



***The Societal Benefits of Copper***  
**A series of copper messages and supporting materials,**  
**created by the ICA Global Communications Team**

The International Copper Association and the copper industry are fortunate to have at our disposal the best and most powerful messages ever regarding copper and the copper industry. The Societal Benefits of Copper series is designed to position copper as a *material* that addresses sustainable development. This series will serve to position the *copper industry* as a key contributor in meeting many of society's greatest challenges. We ask you, our members, to work in partnership with the ICA and take every opportunity to promote these very powerful and important messages when you are communicating about copper.

These messages will provide both your internal and external stakeholders with a positive, strong, and accurate perception about copper and a good understanding of the importance of copper in their lives. We are confident that you will find this series an effective part of your outreach efforts. If you have any questions or concerns, please contact a member of the ICA Global Communications Team.

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**COPPER IS ESSENTIAL FOR ALL LIVING THINGS [1-3]**

***Executive Summary***

- Copper is an integral part of daily life and benefits the world in many ways. Not only does copper make the products it goes into more efficient and sustainable, but it is vital to the health of humans, animals, and plants [1-3].
- Without copper, we would be dead. Copper is needed to ensure that our bodies function normally [4].
- Copper is not manufactured in the body and must be obtained from food and drinking water and, occasionally, through the use of dietary supplements [3].
- Copper is needed during pregnancy and development for mother and fetus to remain healthy and develop normally [5-7]
- Copper is needed for healthy brain function throughout life [8], and indeed copper may be beneficial for Alzheimer's disease patients [9-11]. In a clinical trial, early stage Alzheimer's Disease patients received 8 mg copper/day. When compared with the untreated group, their health remained better throughout the trial, as measured by a marker for disease progression in the cerebrospinal fluid [12]. Learn more COPPER - ESSENTIAL FOR A HEALTHY BRAIN: Full Version (<http://www.youtube.com/watch?v=FJNQXjAZumM>)
- Copper is needed for the maintenance of healthy skin [13, 14], wound healing [15, 16], blood vessels [17-19], and blood cells [20].
- The recommended intake of copper is 0.9 adults and 1 mg/day for pregnant women and 1.3 mg/day for lactating women [21].
- Dark chocolate, leafy greens, legumes, lentils, nuts, organ meats (liver, kidney) and shellfish, all contain copper and provide essential health benefits [22].
- Learn more about [Copper's +Role in the Body.](#)
  
- The Voluntary Risk Assessment (VRA) report is the result of a comprehensive study commissioned by the copper industry to evaluate potential risks to human health and the environment from the manufacture and use of copper products. Because ambient levels of copper were well below approved safe levels in the environment, there were no restrictions

placed on the marketing and use of any copper products within the EU. The overall conclusion is that copper is a safe, essential material from a responsible industry [23]; learn more at [www.eurocopper.org/vra/documents/en/VRA\\_Q&A.pdf](http://www.eurocopper.org/vra/documents/en/VRA_Q&A.pdf)

### ***The Story***

#### ***Getting to the heart of the matter***

Copper is needed for the optimal health of the heart. Studies on animals show that nutritional copper deficiency can cause heart muscle disorders and can lead to inefficient pumping of the heart, impaired blood circulation [24, 25], and elevated cholesterol levels [26]. Furthermore, some studies indicate that high sugar intake in combination with low copper may have the potential to increase multiple risk factors for cardiovascular disease [27-29].

Tests on laboratory animals show that the effects of copper deficiency are usually reversible [30, 31]. Also in humans, copper deficiency and its symptoms are usually reversible by providing adequate supplements for copper repletion, in single cases even several years after a severe copper deficit [32, 33].

**Note:** A snack containing 1 mg copper is provided by eating 3 pieces (26 g = 3 pcs) of dark chocolate AND 17 small Cashew nuts (26 g = 17 small nuts) [34].

#### ***A trio of minerals vital to good health***

Other members of the essential metals family must be present for optimal health, namely iron and zinc.

Copper, iron, and zinc are essential trace nutrients that cannot be made in the body. They are obtained from food or drinking water or occasionally from dietary supplements. All three are needed in small quantities throughout one's lifetime. This is why they are called "essential trace minerals" they are needed in small quantities, traces, and critically needed for health [35].

