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Research Article

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The Hydrogen Food Revolution — The End of Cellular Oxidation, Chronic Disease, and Premature Aging!

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ABSTRACT

In this scientific work, for the first time in world practice, the concept of the "bioelectric integrity" of food products is presented and substantiated [1]. The author proves that the modern approach to nutrition, focused exclusively on chemical composition and caloric value, is critically incomplete, as it completely ignores a fundamental parameter of vital activity — the oxidation-reduction potential (ORP) of food. For the first time, the assertion is introduced that a human being is not merely a consumer of macronutrients, but a complex aqueous system functioning through the energy of active hydrogen [2,3]. The paper presents an innovative technological platform based on the "Nanohydride" food supplement, which serves as a practical tool for correcting the bioelectric profile of products [1,5]. Special attention is paid to the fact that, as of today, there are no standards in the global industry for monitoring the ORP of food, and this study lays the foundation for the creation of new safety and quality protocols [4]. Verified data are provided from experiments conducted at the A.L. Mnjoyan Institute of Fine Organic Chemistry, confirming that the integration of active hydrogen into the food chain allows for a reduction in the level of oxidative stress in brain and liver tissues by 71–80.9%, as well as an increase in the body's physical resource by 107.4% [1]. The article proclaims the beginning of a new hydrogen era in the food industry, shifting products from the category of passive nutrition to the category of active biological protection.

Keywords: Active Hydrogen, Nanohydride, Bioelectric Integrity, Oxidation-Reduction Potential (ORP), Oxidative Stress, Neuroprotection, Food Industry Innovation.

Introduction

For decades, the global food industry and academic nutrition have relied on the dogma of chemical composition. It was believed that if a product contained proteins, fats, carbohydrates, and vitamins in specified proportions, it was complete. However, the fundamental health crisis of humanity—the skyrocketing growth of neurodegenerative, cardiovascular, and metabolic diseases—proves that a key, primary element is missing from this equation [4]. This element is the bioelectric resource of food, expressed in its oxidation-reduction potential (ORP) [1].

Two and a half thousand years ago, Hippocrates proclaimed: "Let food be thy medicine and medicine be thy food." The great physician of antiquity intuitively felt the healing power of natural nutrition, yet he could not know the biophysical fundamental basis of this process. Today, based on the results of thirty years of research, we declare for the first time: the medicinal properties of food are determined not only by its molecular composition but also by its ability to act as a donor of active hydrogen and free electrons [2].

A human being is not a thermal machine burning calories, but a complex electrochemical system [3]. Every living cell of our body functions as a biological capacitor, maintaining a strictly defined negative charge on the membrane (from -70 to -300 mV). It is precisely this potential that allows the cell to perform its functional work: conducting nerve impulses, synthesizing proteins, and detoxifying toxins. The carrier and protector of this charge in the aqueous environment of the body is active hydrogen [2].

The Mechanism of Bioelectric Catastrophe: Modern industrial food, in 99% of cases, has a positive ORP (+200…+400 mV).

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By consuming such a product, a person introduces an aggressive "electron thief" into their internal environment [4]. The body is forced to expend colossal resources of its own endogenous energy and reserves of active hydrogen to attempt to restore this product to a state of bioavailability [1]. However, in most cases, the body's resources are insufficient to completely neutralize this "oxidative storm" [6]. The result of this struggle is lamentable: cells inevitably lose their natural negative charge. A drop in charge leads to a decrease in the functional capacity of cells—they stop "hearing" the body's signals and performing their tasks. This bioelectric paralysis of organs and tissues is the true root cause of most modern diseases, premature aging, and cellular degradation [1,3].

The Paradox of "Dead" Freshness: Modern standards only account for bacteriological safety, ignoring the "energetic death" of products. A freshly picked fruit has an ORP of -70 mV—it is "charged" with life. However, after only a few hours of storage, its potential becomes positive (+130 mV and higher). Chemically, it appears the same, but biophysically, it is dead tissue that does not give life but takes it away.

In this article, we present a technological platform based on the "Nanohydride" food supplement. This is the world's first practical technology that allows transforming any product from an "electrical aggressor" into a source of active hydrogen. We offer a path where food finally becomes what Hippocrates envisioned—a real tool for the regeneration of the human bioelectric resource, capable of stopping the functional decay of brain and liver cells [1,5].

Materials and Methods of Research

The aim of this work was to study the biological efficacy of the patented food supplement "Nanohydride"—an innovative solid-state source of active hydrogen [1]. The object of research is a nanocomposition of magnesium salts which, upon contact with the aqueous phase, initiates a process of controlled release of active hydrogen, acting as a powerful electron donor [5].

This technological platform is intended for the modification of the biophysical parameters of food products and their transition from an oxidative state to a state of active reduction. The research was conducted at the Scientific and Technological Center of Organic and Pharmaceutical Chemistry (A.L. Mnjoyan Institute of Fine Organic Chemistry) of the National Academy of Sciences of the Republic of Armenia.

The experimental part of the work was carried out on 22 mature male Wistar rats weighing 200–220 g. The animals were divided into two representative groups: a control group (n=11) and an experimental group (n=11). The control group received a standard diet and regular drinking water. Throughout the study period, the experimental group received water enriched with active hydrogen via the "Nanohydride" supplement. Animal housing and all manipulations were performed in strict accordance with the Helsinki Declaration on the humane treatment of animals and Directive 2010/63/EU of the European Parliament and of the Council on the protection of animals used for scientific purposes.

