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Marketing of New Bio-Energy Drinks

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Abstract

In modern life it is considered important to be energetic and productive. Shortage of time and rigid society requirements for people, especially youngsters, attracts them to use a variety of stimulators for these purposes, in particular, energy drinks. Most of such drinks are made of unnatural ingredients because of their low costs and fast production cycles.

This paper shows a project of a small joint venture of Tomsk State University and a commercial firm, which allowed launching bio-energy drinks based on natural herbal adaptogens. These new drinks stimulate people without harmful effects on their health.

In this study authors analyzed the target consumers, the possible price and the potential market volume. Authors also developed names, labels and packaging options. There were several focus-groups, interviews and surveys. It was found that the sale of beverages should be aimed at men aged 16 to 30 years old, living in cities, with an active lifestyle, working in the field of management, industries requiring full attention, sport, and studies.

The potential price level was studied by investigating demand price, where some representatives of the target consumer group specified the range of price for one bottle of this drink. The interval-censored data were obtained and Turnbull estimator used for counting the average price and bootstrap to estimate the confidence interval of the price.

The results of this study have allowed the company to make some important decisions.

Keywords. Marketing, pricing, target consumers, Turnbull estimator

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Introduction

Marketing research is an important and essential part of innovative business processes such as launching a new product to the market, because in the face of uncertainty it helps a company to find and analyze significant information for making strategic decisions.

Firstly, producers want to know who exactly will buy their goods. It allows them to focus all company resources on one purpose: to satisfy consumers better. A firm can use various approaches to identify the target consumer, e.g. a method suggested by Mark Sherrington (2003) based on 5W questions:

- 1W – What? What does the company want to sell exactly?
- 2W – Who? Who will be the consumer?
- 3W – Why? Why will the consumers buy the product?
- 4W – Where? Where will the company sell goods from the point of view of consumer convenience?
- 5W – When? When will the consumers buy the product?

Philip Kotler, an outstanding American marketing professor and consultant, emphasized the importance of the following factors for determining the target consumer (Kotler, 1984, 2003; Kotler, Armstrong, Saunders and Wong, 2001):

- Geographical: where consumers live and work;
- Socio-demographic: their age, gender, nation, marital status, profession, etc.;
- Economical: their occupation, income and purchasing capability;
- Psychological: their lifestyle, character, hobby, etc.;
- Behavior: their reasons for purchase.

To obtain this information marketing experts use surveys and interviews. They can recourse to a targeting method, i.e. study consumers via querying a search engine on the Internet. As a result, it becomes possible to rule consumers' attention.

Secondly, a firm must determine the name of a new product. It should be recognizable and pleasant for a representative of the target consumer. The company must also decide a lot of matters concerning the type and the size of the product packaging. At this stage marketing requires creativity. There are various methods used for this purpose, e.g. brainstorming (Osborn, 1953), a morphological approach, (Zwicky, 1969), synectics (Gordon, 1961), etc. These methods are based on different principals of brain work. The most important among them is associativity in teamwork. Consequently, in order to enlarge the sphere of associations and creativity, it is significant to recruit people of varied professions and with different experience.

Finally, the most serious and substantial thing is to appoint the selling price, especially for a new product. To solve this problem marketing experts use a lot of techniques. The key method is the price sensitivity meter (PSM) suggested by Peter van Westendorp (1976). Consumers answer four questions about the price value such as:

- 1) Which price could you afford to purchase the product?
- 2) Which price makes the product expensive enough but still affordable?
- 3) Which price makes the product too expensive to consider it?
- 4) How low should the price be for you to suspect a bad quality?

The answers allow to obtain four distribution functions (c.d.f.) of different price levels. The first and the final c.d.f. must be inverted (in statistical terms it means that survival functions are calculated). All these curves are plotted, and the investigator makes decisions on the price values according to where the curves intersect.

