



# OPTIMAL WELLNESS LABS

Las Vegas, Nevada

## H2Ultra Hydration Study – Spring 2006 Summary

### Overview of the Study

**Purpose:** To evaluate H2Ultra bottled water and a well known commercially available mineral bottled water, using scientifically proven methods of measuring intracellular hydration.

**Study Protocol:** A standard double-blind 14 day clinical study of 100 subjects of various beginning hydration, age, exercise levels, race, sex, and health levels. Fifty subjects were provided Evian water and fifty subjects were provided H2Ultra water following a standard randomized protocol with a double blind clinical procedure. Each subject was instructed to drink one-half of their weight in ounces daily of only the provided water.

**Key Measurements.** Melonie Montgomery, the head of Research and Development at Optimal Research Labs, is the developer of the proprietary mathematical formulation for calculating intra-cellular hydration. This formulation has become the industry standard for hydration studies. The formulation measures the following four parameters:

1. **Conductivity** – how well the cells are communicating with each other;
2. **Resistivity** – how well the cells are receiving nutrients and discarding waste;
3. **Surface Tension** – how well water is flowing in and out of the cells; and
4. **Specific Gravity** – how much foreign matter is introduced to the body by the water.

### The Findings

The Study's results were as follows:

	H2Ultra	Mineral
Overall Intracellular Hydration	+24.5%	+5.3%
Components:		
Conductivity	+6.0%	0%
Resistivity	+5%	-4%
Surface Tension	+3%	+4%
Specific Gravity	0%	-9%

Overall, H2Ultra showed a significant increase in intracellular hydration.

**Peer Review Conducted By : Curtis Poindexter M.D.  
Hydration Study – H2Ultra Water  
March 2006**

### Clinical Trials Performed By Optimal Wellness

#### Hydration

Almost all of the bio-chemical reactions that occur in body cells depend on water. It is vital to maintaining life but also affects physical and mental performance. Water plays many roles within the body; as a media for, and contributor to molecular interactions, as a solvent, a structure-former, a waste remover, a thermoregulator, a lubricant, a shock absorber and a vehicle to distribute nutrients, metabolites, hormones and other materials around the body and within the cells.

In 2005, The International Life Sciences Institute stated that the role of hydration in the maintenance of health is *critical*. Studies in healthy adults show that even mild dehydration can impair a number of

important aspects of cognitive function such as concentration, alertness, and short-term memory. We cannot live without water for more than about 100 hours, whereas other nutrients may be neglected for weeks or months. Inadequate hydration can cause a range of symptoms from tiredness, headaches and decreased alertness to even collapse and death. No other nutrient is more essential and required in as great amounts.

When discussing hydration, however, it is important to delineate the two types of hydration that are necessary in the body which are intra cellular hydration and extra cellular hydration.

Extra cellular water is found between body cells (and is most commonly discussed when assessing hydration levels) however the water inside the cell (intra cellular) is just as critical, if not more so, to individual wellness. Research in the field of cellular hydration has shown that when individual cells become dehydrated, a catabolic state is triggered accompanied by muscle wasting, cell hypoxia (oxygen starvation), DNA damage, and accelerated aging. As a result the cell becomes more sensitive to free radicals and more susceptible to viruses and autoimmune diseases. Virtually all symptoms of aging can be traced to cellular dehydration accompanied by free radical damage

When cells are adequately hydrated, however, this triggers an anabolic mechanism in the body, which is accompanied by positive nitrogen balance, protein synthesis, and growth hormone release, even in older subjects. Improved cellular hydration also results in a reduction of cell acidity, reduced autoimmune response, increased fat burning, DNA repair, and increased resistance to viruses.

Current scientific theory shows that waters are not all created equal in their ability to increase hydration *at the cellular level*

## **Hydration Measurements**

Some current methods that are available for hydration monitoring include weight monitoring, urine and/or saliva tests and Bio Impedance methods. These methods, while easy to use and fairly inexpensive, generally lack the precision and accuracy necessary for consistent repeatable hydration monitoring and to date are not supported by strong clinical data. Blood tests which are a more accurate monitoring method are impractical due to cost, time and the invasive nature of the tests.

## **The Product**

H2Ultra is bottled, ready to drink, purified water product. There have been no outside forces used to produce this product. The bottling plant is compliant with state and federal guidelines for ready to drink bottled water. This all-natural water product is a clear liquid with no visible solids anywhere in the bottle.