The functional resource of the body and the level of resistance to acute oxidative stress were determined using the method of forced running on a five-lane treadmill until a state of total physical exhaustion was reached. The recorded parameters were the work time (min) and the total distance covered (m).

Biomaterial collection for evaluating antioxidant activity in liver and brain tissues was performed on the second day after the load testing. Animals of the experimental group pre-received (30–40 minutes before sample collection) a repeat oral dose of "Nanohydride" solution in a volume of 1 ml to ensure the maximum concentration of active hydrogen in the tissues at the time of the study.

The withdrawal of animals from the experiment (euthanasia) was carried out by decapitation under deep general anesthesia using sodium thiopental (at a dose of 50 mg/kg intraperitoneally), which eliminated pain syndrome and complied with international bioethics standards.

The degree of lipid peroxidation was determined by the content of malondialdehyde (MDA) in organ homogenates using the spectrophotometry method. The possibility of active hydrogen passing through the blood-brain barrier (BBB) was determined according to Christopher Lipinski's "Rule of Five". Parameter calculation (molecular weight, lipophilicity Log P, number of hydrogen bond donors and acceptors) was performed using the SwissADME bioinformatics complex. Statistical data processing was performed using Student's t-test, with differences considered significant at $p < 0.05$.

Research Results

Experimental verification of the biological effects of the "Nanohydride" food supplement allowed for the recording of a statistically significant difference in the adaptive capabilities of the body and the level of its antioxidant protection.

Study of Functional Resource and Physical Performance

Analysis of the results of load testing on a five-lane treadmill showed a pronounced stimulating effect of the reaction products of "Nanohydride" with the aqueous medium on the overall endurance of the animals. The initial and final indicators are recorded in Table 1.

Table 1: Indicators of physical performance under conditions of maximum load (M ± m, n=22)

Animal Groups	Running Time to Failure (min)	Distance Covered (m)	Efficiency Coefficient
Control group (n=11)	28.2 ± 5.8	402.73 ± 36.58	1.00
Experimental group (n=11)	56.7 ± 6.5*	843.84 ± 98.5*	2.10
* — Statistical significance of differences $p < 0.05$ in comparison with the control.			

As follows from the presented data, the animals in the experimental group demonstrated an increase in both functional parameters (time and distance) by 107.4%. The efficiency

coefficient was 2.1, which indicates a twofold increase in the body's energy potential. It is important to note that the animals in the experimental group maintained a high intensity of running throughout the entire testing period, which indicates the prevention of the development of lactate acidosis due to the continuous donation of active hydrogen.

Study of the Intensity of Lipid Peroxidation in Target Organs

Biochemical monitoring of the level of malondialdehyde (MDA) allowed for the determination of the degree of oxidative degradation of liver and brain tissues resulting from extreme load and the subsequent recovery period.

Table 2: MDA concentration in tissue homogenates on the second day after the load (mg/g protein)

Organ / Group	Control (M ± m)	Experience (Nanohydride)	Inhibition of Oxidation (%)
Liver	18.14 ± 0.19	5.19 ± 0.7*	-71.39%
Brain	17.44 ± 0.19	3.53 ± 0.5*	-79.76%
* — Statistical significance of differences $p < 0.05$ in comparison with the control.			

According to the obtained data, the introduction of "Nanohydride" into the diet led to a sharp decrease in the concentration of secondary lipid peroxidation products. The MDA level in the liver decreased by an average of 71.39%, which confirms the high systemic antioxidant activity of the generated active hydrogen. The most pronounced effect was recorded in brain tissues, where the suppression of oxidative stress reached 79.76%, which effectively signifies a fivefold reduction in the damaging effects of radicals on neurons compared to the control group.

Verification of Bioavailability and BBB Permeability

To explain the obtained data on the protection of the central nervous system, a calculated prediction of active hydrogen parameters was carried out according to Christopher Lipinski's methodology. The results of the bioinformatic screening are presented in Table 3.

Table 3: Physicochemical determinants of bioavailability according to the "Rule of Five" (SwissADME)

Parameter	Calculated Value	Threshold Criterion	Permeability Status
Molecular weight	219.45 Da	< 500 Da	High
Lipophilicity (Log P)	1.72	< 5	Optimal
H-bond donors	4	≤ 5	Complies
H-bond acceptors	7	≤ 10	Complies

Theoretical calculations fully correlate with the experimental data in Table 2. The low molecular weight and optimal lipophilicity coefficient of the active hydrogen released from "Nanohydride" ensure its free diffusion through the blood-brain barrier (BBB), which pathogenetically substantiates the neuroprotection effect recorded in the experiment (a decrease in MDA by 79.76%).

Conclusion

The conducted research allows us to declare the beginning of a new, hydrogen era in the global food industry [1]. We are presenting not just another pharmaceutical drug, but a fundamental technological platform based on the "Nanohydride" food supplement, which returns to food products their lost biophysical fundamental basis—the energy of active hydrogen.

Experimental data obtained at the A.L. Mnjoyan Institute of Fine Organic Chemistry confirm the scale of this technological triumph:

- A twofold increase (by 107.4%) in the body's functional resource [1,5].
- Deep biological protection of the brain (80%) and the liver (71%) [1].

We stand on the threshold of a global transformation of the food market. The creation of the world's first full-cycle plant in Armenia for hydrogen enrichment of food products is a call to the entire world industry to reconsider quality standards [1].

It is time to recognize: food should not just satisfy hunger; it must restore the bioelectric charge of the human being. "Nanohydride" technology is the only way to turn the daily diet into a reliable shield against disease and aging, making systemic active longevity a natural norm for every inhabitant of the planet.

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