 Novi Sad, Phone: +381 63 849 33 15, E-mail: [nenad.djokic.vpsns@gmail.com](mailto:nenad.djokic.vpsns@gmail.com)

3 M.Sc., Department of Geography, Tourism and Hotel Management, Faculty of Science, University of Novi Sad, Trg Dositeja Obradovića 3, 21000 Novi Sad, Phone: +381 63 753 85 89, E-mail: [penicns@yahoo.com](mailto:penicns@yahoo.com)

sources. This is done in an effort to achieve the company's economic goal, i.e. profit, as well as the communication goal – a positive and clear image, where accomplishing the communication goal contributes to accomplishing the company's economic goal.

One of the integrated marketing communication tools is sales promotion. Kotler and Keller (2006, p. 588, 589) identify consumer-targeted sales promotion tools (samples, coupons, cash return offers, low-priced packaging, premiums, repeat purchase programmes, prizes, raffles, contests, customer loyalty rewards, free trial periods, product warranties, tie-in promotion, cross-promotion, displays and point-of-sale presentations), then B2B sales promotion tools (price discounts, price allowances, free products), as well as tools for promoting business and sales force (fairs and conventions, sales contests, specialised advertising). Sales promotion activities, targeted predominantly at intermediaries and consumers, are mostly aimed at boosting sales over a certain time period, which means that their effects are short-term, although, when considering sales personnel education, one can also identify long-term effects of sales promotion. This is the fundamental difference between this integrated marketing communication tool on the one hand and advertising, which aims to inform and motivate consumers, and participate in image formation.

Nevertheless, the large volume of research into consumer-targeted sales promotion does not provide a unified conclusion regarding the effects of sales promotion. The first section of this article is devoted to this issue. Differences are present both in recognising the role of sales promotion in attaining the company's economic goals and in considering the impact of sales promotion on achieving the company's communication goal, despite the fact that the latter is not expected in view of the long-term period, so there should be no effect, when considering the impact of sales promotion of attaining the company's communication goal.

Contradicting views in literature concerning the impact of sales promotion activities on brand image as the goal of integrated market communication tend to result in a need to reconsider firmly established views of sales promotion. Actually, the most often quoted argument is that, as far as consumers are concerned, this integrated marketing communication instrument affects irresolute rather than loyal consumers, and the effects on the brand image are not likely to occur in either of the two mentioned segment. If some of the brand damage effects suggested in one part of literature were accepted as possible, this would result in adverse effect of sales promotion in comparison to other marketing communication tools. All of the above warns of the need to very carefully plan sales promotion activities undertaken by a company, notably measuring their communication effects.

Customer-targeted sales promotion activities, especially discounts and bonuses, are frequently used by food companies. In view of this, the goal set in this article is to present a technique that could be used for measuring potential effects of sales promotion activities on a food company's brand image, suitable for application in domestic economic conditions, i.e. deciding whether larger-scale sales promotion activities should be undertaken. The technique proposed is that of metric conjoint analysis, described in the second section of the article, while its application for measuring the communication effect of sales promotion is presented in the third section of the article.

### **Various views of sales promotion effects**

Although literature provides a clear identification of sales promotion objectives, there is no agreement as to whether sales promotion makes a positive impact on some of them, and, more specifically, what is the interaction of various effects of sales promotion. In this sense, some authors introduce viewing sales promotion impact from the point of short, medium, or long term, or view the sales promotion effects depending on whether it is a new product, national brand, or a so-called no-name product.

De Pelsmacker, Geuens & Van den Bergh (2007, p. 371-373) cite the results of several studies pertaining to sales promotion effects. If sales promotion is viewed in the short term, the authors cite Allenby & Lenk's (1995), conclusions, arguing that a significant contribution of sales promotion to the increase in size and market share is noticeable even in such conditions. Some other studies (Dhar & Hoch, 1996) cited by the above mentioned authors, state that a growth in results from sales promotion, in other words (Gupta, 1998), that 80% sales increase can be credited to sales promotion when attracting the consumers of competing products. Moreover, sales promotions attract more consumers to retail outlets (Grover & Srinivasan, 1992). In the short run, these effects could be regarded as positive. Nevertheless, one should bear in mind the asymmetry relating to sales promotion. More precisely, when sales promotion are applied to luxury products, it may result in increased purchases of these products by lower-income brackets consumers, or those prone to buying private labels, i.e. own brands. In the opposite case, however, symmetrical response cannot be identified.

From the mid- and long term perspective, the interpretations of sales promotion are different. On the one hand, some authors point out that promotion campaigns may result in increased sales volume during these activities, which in turn leads to piling up stocks and subsequent decreased sales, but on the other hand, it may lead to consumers reducing the purchases of given product before expected sales promotion activities (De Pelsmacker, Geuens & Van den Bergh, 2007, p. 372). This phenomenon is known as the sawtooth effect. The same authors cite a study into a long-term market share analysis conducted on 341 product, where the nine-year observation period showed that the market share of 60% of observed products remained stable, whereas 24% cases showed a significant impact of sales promotion on the products' market share (Lal & Pandmanabhan, 1995).

The effects of sales promotion on brand image are another significant factor. Some authors, cited in De Pelsmacker, Geuens & Van den Bergh, argue that frequent sales promotions get consumers used to buying discounted products instead of seeking value (Rotschild, 1987). On the other hand, there are authors claiming that possible brand damage caused by sales promotion will be more likely to be eliminated if the discount is not excessive, if the number of loyal customers is high, and in conditions where sales promotions are frequent. (Kahn & Louie, 1990). There are also studies arguing that sales promotions cannot affect brand image, as long-term consumer attitudes are not affected by short-term actions (Davis, Inman & McAlister, 1992). It should also be pointed out that buying products during sales promotions can develop the consumer's habit of using that product

(De Pelsmacker, Geuens & Van den Bergh, 2007, p. 371). Some of the studies even showed that sales promotions may lead to net positive increase in the likelihood of repeat purchases (Guadagni & Little, 1983).