## **Testing Purpose**

The focus of this Human Clinical Study involved subjects drinking two different waters (H2Ultra and a well known commercially available mineral water) to determine if one water product can hydrate the body more effectively than the other.

The test was based on changes observed in intra-cellular hydration and whether or not drinking H2Ultra or the mineral water could move a subject closer to optimal hydration levels and to what extent.

## **The H2Ultra Trial**

Human Clinical Trials were performed by Optimal Wellness using H2Ultra water and the mineral water under standard double-blind clinical testing methods. The purpose of the study was to evaluate H2Ultra bottled water and Evian bottled water, using a scientifically proven method of measuring intracellular hydration.

The study consisted of 100 human subjects selected by the inclusion/exclusion method with varied beginning hydration levels, ages, exercise levels, race, sex, and health. Following an initial screening at the Visit 1 (week-0), subjects entered a 1 week baseline period (subjects refrained from taking any unnecessary OTC's, prescription drugs or natural products for the remainder of the study).

Subjects who met all inclusion and none of the exclusion criteria at the check at Visit 2 (week-1) were randomized thereafter into the randomized product period of the study during which they received either the mineral bottled water or H2Ultra bottled water (in un-marked bottles) in double-blind fashion. Each subject was instructed to drink one-half of their weight in ounces daily of only the provided water.

Final evaluations of test subjects were done on visit 3 (week-2) of this study. The focus of this Human Clinical Study involving subjects drinking two different waters to determine if one can hydrate more effectively than the other is done on the basis of increasing intra-cellular hydration.

All subjects were instructed to make no changes in their standard daily diet and compliance was monitored and maintained through bi-weekly phone calls.

## **Optimal Wellness - The Technology**

The owner of Optimal Wellness, Melonie Montgomery, is the developer of proprietary analysis technology, *The Fenestra Analyzer*, which uses a mathematical formula for calculating intra-cellular hydration. This technology has already been accepted and endorsed by both natural product and specialized water industries as a superior form of testing. It measures four key parameters:

**Conductivity** – how well cells communicate with each other.

**Resistivity** – how well cells receive nutrients and discard waste.

**Surface Tension** – how well water is flowing in and out of cells.

**Specific Gravity** – how much foreign matter is introduced to the body by water.

This technology uses cutting-edge science to evaluate health at the cellular level. Objective testing procedures are the basis for this analysis and there is no subjective input from the tester. A computer-based software program provides print-outs with any cellular imbalances brought to light.

## **The Test Results**

The results of the study were as follows:

	<b>H2Ultra</b>	<b>Mineral</b>
<b>Overall Intracellular Hydration</b>	<b>+24.5%</b>	<b>+5.3%</b>
<b>Components:</b>		
<b>Conductivity</b>	<b>+6.0%</b>	<b>0%</b>
<b>Resistivity</b>	<b>+5%</b>	<b>-4%</b>
<b>Surface Tension</b>	<b>+3%</b>	<b>+4%</b>
<b>Specific Gravity</b>	<b>0%</b>	<b>-9%</b>

The H2Ultra product exhibited an average 24.5% increase in intracellular hydration improvement whereas the commercially available water product (Evian) showed only a 5.3% increase in hydration, consistent with other previously tested commercially available waters.

In this Human Clinical Study of H2Ultra VS a well known commercially available mineral water there is a clear separation between the two products in regards to their Conductivity, Resistivity, Surface Tension, and Specific Gravity measurements (both in vitro and the samples taken from the 100 test subjects).

Other significant findings were; pH results from the group drinking Evian were decreased by 6%, resistivity results from the mineral bottled water group were also increased past Wellness ranges by 4%, and conductivity numbers in the group drinking H2Ultra were improved by 6%.

From my review of all available documentation, I can confirm that the technology, evaluation process, and methodology used in this trial are sound, and consequently can support the results obtained by Fenestra Research Labs.

