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## The Biological Activity of the Natural Means Onion, Marinated For 30 Minutes in a Natural Lemon Juice.

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### ABSTRACT

The alimentary health correction with natural food stuff of plant origin, metabolically close to the body as a means, having the immunoprotective properties, is essential for the maintenance of the human health. Onion, for marinated 30 minutes in a natural lemon juice, in case of ingestion increases greatly the biological activity of all organs and systems (has a strongly expressed Yang beginning). When assimilated, it increases the level of activity of the heart, the pancreas (spleen) and the gallbladder. The mixture can be recommended for alimentary health correction in people with functional weakness of all systems and organs of the body and especially the last three mentioned.

**Keywords:** Alimentary health correction, bulb onion, lemon juice, biological activity of the organs, biological activity of bulb onion and lemon juice mixture.

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### INTRODUCTION

The longevity and the quality of life, according to the research performed by the World Health Organization, is 20% determined by heredity, 20% by the environment, 50% by the lifestyle, and is only 10% determined by the level of medical care [1]. A healthy lifestyle includes healthy (bringing health) food. The ingestion of the nutrients and minor food components is a factor, largely determining the health of the population. Therefore, the alimentary health correction with natural food stuff of plant origin, metabolically close to the body as a means, having the immunoprotective properties, is essential for the maintenance of the human health [2-6]. Lemon and onion are the most important food stuff of plant origin used not only to improve the taste of products, but also to correct the state of human health.

The bulbs contain 4.5-14% of sugars – fructose, sucrose, maltose; inulin, which creates the conditions for their assimilation; 1.5-2% of protein, 0.01-0.05% of essential oils, a lot of ascorbic acid (C), vitamins of B, PP groups, and carotene (provitamin A) [7]. Onion proteins include some essential amino acids: valine, leucine, lysine, methionine, threonine, and tryptophan.

The content of vitamins, macro- and microelements, as well as the daily rate of their consumption by human [8-10] are shown in the Table 1.

**Table 1. The average content of vitamins, micro- and macro- elements per 100 g.**

Vitamins														
Vitamin	Vitamin A	Vitamin B1	Vitamin B2	Vitamin B3	Vitamin B6	Vitamin B9	Vitamin C	Vitamin E						
Content in lemon	1 mcg	40 mcg	20 mcg	200 mcg	60 mcg	9000 mcg	40 mg	500 mcg						
Content in onion	-	50 mcg	20 mcg	100 mcg	100 mcg	9000 mcg	10 mg	200 mcg						
Daily demand of the body	1.5 mg	1.5 mg	1.7 mg	20 mg	2 mg	0.2 mg	60 mg	1.33 mg						
micro- and macro- elements														
Microelement	Potassium	Calcium	Phosphorus	Magnesium	Sodium	Sulfur	Chlorine	Ferrum	Zinc	Boron	Copper	Manganese	Fluorine	Iodine
Content in lemon	163 mg	40 mg	22 mg	12 mg	11 mg	10 mg	5 mg	600 mcg	175 mcg	240 mcg	40 mcg	10 mcg	175 mcg	0.3 mcg
Content in onion	175 mg	31 mg	58 mg	14 mg	4 mg	65 mg	25 mg	800 mcg	850 mcg	200 mcg	85 mcg	230 mcg	31 mcg	3 mcg
Daily demand of the body	1000-2000 mg	1000 mg	1000 mg	400 mg	4000-5000 mg	500-1000 mg	3400 mg	10-20 mg	15 mg	2-5 mg	2 mg	2 mg	2-4 mg	0.15-0.2 mg

Bulb onion increases the tone and the secretion of the gastrointestinal tract, has the antibacterial properties, is used as a diuretic and antiscorbutic means. The alcoholic extract of onion has a stimulating effect on the heart. There are reports on the anti-sclerotic properties of onion. Onion medications are used for treatment of the diseases of the gastrointestinal tract (atony, colitis of non-dysentery origin with a tendency to constipation), in pulmonary diseases, atherosclerosis and hypertension, occurring against the background of atherosclerosis, in some gynecological diseases; and as the appetite enhancing means. Onion helps in avitaminosis and metabolic disorders. Onion volatile oil kills many harmful microbes. For this reason, the consumption of onion should be increased in many diseases, especially of catarrhal nature. Onion consumption helps to lower the blood pressure. Fresh onion juice can treat all kinds of ulcers on the oral mucosa [7]. In China, Onion tea has long been used for fever, headache, cholera and dysentery. In the Tajik complementary medicine, the seeds of onion in the form of decoction are widely used for the treatment of