Kotler & Keller also mention various research into the effects of sales promotion (2006, p. 585). They cite research predicting that sales promotion will not result in consumer loyalty, but rather additional and repeat purchases (Ailawadi, Gedenk & Neslin, 1999). The authors point out that where brands are similar, sales promotion will have short-term impact in the form of higher sales, but increased market share should not be expected in the long term. Also, referring to research by other authors, they argue that in situations with high diversity, consumers may switch to new brands, hoard or buy more (Mela, Jedidi & Bowman, 1998), but also warn that, after a while, sales may drop (Van Heerde, Leeflang & Wittink, 2000).

### **Metric conjoint analysis**

Paul E. Green, the scholar most credited with the development of conjoint analysis writes (Green, Krieger & Wind, 2004), that the development of behavioural sciences, especially psychometrics and mathematical psychology in the 1970s, induced the development of new marketing analysis techniques such as cluster analysis, multidimensional analysis and conjoint analysis. In 1970, Luce & Tukey published an article in *Journal of Mathematical Psychology*, dealing with conjoint measurement, while Green & Rao were the first ones to write an article on conjoint analysis in 1971.

Conjoint analysis is a technique used in situations where the decision maker has to choose between options with two or more simultaneously varying attributes. The question that the decision maker has to answer is whether to choose option X or option Y, where X has a better attribute A, and Y has a better attribute B, which applies to the range of attributes. This analysis is applied to daily decisions made by consumers (such as which toothpaste brand to buy, car to lease, or photocopier to purchase or lease). The data can be gathered from hundreds, or even thousands of respondents.

Conjoint analysis measures consumer preferences and their purchase intention, shows how they would respond to changes on existing products, or launching new ones. Today, however, there is a whole range of areas where this analysis is applied. Gustafsson, Herrmann & Huber (2007, p. 3, 4.) state various possibilities of applying conjoint analysis and authors recording those applications in their work:

- when planning new products – for determining innovation effects' preferences (e.g. Bauer, Huber & Keller, 1997; DeSarbo, Huff, Rolandelli & Choi, 1994; Green & Krieger, 1987; Herrmann, Huber & Braunstein, 1997; Johnson, Herrmann & Huber, 1998; Kohli & Sukumar, 1990; Page & Rosenbaum, 1987; Sands & Warwick, 1981; Yoo & Otha, 1995; Zufryden, 1988);
- for enhancing existing solutions (e.g. Green & Wind, 1975; Green & Srinivasan, 1978; Dellaert et al., 1995);
- for pricing policies (e.g. Bauer, Huber & Adam, 1998; Currim, Weinberg & Wittink, 1981; DeSarbo, Ramaswamy & Cohen, 1995; Goldberg, Green & Wind, 1984, Green

- & Krieger, 1990; Kohli & Mahajan, 1991; Mahajan, Green & Goldberg, 1982; Moore, Gray-Lee & Louviere, 1994; Pinnell, 1994; Simon, 1992; Wuebker & Mahajan, 1998; Wyner, Benedetti & Trap, 1994);
- for advertising (e.g. Bekmeier, 1989; Levy, Webster & Kerin, 1983; Darmon, 1979; Louviere, 1984; Perreault & Russ, 1977; Stanton & Reese, 1983; Neale & Bath, 1997; Tscheulin & Helmig, 1998; Huber & Fischer, 1999);
  - for distribution (e.g. Green & Savitz, 1994; Herrmann & Huber, 1997; Oppewal & Timmermans, 1991; Oppewal, 1995; Verhallen & DeNooij, 1982),
  - for controlling (e.g. Green & Srinivasan, 1978; Herrmann et al., 1999);
  - for market segmentation (e.g. Hagerty, 1985; Akaah, 1988; De Soete & Winsberg, 1994; DeSarbo, Olivier & Ranganwamy, 1989; DeSarbo, Ramaswamy & Chatterjee, 1992; DeSarbo, Wedel, Vriens & Ramaswamy, 1992; Diamantopoulos, Schlegelmilch & DePreez, 1995; Gaul & Aust, 1994; Gaul, Lutz & Aust, 1994; Green & Helsen, 1989; Green & Krieger, 1991; Kamakura, 1988; Ogawa, 1987; Steenkamp, Wedel, 1991; Steenkamp & Wedel, 1993; Wedel & Kistemaker, 1989; Wedel & Steenkamp, 1989; Vriens, 1995; Vriens, Wedel & Wilms, 1996);
  - for stimulating purchase decision with focus on competitors' responses (e.g. Mohn, 1991).

The conjoint analysis flow diagram, explaining the application procedure, includes: choosing preference function; choosing data gathering method; choosing the way to present attributes and their levels; choosing the gathering procedure, choosing the method for valuating attributes and their levels; value benefit assessment (Gustafsson, Herrmann & Huber, 2007, p. 5).

Nowadays, conjoint analysis includes a substantial number of techniques, sometimes mutually significantly different. The following section of the article will be devoted specifically to the application of metric conjoint analysis.<sup>4</sup> Particular attention is paid to its application method ([www.ef.uns.ac.rs/Download/predvidjanje\\_i\\_prognostika](http://www.ef.uns.ac.rs/Download/predvidjanje_i_prognostika)).

Metric conjoint analysis is characterised by the fact that respondents' preferences are modelled directly when the analysis is applied. Once all attributes have been described, the analysis comes down to analysing the variance of main effects. In this, attributes are independent variables; the respondents' preferences are dependent variables, whereas evaluated parameters  $\beta$  from the main variance analysis model feature as partial preferences.

