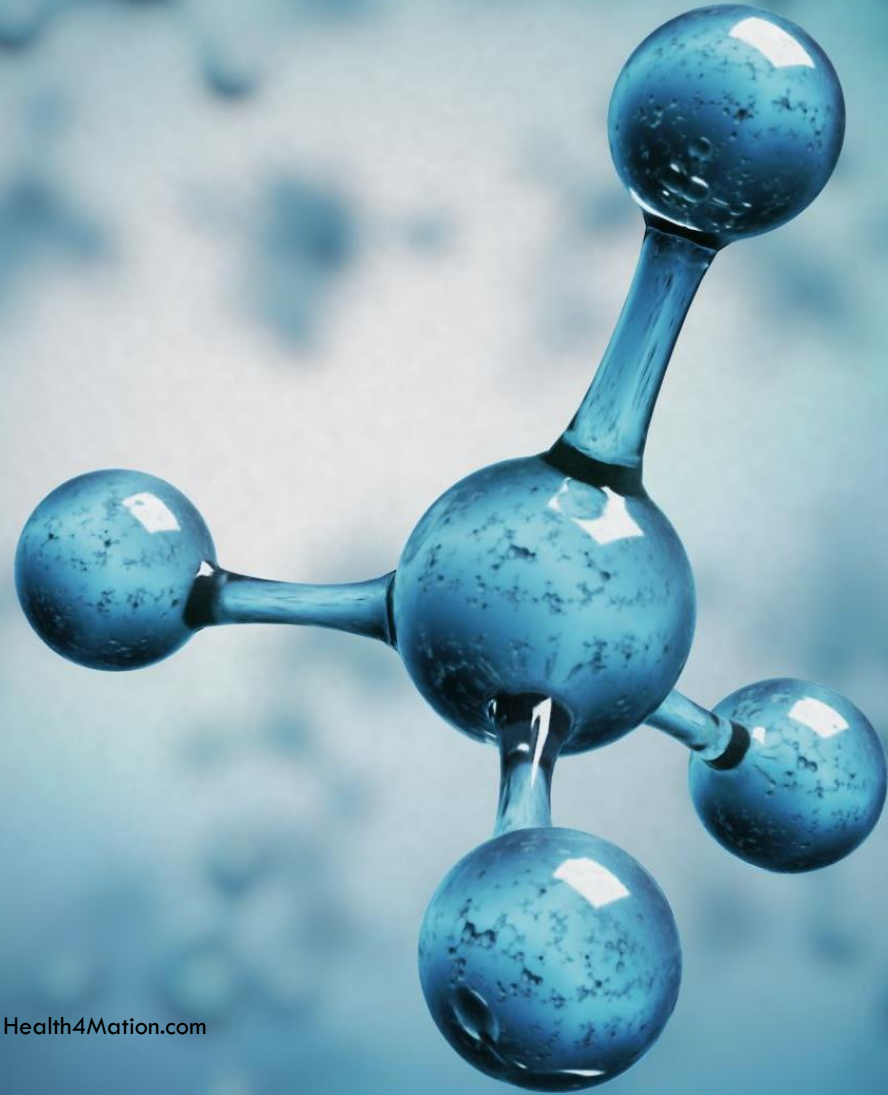


The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance.

# CORNERSTONE HEALTH

EMPOWERING THE MIND TO TRANSFORM THE BODY.

## SECTION 1: FOUNDATIONS OF HEALTH



Health4Mation.com

# PRINCIPLE #2 WATER VS HYDRATION



# DISCUSSION POINTS

- WHAT IS THE DIFFERENCE BETWEEN WATER & HYDRATION?
- WHY IS WATER & HYDRATION SO IMPORTANT TO OUR BODY?
- HOW DO WE OBTAIN GOOD BIO-WATER & PROPER HYDRATION THROUGHOUT THE DAY?

# WHAT IS THE DIFFERENCE BETWEEN.....

WATER



Health4Mation.com

VS

HYDRATION



# WATER IS?

- WATER IN HEBREW IS MAYIM: TERM IS USED 722 TIMES IN THE BIBLE.
- IT REPRESENTS LIFE, REFRESHMENT, FERTILITY, PURIFICATION AND BIRTH IN THE BIBLE AS WELL.
- **WATER IS:**
- A SUBSTANCE COMPOSED OF THE CHEMICAL ELEMENT'S **HYDROGEN AND OXYGEN**
- ONE OF THE MOST PLENTIFUL AND ESSENTIAL COMPOUNDS ON THE EARTH.
- TRANSPARENT AND AN ODORLESS LIQUID
- IT FORMS THE SEAS, LAKES, RIVERS, AND RAIN AND IS THE BASIS OF THE FLUIDS OF LIVING ORGANISMS.
- CAN DISSOLVE ALMOST ANYTHING.
- ONE STUDY IN [ARCHIV FUR KRIMINOLOGIE](#) STATED THAT WE CAN ONLY SURVIVE FOR ABOUT 1 TO 3 WEEKS WITHOUT WATER.

# WHAT IS HYDRATION?

- THE WORD HYDRATE WAS COINED IN THE 1800'S BY A FRENCH CHEMIST JOSEPH LOUIS PROUST. IT COMES FROM THE GREEK WORD "HYDR" WHICH IS THE STEM OF WATER WHICH MEANT TO COMBINE CHEMICALLY WITH WATER TO FORM A HYDRATE. IN 1947 THE MEANING CHANGED TO : RESTORE MOISTURE.
- HYDRATION IS THE PROCESS OF RESTORING MOISTURE AND MINERALS TO THE BODY.
- "HYDRATION IS IMPORTANT BECAUSE THE BODY IS COMPRISED MOSTLY OF WATER, AND THE PROPER BALANCE BETWEEN WATER AND ELECTROLYTE IN OUR BODIES REALLY DETERMINES HOW MOST OF OUR SYSTEMS FUNCTION, INCLUDING NERVES AND MUSCLES," LARRY KENNEY, PHD, A PROFESSOR AT PENN STATE.
- ELECTROLYTES IS AN UMBRELLA TERM ENCOMPASSING MINERALS THAT HELP THE BODY TO CONDUCT ELECTRICITY IN THE BODY.

