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MARKETING MIX APPLIED TO PREPARATIONS WITH VITAMIN C AND RESVERATROL CONTENT

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Abstract. Preparations containing vitamins and antioxidants through their wealth in bioactive components are a very efficient source of compounds to prevent excessive accumulation of free radicals in the body or to interact with existing ones and improve the health of the population. This study aims to study bio components products containing antioxidant compounds with vitamin activity. An example of this is grapes, especially those of *Vitis vinifera*. For these products to meet both the human body needs and the demands of consumers, the study was completed by operational marketing applications. The high quality of the studied products is represented by the ability to easily enter the usual American diet and inadequate consumer components of vitamins and antioxidants. This is also an effective way to prevent power imbalances that can lead to degenerative diseases and maintain a state of optimal health.

***Keywords*:** marketing mix, vitamin C, antioxidant bio components, resveratrol

Introduction

The literature reveals researches which noted that large consumers of crops in this case those bio components vitamins and antioxidants such as resveratrol one of the most potent antioxidants known–less prone to degenerative diseases and cancer [JASSIM RA *et al.*, 2010].

Numerous international studies on the role of this bio components health have shown that they have a protective role against the risk of tumor formation, cardiovascular disease, metabolic syndrome and macular degeneration[BUTNARIU *et al.*, 2007], helping to control blood pressure and cholesterol levels and prevent various digestive problems. Activity is directed on the body getting healthy again, recovery and rejuvenation processes are activated [BOTTINO *et al.*, 2009].

This raises the utility of defining plant–based food products that meet nutritional role on the one hand but also meet consumer pleasure so that they can be consumed by most the population [BUTNARIU *et al.*, 2011]. In order to define such a product on a highly diversified food market, I tried to apply the operational marketing [COOPER, 2010].

Operational marketing, or marketing mix, tries to control and use several variables that can act on the consumer market and to achieve maximum impact and profit [TEMPLE, 2010].

Operational marketing attempts to calibrate these variables, called tactical marketing tools, to combine them in a mix so as to obtain a response from the market as favorable as possible. Marketing mix is the most visible aspect of marketing and appears as a determinant factor of product profitability, on a short and medium term [BUTNARIU *et al.*, 2010]. In other words, the marketing mix is a set of tactical marketing tools, controllable, which can be combined so as to produce the desired combination on the chosen strategic segment [VERGARI *et al.*, 2011].

As far as the functional food consumer is concerned, too, marketing believes that we have an "average consumer" and consumers differ from each other.

Thus in the functional food field, series of medium and small products or individual commands with antioxidant bio components must be made [WEGENER *et al.*, 2010].

The greatest possible differentiation of products is required, because the desires and needs of consumers are very different and therefore there are a variety of market segments distinguished by different needs.

Hus we sought to identify in our study, groups of users among patients with very frequent pathologies by defining a very large market of potential consumers [ZAGROS *et al.*, 2002] and secondly, through conducted research, these consumers to be helped with medication and treatment as their base to enjoy simple food to enhance the quality of life and can be considered as an adjunct in the treatment of their disease [Mc ANULTY *et al.*, 2011].

As a matter of fact, the marketing mix involves characterization of the final obtained

product–the vegetable salad based on vegetable products with antioxidant bio components–through the "4 c" as follows:

- cost–to have affordable, tangible medium or low income consumers, according to the market research, this cost varies between 15 and 48 lei for the necessary treatment period of 30 days;
- convenience–the product to be available to consumers, since the vegetables were purchased from markets and hypermarkets within reach of consumers, it is considered that this characteristic is fulfilled;
- to correspond to customer's needs–to satisfy a need, in this case in addition to a nutrient compound to be an add in order to maintain health or to achieve better control of various pathologies; this feature is demonstrated by studying the antioxidant capacity of components of plant products and vegetable salad;
- Communication or promotion–the information on this product and the impact of use in maintaining the health to reach the consumer as easily as possible.

Material and methods

The study aims mainly the impact of vitamins and antioxidants on human health and was conducted in a clinical study conducted on a sample of healthy human subjects consisting of five young people between 18 and 25 years following the impact on carbohydrate metabolism.

It was initially studied the behavior of the ingestion of 50g glucose (glucose tolerance test) by analysis of blood serum, and then by the same method it was studied the same behavior after 30 days in which subjects used the product corresponding dose studied, 2 capsules / day as nutritional supplement.