Let us assume that a product has  $M$  attributes, where  $m = 1, 2, 3, \dots, M$ ; while individual attributes have a precisely determined number of levels: the first attribute  $n_1 = 1, 2, \dots, N_1$ ; the second attribute  $n_2 = 1, 2, \dots, N_2$ ; the  $m^{\text{th}}$  attribute  $n_m = 1, 2, \dots, N_m$ ; and the

---

4 Metric conjoint analysis was chosen for application in this article due to comparative simplicity of its application. In an attempt to suggest an analysis applicable in domestic conditions, without purchasing costly software as technique for measuring the communication effects of sales promotion, it was metric conjoint analysis that arose as a technique of choice.

$M^{\text{th}}$  attribute  $n_M = 1, 2, \dots, N_M$ . The dependent variable is, in fact, as it has already been pointed out, consumers' preference for a certain product, where this product is described by the listed set of attributes.

After this, a stochastic model is set for each combination of levels:

$$y_{n_1 n_2 \dots n_m} = \mu + \beta_{1n_1} + \beta_{2n_2} + \dots + \beta_{mn_m} + \dots + \beta_{Mn_M} + u_{n_1 n_2 \dots n_m}$$

where  $u_{n_1 n_2 \dots n_m}$  is the stochastic element.

In this, the set prerequisite is that the sum of values of parameters of all levels per individual attributes equals zero:

In the evaluated form, the model reads:

$$\hat{y}_{n_1 n_2 \dots n_m} = \hat{\mu} + \hat{\beta}_{1n_1} + \hat{\beta}_{2n_2} + \dots + \hat{\beta}_{mn_m} + \dots + \hat{\beta}_{Mn_M}$$

and features as the valued product benefit with the given combination of attributes.

The relative values of evaluated parameters mark the order of partial benefits allocated by respondents to individual attribute levels. Entering the evaluated parameters values into a system of equations results in assessed values of the dependent variable  $\hat{y}_{n_1 n_2 \dots n_m}$ . The difference between the original value and assessed value is the residual. The sum of squared residuals equals 0.

The impartial assessment of the model error variance is

$$\sigma^2 = \frac{\sum e_{n_1 n_2 \dots n_M}^2}{N - k}$$

Deviation or standard error of the regression is  $\sigma = \sqrt{\sigma^2}$ .

The sum of squared centred values of the dependent variable (deviation of original data

from the average) is  $\sum (Y_{n_1 n_2 \dots n_M} - \bar{Y})^2$ .

Coefficient of determination is obtained by means of equation:

$$R^2 = 1 - \frac{\sum e_{n_1 n_2 \dots n_M}}{\sum (Y_{n_1 n_2 \dots n_M} - \bar{Y})}$$

The scope of partial preference of a certain attribute is obtained by subtracting the lowest value of the partial preference of the given attribute from its highest value. The total scope is obtained by adding up the obtained scopes of partial preferences. Mutual relative relevance of individual attributes is determined by dividing the scope of partial preferences of individual attributes by the total scope.

## **Measuring the communication effects of sales promotion in a food company with metric conjoint analysis**

All the research cited so far suggesting different levels impact of product promotion activities on brand image, or lack thereof, take brand loyalty as the starting point for inferences, where a loyal customer is defined as a person characterised by repeat purchases of the given brand within a certain period. However, in relation to this inference practice, the authors of the article emphasise two fundamental remarks. First of all, absence of repeat purchase does not necessarily mean brand damage brought about by sales promotion activities. It is a well-known fact that, if consumer satisfaction were rated on a scale from 1 to 5, only those whose satisfaction is at level 5 are actually loyal consumers (Salai & Kovač-Žnideršić, 2008, p. 9), whereas the consumers whose satisfaction takes level 2,3 or 4 can only be loyal until competition comes up with a better offer. Total absence of or reduction in consumer loyalty, therefore, does not imply that such state stems from sales promotion activities. In addition, it is well known that the basic construction of the image comprises perception, identity, and only then attitude as willingness to act (Salai & Grubor, p. 49). All of the above suggest that the authors are reserved towards the presented manner of measuring the communication effects of sales promotion.

This article opts to measure the communication effects of sales promotion through observing consumers' brand perception. What is observed is the expressed relevance of this product attribute in relation to a range of other attributes, as well as in comparison with competitors' offers. The absence of negative impact of sales promotion on brand preference (as the communication effects of sales promotion), the economic effects would be the only one to observe. In addition, the proposed experimental method enables isolating the measurement of communication effects of sales promotion from the impact of other marketing communication tools to a great extent.

The example in this article describes a dairy planning to begin sales promotion activities to boost the sales of their yoghurt.<sup>5</sup> What kind of sales promotion programme would most appeal to consumers is previously defined by appropriate pre-testing methods tailored for sales promotion programmes, where opinions on the tools of future actions, samples, packaging etc. (Salai & Grubor, 2011, p. 287) are gathered in test retail outlets.

Metric conjoint analysis, as a comparatively simple and cost-effective technique for consumer preference research, was chosen for measuring brand preference as the communication effect of sales promotion.

Before deciding whether to undertake sales promotion activities on the entire market, the dairy's marketing representatives have to select a single representative experimental retail outlet as the initial point of sales promotion activities. The chosen representative sales outlet

---

5 The significance of marketing for food industry is the topic of numerous papers (for example: Đokić, Kočić-Vugdelija & Berber, 2011; Vlahović, Radojević & Živanić, 2011). Sales promotion as part of integrated marketing communication belongs to important marketing activities for food industry companies.



should be relatively distant from other points of sale of the yoghurt under research. Another step is to choose another, representative, control sales outlet on the other side of the country, where the temporary sales promotion activities would not be initiated.