The background is a light blue gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The largest droplet is in the bottom right corner, and there are smaller ones in the top left and bottom center.

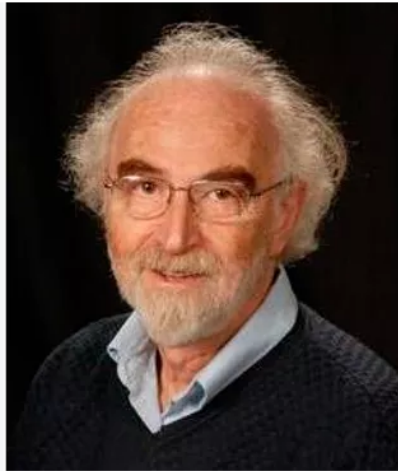
# WATER & HYDRATION

WHY IS WATER AND HYDRATION SO IMPORTANT TO OUR BODY?

## Pollack Laboratory

Uncovering nature's deeply held secrets

jerry research



*Gerald H. Pollack*

*"The overriding philosophy of the laboratory is that science is essentially simple."*

**Gerald Pollack** maintains an active laboratory at the University of Washington in Seattle. He is the Founding Editor-in-Chief of [WATER: A Multidisciplinary Research Journal](#); Executive Director of the [Institute for Venture Science](#); co-founder of 4th-Phase Inc.; and founder of the [Annual Conference on the Physics, Chemistry, and Biology of Water](#). He has received numerous honors including: the *Prigogine Medal for Thermodynamics*; the *University of Washington Annual Faculty Lecturer*; the *NIH Director's Transformative Research Award*; and the *1st Emoto Peace Prize*. He is recognized internationally as an accomplished speaker and author.



- ELSEVIER HAS 140 YEARS' EXPERIENCE CURATING AND VERIFYING SCIENTIFIC KNOWLEDGE SO WHEREVER YOU ARE IN YOUR PUBLICATION JOURNEY, WE ARE HERE TO HELP YOU. THE AUTHOR HUB IS GATEWAY TO A COLLECTION OF CAREFULLY CURATED RESOURCES, ALL DESIGNED TO MOVE YOU FORWARD WITH YOUR PUBLICATION AND GET THE BEST IMPACT FOR YOURSELF AND YOUR RESEARCH.



## 1. Introduction

Water is the most abundant molecule in the cell, accounting for some 70% of the total cell mass. The cell also contains organelles and various macromolecules, such as nucleic acids, proteins, lipids, and carbohydrates, packaged tightly within the cell membrane. Because of this tight packing, most intracellular water molecules lie within several nanometers' proximity of hydrophilic surfaces. Cell water is, therefore, mainly interfacial, a feature of potentially major significance for cell function (Pollack, 2001). We have termed this water "exclusion zone" (EZ) water, or "fourth phase" water (Pollack, 2013). Well characterized as building extensively next to hydrophilic surfaces, such as gels and biological surfaces, and to exclude solutes, EZ water has been shown to be vital for cellular health and function (Pollack, 2001). Shifts of EZ to bulk water, on the other hand, have been shown to be a key factor underlying malfunction of many cellular and physiological actions (Pollack, 2013).

Since EZ water is critical to cell function, we hypothesized that substances known to promote health could plausibly mediate their effects by building EZ water, thereby hydrating the cell, normalizing cell function, and restoring health. By this mechanism, such substances would be deemed health promoting.

Once considered anathema to health, fats are now recognized widely to be important for health (Sserunjogi, Abrahamsen, & Narvhus, 1998; Zevenbergen et al., 2009). Amongst different fats, ghee is traditionally considered to be a food, medicine, and the healthiest source of edible fat with many beneficial properties (Sharma, Zhang, & Dwivedi,

2010; Sserunjogi et al., 1998; Sud & Kateriya, 2015; Tirtha, 1998). Ghee is also the common Indian name for clarified butter (Sserunjogi et al., 1998). Similarly, while coconut oil is becoming increasingly popular as a saturated fat (Gopala Krishna, Raj, Bhatnagar, Prasanth Kumar, & Chandrashekar, 2010; Marina, Che Man, & Nazimah, 2009), lard has been used widely in the past (Li et al., 2017).

We, therefore, wanted to determine whether these and related fats including caprylic acid triglycerides from highly refined coconut oil (Brain Octane®) build EZ water. If so, this would support the hypothesis that, as a class, health-building substances (Sharma et al., 2018) could mediate their effects through the buildup of EZ water.

We used a standard approach for measuring EZ size (Sharma et al., 2018; Zheng, Chin, Khijniak, Khijniak, & Pollack, 2006). This included an EZ-nucleating surface, such as Nafion, immersed in an aqueous microsphere suspension. EZ is defined as the zone adjacent to the Nafion from which suspended microspheres are excluded. In the current experiments, we replaced Nafion with a cylinder made of one or other of the fats and examined the size of the exclusion zone around the cylinder. To our knowledge, this is the first study demonstrating the presence of EZ against the surfaces of fats.

## 2. Materials and methods

### 2.1. Microsphere suspension

The suspension used for determining EZ size contained polycarboxylate-coated 2  $\mu\text{m}$  microspheres (Polysciences Inc; # 18327;

\* Corresponding author.

E-mail address: abha6@u.washington.edu (A. Sharma).

<https://doi.org/10.1016/j.foodchem.2020.126305>

Received 9 February 2019; Received in revised form 26 December 2019; Accepted 26 January 2020

Available online 31 January 2020

0308-8146/ © 2020 Elsevier Ltd. All rights reserved.



