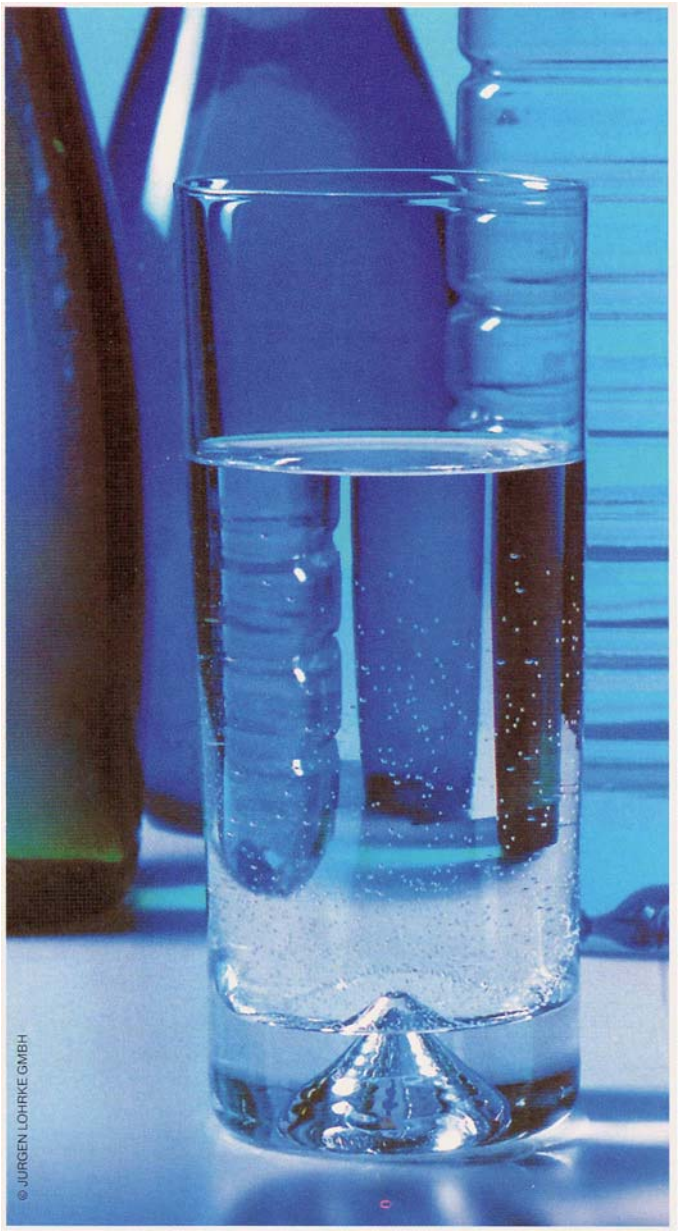
Commercials and Genuine Characteristics of Bottled Water



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According to RosBusinessConsalting the Russian market of mineral and bottled drinking water is one of the speediest growing consumable markets as by now. In the past four years it has been constantly growing at a pace of 20 per cent per year. Though the level of bottled water consumption is several times less than in Europe the growth tendency indicates the Russians develop a culture of water consumption. Many our country fellows developed a habit of buying a bottle of drinking water in a shop.

We can't do without water

An average bottled water consumer hardly knows all the nuances of the technological process associated with its production. And choosing a concrete item relies heavily on its advertising information. In reality bottled water advertising, if advertised at all, lacks variety and imagination. According to a bottled water market study*, manufacturers promote their products as «pure», «natural» and «beneficial». In this article we will try to answer the question, whether the bottled water meets those alleged characteristics.

Let's start with basics. Water is one of the base elements

*Тамберг В. Минеральная линия: за чем потребитель лезет в бутылку. /В.Тамберг, А. Бадьин// Sales Business / Продажи. 2007 №2

of life on Earth. All living matter on the planet up to 90% consists of water. An adult's body contains about 70 % water, Its daily consumption is necessary to maintain all physiological processes. A human can survive without water for several days only. Numerous researches of biologists, medics, including gerontologists, allow us to assert that human health and longevity directly depend on the quality of drinking water.

Since our school days we know water is a substance molecule of which consists of one oxygen atom and two hydrogen atoms with a chemical formula being H_2O. All living matter consists of those molecules, they are essential for human survival. Every day an adult consumes approximately 2,5 l of water. It is easy to calculate that an average person during the span of his life consumes about 70 tons of water which is 1000 higher than his own mass. Major source of liquid for our contemporary is drinking water, other drinks using it as the base as well as milk, vegetable and fruit juices. But the major part of liquids demand is covered by drinking water. That is why it is so important.

Water from a well? A problem!