Raw material used for the study was defined as capsules product supplement, each capsule containing a quantity of:

- Active substance: 200 mg trans–resveratrol and 80 mg vitamin C;
- Inactive ingredients: corn starch on gelatin;
- Oral glucose TTGO tolerance test.

Oral glucose tolerance test was performed and interpreted according to WHO criteria (World Health Organization) as follows:

- three days before testing eating at least 150 g carbohydrate/day (so post or not a diet) was performed;
- Test was performed in the morning, at rest, after at least 8 hours of caloric rest (after night);
- the test day, venous blood was collected in anticoagulant for determination of glucose (fasting) plasma results, immediately after the volunteers received a solution of 50 g glucose dissolved in 300 ml of plain water (concentration 25%) within 5 minutes;
- for two hours blood sampling was repeated every 30 minutes in the same way. Glucose dosage was achieved by enzymatic method, with glucozoxidaze.
- Interpretation of results was done according to blood sugar levels in 2 hours:
- Glucose <140 mg/dl=normal;
- Glucose 140–199 mg/dl=decreased glucose tolerance (IGT);
- Glucose≥200 mg/dl=sugar diabetes DZ.

Determination of glucose. Determination of glucose concentration in serum was performed using automated analyzer COBAS 6000, through spectophotometric method. Principle: Glucose is oxidized to gluconic acid and hydrogen peroxide, the reaction being catalyzed by glucozoxidaze. The reaction is followed by oxidative coupling catalyzed by peroxidase to form a leuco dye, resulting in a red colored compound spectrophotometerable at 540nm. Reaction conditions:

- wave length: 540 nm;
- reaction temperature: 37°C;
- determining duration: 5 minutes;
- sample volume required: 10µl;
- unit.: mg / dL (mmol / l).

Comments: Serum samples collected from participating volunteers were stable 24 hours at room temperature or 7 days at 2–8°C, but these samples were removed from red cells within 30 minutes of harvesting to prevent glucose metabolism by the red blood

cells (~ 7% per hour at room temperature). Hemolysis can cause a decrease in blood glucose by 10% in the presence of hemolysis equivalent to 250 mg/dl hemoglobin, this interference is caused by the presence of catalase or other cellular constituents released during hemolysis. In lipemia sera, the presence of lipids in the oxygen diffusion limited lot reactants and therefore highly recommended dilution of samples before determining glucose lipemia.

Results

The reason behind the choice of these products as material of study was that they present biological valences for use as nutritional supplements, vitamins and antioxidants in value, bringing real benefits for health as follows:

- they are supplements with certain antioxidant activity;
- they have low energy intake;
- they contain biologically active compounds with impact on the body biochemistry.

Antioxidant bio components act by counteracting the "cellular oxidative stress" that harms the body. Thus, there is a great interest in research on health effects of antioxidants. Health benefits of rich in antioxidants diets are obvious, but advantages in terms of performance are not too many.

Based on assessment of nutritional properties and sensory preferences expressed by consumers, these products have been selected and they are intended to be consumed as a supplement to normal diet and contain biologically active ingredients with vitamins and antioxidants and the role offers a growth in potential health or disease risk reduction.

The results obtained in determinations of blood glucose after 50 g glucose consumption is included in Table 1.

Table 1.

Values of a jeun blood sugar and after consuming 50 g of glucose

No.	Collecting time (min)	Blood sugar (mg/dl) Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Average
	0	0	79	63	66	80	51
	30	30	89	80	135	90	67
	60	60	99	96	141	97	83
	90	90	95	93	140	96	80
	120	120	90	90	139	95	76
	150	150	88	90	122	90	75
	180	180	86	90	104	85	73

Blood sugar value addiction depending on time after the ingestion of 50 g glucose. The results obtained in determinations of the antioxidant nutritional supplement blood glucose after consumption for 30 days are included in *Table 2*.

Table 2.