# DR. MASARU EMOTO

DR. MASARU EMOTO WAS A JAPANESE SCIENTIST AND AUTHOR KNOWN FOR HIS RESEARCH ON THE EFFECTS OF HUMAN CONSCIOUSNESS ON THE MOLECULAR STRUCTURE OF WATER. HE BELIEVED THAT **WATER COULD ABSORB AND RETAIN POSITIVE OR NEGATIVE ENERGY BASED ON THE THOUGHTS, WORDS, AND INTENTIONS DIRECTED TOWARDS IT.**

DR. EMOTO CONDUCTED EXPERIMENTS WHERE HE EXPOSED WATER SAMPLES TO DIFFERENT WORDS, MUSIC, OR IMAGES AND THEN FROZE THE SAMPLES TO OBSERVE THEIR CRYSTALLINE STRUCTURE UNDER A MICROSCOPE. HE CLAIMED THAT POSITIVE WORDS AND INTENTIONS RESULTED IN BEAUTIFUL AND SYMMETRICAL CRYSTALS, WHILE NEGATIVE WORDS AND INTENTIONS PRODUCED DISTORTED OR ASYMMETRICAL CRYSTALS.

# WORDS, THOUGHTS & WATER...

## AMAZING GRACE



## LOVE & GRATITUDE



## HUSBAND & WIFE LOVE





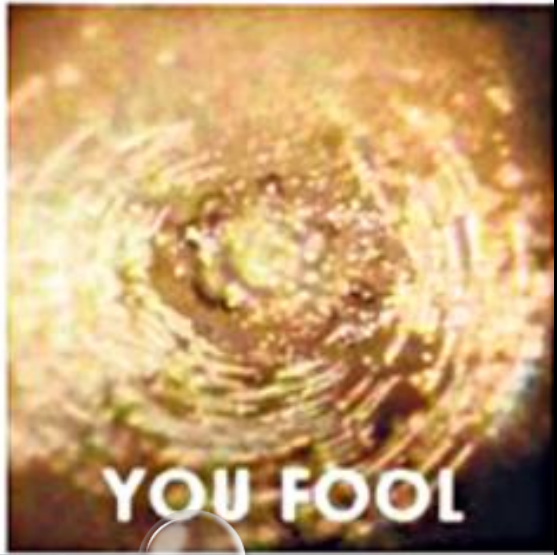
**TRUTH**



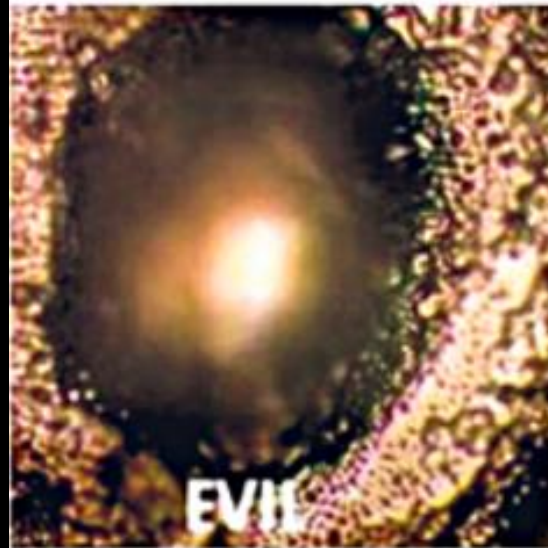
**THANK YOU**



**YOU MAKE ME SICK**



**YOU FOOL**



# I CAN'T DO IT



I can't do it Item 44 of 85

© Office Masaru Emoto

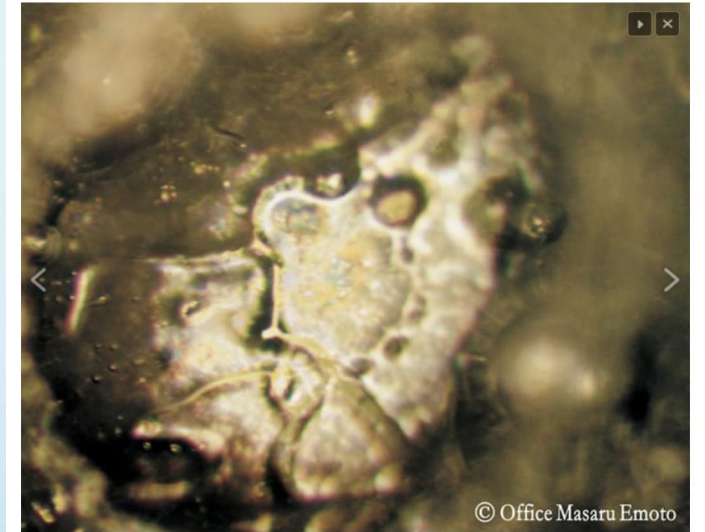
# TAP WATER BEFORE PRAYER



Tap water before students's prayers at a elementary school in Japan Item 75 of 85

©Office Masaru Emoto

# DAM WATER B4 PRAYER



Dam water: Before a Buddhist monk offered a prayer Item 67 of 85

© Office Masaru Emoto

# I CAN DO IT



I can do it Item 45 of 85

© Office Masaru Emoto

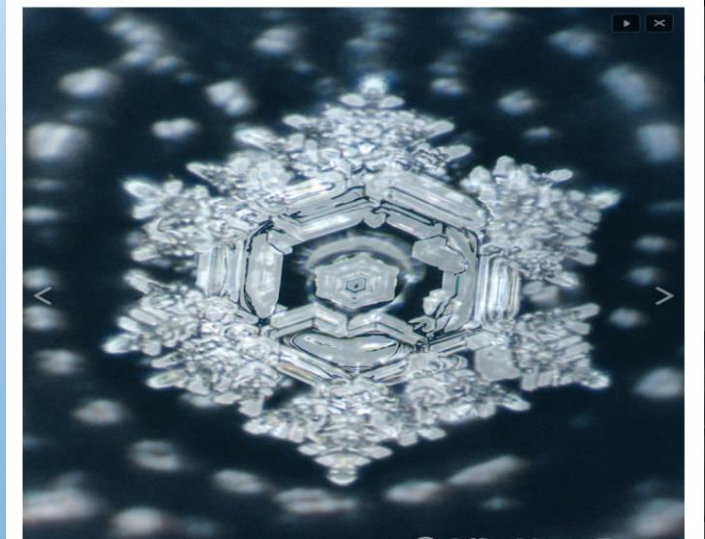
# TAP WATER AFTER PRAYER



Tap water after students's prayers at a elementary school in Japan Item 76 of 85

©Office Masaru Emoto

# DAM WATER AFTER PRAYER



48) Dam water: After a Buddhist monk offered a prayer Item 68 of 85

© Office Masaru Emoto



## WATER: ENABLES THE BODY TO HYDRATION: PROCESS OF RESTORATION

### LIFE:

MAINTAINS THE HEALTH AND INTEGRITY OF  
EVERY CELL IN THE BODY.