The authors of this article designed a survey comprising two parts, to research preferences of a yoghurt brand. In the first part of the survey, the consumers answer questions on how often they buy yoghurt, at what quantities, whether they buy a single brand, and if yes, which one it is, so as to separate the group of loyal customers from the others. The second part of the survey contains combinations of various levels of the yoghurt's attributes, and is intended for the application of the metric conjoint analysis.

Attributes can be defined by using focus groups, in-depth interviews with consumers, or internal corporate analysis (Green, Krieger & Wind, 2004, p. 118). The dairy employees were also consulted when defining the yoghurt's relevant attributes and their levels. The following attributes and levels were defined: *brands*: A – yogurt brand of the observed dairy; B and C – brands of competing yogurts; *types*: fermented cow's, sheep's or goat's milk; *milk fat percentage*: 0.5 or 2.8%; *packaging volumes*: 0.5 litre or 1.0 litre; *density*: thin or creamy; *taste*: sour or mild; *flavours*: none or fruit-flavoured.

When generating attribute levels, the attributes should be descriptive. It is also necessary for their levels to be: independent, focussed, realistic, and balanced (Kuzmanović, 2004). *Independent* attribute levels means that one attribute level does not exclude a level of another attribute; *focussed* means that attribute levels must be defined within a single dimension; *realistic* means that the interval or range defined by attribute levels has a direct impact on the attribute's relevance, whereas *balanced* levels imply that there is no great difference in the number of levels between individual attributes.

Given that the technique of metric conjoint analysis does not examine consumers' preferences directly, before beginning the application of the designed survey, the representatives of the dairy's marketing service should hand out questionnaires to a sample of 5 consumers who would fill in the questionnaire, which was, in this case, done by the article authors. Analysis was performed, their preferences were defined based on the application of the metric conjoint analysis technique, and then they were asked directly whether the results match their opinions. The outcome showed that results obtained by metric conjoint analysis matched the replies obtained by direct inquiry about reference.

What should also be mentioned here is that the listed 7 attributes were allocated the following number of levels: 3,3,2,2,2,2,2 respectively, so that the possible number of combinations, i.e. cards with yoghurt descriptions, containing all the possible attribute combination would be  $3 \times 3 \times 2 \times 2 \times 2 \times 2 \times 2 = 288$ . However, handing out 288 cards with descriptions of 288 combinations of attribute levels of yoghurt is neither practical nor necessary. Kuzmanović (2008, p. 67) provides a formula determining the sufficient number of cards. Actually, it introduces the notion of saturated design, obtained by subtracting the number of attributes (here: 7) from the total number of levels of all attributes (here:  $3+3+2+2+2+2+2=16$ ), and adding number 1, i.e.  $16-7+1=10$ . In addition, it also introduces the notion of recommended design, which is obtained by multiplying the previous result by 2 or 3, so that here it

amounts to 20-30 combinations. When creating this number of combinations, one should bear in mind that appropriate attribute levels should be equally represented.

However, between commencing sales promotion activities at the chosen experimental sales retail, the dairy's marketing service representatives should decide to survey 50 consumers in the experimental and 50 in the control outlet, about their preferences regarding the dairy's yoghurt brand. The surveyed consumers would fill in the questionnaire sections on purchasing habits, whereas the preferences of offered combinations would be expressed on a scale of 1 to 9, after which the results would be analysed.

Following this, sales promotion activities should be conducted in the experimental outlet for a week, whereas no sales promotion activities would be conducted in the control sales outlet. Consumer surveys would be repeated in both experimental and controlled on a sample of 50 consumers each. The results would be compared to those obtained a week earlier, to examine whether there has been a change in brand preference at the local where sales promotion activities were conducted.<sup>6</sup>

Starting from the defined yoghurt attributes and combinations of their levels, we have compiled a system of equations for valuating unknown parameters  $\beta$ , comprising 36 equations:

1.  $\hat{y}_{111111} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
2.  $\hat{y}_{121121} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{71}$
3.  $\hat{y}_{111222} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} + \hat{\beta}_{31} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{62} + \hat{\beta}_{72}$
4.  $\hat{y}_{121122} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
5.  $\hat{y}_{3311221} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{23} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{62} + \hat{\beta}_{71}$
6.  $\hat{y}_{2211221} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{62} + \hat{\beta}_{71}$
7.  $\hat{y}_{2211112} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{72}$
8.  $\hat{y}_{1112221} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} + \hat{\beta}_{31} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{71}$
9.  $\hat{y}_{1212122} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
10.  $\hat{y}_{3311211} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{23} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{71}$
11.  $\hat{y}_{2212122} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
12.  $\hat{y}_{3311212} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{23} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{72}$

6 The following section of the article will present one of the above mentioned required analyses (testing in the control retail outlet before commencing the sales promotion activities in the experimental retail outlet), to demonstrate the principle of applying the metric conjoint analysis techniques. This survey was conducted in Novi Sad, in the spring of 2011. The conclusion of the article will look into the impacts of possible results of other required analysis. Conducting these requires undertaking sales promotion activities by a well-chosen dairy. However, given that the authors have not managed to initiate such an experiment in any of the existing dairies, the functioning principle of such an analysis and the inferences drawn presented here are only hypothetical.

