



# Consumer knowledge about the chemical composition of organic foods

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## Abstract

**Background:** In Mexico, the development of organic agricultural food had its beginnings in the sixties, today the fields of organic crops are distributed throughout the country, taking in 2005 a figure of 400,000 acres of organic farming, of which only 15% is consumed by the country and 75% exported.

**Objective:** To describe and identify knowledge about the chemical components those come into organic foods among consumers.

**Material and methods:** An exploratory study was conducted in 40 surveyed adults made to residents of the state of Hidalgo, randomly selected to analyze their understanding of organic food and observe their habits in buying them.

**Results:** Through research and series of surveys conducted it was found that 77.5% of the surveyed population were aware of what is supposed to be organic food, but only 70% consume it, 62.5% believed they can benefit their health with it, 22.5% didn't have knowledge about it, 15% believed that can cause harm to their health and 30% didn't consume.

**Conclusion:** Surveyed adults didn't have adequate knowledge of what is organic food.



## Key words

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Organic crops, Chemicals, Knowledge, Health benefit.

## Introduction

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Organic foods can be defined as free of additives, preservatives and/ or coloring, among other chemicals that would cause physical harm to long-term, overall level is why there are consumers who are only willing to ingest classified as biologically pure products. And this attitude can be dangerous to health. In most people it's poorly informed about the contents of these [1, 2, 3, 4].

Nationally there is little information about the chemicals that are applied in this type of food, the lack of culture in our population when buying prevents labels where the content is set to be read. It is practically impossible to carry out any long preservation of food without the use of synthetic, like fruit and vegetables with pesticides required to prevent pests. Studies by scientists at Stanford University showed that organic food doesn't have more nutrients or is less dangerous to health. There isn't much difference between conventional and organic food if we relied only on health. The investigation doesn't found evidence that organic fruits and vegetables were more nutritious [5, 7].

It has been found through research and articles abroad the existence of a list of substances, most toxic of these manufacturers have allowed through the years there has been increased consumption, which makes them dishonest to consumers by affecting their health and economy, as a product is 20% more expensive than usual [6, 7, 8].

National Organic Standards Board has allowed the use of ingredients that are manufactured using chemical processes; there are currently 250 non-organic substances on the list, while in 2007 there were only 77 [8].

## General objective

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Describe the consumer knowledge about the chemical composition of organic food.

## Specific objective

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Inform the public about the risks that the consumption of chemicals in their usual foods leads and generate collective consciousness to everyone who is willing to consume them aware of their existence and characteristics.

## Material and methods

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A total of 40 surveys were conducted on residents of the state of Hidalgo during the year 2013, whose variables were removed from the results presented below.

Questions	Yes	No
For you, what is an organic food?	31	9
Do you think that organic food is beneficial for your health?	25	15
Do you eat some organic food?	28	12

## Results

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The 77.5% of the surveyed population is aware of what is supposed to be organic food, but only 70% consume it and 62.5% believe that it can benefit their health, while 22.5% doesn't have



knowledge of what is organic food, 15% believe it can get cause harm to their health and 30% don't consume it.

12.65% of Hidalgo population between 20 and 50 years [9].

Opposition arises to those who described organic food as a source of healthy food for humans, due to the tendency of corporations to use excess pesticides and preservatives that long-term trigger a series of illnesses mostly related to cancer; the project results in a list of most toxic substances allowed in this type of food that makes it no longer "organic" and becomes the fact that those who make use of this type of food ignore their existence.

Through the information obtained during the investigation and observation of the behavior of consumers to such foods unveiled the list below that mark some of the additives and chemicals that are applied to food that say "organic", on which damages in the body who consume it as per **Table - 1**.

## Discussion

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Both in Mexico and in the world, organic food consumption has been increasing over the past 10 years; the same has happened with the substances that are allowed to process and add that make the title of organic food be a fallacy for the consumer.

The problem of the Mexican population to be exposed to this kind of misleading food is the lack of information and lack of culture on consumers when acquiring it

### Impact on health

Individuals who consume additives and preservatives frequently tend to develop to long-term chronic diseases, more specifically talking; genetic mutations and cancer; this last in its various forms in recent years has affected a

## Conclusion

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Obtaining information (magazines and nutritional items from abroad) point the lack of information out there about organic food that are known in our country, and the little care taken to consume it, those who consume this food thinking they are healthier end doing in the same way and with a price increase, which is why there should be a more analytical mindset when eating and the way to achieve this is to read the labels of the products we consume, as all companies are required to put the ingredients used in making the product. Finally it is necessary to note that the sample doesn't have adequate knowledge of what is organic food.