HELPS THE BODY TO BREAKDOWN FOOD AND  
ABSORB NUTRIENTS.

### REFRESHMENT:

KEEPS THE MUCOUS MEMBRANES  
MOISTENED THAT ARE IN THE LUNGS AND  
MOUTH.

CARRIES NUTRIENTS AND OXYGEN TO CELLS.  
LUBRICATES AND CUSHIONS JOINTS.

ACTS LIKE A SHOCK ABSORBER IN THE EYES  
AND SPINAL CORD.



## **FERTILITY**

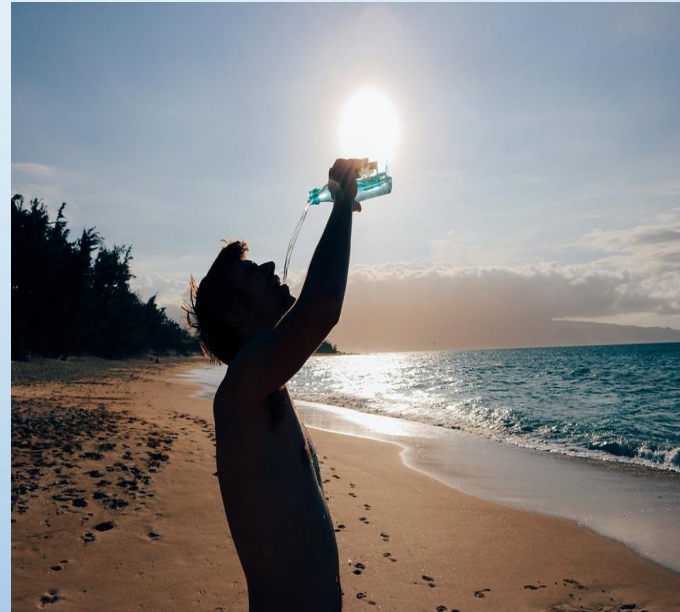
- DIRECTLY AFFECTS THE MALE AND FEMALE REPRODUCTIVE SYSTEM.

## **PURIFICATION**

- ELIMINATION
- PREVENT CONSTIPATION



# HOW DO WE OBTAIN BIO-WATER AND PROPER HYDRATION THROUGHOUT THE DAY?



# QUALITY OF VESSEL

PLASTIC- BPA- BISPHENOL A- SYNTHETIC ESTROGEN.



STAINED GLASS- CADMIUM- SKIN, LUNGS AND GUT.



# BIO-WATER QUALITY

## CONTENTS IN THE VESSEL

- MOST FRUITS HAVE A CERTAIN AMOUNT OF WATER AND MINERALS IN THEM. WATER IS A UNIVERSAL DISSOLVER SO IF YOU PUT FRUITS AND VEGETABLES IN THE WATER THAT WILL BE EXTRACTED AND BECOME A PART OF THE WATER.
- CHLOROPHYLL: CUCUMBERS, KEY LIME, MACHA.
- CAROTENOIDS: LEMONS, STRAWBERRIES, WATERMELONS.
- FLAVONOIDS: CHAMOMILE, BLUEBERRIES, CRANBERRIES.

# WATER CONSUMPTION

- THEORY HAS IT THAT HUMANS ARE TWO-THIRDS FLUIDS. THIS MEAN WE SHOULD DRINK AT LEAST HALF OF OUR WEIGHT IN FLUID OUNCES. 200 POUNDS, 100 OUNCES.
- DARK URINE MEANS YOU ARE DEHYDRATED.
- THE BODY IS MADE OF APPROXIMATELY 60% FLUID ([9TRUSTED SOURCE](#)).
- 40% OF THIS FLUID IS FOUND INSIDE YOUR CELLS IN A SUBSTANCE CALLED INTRACELLULAR FLUID (ICF).
- THE REMAINDER IS FOUND OUTSIDE YOUR CELLS IN AREAS SUCH AS YOUR BLOOD, SPINAL FLUID AND BETWEEN CELLS. THIS FLUID IS CALLED EXTRACELLULAR FLUID (ECF).
- INTERESTINGLY, THE AMOUNT OF WATER IN THE ICF AND ECF IS AFFECTED BY THEIR CONCENTRATION OF ELECTROLYTES, ESPECIALLY POTASSIUM AND SODIUM.

Health4Mentor.com





# HYDRATING FRUIT

- NEARLY 60% OF THE HUMAN BODY IS MADE UP OF FLUID, WHICH IS WHY IT IS SO IMPORTANT TO REMAIN HYDRATED THROUGHOUT THE DAY. AN EASY SOLUTION TO STAYING HYDRATED IS TO MAKE SURE YOU ARE DRINKING ADEQUATE AMOUNTS OF WATER BY ADOPTING A SYSTEM SUCH AS CARRYING A WATER BOTTLE WITH YOU DURING THE DAY. ASIDE FROM DRINKING WATER, WHAT ARE SOME OTHER WAYS TO STAY HYDRATED? GRABBING A RIPE PIECE OF FRUIT IS ONE WAY. FRUITS CONTAIN ADEQUATE VITAMINS AND MINERALS TO KEEP YOUR BODY HEALTHY, PLUS THEY CONTAIN A LARGE PORTION OF WATER THAT CAN HELP QUENCH YOUR THIRST. ACCORDING TO THE [U.S. DEPARTMENT OF AGRICULTURE](#), THE FRUITS LISTED BELOW CONTAIN SIGNIFICANT PORTIONS OF WATER:

# CUCUMBER

A [CUCUMBER](#) IS BOTANICALLY CONSIDERED A FRUIT BECAUSE THEY HAVE SEEDS AND GROW FROM THE FLOWER OF THE PLANT. THIS CRISP, GREEN FRUIT HAS ONE OF THE HIGHEST WATER CONTENTS OF ANY FRUIT AT 95% WATER.