The following shows the recommended daily intake for each essential trace element:

- Copper: 0.9 for adults and 1 mg/day and pregnant women, 1.3 mg/day for lactating women
- Iron: 8 mg/day for men, 18 mg/day for women (27 mg/day in pregnancy)
- Zinc: 15 mg/day for men, 12 mg/day for women [21]

**Copper** is required for a healthy body and mind. It aids in blood vessel formation, a healthy heart and stabilizing the connective tissue, which binds one part of the body to another and is needed for brain development, healthy bones and teeth. Copper also aids in maintaining a healthy immune system and improved skin tone [3, 36].

**Iron** is a basic part of many proteins and enzymes that maintain good health. Iron is essential in the production of hemoglobin, the protein in red blood cells that carries oxygen to the tissues [37, 38].

**Zinc** plays a crucial role in the function of 300 enzymes in the human body along with growth and fertility, a healthy immune system, and healthy skin, hair, nails and eyes [39-41].

Balance is very important when it comes to a healthy body. An excess of any nutrient such as copper, zinc, or iron may lead to health problems. For optimal health, follow the U.S. National Academy of Sciences guidelines. People who take an iron supplement of 30 mg or more per day, under the supervision of a doctor, should balance that intake with about 15 mg zinc and 2 mg of copper [42].

Pregnant women should consult with their doctor to ensure that their pre-natal supplements contain the proper balance of this essential trio.

#### Copper Deficiency, a global concern

The World Health Organization (WHO) estimates that global populations are at greater health risks from the lack of copper in their diets than from an excess of copper [43]. The elderly, who do not get enough copper, and lactating and pregnant women who need more copper in their diet, are especially impacted. This view is echoed by the EU VRA, which concludes that some EU citizens are at a risk of copper deficiency, for example, post-menopausal women [23].

Apart from its role in tissue formation, copper is needed for brain development and for the effective communication between nerve cells in the brain as well as for healthy teeth and bones. More copper is needed for infants and teens, as well as pregnant and nursing mothers, who are feeding themselves along with their babies [21]. Eat a well-balanced diet that includes good sources of copper.

Copper deficiency manifests itself in a variety of ways, from serious diseases such as blood diseases, blood vessel abnormalities, abnormal bone formation, hypopigmentation of the skin and “steely” or “kinky hair” to a risk factor in osteoporosis, rheumatoid arthritis, and heart disease. Additionally, even a mild deficiency can lower the immune system, resulting in more frequent colds and flu, loss of skin tone, reproductive problems, and fatigue [44].

There is an emerging new group of patients with an elevated risk of copper deficiency. People who are morbidly obese and undergo gastric bypass surgery for weight loss experience a great benefit in reducing their risk of weight-related diseases, such as diabetes. However, about 10% of these patients develop severe copper deficiency because their doctors do not recognize the problem of an emerging copper deficiency early enough. With around 190,000 people per year in the US having this surgery, many of them women of child-bearing age, as well as a growing subgroup of teenagers, copper deficiency is becoming an important public health issue [33, 45, 46].

Copper is an essential micro-nutrient, helping to achieve good health and development in all organisms [1-3]. For plant life, copper is necessary for normal growth and metabolism. A deficient copper supply can lead to reduced crop yields, compromised quality, increased susceptibility to diseases, and in severe cases, crop failure. Copper deficiency in soil can impact crops such as rice, wheat, citrus fruits, oats, spinach and carrots [47]. It has been estimated that 1.2 million km<sup>2</sup> of farm land in Europe is copper deficient. Applying copper fertilizers is an effective treatment [48].

#### Copper sustains life

Copper has unique attributes and is critical throughout our human life span, especially when it comes to our health. It would be impossible to live without copper [49].

Copper plays an important role in addressing issues critical to society. Not only does copper contribute to our food and health, it also contributes to energy efficiency, CO<sub>2</sub> reduction and other important issues [50]. With so many positive messages, now is the time to let the world know about the importance of copper and how it impacts and influences lives.

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