kidney stones. The Russian herbalists recommend onion as a treatment of dropsy, kidney stones, bladder; it helps digestion, softens the sputum, increases the sexual desire; it is effective in the propensity to edema, as a diuretic. Onion is a good antiscorbutic means, it is very useful for the prevention and treatment of hypo- and avitaminosis [11-12]. Fresh onion stimulates the appetite, acts as an antiseptic, is used for intestinal atony, avitaminosis, sclerotic form of hypertension, it can lyse the hyperkeratosis. A small onion bulb before night, is a good means to cure the prostatic hypertrophy [13-14].

The chemical composition of the lemon juice depends on the place of growth and the species of the lemon tree. Up to 8% of the citric acid and 0.25% of the malic acid [11]; from 2.06 to 6.0% of sugars (more than 0.80% of glucose, up to 0.75% of sucrose and more than 0.60% of fructose), not more than 0.9% of proteins, up to 0.1% of fat (lemon essential oil), up to 0.5% of pectin, and fiber, glycosides of various structures, etc. are concentrated in the fruit pulp [8]. The biologically active substances such as: flavonoids, coumarin derivatives, sesquiterpenes [8, 11-12, 15] are also present in lemon fruits.

In ancient Oriental medicine of 10th-11th centuries it was believed that lemon "hardens" the stomach, strengthens the heart, helps to cure the infectious diseases, the diseases of the liver, stomach, as well as fever, sepsis, asthma, angina. It was used as an antidote for the bites of the insects. In complementary medicine, the juice and the fruit of lemon were widely used in treatment of the diseases of stomach, liver, gallbladder and biliary tract, the kidneys, the joint and muscle pain as a hemostatic, antipyretic and tonic, in case of various infectious diseases, as well as for treatment of diabetes, hypertension [11-12]. The modern studies show that the rich vitamin and mineral composition provides lemon juice with a wide range of useful properties: the citric acid, included in juice, is converted into alkali in the process of digestion, reducing the acidity of the stomach, eliminating the burning sensation; lemon juice dilutes the bile, promoting its outflow, enhances the effect of the liver enzymes, prevents the formation of gallstones; it is capable of destroying the uric acid salt deposits in case of gout and rheumatism; the significant content of lemon juice potassium improves the nutrition of the brain cells, the heart, the nerve endings; calcium helps to strengthen bones and tooth enamel. The combination of magnesium and calcium supports the body in the periods of increased nerve and physical stress, it helps to maintain good health and functional ability. Organic citric acid is capable of forming the soluble complexes with calcium, which is used in the treatment of diseases associated with the formation of gallstones, pancreas and kidney stones. Pectin, contained in lemons, along with other nutrients, improving the blood circulation and metabolism, can help to reduce the blood cholesterol level, promote the weight loss, the blood pressure normalization. The presence of vitamin C is very useful for the circulatory system: it strengthens the blood vessels, making them less permeable, it also beneficially affects the capillaries; it strengthens the immune system and is the excellent preventative measure during the seasonal epidemics of influenza and SARS, as the useful properties of lemon include the antimicrobial and anti-inflammatory effect [15-17].

The purpose of this study is to identify the nature of the effect of onion, marinated in lemon juice, on the human body, the change of the biological and functional activity of the human organs produced by its ingestion.

#### **MATERIALS AND METHODS**

The software and hardware complex RUNO (thermoalgometry) was used to analyze the changes in the condition of the biological activity of the organs under the influence of the ingestion of onion, marinated in lemon juice. The diagnosis is based on the reflex correlation of the activity of the vegetative centers with the sensitivity of the areas of the skin – the smaller the threshold of sensitivity of the respective biologically active point of the meridian of the body, the higher the biological activity of the corresponding organ. The professional medical diagnostic system RUNO is entered in the Register of medical devices, certified by the RF Ministry of Health. Today it is the most accurate, complete, and at the same time, the simplest express-diagnostics technology, allowing to identify the changes in the activity of the organs during 3-5 minutes.

The apparently healthy men and women [18] of the most socially significant age from 20 to 69 years were taken as the material for this study.