13.  $\hat{y}_{2211222} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{62} + \hat{\beta}_{72}$
14.  $\hat{y}_{3312211} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{23} + \hat{\beta}_{31} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{71}$
15.  $\hat{y}_{2311211} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{23} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{71}$
16.  $\hat{y}_{2311122} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{23} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
17.  $\hat{y}_{1122211} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{71}$
18.  $\hat{y}_{1221112} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{32} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{72}$
19.  $\hat{y}_{1222121} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{71}$
20.  $\hat{y}_{1222212} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{72}$
21.  $\hat{y}_{2121111} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
22.  $\hat{y}_{3212122} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
23.  $\hat{y}_{1221211} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{32} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{71}$
24.  $\hat{y}_{2122121} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{71}$
25.  $\hat{y}_{2322222} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{23} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{62} + \hat{\beta}_{72}$
26.  $\hat{y}_{1222111} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
27.  $\hat{y}_{2122122} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
28.  $\hat{y}_{3211122} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
29.  $\hat{y}_{3222211} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{22} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{71}$
30.  $\hat{y}_{3222212} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{22} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{72}$
31.  $\hat{y}_{2122212} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{72}$
32.  $\hat{y}_{2321111} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{23} + \hat{\beta}_{32} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
33.  $\hat{y}_{3122221} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{52} + \hat{\beta}_{62} + \hat{\beta}_{71}$
34.  $\hat{y}_{3122122} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{42} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{72}$
35.  $\hat{y}_{3121212} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{41} + \hat{\beta}_{52} + \hat{\beta}_{61} + \hat{\beta}_{72}$
36.  $\hat{y}_{3121121} = \hat{\mu} + \hat{\beta}_{13} + \hat{\beta}_{21} + \hat{\beta}_{32} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{62} + \hat{\beta}_{71}$

According to the condition defined in the description of the metric conjoint analysis, it follows that:

- a)  $\beta_{11} + \beta_{12} + \beta_{13} = 0 \Rightarrow \beta_{13} = -\beta_{11} - \beta_{12}$
- b)  $\beta_{21} + \beta_{22} + \beta_{23} = 0 \Rightarrow \beta_{23} = -\beta_{21} - \beta_{22}$
- c)  $\beta_{31} + \beta_{32} = 0 \Rightarrow \beta_{32} = -\beta_{31}$
- d)  $\beta_{41} + \beta_{42} = 0 \Rightarrow \beta_{42} = -\beta_{41}$
- e)  $\beta_{51} + \beta_{52} = 0 \Rightarrow \beta_{52} = -\beta_{51}$
- f)  $\beta_{61} + \beta_{62} = 0 \Rightarrow \beta_{62} = -\beta_{61}$
- g)  $\beta_{71} + \beta_{72} = 0 \Rightarrow \beta_{72} = -\beta_{71}$

Entering conditions a), b), c), d), e), f) and g) into equations 1 – 36 results in a modified system comprising k = 10 unknown parameters

$$(\hat{\mu}, \hat{\beta}_{11}, \hat{\beta}_{12}, \hat{\beta}_{21}, \hat{\beta}_{22}, \hat{\beta}_{31}, \hat{\beta}_{41}, \hat{\beta}_{51}, \hat{\beta}_{61}, \hat{\beta}_{71}):$$

- 1a.  $\hat{y}_{111111} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
- 2a.  $\hat{y}_{121121} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} + \hat{\beta}_{71}$
- 3a.  $\hat{y}_{111222} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} + \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71}$
- 4a.  $\hat{y}_{121122} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71}$
- 5a.  $\hat{y}_{3311221} = \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} - \hat{\beta}_{61} + \hat{\beta}_{71}$
- 6a.  $\hat{y}_{2211221} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} - \hat{\beta}_{61} + \hat{\beta}_{71}$
- 7a.  $\hat{y}_{2211112} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} - \hat{\beta}_{71}$
- 8a.  $\hat{y}_{1112221} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} + \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
- 9a.  $\hat{y}_{1212122} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} + \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71}$
- 10a.  $\hat{y}_{3311211} = \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
- 11a.  $\hat{y}_{2212122} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71}$
- 12a.  $\hat{y}_{3311212} = \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} - \hat{\beta}_{71}$
- 13a.  $\hat{y}_{2211222} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71}$
- 14a.  $\hat{y}_{3312211} = \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} + \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
- 15a.  $\hat{y}_{2311211} = \hat{\mu} + \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
- 16a.  $\hat{y}_{2311112} = \hat{\mu} + \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71}$
- 17a.  $\hat{y}_{1122211} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{21} - \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
- 18a.  $\hat{y}_{1221112} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} - \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} - \hat{\beta}_{71}$
- 19a.  $\hat{y}_{1222121} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} - \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} + \hat{\beta}_{71}$
- 20a.  $\hat{y}_{1222212} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} - \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} - \hat{\beta}_{71}$
- 21a.  $\hat{y}_{2121111} = \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$
- 22a.  $\hat{y}_{3212122} = \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71}$
- 23a.  $\hat{y}_{1221211} = \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} - \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71}$

$$\begin{aligned}
 24a. \hat{y}_{2122121} &= \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} + \hat{\beta}_{71} \\
 25a. \hat{y}_{2322222} &= \hat{\mu} + \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} - \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71} \\
 26a. \hat{y}_{1222111} &= \hat{\mu} + \hat{\beta}_{11} + \hat{\beta}_{22} - \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71} \\
 27a. \hat{y}_{2122122} &= \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71} \\
 28a. \hat{y}_{3211122} &= \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{22} + \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71} \\
 29a. \hat{y}_{3222211} &= \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{22} - \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71} \\
 30a. \hat{y}_{3222212} &= \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{22} - \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} - \hat{\beta}_{71} \\
 31a. \hat{y}_{2122212} &= \hat{\mu} + \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} - \hat{\beta}_{71} \\
 32a. \hat{y}_{2321111} &= \hat{\mu} + \hat{\beta}_{12} - \hat{\beta}_{21} - \hat{\beta}_{22} - \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} + \hat{\beta}_{61} + \hat{\beta}_{71} \\
 33a. \hat{y}_{3122221} &= \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} - \hat{\beta}_{41} - \hat{\beta}_{51} - \hat{\beta}_{61} + \hat{\beta}_{71} \\
 34a. \hat{y}_{3122122} &= \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} - \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} - \hat{\beta}_{71} \\
 35a. \hat{y}_{3121212} &= \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} + \hat{\beta}_{41} - \hat{\beta}_{51} + \hat{\beta}_{61} - \hat{\beta}_{71} \\
 36a. \hat{y}_{3121121} &= \hat{\mu} - \hat{\beta}_{11} - \hat{\beta}_{12} + \hat{\beta}_{21} - \hat{\beta}_{31} + \hat{\beta}_{41} + \hat{\beta}_{51} - \hat{\beta}_{61} + \hat{\beta}_{71}
 \end{aligned}$$