In this paper authors described some stages of marketing processes, which were organized for a small joint venture of Tomsk State University and a Tomsk commercial firm, and also have suggested a new method of pricing based on interval censored data of consumer's price preferences, which helps producers to limit the lowest value of the market price.

Bio-Energy Drinks

It is a well known fact that some energy beverages have a harmful effect on people's health and can even kill because they often contain large doses of caffeine and other stimulators (Meier, Nov. 2012; Haiken, 2012). Nevertheless, a significant part of population continues drinking them. Of high concern is the fact that energy drinks are marketed in order to appeal to the youth. They are consumed by 30-50% of children, adolescents, and young adults. Moreover, the number of consumers is constantly increasing (DAWN, 2011 and 2013). Such tendency can be observed everywhere in the world (Meier, Oct. 2012).

The governments of some countries, e.g. Australia and New Zealand, have limited sales of these drinks, whereas in other countries, including the Russian Federation, the consumer demand is growing up. For people's health, it is vital to change this dangerous situation, yet banning is not a good way out. The best solution is presumably to promote drinks composed of natural herbal adaptogens.

In 2010 the Siberian Botanical Garden of Tomsk State University (TSU) and a commercial firm "SAVA" created a small innovative enterprise "Scientific Production Company (SPC) "SAVA". The main goal of this company is bringing to the market new natural drinks based on herbal adaptogens *Rhodiola Rosea*, *Guarana* and *Schisandra Chinensis* (magnolia-vine), which are competitive foods with high nutritional and biological value

(Brown, Gerbarg and Ramazanov, 2002; Bucci, 2000; Panossian and Wikman, 2010).

SPC “SAVA” developed a line of beverages “BioEnergy”, which includes three drinks: “Charging” with Schisándra and Rhodiola juice, “Refreshing” with Schisándra juice and “Lighting” with Schisándra juice and Guarana extract.

In the cooperation with TSU scientists have developed a new innovation technology of doping herbal adaptogens into the drinks. It allows keeping useful properties of plants extracts and prolongs their action.

Thus, the new line of drinks has a lot of competitive advantages. Firstly, it is natural, and secondly it can be used not only to relieve fatigue, but also to stimulate person’s activity. In addition, herbal adaptogens rise physical endurance and mental performance, increase the long-term concentration and the integrity of perception, sharpens hearing and vision, especially at night (Panossian and Wikman, 2010). It can be used for athletes as specialized sports nutrition increasing the body resistance to prolonged physical stress and restoring strength and energy after exercise. The key advantage of the new drinks “BioEnergy” is that they are adaptive, and a toning effect is not accompanied by depletion of nerve cells and is not addictive. This evidence suggests that “BioEnergy” has a good chance of promotion.

Marketing Survey of Target Consumers of New Bio-Energy Drinks Based on Adaptogens

The market success of a new product is the result of many ingenious and difficult decisions, made on a lot of preliminary researches. The first step is identifying the target audience. For this purpose, authors organized a detailed survey of 1500 representatives of the target consumers. That quantity ensures the representativeness of the sample and accuracy of statistical estimations. People were asked during personal interviews and computer assisted interviews via social nets on Internet. The questions were as follows:

- 1) Do you drink energetic beverages? How often do you do this?
- 2) Why do you drink energetic beverages? What for (the main purposes)?
- 3) Do you understand the harmful effect of unnatural synthetical components of some energetic beverages?
- 4) Do you want and ready to drink natural energetic beverages?
- 5) What kind of packaging do you think natural energetic beverages must have?
- 6) Which place do you think the most convenient for you to buy energetic beverages, etc.?

As a result of this research it was found that the main consumers are young people, mostly men (80%) aged between 16 and 35. They live in cities, have an active lifestyle, have jobs which require high concentration, e.g. managers,

students, drivers, employees working at night, and athletes. The motivation for consumption is an aspiration for being active, energetic and productive during a day and a night. The potential consumers emphasize a necessity of constantly accessibility of the energetic beverages; they want to have an ability to buy the drinks on campus, in night clubs and retail networks, on gas stations, etc.