[Health4Mation.com](http://Health4Mation.com)



# Phytochemical and therapeutic potential of cucumber

Pulok K Mukherjee <sup>1</sup>, Neelesh K Nema, Niladri Maity, Birendra K Sarkar

Affiliations + expand

PMID: 23098877 DOI: [10.1016/j.fitote.2012.10.003](https://doi.org/10.1016/j.fitote.2012.10.003)

## Abstract

Cucumber (*Cucumis sativus* L.) is a member of the Cucurbitaceae family like melon, squash and pumpkins. It is a popular vegetable crop used in Indian traditional medicine since ancient times. This vegetable is very high in water content and very low in calories. It has potential antidiabetic, lipid lowering and antioxidant activity. Cucumber has a cleansing action within the body by removing accumulated pockets of old waste materials and chemical toxins. Fresh fruit juice is used for nourishing the skin. It gives a soothing effect against skin irritations and reduces swelling. Cucumber also has the power to relax and alleviate the sunburn's pain. The fruit is refrigerant, haemostatic, tonic and useful in hyperdipsia, thermoplegia etc. The seeds also have a cooling effect on the body and they are used to prevent constipation. Several bioactive compounds have been isolated from cucumber including cucurbitacins, cucumegastigmanes I and II, cucumerin A and B, vitexin, orientin, isoscoparin 2"-O-(6"-E)-p-coumaroyl glucoside, apigenin 7-O-(6"-O-p-coumaroyl)glucoside) etc. Despite huge exploration of cucumber in agricultural field, comparatively very few studies have been published about its chemical profile and its therapeutic potential. This article reviews the therapeutic application, pharmacological and phytochemical profile of different parts of *C. sativus*. In this review we have explored the current phytochemical and pharmacological knowledge available with this well known plant and several promising aspects for research on cucumber.





# TOMATOES

ALSO OFTEN THOUGHT OF AS A VEGETABLE, TOMATOES HOLD ALMOST 95% WATER INSIDE THEIR THIN SKINS. TOMATOES ARE ALSO AN EXCELLENT SOURCE OF A VARIETY OF VITAMINS.

# Lycopene as a Natural Antioxidant Used to Prevent Human Health Disorders

[Muhammad Imran](#),<sup>1</sup> [Fereshteh Ghorat](#),<sup>2</sup> [Iahtisham Ul-Haq](#),<sup>3</sup> [Habib Ur-Rehman](#),<sup>4</sup> [Farhan Aslam](#),<sup>5</sup> [Mojtaba Heydari](#),<sup>6</sup> [Mohammad Ali Shariati](#),<sup>7</sup> [Eleonora Okuskhanova](#),<sup>8</sup> [Zhanibek Yessimbekov](#),<sup>8</sup> [Muthu Thiruvengadam](#),<sup>9,\*</sup> [Mohammad Hashem Hashempur](#),<sup>10,11,\*</sup> and [Maksim Rebezov](#)<sup>12,13</sup>

▶ [Author information](#) ▶ [Article notes](#) ▶ [Copyright and License information](#) [Disclaimer](#)

This article has been [cited by](#) other articles in PMC.

## Abstract

[Go to:](#) ▶

Lycopene, belonging to the carotenoids, is a tetraterpene compound abundantly found in tomato and tomato-based products. It is fundamentally recognized as a potent antioxidant and a non-pro-vitamin A carotenoid. Lycopene has been found to be efficient in ameliorating cancer insurgences, diabetes mellitus, cardiac complications, oxidative stress-mediated malfunctions, inflammatory events, skin and bone diseases, hepatic, neural and reproductive disorders. This review summarizes information regarding its sources and uses amongst different societies, its biochemistry aspects, and the potential utilization of lycopene and possible mechanisms involved in alleviating the abovementioned disorders. Furthermore, future directions with the possible use of this nutraceutical against lifestyle-related disorders are emphasized. Its protective effects against recommended doses of toxic agents and toxicity and safety are also discussed.



# WATERMELON

“WATER” IS IN THE NAME, SO OF COURSE THIS FRUIT IS MADE UP OF A LARGE PORTION OF WATER. WATERMELON IS MADE UP OF 91% WATER, WHICH MAKES IT ONE OF THE BEST FRUITS TO EAT IF YOU ARE FEELING DEHYDRATED.

Lycopene has been linked with heart health, bone health and prostate cancer prevention. It's also a powerful antioxidant thought to have anti-inflammatory properties, according to Victoria Jarzabkowski, a nutritionist with the Fitness Institute of Texas at The University of Texas at Austin.

To really maximize your lycopene intake, you need to let your watermelon fully ripen. The redder your watermelon gets, the higher the concentration of lycopene becomes. Beta-carotene and phenolic antioxidant content also increase as the watermelon ripens. "Beta carotene is an antioxidant found in red-orange fruits and vegetables. It helps with immunity, skin, eye and the prevention of cancer," said Lemond.

A 2011 study in the [Journal of Food Composition and Analysis](#), which investigated five types of watermelon at four stages of ripening, found that

## WATERMELON NUTRITIONAL INFORMATION

Here are the nutrition facts for the watermelon, according to the [U.S. Food and Drug Administration](#), which regulates food labeling through the National Labeling and Education Act:

– **Serving size:** 2 cups diced (10 oz / 280 g) **Calories:** 80 (Calories from Fat 0)

– **Amount per serving** (and %DV\*)

\*Percent Daily Values (%DV) are based on a 2,000 calorie diet.

– **Total Fat:** 0g (0%)

– **Total Carbohydrate:** 21g (7%)

Dietary Fiber: 1g (4%) Sugars: 20g

– **Cholesterol:** 0mg (0%) **Sodium:** 0mg (0%) **Potassium:** 270mg (8%)

**Protein:** 1g

– **Vitamin A:** (30%) **Vitamin C:** (25%)

**Calcium:** (2%) **Iron:** (4%)

A 2011 study in the [Journal of Food Composition and Analysis](#), which investigated five types of watermelon at four stages of ripening, found that unripe watermelon with primarily white flesh has nearly zero beta-carotene present. By the time it is fully red, the fruit is an excellent source of the phytonutrient.