Relative values of evaluated parameters denote the order of partial benefits awarded by respondents to individual attribute levels. In this example, relative values of evaluated parameters can be represented as follows:

$$\hat{\beta}_{11} > \hat{\beta}_{12} > \hat{\beta}_{13}, \hat{\beta}_{21} > \hat{\beta}_{23} > \hat{\beta}_{22}, \hat{\beta}_{32} > \hat{\beta}_{31}, \hat{\beta}_{41} > \hat{\beta}_{42}, \hat{\beta}_{52} > \hat{\beta}_{51}, \hat{\beta}_{62} > \hat{\beta}_{61}, \hat{\beta}_{72} > \hat{\beta}_{71}$$

Further analysis produces the following results: entering the assessed parameter values into the system of equations 1-36 results in assessed values of the dependent variable

$$\hat{Y}_{abcdefg}. \text{ The difference between the original value and assessed value is the residual: } e_{abcdefg} = Y_{abcdefg} - \hat{Y}_{abcdefg}. \text{ The sum of residuals equals to 0.}$$

The sum of squared residuals is  $\sum e_{abcdefg}^2 = 1,110745$ .

The impartial assessment of the model error variance is

$$\sigma^2 = \frac{\sum e_{abcdefg}^2}{N - k} = \frac{1,110745}{36 - 10} = 0,042721.$$

Deviation or standard error of the regression is  $\sigma = 0,206691$ .  $\sigma = \sqrt{\sigma^2}$ .

The sum of squared centred values of the dependent variable (deviation of original data from the average) is  $\sum (Y_{abcdefg} - \bar{Y})^2 = 13,1624 \cdot \sum (Y_{n_1 n_2 \dots n_M} - \bar{Y})^2$ .

Coefficient of determination is obtained by means of equation:

$$R^2 = 1 - \frac{\sum e_{abcdefg}}{\sum (Y_{abcdefg} - \bar{Y})^2}$$

so that, in this case:

$$R^2 = 1 - \frac{1,110745}{13,1624} = 1 - 0,084388 = 0,915612$$

The scope of partial preference of a certain attribute is obtained by subtracting the lowest value of the partial preference of the given attribute from its highest value:

$$O_1 = 0.74676 - (-0.747486) = 1.494246$$

$$O_2 = 0.135864 - (-0.18945) = 0.325314$$

$$O_3 = 0.10858 - (-0.10858) = 0.21716$$

$$O_4 = 0.086086 - (-0.086086) = 0.172172$$

$$O_5 = 0.11478 - (-0.11478) = 0.22956$$

$$O_6 = 0.10488 - (-0.10488) = 0.20976$$

$$O_7 = 0.0141 - (-0.0141) = 0.0282$$

The total scope is obtained by adding up the obtained scopes of partial preferences:  $O_1 + O_2 + O_3 + O_4 + O_5 + O_6 + O_7 = 2,676412$ . Mutual relative relevance of individual attributed is determined by dividing the scope of partial preferences of individual attributes by the total scope.

First attribute relevance:  $V_1 = 55.8\%$ ,

Second attribute relevance:  $V_2 = 12.2\%$ ,

Third attribute relevance:  $V_3 = 8.1\%$ ,

Fourth attribute relevance:  $V_4 = 6.4\%$ ,

Fifth attribute relevance:  $V_5 = 8.6\%$ ,

Sixth attribute relevance:  $V_6 = 7.8\%$ ,

Seventh attribute relevance:  $V_7 = 1.1\%$ .

The results above show that the first attribute relevance (yogurt brand) is the highest, on the second place is attribute describing yogurt type, while other attributes (milk fat percentage, packaging volumes, density and taste) have relatively similar level of mutual relevance. The least important attribute is flavours.

Given that the possible effects of sales promotion on brand preference needs to be viewed over a relatively long period, the above described trial sales promotions, and preference measurement should be repeated several times, for at least six months or a year. After that, in accordance with the obtained results, it can be decided whether to undertake sales promotion activities or not.

### Conclusion

Based on the literature cited in the article, it can be clearly inferred that there is no unique viewpoint regarding the effect of sales promotions – not only primarily expected economic effects, but also communication effects, which should not even emerge. It is due to the latter effects, notably some authors' claims that sales promotion makes a negative impact on brand image, sales promotion activities must be planned carefully, to avoid backfire, i.e. opposite effect of promotion activities in relation to other integrated marketing communication tools. To this end, one needs to be able to measure the potential communication effects of sales promotion. The above mentioned also applies to food companies, which use sales promotion activities in the domestic conditions as well.

The article presented the application of the metric conjoint analysis techniques for measuring the communication effects of sales promotion. This technique enables measuring changes in a brand's consumer preference. An overview of this technique over a given period in an experimental design was presented after application in an experimental and a control retail outlet. In addition to measuring communication effects of sales promotion with consumer preferences rather than consumer loyalty as it was often applied, and is appropriately theoretically backed up the authors, it can also be inferred that applying the metric conjoint analysis technique in the given experimental design enables comparatively successful isolation of the effects of sales promotion on possible changes in brand preferences. The chosen technique is simple and cost-effective in domestic economic conditions.