## References

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1. Muñetón Patricia Perez. UNAM digital magazine. April 10, 2009. Available in: <http://www.revista.unam.mx/vol.10/num4/art18/int18.htm>
2. Monica L., Chávez González, Cristóbal N. Aguilar. Organic food in Mexico. Popular science magazine "Science for sure," 2011, no. 26. Available in: <http://www.postgradoeinvestigacion.uadec.mx/CienciaCierta/CC26/2alimentos.html>.
3. Effect of crop management practices (organic, 'low input' and conventional) on the nutritional quality of foods (nd). Available in: <http://www.qlif.org/research/sub2/wp1.html>
4. Tecnologías mitigation (nd). Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (Sagarpa). Available in:

- <http://www.sagarpa.gob.mx/desarrolloRural/Documents/cambioclimatico/Tecnologiasdemitigacion.pdf>
5. RFI. Organic food is not significantly healthier, Spanish RFI, 2012. Available in: <http://www.espanol.rfi.fr/ciencia/20120905-la-comida-organica-no-es-significativa-mente-mas-sana-revela-una-investigacion>.
  6. Alexander Pourtales. The great fantasy of organic food. 2012. Available in: <http://pijamasurf.com/2012/07/la-gran-fantasia-de-la-comida-organica-o-como-las-grandes-corporaciones-han-cooptado-la-industria-sin-que-te-des-cuenta/>.
  7. Crystal Smith-Spangler, Margaret Brandeau, Grace E. Hunter, Bavinger J. Barro, Maren Pearson, Paul J. Eschbach, Vandana Sundaram, Hau Liu, Patricia Schirmer, Christopher Cane, Ingram Olkin, Dena Bravata M. Are Organic Foods Healthier Than Conventional or Safer Alternatives?: A Systematic Review, 2012. Available in: <http://annals.org/article.aspx?articleid=1355685>.
  8. Lista allowed for the production of organic food substances. Available in: <http://iio.ens.uabc.mx/hojasseguridad/lista%20de%20compuestos%20organicos.pdf>
  9. National Institute of Geography and Statistics. Available in: <http://www.inegi.org.mx>

**Table – 1:** List marking some of the additives and chemicals to foods that say "organic" apply [7, 8].

Substances	Damage
Sulfur	Sulfur has uses as fungicide and in the manufacture of phosphate fertilizers. Overall sulphurous substances may have the following effects in humans: neurological effects, impaired blood circulation, heart damage, effects on eyes and vision, reproductive failure, damage to the immune system, stomach and gastrointestinal disorders, damage in the functions of liver and kidneys, hearing defects, hormone metabolism disorders, dermatological effects, asphyxia and pulmonary embolism.
Ethanol	Possible penetration alcohols routes are digestive, respiratory, and absorption through the skin.
Isopropanol	It has been detected a higher incidence of larynx and sinuses cancers in workers involved in the production of isopropyl alcohol. Clinical experience shows that isopropyl alcohol is more toxic than ethanol, but less than methanol. In humans, concentrations of 400 ppm cause irritation of eyes, nose and throat.
Sodium hypochlorite and calcium	Gastrointestinal irritation. Severe corrosive injury to the mouth, throat, esophagus and stomach accompanied with bleeding, perforation, and eventually death. Nasal irritation, sore throat and cough. Contact with skin can cause painful burns, swelling and blisters. Eye contact may cause mild and temporal irritation.
Sodium dioxide	It is unclear.