- vitamin A: (50%) vitamin C: (25%)  
Calcium: (2%) Iron: (4%)

However, that doesn't mean the red parts are the only good ones. "All parts of the watermelon are good. There are a lot of nutrients throughout," said Jarzabkowski. This includes the white flesh nearest the rind, which contains more of the amino acid citrulline than the flesh, according to a 2005 study in the [Journal of Chromatography](#).

Citrulline is a valuable amino acid that converts to the amino acid arginine. These amino acids promote blood flow, which leads to cardiovascular health, improved circulation, and even treatment for erectile dysfunction, according to research at [Texas A&M University](#).

Recent studies have also found that watermelon seeds are also wonderfully nutritious, especially if they are sprouted and shelled. They are high in [protein](#), [magnesium](#), vitamin B and good fats, according to an analysis by the [International Journal of Nutrition and Food Sciences](#).

The high levels of lycopene in watermelon are very effective at protecting cells from damage and may help lower the risk of heart disease, according to a study at [Purdue University](#). A study published in the [American Journal of Hypertension](#) found that watermelon extracts helped reduce hypertension and lowered blood pressure in obese adults.

Watermelon may also be especially important for older women. A study published in [Menopause](#) found that postmenopausal women, a group known to have increased aortic stiffness, who took watermelon extract for six weeks saw decreased blood pressure and arterial stiffness compared to those who did not take watermelon extract. The authors of the study attributed the benefits to citrulline and arginine.

Arginine can help improve blood flow and may help reduce the accumulation of excess fat.

"The lycopene in watermelon makes it an anti-inflammatory fruit," Jarzabkowski said. Lycopene is an inhibitor for various inflammatory processes and also works as an antioxidant to neutralize free radicals. Additionally, the watermelon contains choline, which helps keep chronic inflammation down, according to a 2006 article published in [Shock](#) medical journal.

Reducing inflammation isn't just good for people suffering from arthritis. "When you're sick, you have cellular damage, which can be caused by a variety of factors including stress, smoking, pollution, disease, and your body becomes inflamed,"

The research specifically finds that the antioxidants in watermelon can help your body fight free radicals and slow down cell damage. The fruit's non-protein amino acids will also help to repair your body tissue, break down food from other meals, and even regulate your blood pressure.

"Watermelon could be part of the refreshing and healthy fruit options on your summer picnic table," said USDA-ARS scientist [Larry Parnell](#). "The fruit has gone through many years of evolution, domestication, and selection for desirable qualities—mainly those associated with flesh color, texture and nutrient and sugar content. But our research continues to find that the fruit contains a wide range of nutrients that improve your overall health."

Most Americans purchase the sweet dessert watermelon species, *Citrullus lanatus*, at their local grocery store or farmer's market. This species is among the most important vegetable crops grown and consumed throughout the world, with over 100 million tons in annual global production. The fruit also has more lycopene than a raw tomato, which is linked to healthy eyes, overall heart health and protection against certain cancers. Other nutrients, like carotenoids, flavonoids, carbohydrates and alkaloids, are also found in the flesh, seed, and rind.

# STRAWBERRIES

STRAWBERRIES ARE MADE UP OF NEARLY 91% WATER. THESE SMALL, RED FRUITS ARE A FAVORITE SWEET TREAT.





Review > J Agric Food Chem. 2016 Jun 8;64(22):4435-49. doi: 10.1021/acs.jafc.6b00857.

Epub 2016 May 31.

## Promising Health Benefits of the Strawberry: A Focus on Clinical Studies

Sadia Afrin<sup>1</sup>, Massimiliano Gasparri<sup>1</sup>, Tamara Y Forbes-Hernandez<sup>1 2</sup>,  
Patricia Reboredo-Rodriguez<sup>1 3</sup>, Bruno Mezzetti<sup>4</sup>, Alfonso Varela-López<sup>5</sup>, Francesca Giampieri<sup>1</sup>,  
Maurizio Battino<sup>1 6</sup>

Affiliations + expand

PMID: 27172913 DOI: 10.1021/acs.jafc.6b00857

### Abstract

The potential health benefits associated with dietary intake of fruits have attracted increasing interest. Among berries, the strawberry is a rich source of several nutritive and non-nutritive bioactive compounds, which are implicated in various health-promoting and disease preventive effects. A plethora of studies have examined the benefits of strawberry consumption, such as prevention of inflammation disorders and oxidative stress, reduction of obesity related disorders and heart disease risk, and protection against various types of cancer. This review provides an overview of their nutritional and non-nutritional bioactive compounds and which factors affect their content in strawberries. In addition, the bioavailability and metabolism of major strawberry phytochemicals as well as their actions in combating many pathologies, including cancer, metabolic syndrome, cardiovascular disease, obesity, diabetes, neurodegeneration, along with microbial pathogenesis have been reviewed, with a particular attention to human studies.



# CANTELOUPE

CANTELOUPE IS A MILDLY  
SWEET MELON FRUIT THAT,  
WHEN RIPE, CONTAINS 90%  
WATER.

The Cucurbitaceae family covers several species of great economic importance, including muskmelon (*Cucumis melo* L.), which is largely cultivated and consumed in Europe. Muskmelon encircles a wealth of varietal types, such as smooth-skinned varieties like Honeydew, Crenshaw, and Casaba (*C. melo* var. *inodorous*), rough-skinned varieties like Cantaloupe, Persian melon, and Santa Claus or Christmas melon (*C. melo* var. *reticulatus*), and varieties used when they are immature as vegetables like Barattiere, Carosello, and Armenian Cucumber (*C. melo* var. *flexuosus*). The Cantaloupe melon is well recognized by its net-like slightly ribbed, gray-to-green or light brown skin. It is one of the most consumed melons worldwide thanks to its sweetness, juicy taste, pleasing flavor, and nutritional value [1,2]. In 2016, about 1.9 million tons of melon were harvested in the Mediterranean area, with Spain, Italy, and France representing the main European producers, accounting for 35%, 34%, and 13% overall yield, respectively [3]. In Italy, Cantaloupe is the most cultivated variety. Its name is supposed to derive from Italian “Cantalupo in Sabina”, which was formerly a papal county seat near Rome [4].