The example given in the article presents analysis results at a control retail outlet before commencing sales promotion at the experimental sales outlet, which was the only thing the authors could have accomplished independently, without cooperation with the dairy in question. The results may lead to several conclusions. The most preferred yoghurt brand is A, the second place is taken up by B, and the third by C. The surveyed consumers most prefer cow's milk yogurt to other types, followed by goat's, and finally sheep's milk yoghurt. Moreover, they prefer the yoghurt with 2.8 milk fat to that with 0.5%. As for volume, they prefer 0.5-liter to 1-liter packaging. They will rather buy creamy than thinner, mild rather than sour, and fruit flavoured rather than plain. Thus, it can be concluded that the most preferred yoghurt would be brand A, produced from cow's milk, creamy, mild and fruit flavoured.

The whole analysis presented above, however, acquires its full sense only when considering the relative relevance of individual attributes. In the previous section, it was calculated that the relevance of the first attribute is 55.8%, the second 12.2%, the third 8.1%, the fourth 6.4%, the fifth 8.6%, the sixth 7.8%, and finally, the seventh 1.1%. For consumers, the

most important attribute for consumers is the brand. This shows that the market consists of consumers with express awareness; thus, the number of loyal consumers is significant. This goes to the credit of the dairy marked A by the authors, as their brand enjoys the highest degree of reference. Much less significant to consumers is whether the yoghurt is produced from cow's, sheep's or goat's milk, whereas the issues of milk fat percentage, volume, thickness and flavour are of comparatively low significance level, whereas the issue of additional flavours is by far the least significant.

For a definite answer to the question of the impact of sales promotion on brand preference in food industry, it is necessary to make further comparison, which would be possible by including a certain dairy intending to undertake sales promotion activities into the experimental design. First of all, it is about comparing research results from the control sales outlet (presented in this article) and the experimental sales outlet before commencing the sales promotion activities at the experimental sales outlet. If certain significant differences in consumers' preferences were noticed, one should first examine whether those differences are found at the level of loyal or occasional consumer, or depend on the region where the control and experimental sales outlets are located. However, what is of special significance is subsequent implication regarding the comparison of results in the experimental and control retail outlet, before and after completing sales promotion activities at the experimental sales outlet. In this procedure, it is necessary to compare the results at the two given moments at the control sales outlet. More notable differences that would not be ascribed to variations in the structure of the sample could be attributed to the effect of other integrated marketing communication tools of the above mentioned dairy, especially their advertising, or competitors' activities. On the other hand, one must also observe the differences in brand preferences at the experimental sales outlet as well. If the difference in brand preferences between the experimental and control sales outlet were significantly different, this difference could be attributed to sales promotion activities. It is the repetition of experiment over a longer period that could result in clearly noted possible impact of sales promotion activities. A particularly significant implication could be if differences in possible changes in brand preference between the experimental and control sales outlet did not exist, for then it could be inferred that sales promotion makes no impact on brand preferences. In that case, the decision whether to conduct sales promotion activities or not would be based exclusively on expected economic effects of such activities.

### References

1. De Pelsmacker, P., Geuens, M., Van den Bergh, J. (2007): *Marketing Communications-A European Perspective*, 3<sup>rd</sup> ed. Prentice Hall, New York.
2. Đokić, N., Kočić Vugdelija, V., Berber, N. (2011): *Uticaj razvoja tržišta na promociju organskih poljoprivrenih proizvoda*, Ekonomika poljoprivrede, IEP Beograd, vol. 58, no. 3.
3. Green, P., Krieger, A., Wind, J. (2004): *Thirty Years of Conjoint Analysis: Reflection and Prospects*. In: Wind, Y. & Green, P. (eds.): *Marketing Research and Modelling: Progress and Prospects*, Springer Verlag, Berlin.
4. Gustafsson, A., Herrmann, A., Huber, F. (eds.) (2007): *Conjoint Measurement: Methods*



- and Applications*, Springer Verlag, Berlin.
5. Kotler, Ph., Keller, K-L. (2006): *Marketing menadžment*, Data Status, Beograd.
  6. Kuzmanović, M. (2008): *The nonstandard algorithm for constructing efficient conjoint experimental designs*, Yugoslav Journal of Operations Research, no. 18 (1).
  7. Kuzmanović, M. (2004): *Razvoj poslovnih rešenja pomoću conjoint analize*, SymOrg, Belgrade.
  8. Salai, S., Grubor, A. (2011): *Marketing komunikacije*, Ekonomski fakultet Subotica, Subotica.
  9. Salai, S., Kovač-Žnideršić, R. (2008): *Marketing*, Alfa Graf, Novi Sad.
  10. Vlahović, B., Radojević, V., Živanić, I. (2011): *Istraživanje stavova potrošača o potrošnji organske hrane u Srbiji*, Ekonomika poljoprivrede, IEP Beograd, vol. 58, no. 3.
  11. [www.ef.uns.ac.rs/Download/predvidjanje\\_i\\_prognostika](http://www.ef.uns.ac.rs/Download/predvidjanje_i_prognostika), accessed April 30, 2011.