A good question: where do we get drinking water from? Nature took care of us and offers a wide variety of water sources like rivers, lakes, streams and discharges from underground water bearing layers. Men found technical solutions in digging wells and collecting rain water. Our ancestors used them actively not caring about water quality, totally relying on Mother-nature which created it. They settled next to rivers and lakes not only because those were important transport and communication means but also because a river flood land was full of small streams, springs and small rivers. Thus the problem of water supply had a solution.

Our ancestors did not have a good idea about such sciences like chemistry, physics, biology. Thus they were not aware of the fact that a drop of water picked up from a natural source, besides molecules of so important water, contains small, sometimes invisible, mechanical particles, several chemical compounds diluted in water, microbiological objects like microbes, viruses, fungi and, possibly, parasites. Water is a wonderful solvent, that's why practically everything it gets into contact with becomes part of it. In nature there is no water which does not contain such inclusions. Our ancestors did not know about that. They were drinking water from natural water sources and did not experience serious physiological problems. Why? The answer is quite simple. In the process of evolution humans had adapted to those water inclusions when nature itself is responsible for their type and composition.

Unfortunately those good old days when the people were living under the conditions of benevolent ecology are gone for good. Senseless human activities brought about serious contamination with industrial wastes, particularly in industrially developed countries. We simply cannot expect virgin areas not touched by civilization to survive in proximity with cities and industrial zones. Nature does not draw borders. A radioactive cloud resulting from Chernobyl meltdown reached Sweden resulting in a radioactive rain there. Having penetrated into the soil radioactive particles contaminated ground water.

Our contemporaries, compared to their not so ancient ancestors, cannot safely drink from natural water sources. I mean, from all natural water sources. Assertions that there survived safe or even heeling springs are tantamount to myths. They contain same chemical and bacteriological impurities as other natural sources.

Bottled water characteristics

What is a difference between the water we buy in shops and the one which plays in lakes or rivers, or comes out from our tap? One major difference is that the composition and amount of foreign inclusions in bottled water is strictly specified by the Russian Government regulatory act (СанПиН 2.1.4.1116-02). It is practically impossible to find natural water which meets all its requirements.

Before the water becomes a drinking bottled one it has to be cleaned of mechanical particles, chemical compounds and microbiological objects. It is almost impossible to get rid of all of those, though our reticulation systems usually reduce them to levels stipulated by «СанПиН». It is believed that the water meeting those standards is safe and people may drink it without any fear for their health. Having drunk such water a human will not get sick or develop any intestine disorder, or higher pressure or temperature, he will continue to stay able bodied. It is though impossible to foresee long standing consequences of drinking such water.

Thus reference to being «pure» means that it meets «СанПиН» standards. In this context all samples of bottled drinking water which end up legally on shop shelves do not significantly differ from each other. Making a statement that bottled water is pure is tantamount to a statement that sun is always rises in the East.

Such level of purity is reached through technological processing of water at water works. Purification technologies differ depending on the composition of impurities in feed water. As usual most bottled water manufacturers use a membrane purification method. Since all this water undergoes industrial processing it is a bit of a slyness on behalf of the manufacturers to claim that it is «natural». Water stays natural only when it is confined to natural reservoirs. Research data indicate that even

producing water from ground water bearing layers and transportation in the pipes changes its biophysical characteristics and it tells on its quality.

Every bottled water manufacturer woes a consumer to buy his brand of water. We would treat those attempts to manipulate with pure and natural characteristics with a pinch of irony if we were dead sure that such water is beneficial. Only this argument makes us rebuff tap or well water and stick to bottled water option.

When one tries to understand what really «beneficial water» means he faces a serious problem since nowhere in the system of water reticulation there is such a concept which is rather different from «safe water» concept. Lack of regulations for beneficial water product allows the manufacturers and advertisers to treat this concept with voluntarism without bothering to substantiate the claim. On rare occasions manufacturers conduct research on product impact on living objects and can somehow substantiate their claims. Such situation is rather an exclusion which underlines the common rule: most manufacturers cannot and even do not try to prove argumentatively that their product is beneficial.

How healthy is healthy water?

Criticism of present situation in the field of bottled water manufacture should be substantiated with constructive proposals aimed at rectifying it. We submit for your attention our variant of universal criterion and method of assessing drinking water utility.

We have to treat utility concept from a common established perceptions. The things are beneficial when they ameliorate human physiology. There are many factors which impact human wellbeing. Of most importance is food, medicines, biologically active supplements and drinking water, of course. Everything a human consumes makes an impact on his health.

Human physiology can be assessed through instrumental measuring., like blood pressure, pulse, number of erythrocytes in blood etc. Depending on the type and sophistication of a research the number of measurements may reach hundreds to give a more objective assessment of a human's health. Every measurement or a number of those give an idea about an organ or a system of organs condition. They are measured in specific units and usually have statistically optimum readings. Thus for blood pressure it is well known 120/80. In most cases actual readings taken from a human body do differ from the optimum one. The difference between tolerated deviation from the optimum reading which indicates that a human is healthy, is called a norm corridor. The optimum reading may be sitting in the centre of norm corridor, come nearer to this or that its border and in some cases coincide with it.