Cantaloupe is an excellent source of vitamin A, vitamin C, and microelements such as potassium and magnesium [1,4,5]. In recent years, it has been shown to possess useful medicinal properties such as analgesic, anti-inflammatory, antioxidant, antiulcer, anticancer, antimicrobial, diuretic, and antidiabetic properties [2,6,7]. Furthermore, it showed a hepato-protective effect, activity against hypothyroidism and immune-modulator action [6].

Ever-increasing demand for healthy food has stimulated the manufacturing sectors to search for new natural sources of nutritional and healthful components to be employed as food additives or supplements, with high nutritional value [8,9]. As a consequence, the European Union has encouraged the exploitation of fruit by-products for their use as a source of nutritionally and therapeutically functional ingredients to utilize for dietary intake, and as active ingredients in pharmaceuticals and cosmetic industries [10,11].

During fresh consumption and industrial processing of melons (juices, compotes, and salads), large quantities of peels and seeds are produced, and are considered waste. The complete utilization of these by-products could minimize the litter volume, so reducing the environmental impact and the economic costs associated to their disposal. Peels and seeds, in fact, are potential sources of phytochemicals, such as polyphenols, carotenoids, flavonoids, and other bioactive compounds with potential health-promoting effects [12,13]. Among them, polyphenol compounds show antioxidant activity, delaying or inhibiting the oxidation of lipids and other molecules, thus playing an important role in defending cells against free radical damage, a very important way of preventing diseases like cancer and cardiovascular disorders [12,13,14,15].

# GRAPEFRUIT

- THIS POPULAR BREAKFAST FRUIT COMPRISES 88% WATER, WHICH, ALONG WITH GRAPEFRUIT'S OTHER HEALTH ADVANTAGES, MAKES IT AN EXCELLENT WAY TO START THE DAY.



# Flavonoids in Grapefruit and Commercial Grapefruit Juices: Concentration, Distribution, and Potential Health Benefits

JIUXU ZHANG

Florida Department of Citrus, 700 Experiment Station Road, Lake Alfred, FL 33850

ADDITIONAL INDEX WORDS. *Citrus*, *Citrus paradisi*, phytochemicals, polyphenolic compounds, flavanones, flavones, flavonols, polymethoxylated flavones

## Potential Health Benefits of Grapefruit Flavonoids

### Grapefruit and grapefruit juice are rich sources of flavonoids.

Interest in the possible health benefits of flavonoids has increased largely due to their antioxidant and free-radical scavenging activities. The antioxidant activity of flavonoids has been related to their protection against vitamin C oxidation (Middleton, et al., 2000). Flavonoids have long been recognized to possess anti-inflammatory, anti-allergic, hepatoprotective, anti-thrombotic, antiviral, and anti-carcinogenic activities (Havsteen, 1984; Middleton, et al., 2000). Flavonoids have been linked to a reduced risk of certain cancers, inflammation, stroke, heart diseases (Bohm et al., 1998; Manach et al., 2005), asthma (Garcia et al., 2005; Knekt et al., 2002), vision disorders (Cornish et al., 2002; Yarma et al., 1975), and bone loss (Pang et al., 2006).

Naringin is to a large extent unique to grapefruit and grapefruit juice, and has been reported to be associated with many health benefits. It is mainly the naringin aglycone (naringenin) that is bioavailable and it is largely responsible for the beneficial properties of naringin. Research on naringin or naringenin has shown the following effects: Naringin could 1) act as a free radical scavenger and antioxidant (Jeon et al., 2002; Kumar et al., 2003; Naderi et al., 2003); 2) reduce total cholesterol level and enhance lipid metabolism (da-Silva et al., 2001; Shin et al., 1999); 3) enhance ethanol metabolism (Seo et al., 2003); 4) reduce the risk of atherosclerosis (Choe et al., 2001); 5) act as an anti-apoptotic agent (Blankson et al., 2000); 6) protect plasma vitamin E levels (Jeon et al., 2001); 7) reduce radiation-induced chromosome damage in bone marrow (Jagetia and Reddy, 2002; Jagetia et al., 2003) and increase bone cell activity (Wong and Rabie, 2006), and stimulate DNA repair in prostate cancer cells (Gao et al., 2006); and 8) reduce oxidative stress and inflammatory response (Ghanim et al., 2007). So far most of the data on the health benefits of naringin have mainly been obtained from in vitro or animal research. Clinical studies are needed to corroborate the health properties of naringin in humans.

Narirutin is present at the second highest concentration among the flavonoids in grapefruit and grapefruit juice. Naringin and narirutin are closely related in their chemical structures. In com-

Bohm, H., H. Boeing, J. Hempel, B. Raab, and A. Kroke. 1998. Flavonols, flavanes and anthocyanins as native antioxidants of food and their possible role in the prevention of chronic diseases. *Zeitschrift Fur Ernahrungswissenschaft* 37:147–163.

Choe, S.C., H.S. Kim, T.S. Jeong, S.H. Bok, and Y.B. Park. 2001. Naringin has an antiatherogenic effect with the inhibition of intercellular adhesion molecule-1 in hypercholesterolemic rabbits. *J. Cardiovasc. Pharmacol.* 38:947–955.

Cornish, K.M., G. Williamon, and J. Sanderson. 2002. Quercetin metabolism in the lens: Role in inhibition of hydrogen peroxide induced cataract. *Free Radical Biol. Med.* 33:63–70.

da-Silva, R.R., T.T. de-Oliveira, T.J. Nagem, A.S. Pinto, L.F. Albino, M.R. de-Almeida, G.H. de-Moraes, and J.G. Pinto. 2001. Hypocholesterolemic effect of naringin and rutin flavonoids. *Arch. Latinoam. Nutr.* 51:258–264.