Authors also came to the conclusion that the best package for natural product is a glass bottle since other types of materials (e.g. plastic), which are not associated with health.

Pricing of New Bio-Energy Drinks Based on Adaptogens

The next and most complicated task is to determinate the price level of a new product, especially if it has never been produced before, as there is no information about its sales history, and manufacturers do not have any guideline for making decisions. So they use self-cost and organize marketing research of customer demand for assigning final price. In this paper authors suggest a new method based on interval censored data about consumers preferable price levels.

During this step of the study the 26 representatives of the target consumer group ($N=26$) were asked about the price range of one bottle after testing the drink. The i -th answer, $i = \overline{1, N}$, includes two values: L_i is the more acceptable price level and U_i is a highest one, above which user is not ready to pay. The results of the survey were scaled for saving a secret and are shown in the Tab.1.

Table 1. Price Preferences

№	L_i , RUBLES for a bottle	U_i , RUBLES for a bottle	№	L_i , RUBLES for a bottle	U_i , RUBLES for a bottle
1	18	22	14	48	52
2	25	29	15	48	52
3	48	52	16	58	62
4	28	32	17	48	52
5	23	27	18	43	47
6	29	33	19	28	32
7	28	32	20	48	52
8	18	22	21	58	62
9	28	32	22	48	52
10	25	29	23	38	42
11	48	52	24	48	52
12	16	20	25	38	42
13	28	32	26	46	50

Thus the interval-censored sample $(L_i, U_i]$, $i = \overline{1, N}$, was obtained and the distribution function $F(x) = P(\xi \leq x)$ of ξ , which is unknown price of one

bottle, $\xi > 0$, was estimated using iterative Turnbull estimator $F_N(x)$ (Turnbull, 1974).

Turnbull algorithm estimates probabilities $p_j = F_N(\tau_j) - F_N(\tau_{j-1})$ on the intervals $(\tau_{j-1}, \tau_j]$, $j = \overline{1, m}$, where $0 < \tau_0 < \tau_1 < \dots < \tau_m$ is a set of all ordered and not repeated points L_i and U_i , $i = \overline{1, N}$. For a few steps estimator maximizes the likelihood function

$$L(F) = \prod_{i=1}^N \sum_{j=1}^m \alpha_{ij} p_j \Rightarrow \max_{\{p_j, j=\overline{1, m}\}},$$

where

$$\alpha_{i,j} = \begin{cases} 1: & (\tau_{j-1}, \tau_j) \subset (L_i, U_i], \\ 0: & (\tau_{j-1}, \tau_j) \not\subset (L_i, U_i]. \end{cases}$$

This estimator is nonparametric (Turnbull, 1974). Chang and Yang (1987) proved that there are some conditions, when Turnbull estimator is strong consistent, e.g.

$$P \left\{ \sup_{x \in (0, +\infty)} |F_N(x) - F(x)| \xrightarrow{N \rightarrow +\infty} 0 \right\} = 1.$$

As the Turnbull estimator has some areas where the function is not defined, it was extent and designated for $x \in (\tau_{j-1}, \tau_j]$, $j = \overline{1, m}$ as:

$$F_N(x) = F_N(\tau_j), \tag{1}$$

and for $x \in [0, \tau_0]$ $F_N(x) = 0$. The results of calculation are shown in the Tab. 2 and Fig.1.