Based on the proposed description model of physiological condition of a human being we introduce a concept of beneficial impact, first in a description form and later with symbols. We will consider certain impact on human body as beneficial judging by P index if it transforms the body from present P_T into new state P_B, which is placed closer to optimum index P_O (Fig. 1) along the measurement axis. Measuring axis of P index contains five points: P_O – optimum index; P_{MIN} и P_{MAX} – minimum and maximum readings which define borders of norm corridor; P_T - current index; P_B – a changed index under some impact on human body.

Fig.. 1, *a* depicts a variant of a beneficial impact on human body. Index volume shifts closer to the optimum one. Fig. 1, *b* depicts the opposite situation.

Impact is considered to be beneficial according to P index, if

$$|P_O - P_B| < |P_O - P_T| \qquad (1)$$

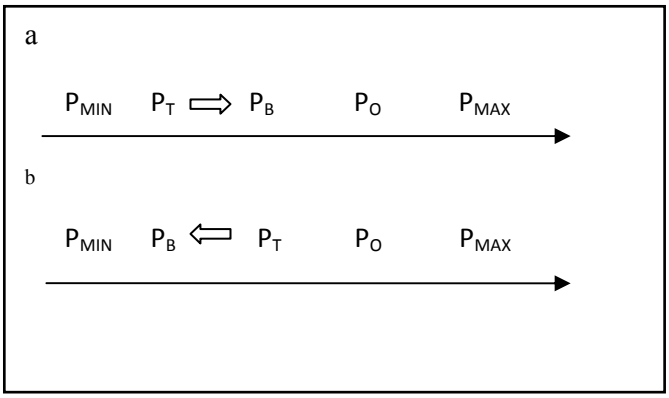


Fig.1 digital axis of P index

Simple indices usually characterize condition of a single organ or a functional system. In order to describe physiological condition of the body as a unit they use a so called systemic index, which is a motivated use of a function over simple indices. The choice of systemic index function depends on a character of formulated tasks to assess human health. We may generally present systemic index in a form of a formula:

$$S = S(P^1, P^2, \ldots\ldots P^N) \qquad (2)$$

where $P^1, P^2, \ldots\ldots P^N$ - simple indices.

All the above attributed to a simple index may be attributed to a systemic index. Its optimum reading $So = S(P_O^1, P_O^2, \ldots P_O^N)$ corresponds to the best state of health. With the same token the systemic index has norm corridor limited by S_{MIN} and S_{MAX} indices.

The systemic index chosen to depict state of body health in general should meet the following criteria:

- comprehensive character (this index should give an objective picture of the state of health of all human organs and systems);
- objectivity (systemic index is identified with instruments which do not depend on the state of the studied body);
- mobility and efficiency (systemic index variations may be monitored irrespective of time, venue and outer conditions).

To achieve those aims we advise to use Voll-Nakatani method as the foundation for control process of systemic indices readings characterizing human health. It fully meets the above requirements. These methods help to assess functional level (state of health) of separate organs and systems as well as the whole body according to conductivity of biologically active points. They allow to assess the nature of impact of various factors including medicines, food, and drinking water. The methodology core is Ryodoraku theory of the better conductivity lines, developed by Japanese doctor Nakatani. According to this theory there is a direct link between functional status of human organs and electrical conductivity of the channels corresponding to 12 classical Chinese meridians.

There are several PC operated automated complexes like KANO, Diacoms etc. They control the condition of all human organs and systems in real time. The above complexes are allowed to be used in Russian health care bodies.

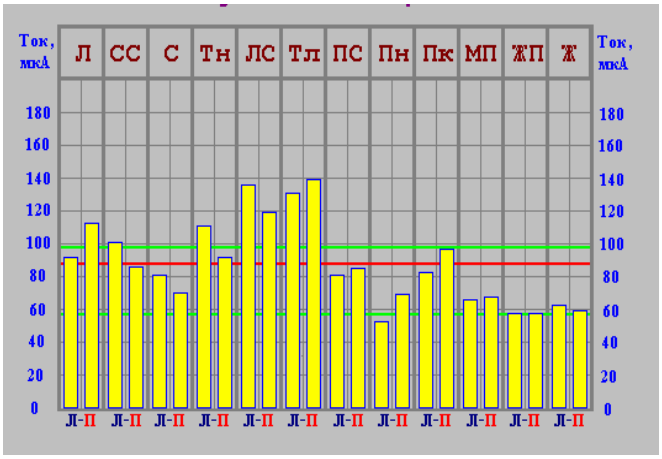


Fig. 2 Functional condition of a human:

Л – left, П – right energetic channel;

norm corridor;

average reading of indices of all systems and organs.