To perform the "anchor measurement" – the annual average value of the biological activity of the organs within 3 years (November 2012 – October 2015), from 7.00 a.m. to 8.00 a.m., fasted, every 2 weeks the

measurements of the biological activity state of the organs of the apparently healthy people were conducted. Totally, 557 measurements were conducted to detect the annual average of the biological activity of the organs within a given period of time. The number of the measurements and the average age of the studied by the age groups are presented in the Table 2.

**Table 2. The number and the average age of the apparently healthy men and women participated in the "anchor measurement" by age groups.**

Age group	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years
Number	40	165	65	169	118
Average age, years	27.7±0.02	37.0±0.08	43.1±0.03	51.7±0.02	64.0±0.01

During the same time period of the day (from 7 a.m.), to assess the changes in the biological activity of the organs under the influence of ingested 50 g of onion, 30 minutes marinated in lemon juice, using the hardware and software complex RUNO, two measurements in each of 65 people were performed: immediately after the ingestion of the mixture and in 1 hour after the ingestion.

### RESULTS AND DISCUSSION

The databases analyzed were completed in Microsoft Excel 2003 software. The variation series for each indicator were built for:

The age of the study subjects;

12 measurements of the biological activity of the meridians of the organs:

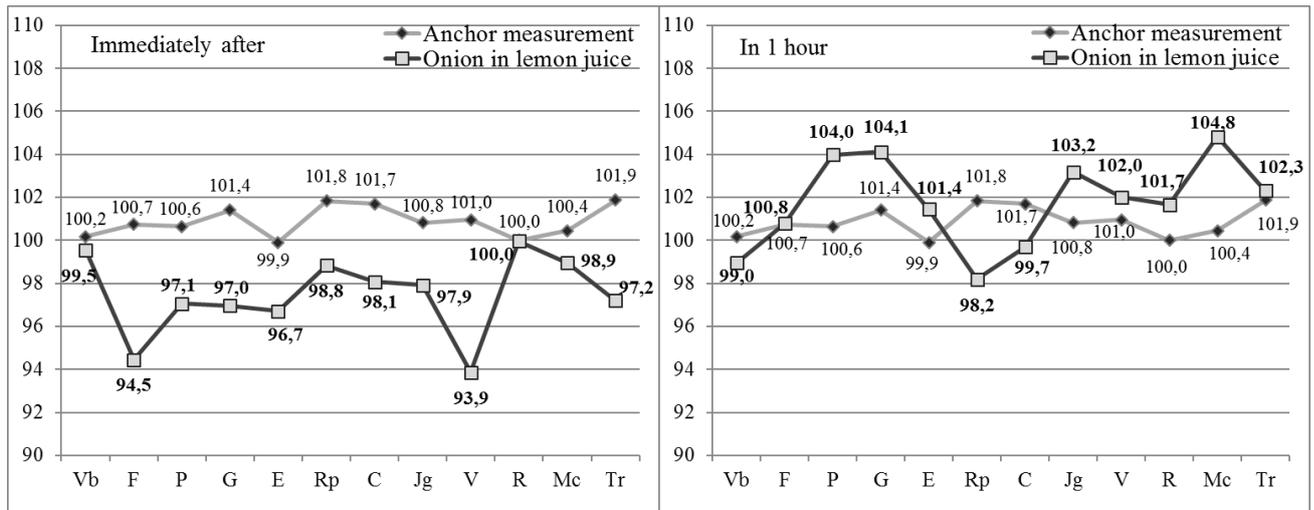
- by the "anchor measurement" of the state of the biological activity of the organs;
- by the values of the biological activity of each organ immediately after the ingestion of onion, marinated in lemon juice;
- by the values of the biological activity of each organ in 1 hour after the ingestion of onion, marinated in lemon juice.

The average values by the mode, by the median, by the method of moments and the boundaries of their confidence intervals were established. The critical level of significance was taken to be  $p = 0.05$ . The indicators of the state of the activity of the organs are shown in the Table 3 and Figure 1.