## MERENJE KOMUNIKACIJSKIH EFEKATA UNAPREĐENJA PRODAJE PREHRAMBENOG PREDUZEĆA

*Ines Mesaroš<sup>7</sup>, Nenad Đokić<sup>8</sup>, Mirjana Penić<sup>9</sup>*

### Sažetak

*Aktivnosti unapređenja prodaje usmerene na potrošače, posebno popusti i pokloni dodatnih proizvoda, često se preduzimaju od strane prehrambenih preduzeća. Osnovni njihov cilj je da se poveća prodaja u određenom vremenskom periodu dok su njihovi efekti kratkoročni. Međutim, u literaturi koja se bavi proučavanjem efekata unapređenja prodaje, postoji nesaglasje ne samo u vezi sa očekivanim ekonomskim efektima unapređenja prodaje, već i u vezi sa neočekivanim uticajem unapređenja prodaje na imidž marke proizvoda, što je komunikacijski cilj promocije. Ukoliko bi se određeni negativni efekti na imidž marke proizvoda sugerisani u delu literature prihvatili kao mogući, to bi dovelo do suprotnog dejstva unapređenja prodaje u odnosu na ostale instrumente marketing komunikacija. Sve to alarmira na potrebu vrlo promišljenog planiranja aktivnosti unapređenja prodaje od strane prehrambenog preduzeća, što zahteva mogućnost merenja komunikacijskih efekata unapređenja prodaje. U ovom radu prikazano je merenje komunikacijskih efekata unapređenja prodaje tehnikom metričke združene analize na primeru proizvoda jedne mlekare.*

**Ključne reči:** *unapređenje prodaje, metrička združena analiza, prehrambeno preduzeće*

---

7 M.A., Ines Mesaroš, asistent, Ekonomski fakultet, Univerzitet u Novom Sadu, E-mail: [mines@ef.uns.ac.rs](mailto:mines@ef.uns.ac.rs)

8 M.A., Nenad Đokić, asistent, Visoka poslovna škola strukovnih studija, Novi Sad, E-mail: [nenad.djokic.vps.ns@gmail.com](mailto:nenad.djokic.vps.ns@gmail.com)

9 M.Sc. Mirjana Penić, doktorant, Departman za geografiju, turizam i hotelijerstvo, Prirodno-matematički fakultet, Univerzitet u Novom Sadu, E-mail: [penicns@yahoo.com](mailto:penicns@yahoo.com)

## CONTENT

1. Di Vita Giuseppe, D'Amico Mario  
**ORIGIN DESIGNATION AND PROFITABILITY  
FOR SMALL WINE GRAPE GROWERS:  
EVIDENCE FROM A COMPARATIVE STUDY . . . . . 7**
2. Đuričin Sonja, Bodroža Duško  
**THE IMPACT OF DROUGHT ON YIELD POSITION OF  
THE GROUP OF ENTERPRISES FROM  
AGRICULTURE SECTOR . . . . . 25**
3. Kljajić Nataša, Vuković Predrag, Arsić Slavica  
**TENDENCIES RELATED TO THE PRODUCTION  
OF RASPBERRIES IN THE REPUBLIC OF SERBIA. . . . . 39**
4. Mesaroš Ines, Đokić Nenad, Penić Mirjana  
**MEASURING THE COMMUNICATION EFFECTS OF SALES  
PROMOTION IN A FOOD COMPANY. . . . . 49**
5. Milenković Svetislav, Utvić Svetlana  
**THE CHALLENGES OF RURAL AREAS IN SERBIA  
PROMISING TOURIST ACTIVITIES . . . . . 65**
6. Sarić Radojica, Jeločnik Marko, Popović Vesna  
**THE INDEXING APPROACH IN MEASURING  
OF SUSTAINABLE SOCIETY . . . . . 77**
7. Vasiljević Dragan, Stepanović Miroslav, Manojlović Oliver  
**CROSS DOCKING IMPLEMENTATION  
IN DISTRIBUTION OF FOOD PRODUCTS. . . . . 91**
8. Bošković Tatjana, Tomić Radovan, Tomić Danilo  
**POTENTIALS AND LIMITATIONS FOR  
THE DEVELOPMENT OF RURAL TOURISM IN VOJVODINA . . . . .103**
9. Cvijanović Drago, Trandafilović Saša, Imamović Nedžad  
**MARKETING CONCEPT IN TERMS OF AGRICULTURAL  
ENTERPRISES DEVELOPMENT  
IN TRANSITIONAL COUNTRIES . . . . . 113**

10.	Kagan Adam <b>THE INFLUENCE OF AGRICULTURAL HOLDINGS ON THE NATURAL ENVIRONMENT . . . . .</b>	<b>.123</b>
11.	Lukač Bulatović Mirjana, Rajić Zoran, Đoković Jelena <b>DEVELOPMENT OF FRUIT PRODUCTION AND PROCESSING IN THE REPUBLIC OF SERBIA . . . . .</b>	<b>.141</b>
12.	Mrkša Milutin, Gajić Tamara <b>SUSTAINABLE AGRICULTURE AS A BASIS FOR SUSTAINABLE ENVIRONMENTAL DEVELOPMENT OF RURAL MUNICIPALITY VRBAS . . . . .</b>	<b>.153</b>
13.	Počuča Milan, Petrović Zdravko, Mrkšić Dragan <b>INSURANCE IN AGRICULTURE. . . . .</b>	<b>.163</b>
14.	Tešanović Dragan, Vuksanović Nikola, Kalenjuk Bojana, Vukić Milorad, Gagić Snježana <b>DANUBE TOURIST SHIPS AS AN OPPORTUNITY FOR EXPORT OF AGRICULTURAL AND FOOD PRODUCTS . . . . .</b>	<b>.179</b>
15.	Veselinović Janko <b>PHYSICAL PERSONS AS TOURIST SERVICE PROVIDERS IN AGRITOURISM. . . . .</b>	<b>.195</b>
16.	<b>Prikaz monografije</b> <b>SISTEMI ZA OBRADU RITSKIH ZEMLJIŠTA SA ASPEKTA POTROŠNJE GORIVA, INVESTICIJA PO HEKTARU I ODRŽIVIH EKO SISTEMA. . . . .</b>	<b>.203</b>
17.	<b>Prikaz monografije</b> <b>MENADŽMENT U ORGANSKOJ BILJNOJ PROIZVODNJI . . . . .</b>	<b>.205</b>