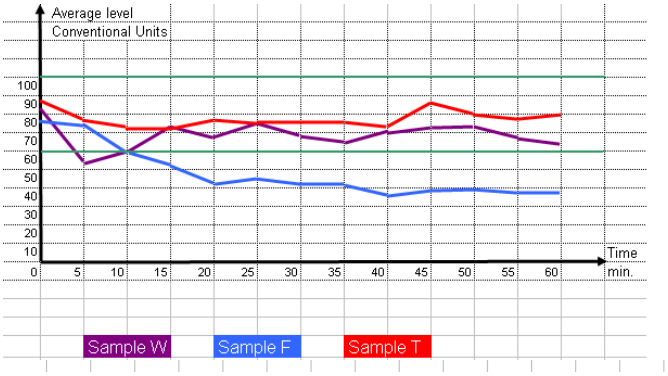
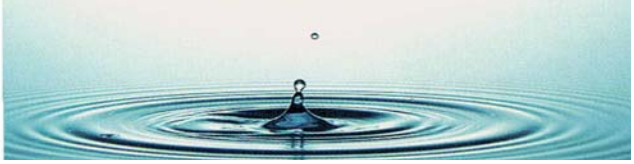


Fig. 3 Average level of functionality

Fig. 2 depicts a diagram received from Diacoms diagnostic complex which gives a good idea of the method and its potential. It reflects functional condition of the following 12 body systems in a specific point of time:

- Lungs (Л)
- Cardio-Vascular system (СС)
- Heart (С)
- Small Intestines (Тн)
- Lymphatic System (ЛС)
- Large Intestine (Тк)
- Pancreas – Spleen (ПС)
- Liver (Пн)
- Kidneys (Пк)
- Urinal & Genital system (МП)
- Gall Bladder (ЖП)
- Stomach (Ж)



Experimental data

According to the method a body functions in a normal way if the indices readings of all the organs, placed along the vertical axis are within the borders of norm corridor (60-100 units range, borders are depicted in green).Optimum level equals 80 units. Condition of human health is also characterized by such integral characteristic like average functionality level (average reading of indices of all systems and organs), which is also placed inside norm corridor when human body functions in a normal manner. Fig. 3 depicts graphs of average functionality level of a 56 years old man's body, under the impact of 200ml of water from three different sources:

• *Sample W* - water taken from a pipeline of Western Administrative District of Moscow;

• *Sample F* – water after treatment with reverse osmosis using a nano membrane with one stage purification. Feed water - sample *W*. For purification purposes a household unit EE- RO-6PF made by «Zepter International» was utilized;

• *Sample T* – water (sample *F*) after treatment with Aquator field generator.

Judging by Fig. 3, body physiological reactions to various type of water vary significantly (see details on www.ecotor.com).

Bearing in mind this method specifics as the systemic index reflecting the state of human organism in its totality we propose to use S unit which can be found according to the following formula:

$$S = 1/(T_1 - T_0)\int_{T_0}^{T_1} F(P^1, P^2, \dots P^{24}, t)dt \qquad (3)$$

where F - function of average functionality level; T - time.

In real terms systemic index S is an average indication, in time terms for the whole period of observation (from T_0 to T_1 moment), of average functionality level. The research confirmed that the most suitable observation period of human physiology changes caused by drinking water is 60 minutes. By the end of the above period physiological condition stabilizes as a rule. We calculate systemic index S based on an example presented in Fig. 3 (S_0=80):

• *sample W*: $S_T = 83.0$; $S_B = 68.5$; $|S_0 - S_T| = 3.0$; $|S_0 - S_B| = 11.5$;

• *sample F*: $S_T = 78.0$; $S_B = 47.4$; $|S_0 - S_T| = 2.0$; $|S_0 - S_B| = 32.6$;

• *sample T*: $S_T = 89.0$; $S_B = 77.4$; $|S_0 - S_T| = 9.0$; $|S_0 - S_B| = 2.6$.

Introducing correlation (1) to the received result we may conclude that out of three samples only sample *T* is beneficial. Besides the introduced correlation allows to range the water samples according to the physiological value. Thus among the three samples the best one is sample *T* and the worst one is sample *F*. Both samples were treated with reverse osmosis method and meet (СанПиН 2.1.4.1116-02) standards.

The proposed approach towards specifying beneficial level of drinking water is not the only one. Other opinions are welcome. It is clear though that a manufacturer should bear responsibility before a buyer not only for water purity but also for its properties which produce a positive impact on human physiology. Only in this case the drinking water has every right to be called beneficial. A manufacturer has a moral right to use this criterion in his advertising campaign if he can substantiate it with the relevant expertise results of his production.