**Table 3. The average values of the indicators of the biological activity of the organs.**

Meridian	Vb	F	P	G	E	Rp	C	Jg	V	R	Mc	Tr
	Gallbladder	Liver	Lungs	Large intestines	Stomach	Pancreas - Spleen	Heart	Small intestine	Bladder	Kidneys	Pericardium (Circulatory System)	Triple Heater (hormonal system)
Anchor measurement	100.17 ±1.49	100.74 ±1.19	100.65 ±1.17	101.40 ±1.22	99.90 ±1.20	101.83 ±1.41	101.69 ±0.95	100.82 ±2.31	100.96 ±2.31	99.99 ±1.39	100.45 ±1.14	101.88 ±0.99
Immediately after	99.54 ±5.16	94.45 ±3.57	97.06 ±4.10	96.96 ±3.53	96.72 ±3.69	98.83 ±3.44	98.07 ±3.22	97.92 ±3.26	93.86 ±6.36	99.97 ±4.50	98.94 ±4.34	97.19 ±3.02
In 1 hour	98.95 ±4.74	100.78 ±3.63	103.98 ±3.58	104.11 ±3.98	101.4 ±3.72	98.18 ±3.43	99.69 ±2.65	103.18 ±3.15	102.01 ±5.79	101.66 ±5.00	104.81 ±3.43	102.31 ±2.92

Figure 1. The indicators of the state of the activity of the organs.

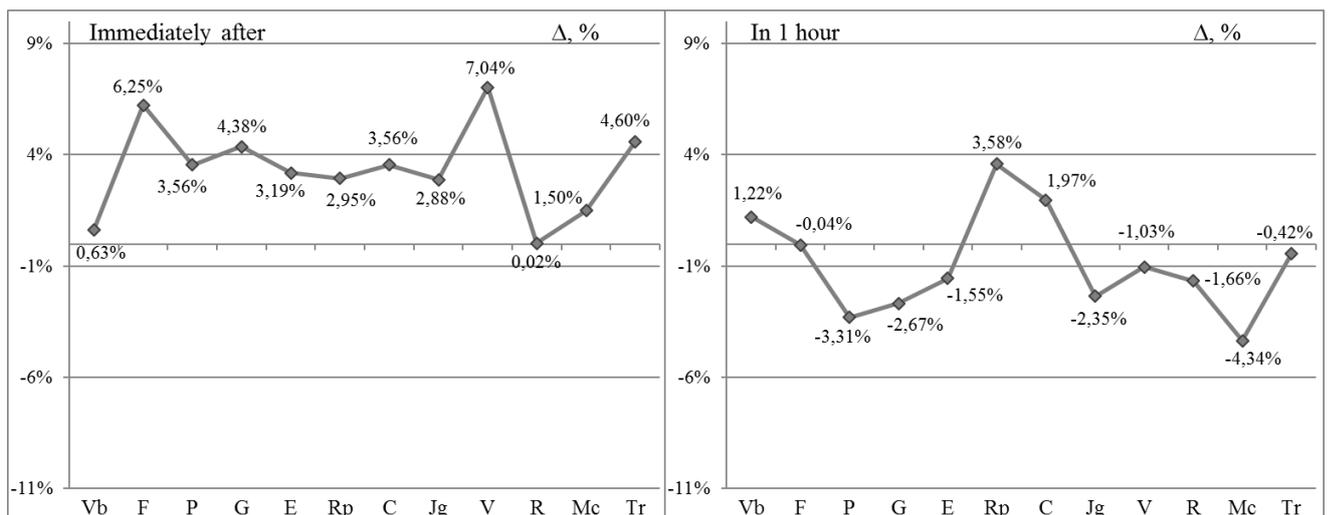


The change of the biological activity of the organs in case of ingestion of onion, marinated in lemon juice relative to the "anchor measurement" in absolute values and in percentage is shown in the Table 4 and Figure 2.

Table 4. The change of the biological activity of the organs in absolute values ( $\Delta$ , points) and in percentage ( $\Delta$ , %) relative to the indicators of the biological activity of the organs in "anchor measurement".

Meridian		Vb	F	P	G	E	Rp	C	Jg	V	R	Mc	Tr
Immediately after	$\Delta$ , points	0.63	6.29	3.58	4.44	3.18	3.00	3.62	2.90	7.11	0.02	1.50	4.69
	$\Delta$ , %	0.63	6.25	3.56	4.38	3.19	2.95	3.56	2.88	7.04	0.02	1.50	4.60
In 1 hour	$\Delta$ , points	1.22	-0.04	-3.33	-2.71	-1.54	3.65	2.00	-2.37	-1.04	-1.66	-4.36	-0.43
	$\Delta$ , %	1.22	-0.04	-3.31	-2.67	-1.55	3.58	1.97	-2.35	-1.03	-1.66	-4.34	-0.42

Figure 2. The change of the biological activity of the organs in percentage in case of ingestion of onion, marinated in lemon juice relative to the "anchor measurement".