Hydrogen peroxide	In the food industry is widely used to whiten cheese, chicken, meat, bones, and is also used in the process for the production of vegetable oils
Ozone	Only for use as gas cleaner of irrigation systems.
Streptomycin	Used as fire blight control in apples and pears. It may cause hypersensitivity to streptomycin, kidney illnesses and eighth cranial nerve injury.
Tetracycline	It is used for the control of fire blight in apples and pears. Constituted a group of antibiotics, some natural and others obtained by semisynthesis, covering a broad spectrum antimicrobial activity. It can even cause: Increases in blood urea levels, hemolytic anemia, thrombocytopenia, neutropenia and eosinophilia, headache, Glossodynia, nausea and vomiting, acute pharyngitis; noninfectious gastroenteritis and colitis, stomatitis and dental hypersensitivity to heat.
Potassium hydroxide	Is used in the extraction of aquatic plants (not hydrolyzed). Symptoms from ingestion of potassium hydroxide include: strong Abdominal pain, respiratory distress due to obstruction by swelling of the throat, burning in mouth and throat, fainting, diarrhea, pain in the mouth, rapid drop in blood pressure, Severe pain throat, symptoms of skin or eyes contact with potassium hydroxide include: burning, intense pain, vision loss.
Sodium hydroxide	Is used in the extraction of aquatic plants (not hydrolyzed). Sodium hydroxide is a white solid and industrially used as a solution. It is soluble in water, heat shedding. It absorbs moisture and carbon dioxide from the air and is corrosive to metals and tissue. Sodium hydroxide is irritating and corrosive to tissue. The most common cases of accident are in contact with skin and eyes.
Boron	It is a mineral found in food and environment, appear to affect the way the body handles other minerals like magnesium and phosphorus. Apparently increase estrogen levels in older women (post-menopausal) and in healthy men. Large amounts of boron can cause poisoning. Signs of poisoning include swelling and peeling skin, irritability, tremors, seizures, weakness, headaches, depression, diarrhea and vomiting.
Sulfuric acid	It is a highly corrosive chemical. The Interstate Commerce Commission of the United States classifies the sulfuric acid as a corrosive liquid. Due to corrosive, oxidizing and sulfonating properties, solutions of sulfuric acid, particularly the more concentrated, rapidly destroy body tissue, producing severe burns. Constant exposure to low concentrations may cause dermatitis. Contact with the eyes is particularly dangerous; cause serious damage and, in some cases, loss of sight.
Formic acid	Formic acid is a colorless liquid with a pungent odor. Prolonged exposure may cause pulmonary edema, shock, and death from respiratory failure. Symptoms resulting from inhalation include irritation of the nose, eyes,

	throat, cough, runny nose, watery eyes and difficulty breathing. Ingestion may cause salivation, vomiting, abdominal pain, burning and intense burning in the mouth, lips and esophagus, vomiting blood, diarrhea and possibly death. Its absorption through the skin produces: pain, redness and burns. The concentrated solution causes irritation and blisters. If it is absorbed quickly produce serious toxic effects
Phosphoric acid	Is an anorganic acid relatively weak, which is used in the food industry as a preservative, emulsifier, acidulant (in cola) or acidity regulator. At high acid concentrations it irritates the skin and mucous membranes. Phosphoric acid also leaches calcium from the bones, it doesn't allow proper absorption in the body, causing weakening and thus increase the chance of fracturing, also says that phosphoric acid is one of the largest contributors to osteoporosis increasing.
Iron sulfate	It is a fine yellowish or greenish solid or granular crystals. Is used as a fertilizer, in food products. It can cause irritation of eyes, nose, throat, lungs, causing coughing and / or shortness of breath; to short term. In the long term, it can lead to cancer risks, risks in reproduction.
Copper sulfate	A well-known herbicide, fungicide and pesticide. Used to kill fungus, aquatic plants and roots of plants, parasitic infections in aquarium fish and snails, algae and bacteria such as Escherichia coli, copper sulfate does not sound for human consumption, and much less for children. It is classified according to the Dangerous Substances Directive as "Harmful".
Hydrated lime	It is used for the Preservation of fruit and vegetables. Calcium hydroxide doesn't cause acute toxicity oral, dermal, or inhalation route. The substance is classified as irritating to the skin and respiratory system, and involves a risk of serious eye damage.
Potassium bicarbonate	Streptomycin: for fire blight control in apples and pears. It is not absorbed in the gastrointestinal tract. Normally small quantity goes into the cerebrospinal fluid, but the penetration increases when the meninges are inflamed. It is excreted unchanged in the urine.
Tetracycline	For the control of fire blight in apples and pears. One of the less toxic agents.
Lignin sulfonate	Calcium lignin sulfonate is suitable for use as a strength agent, antifreeze and pumping, a carrier for the production of encapsulated vitamins and tackifier in the mining industry, use as a fireproof material and in the granulation process.

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