**As a result, I am confident that there has been a clear demonstration that H2Ultra Water currently exhibits hydration properties which are superior to the well known commercially available mineral Water product.**

## **Optimal Wellness Test /H2Ultra Water**

**Peer Review by**

**Lisa Tully, PhD, Pharmacology and Toxicology**

The purpose of this document is a peer review of research performed by Optimal Wellness Research Labs in which clinical testing of hydration levels before and after consuming H2Ultra water. The review finds the research protocol to be scientifically valid; there was a sufficient number of subjects obtained utilizing appropriate inclusion and exclusion criteria and double blind procedure was employed. What makes Optimal Wellness Research Labs test stand out from others (that suffer from inaccuracy) is that urine and saliva are measured and four different parameters are measured: conductivity, resistivity, surface tension and specific gravity. These parameters are used to determine zeta potential, which is an indicator of how well nutrients are absorbed and toxins removed. Since these processes are dependant upon hydration levels, zeta potential assessment is a very reliable and accurate means of measuring hydration levels. Therefore, this test gives a more complete view of hydration. The Optimal Wellness Research Labs test of H2Ultra water clearly demonstrates that it is superior to a well known commercially available mineral water in terms of hydrating ability.

Water is essential for life-humans can survive many days without food, but only a few days without water. Water is the most abundant component of the body and maintaining a proper level in the body is a key factor in health. Water composes 75 percent of all muscle tissue and 25 percent of fatty tissue and acts within each cell to transport nutrients and dispel waste. Nearly all of the biochemical reactions that occur in body cells depend on water and normal metabolic activity can only occur when cells are at least 65% water body (Molecular Biology of the Cell, Alberts et al, 1989).

Therefore, proper hydration determines health. Studies have shown that a number of illnesses are related to dehydration. In fact, water has been used as a treatment for peptic ulcer disease (J Clin Gastroenterol 5:203,205, 1983). Cellular “free water” insufficiency produces a disturbance on tryptophan (a precursor of serotonin) metabolism, which regulates body temperature, depression and is involved in immune function and pain modulation (Anticancer Research 7: 971-990, 1997).

Water regulates the body's temperature, cushions and protects vital organs, aids the digestive system and is a powerful cleanser - many toxins are flushed from the body in urine. It is impossible to sustain life for more than a week without water. Water is vital to maintaining life but is also critical for physical and mental performance (Your Body's Many Cries for Water, [Batmanghelidj](#)).

Some drinks such as coffee, beer and sodas can actually *increase* the body's need for hydration because they can have a diuretic effect. When the body becomes dehydrated, the brain does not work properly-creating a groggy feeling, there is muscle tone loss, loss of coordination, kidneys do not function-causing toxic build up in the body, there can be constipation, fats stored in the body are not metabolized, constant hunger, dry, itchy and saggy skin and there is trouble regulating body temperature. Dehydration is a factor in many disease states and therefore, proper hydration is essential for optimal health (Int Nurs Rev. 2004 Sep;51(3):159-66).

Numerous studies have shown that increased hydration may result in improved general wellness and wellbeing, enhanced immune system function, improved utilization of nutrients, increased oxygenation (which leads to better memory, increased endurance and faster recovery from physical activity), reduced hypertension, improved detoxification of tissue and organs and faster recovery from surgery and illness, including colds (Acta Pardiatr. 12:1557-8, 2004).

Water is the most important nutrient because it is responsible for so many functions and for the activation of cellular functions by other nutrients. When nutrients have reached the cells, water is necessary for the cells to function, maintain (catabolic phase) and build and repair (anabolic) phase. These two phases of cellular function are closely related to the cellular water flow or lack of its flow.

There are two types of water in the body, intra-cellular and extra-cellular. Extra-cellular is the fluid outside an individual cell while intra-cellular is the fluid found inside the cell. Both of these types of water are necessary for optimal health or wellness of every cell in the body. In order for the cells to be biologically active they must absorb water.

When the cells over hydrate it triggers an anabolic phase, one of the healing mechanisms in the body. The anabolic phase is triggered by a positive hydrogen balance, protein synthesis, or growth hormone. When cells dehydrate, they put into motion the catabolic phase that can lead to inflammation and premature aging.

Typically, as aging occurs, cells lose their natural ability to expand and start to shrink, in part due to the loss of intra-cellular water as well as the loss of cellular [zeta potential](#). Zeta potential is a basic law of nature and without it, life could not exist. Zeta potential is the key to understanding dispersion and aggregation processes. When tiny mineral or organic particles are suspended in a fluid, zeta potential maintains the dispersion or discreteness of the particles in suspension. Zeta potential in the body as a fluid system is an indication of how nutrients move into and toxins are moved out of cells.

Another benefit of increased zeta potential is in the blood. The high zeta potential or negative electrical charge on particles entering the bloodstream may help to increase the dispersion or discreteness of blood cells by helping to enhance the electrical charge on blood colloids which include blood cells. When blood cells are free flowing, they expose maximum surface area to the blood and are therefore able to hold and transport more oxygen and other nutrients throughout the body.