De-Castro, W.V., S. Mertens-Talcott, A. Rubner, V. Butterweck, and L. Derendorf. 2006. Variation of flavonoids and furanocoumarins in grapefruit juices: A potential source of variability in grapefruit juice–drug interaction studies. *J. Agr. Food Chem.* 54:249–255.

Del Rio, J.A., M.D. Fuster, F. Sabater, I. Porrás, A. Garcia-lidon, and A. Ortuno. 1997. Selection of citrus varieties highly productive for the neohesperidin dihydrochalcone precursor. *Food Chem.* 59:433–437.

Dugo, P., M.L. Presti, M. Öhman, A. Fazio, G. Dugo, and L. Mondello. 2005. Determination of flavonoids in citrus juices by micro-HPLC-ESI/MS. *J. Separation Sci.* 28:1149–1156.

Erlund, I. 2004. Review of the flavonoids quercetin, hesperetin, and naringenin. Dietary sources, bioactivities, bioavailability, and epidemiology. *Nutr. Res.* 24:851–874.

Gao, K., S.M. Henning, Y. Niu, A.A. Youssefian, N.P. Seeram, A. Xu, and D. Heber. 2006. The citrus flavonoid naringenin stimulates DNA repair in prostate cancer cells. *J. Nutr. Biochem.* 17:89–95.

Garcia, V., I.C.W. Arts, J.A.C. Sterne, R.L. Thompson, and S.O. Shaheen. 2005. Dietary intake of flavonoids and asthma in adults. *European Respiratory J.* 26:449–452.

Ghanim, H., P. Mohanty, R. Pathak, A. Chaudhuri, C. Ling-Sia, and P. Dandona. 2007. Orange juice or fructose intake does not induce oxidative and inflammatory response. *Diabetes Care* (in press, available online).

Hagen, R.E., W.J. Dunlap, and S.H. Wender. 1966. Seasonal variation of naringin and certain other flavanone glycosides in juice sacs of Texas Ruby Red grapefruit. *J. Food Sci.* 31:542–543.

Havsteen, B. 1984. Flavonoids: A class of natural products of high pharmacological potency. *Biochem. Pharmacol.* 32:1141–1148.



# PEACHES

NEARLY 88% OF THESE FUZZY,  
SOFT FRUIT IS MADE UP OF  
WATER, WHICH CAN HELP  
KEEP YOU HYDRATED.



## Conclusions

Go to: ►

FPP, peels, PPP and syrup present different antioxidant, anti-glycation and anti-inflammatory properties, as assessed by *in vitro* and *ex vivo* assays. The assessment of antioxidant and anti-inflammatory effects in liver, kidney and brain cortex slices showed significant differences between the peach-derived products; FPP and peel presented the highest antioxidant and anti-inflammatory properties, followed by PPP. Syrup had no significant effect in all assays. We observed that the content of phenolic compounds and carotenoids is significantly higher in FPP and peels, followed by PPP, and a low levels of phenolic compounds plus undetectable levels of carotenoids in syrup. Further studies will address the effects of the consumption of these products derived from peaches *in vivo* models, as well as the role of the micronutrients and their effects.



# ORANGES

- NOT ONLY DO ORANGES CONTAIN 87% WATER, THEY ALSO COME IN A NATURAL CONTAINER AND ARE EASY TO TAKE WITH YOU. JUST PEEL AND ENJOY!



- Protects your cells from damage
- Helps your body make collagen, a protein that heals wounds and gives you smoother skin
- Makes it easier to absorb iron to fight anemia
- Boosts your immune system, your body's defense against germs
- Slows the advance of age-related macular degeneration (AMD), a leading cause of vision loss
- Helps fight cancer-causing free radicals

When you're feeling anxious, vitamin C can also lower your levels of the stress hormone cortisol and your blood pressure.

Some other benefits:

**Anti-inflammatory.** Some foods tell your immune system it's under attack. This causes inflammation. When inflammation turns into a long-term problem, it can trigger diabetes, heart disease, arthritis, cancer, and Alzheimer's disease. Oranges have the opposite effect.



Health4Mation.com

# WATER MYTH BUSTERS DEMO

- BOILED WATER
- BOTTLE WATER
- BAKING SODA



The background is a dark gray gradient. In the top-left and bottom-right corners, there are several realistic water droplets of various sizes, some overlapping, with highlights and shadows that give them a three-dimensional appearance.

THANK YOU

# SOURCES

- [HTTPS://QUENCHWATER.COM/BLOG/11-REASONS-WHY-DRINKING-WATER-IS-GREAT-FOR-OUR-HEALTH/](https://quenchwater.com/blog/11-reasons-why-drinking-water-is-great-for-our-health/)
- [HTTPS://WWW.HEALTHLINE.COM/NUTRITION/19-HYDRATING-FOODS](https://www.healthline.com/nutrition/19-hydrating-foods)
- [HTTP://WWW.WHFOODS.COM/GENPAGE.PHP?TNAME=FOODSPICE&DBID=42](http://www.whfoods.com/genpage.php?tname=foodspice&dbid=42)
- [HTTPS://WWW.NCBI.NLM.NIH.GOV/PMC/ARTICLES/PMC1578573/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1578573/)
- [HTTPS://PUBMED.NCBI.NLM.NIH.GOV/20069776/](https://pubmed.ncbi.nlm.nih.gov/20069776/)
- [HTTPS://WWW.MDPI.COM/2304-8158/8/6/196/HTM](https://www.mdpi.com/2304-8158/8/6/196/htm) - CANTALOUPE
- [FILE:///C:/USERS/CWILL/DOWNLOADS/PERRYCOLLINS-288-294.PDF](file:///C:/Users/CWILL/Downloads/PerryCollins-288-294.pdf) - GRAPEFRUIT
- [HTTPS://WWW.NCBI.NLM.NIH.GOV/PMC/ARTICLES/PMC4186376/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4186376/) - PEACHES
- [HTTPS://HADO.COM/IHM/WATER-CRYSTALS/](https://hado.com/iHM/WATER-CRYSTALS/) - WATER CRYSTALS