The change of the biological activity of the organs relative to the "anchor measurement" values *immediately after* ingestion of onion, marinated in lemon juice is shown in the Table 5. The change of the biological activity of the organs relative to the "anchor measurement" values *in 1 hour* after ingestion of onion, marinated in lemon juice is shown in the Table 6.

**Table 5. The change of the biological activity of the organs *immediately after* ingestion of onion, marinated in lemon juice , %.**

Meridian of the organ	V	F	Tr	G	C	P	E	Rp	Jg	Mc	Vb	R
%	7.0	6.2	4.6	4.4	3.6	3.6	3.2	2.9	2.9	1.5	0.6	0.02

**Table 6. The change of the biological activity of the organs *in 1 hour after* ingestion of onion, marinated in lemon juice , %.**

Meridian of the organ	Rp	C	Vb	F	Tr	V	E	R	Jg	G	P	Mc
%	3.6	2.0	1.2	0.0	-0.4	-1.0	-1.5	-1.7	-2.3	-2.7	-3.3	-4.3

The comparison of the results (Figure 2, Tables 5 and 6) show that the total change in the biological activity of all organs *immediately after* ingestion of 50 g of onion, 30 minutes marinated in lemon juice, is equal to **+40.52%**, i.e. the total biological activity of the organism increases abruptly. Speaking the language of the Oriental Medicine, after ingestion, onion marinated in lemon juice, initially shows highly expressed Yang beginning [19]. This increases the biological activity of absolutely all organs and systems. By organ systems the biological activity is increased in: the cardio vascular system by 12.4%; the lung – large intestine system by 8.0%; the liver – gallbladder system by 7.6%; the bladder – kidney system by 6.22%; the gastric – pancreas (spleen) system by 6.1%. The biological activity of the hollow, Yang organs, ensuring the release of the body of the toxic substances and waste (by **22.7%**) increases especially. The biological activity of the dense, Ying organs, increases less – by **17.82%**. *In 1 hour* after ingestion of 50 g of onion, 30 minutes marinated in lemon juice, the total change in the biological activity of all organs is equal to **-10.6%**, i.e. the total biological activity of the organism decreases. Thus, speaking the language of the Oriental Medicine, after ingestion, onion marinated in lemon juice, in case of its assimilation by the body shows the Ying beginning [19]. A lot of biological energy is required by the organism for the digestion of this complex product. The Yang beginning (the enhanced biological activity) is kept only by the pancreas (spleen), the heart and the gall bladder.

### CONCLUSION

Summarizing the foresaid, the following conclusions can be drawn:

- *Immediately after* ingestion the body reacts to onion, marinated for 30 minutes in a natural lemon juice, with the increase in the total biological activity by 40.5%. At the same time, the biological activity of all organs and systems of the body, without exception, increases, especially that of the cardiovascular system, the lungs – large intestine system and the liver – gallbladder system.
- *In 1 hour after* ingestion of onion, marinated for 30 minutes in a natural lemon juice, the biological activity of the body decreases to **-10.6%** of the initial state of the organism. The maximum decrease in the biological activity is observed in: the large intestine – lungs (G, P) – the activity decreases by 6.0%; the cardiovascular system (Mc, Jg, C, Tr) – by 5.1%; the kidney – bladder (R, V) – by 5.0%. Only the stomach – pancreas – spleen (R p, E) system – shows the increase in the activity by 2.0%.
- A lot of biological energy is required by the organism for the digestion of this complex product. The loss of energy happens in all systems, a slight increase in biological activity is retained only by the pancreas (spleen), the heart and the gallbladder.
- Bulb onion marinated in natural lemon juice, shows highly expressed Yang beginning, and this mixture can be recommended for the alimentary health correction in people suffering from the functional weakness of the cardiovascular system, the stomach – pancreas – spleen system, the large intestine – lungs system, the liver – gallbladder system and the kidney – bladder system.

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