Figure 1. Estimation of the Distribution Function $F_N(x)$

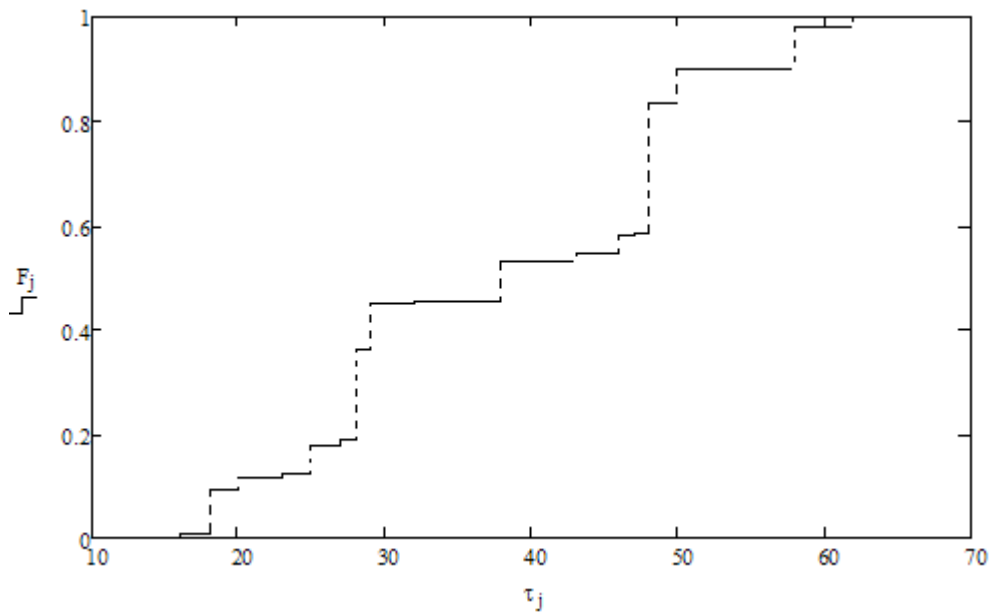


Table 2. Probability Values $F_N(\tau_j)$

τ_{j-1}	τ_j	p_j	$F_N(\tau_j)$
18	20	0.085	0.085
20	22	0.021	0.106
23	25	0.01	0.116
25	27	0.052	0.168
28	29	0.173	0.341
29	32	0.089	0.430
38	42	0.077	0.507
43	46	0.012	0.519
46	47	0.036	0.555
48	50	0.251	0.806
50	52	0.067	0.873
58	62	0.077	0.950

The expected price level has been computed by means of substitution of the c.d.f. estimation (1) into the integral of the expected value as:

$$\bar{\tau} = \int_0^{\infty} x dF_N(x) = \sum_{i=1}^m \tau_i (F_N(\tau_i) - F_N(\tau_{i-1})). \quad (2)$$

Finally, it was obtained that $\bar{\tau} = 37.97$ rubles for a bottle.

This value can be used as a minimum price level, because usually during a survey consumers understate the price value of goods. A manufacturer might correct the estimation (2) by the coefficient $k > 1$ as:

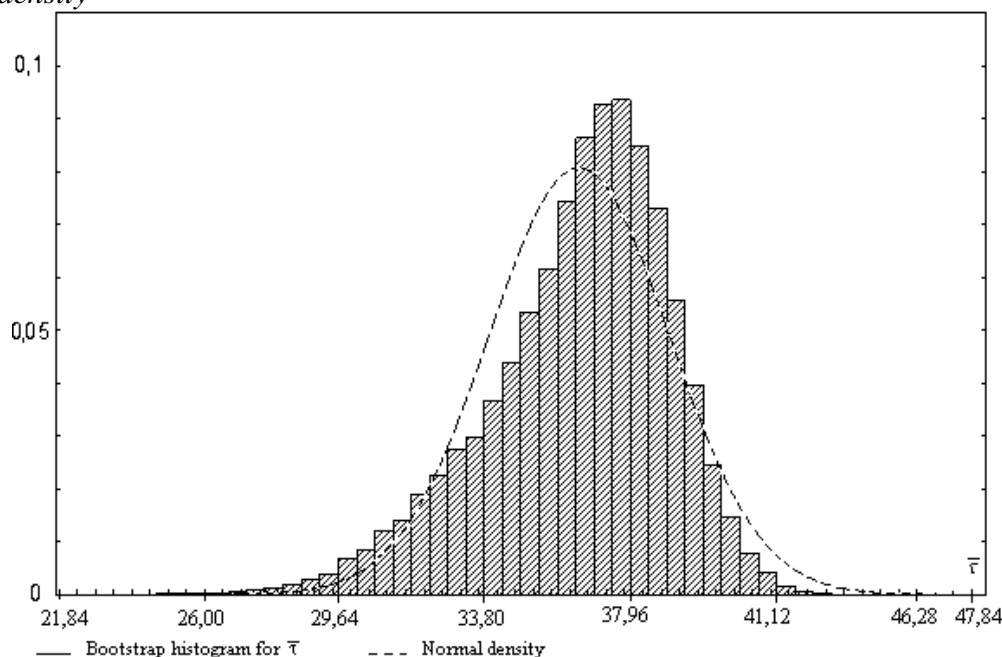
$$P = \bar{\tau} \cdot k,$$

where k is determined under a test marketing.

Then a distribution function of the estimation $\bar{\tau}$ was analyzed by means of bootstrap method (Efron, 1979). This method is nonparametric and (under some conditions) consistent and asymptotically optimal (Beran, 1982).

It was created $M = 5 \cdot 10^4$ resamples using original interval-censored data that allowed us to obtain bootstrap distribution for the average price $\bar{\tau}$. The bootstrap histogram and corresponding normal density are shown in Fig. 2.

Figure 2. Bootstrap histogram for the estimation $\bar{\tau}$ and corresponding normal density



Using the bootstrap sample helps us to find a $\gamma = 95\%$ confidence interval for expected average price (Efron, Tibshirani, 1993). It has obtained

$$X_{\min} = X_{\left(M \cdot \frac{1-\gamma}{2}\right)} = 31.77 \text{ rubles for a bottle,}$$

$$X_{\max} = X_{\left(M \cdot \frac{1+\gamma}{2}\right)} = 40.83 \text{ rubles for a bottle,}$$

where $X_{(j)}$ is the j -th order statistic of the bootstrap sample.

This result allows to assume that most consumers prefer to buy no more expensive than 40.83 rubles for a bottle, and only 2.5% would be able to pay more.

Conclusion

In this paper comprehensive target consumers and their preferences for new bio-energy beverages “BioEnergy” were studied. Summing up, authors have given the company the following recommendations:

1. Due to the fact that Tomsk is a student city (from 80 to 110 thousand students among about half a million population) it was suggested to distinguish them to separate target segment of the market.
2. Authors believe it is very profitable to distinguish athletes and employees working at night and consider them to be two special target groups with the different marketing mixes.

3. It is considered important to launch the drinks to students using promotion slogan “Clever energetic”, emphasizing the ability to increase mental and physical activities simultaneously. Slogan for the athlete’s target group is “Energy and power every day”, laying stress on the effect of regularly drinking for being energetic and active.

4. Authors assure that it should be perspective to add three new drinks to the product line, these might differ by concentration of adaptogens, e.g., low level “Freshen up!” with Schisándra, middle “Charge!” with Schisándra and Rhodiola Rosea and high “Ignite” with Guarana and Rhodiola. These goods might help company protect itself from the rivals.

5. As for packaging authors recommended to use glass bottle mainly, but it is possible to pour drinks into plastic bottles and consider a doy pack with dispenser in the future.

6. Regarding the price authors have advised to set the approximate price level at 39-40 rubles for a bottle and use price adjustment, especially when promoting new drinks on campus, the price must be lower than 35 rubles for a bottle and then subsequently increased to 38.

7. The special price range is to be set in retail networks; it might vary from 39 to 41 rubles and definitely be higher than that on campus.

Now authors have observed that the company’s management is following these recommendations; and successful promotion of the beverages has started mainly due to the research.

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