Values of a jeun blood sugar and after the supplement consumption

No.	Collecting time (min)	Blood sugar (mg/dl) Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Average
	0	81	83	69	82	78	78.6
	30	80	81	92	84	56	78.6
	60	70	66	113	81	74	80.8
	90	76	90	94	87	64	82.2
	120	84	81	98	92	77	86.4
	150	85	92	105	85	72	87.8
	180	71	85	107	103	85	90.2

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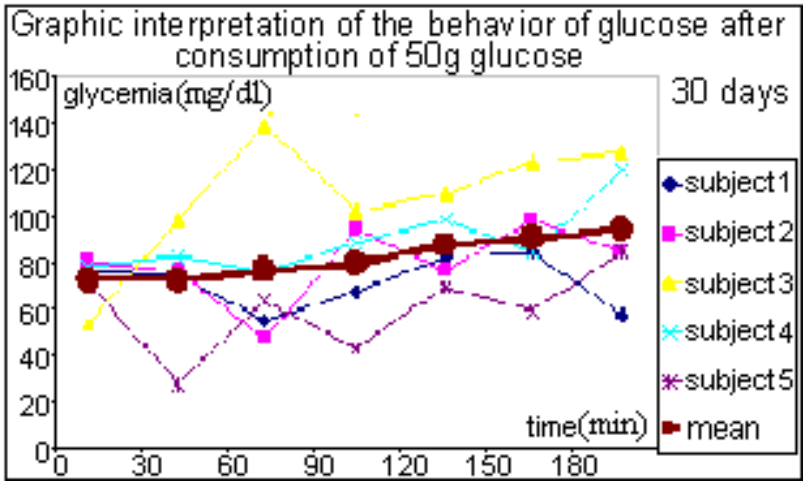

Figure 1. The dynamic evolution of blood sugar for 30 days after consumption of nutritional supplements

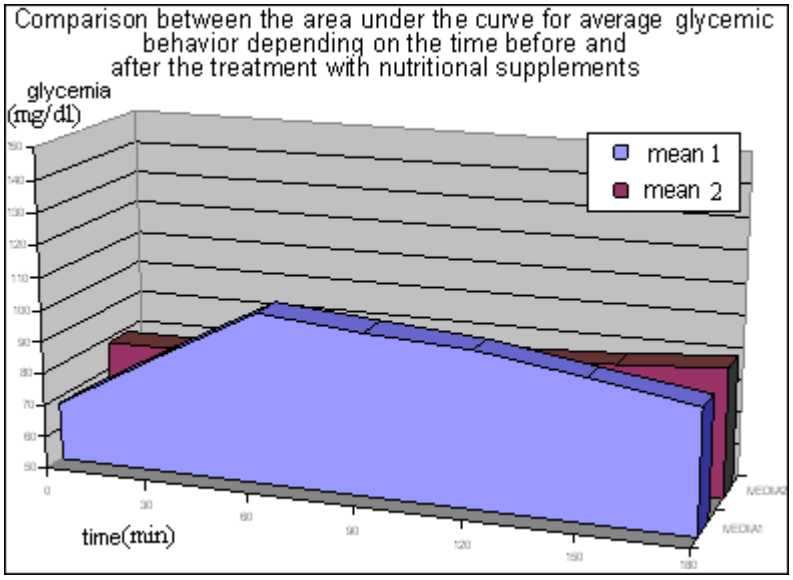

Figure 2. Comparison between the areas under the curve for average glycemic behavior depending on the time before and after the treatment with nutritional supplements

Blood sugar value addiction depending on time on the ingestion of 50 g glucose, after a 30 days consumption of the nutritional supplement.

Discussion

Based on blood sugar values recorded after the consumption of glucose before and after treatment with antioxidants nutritional supplements the represented behavior was calculated and compared taking into account the areas under the curves drawn for blood sugar addiction–time.

For supplements tested similar values were obtained but whose average stands at about 85% to the initial situation.

Conclusions

Based on data on vitamin C and antioxidant content in the products surveyed we believe that the supplement is a product that is easy to be reach by most consumers, considering the cost and the convenience of consumption and will have beneficial effects on health due to the capacity of better managing some risk factors for degenerative diseases. It also stands for the studied product and the performance of all four conditions essential to ensure marketing and operational success in today's market.

One can see that both the individual cases and for the medium values, placing the

food consumption of this supplement leads to a positive response in healthy individuals, which recommends these products for people with diabetes calorie diet mellitus, other degenerative diseases (e.g. metabolic syndrome) or predisposition to the development of problems connected to carbohydrate metabolism.

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