During the past 20 years, many tests have been developed to assess hydration levels in humans these include, changes in body weight, blood and urine parameters, bioelectrical impedance (BIA - which involves measurement of impedance at a single frequency) skinfold thickness, heart rate and blood pressure changes.

Changes in body weight, plasma osmolality, urine osmolality, color and specific gravity are widely used markers of hydration. Some other methods of measuring hydration levels involve the dilution of tracer substances in the subject's body. Many of these methods are invasive, and most are time-consuming (a typical measurement takes between 1 and 6 hours), and cannot be repeated until the diluted tracer substances leave the body.

Bioelectrical impedance analysis has found extensive application as a simple noninvasive method for the assessment of body fluid volumes. It proposes to measure fat-free mass, total body water, percent fat, body cell mass, intracellular water, and extracellular water. It is unlikely, however, that BIA is quite as versatile as its claims and it is difficult to determine whether BIA is specific for any or all of these compartments. Whereas BIA has potential as a quick, inexpensive, and quantitative technique to directly measure fluid gain or loss, BIA generally lacks the precision and accuracy necessary for hydration monitoring (a significant error may occur in the measurement of body composition from whole body BIA.) It has not found universal acceptance even with the introduction of multi-frequency BIA which, potentially, may improve the predictive accuracy of the measurement and there are a number of reasons for this.

Perhaps the major reason is that no single algorithm has been developed which can be applied to all subject groups, in addition, the measured impedance is not only related to the volume of fluid but also to its inherent resistivity. The primary determinant of the resistivities of body fluids is the concentration of ions, which may be variable. Actually the BIA manufacturing companies report that BIA cannot be used as a standard to measure intra-cellular or extra-cellular hydration because of their inaccuracy.

As for the other tests, body mass change, blood and urinalysis have been shown to be a valid and reliable method for determining moderate changes in fluid balance, but they do not give an indication of intracellular or extracellular hydration. Blood tests are also impractical because of cost and invasiveness.

These tests can only provide a very limited look at the cellular properties of cells, cellular activity, toxic build-up, nutrient utilization and absorption rates.

Optimal Wellness Labs developed the Fenestra Analyzer after years of research into the fields of Bioelectric Impedance (an FDA approved system), Microscopy cellular analysis, Bio-Terrain Analysis, Dr. Carry Reams system called REAMS testing, symptomology, medical diagnosis, and intake questionnaires. Each one of these systems have several areas where they overlap or provide validation for the others as well as providing invaluable science.

Optimal Wellness Labs has developed a mathematically based, analytical test for measuring and monitoring health following consumption of a product. The measurement of resistivity, conductivity, surface tension, specific gravity by Optimal Wellness Labs and the calculation for zeta potential and anabolic-catabolic balance provide us with a look at the ability of the nutrients to flow into the cell and the toxins and waste to flow out of the cell. This look at the flow of intra-cellular and extra-cellular water is the key to understanding cellular hydration.

**Optimal Wellness Lab's assessment of hydration is the most advanced and accurate to date. The evaluation of the intra-cellular hydration measurement is a standard measurement utilizing biochemistry and biophysics and accepted by the natural products and the water industries.**

The results obtained by Optimal Wellness Lab show an increase in hydration by H2Ultra water of 24.5% in subjects overall with the group drinking the H2Ultra product and increased 05.3% in the group overall drinking the well known commercially available mineral water product. The increase in hydration is scientifically significant. In order to demonstrate scientific significance, a difference of 10% is necessary. Since the difference was 24.5%, this is a substantial increase in hydration, especially when compared to Evian (only a 5.3% increase), which is a high quality drinking water. Since hydration is the end result of drinking water, H2Ultra dramatically improves hydration, which is a major health benefit.

The only other parameter measured in which the H2Ultra water differed from the mineral water was conductivity (6% increase vs. 0% in Evian). Conductivity gives an indication of how well cells are communicating with each other, so an improvement in this measure is likely related to hydration and is certainly beneficial to health.

In conclusion, the Optimal Wellness Labs test for hydration is an accurate and reliable test for measures of hydration that are related to physiological function. The study was well designed, with appropriate inclusion and exclusion criteria and protocol. The results of the study demonstrated a dramatic increase in hydration over the well known commercially available mineral water that indicates its usefulness in maintaining health.