

# Module 1: Hydrothermal processing to promote micronutrient bioavailability in processed food products

Understanding Hidden Hunger -  
How does Hidden Hunger Affect People's Health and Society?

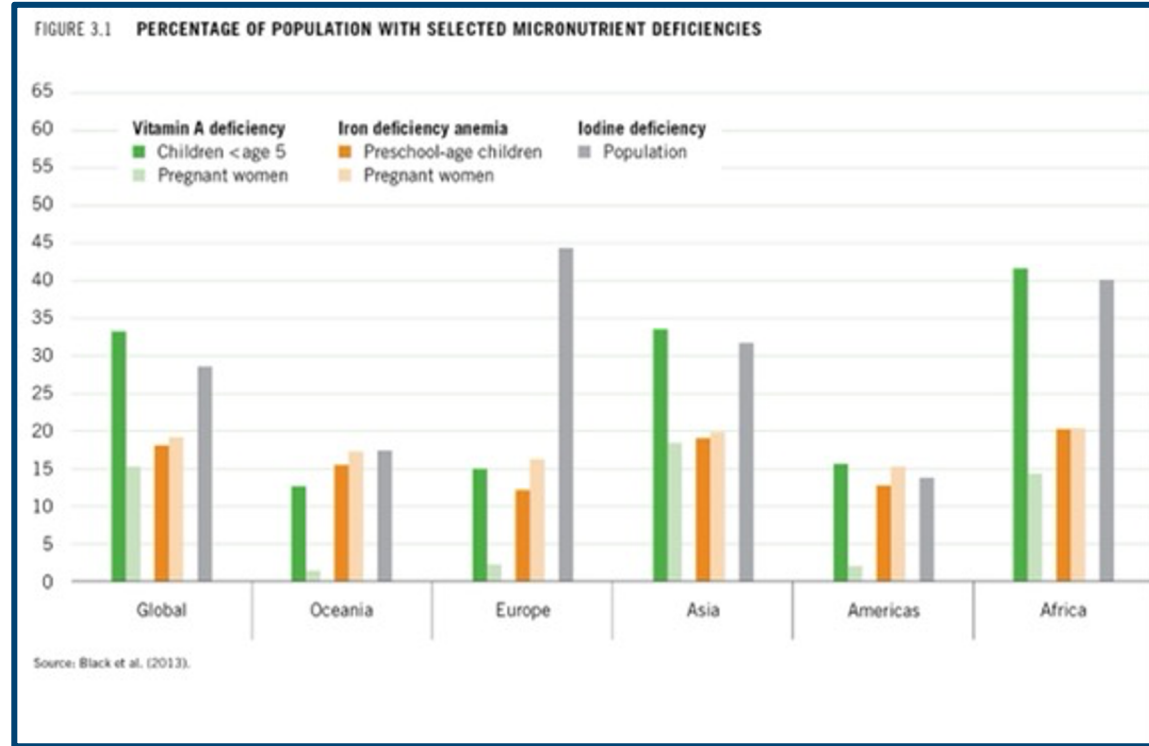


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# Main deficiencies causing hidden hunger

The most widespread micronutrient deficiencies globally are on **iron**, **zinc**, **vitamin A**, **iodine** and **folate**.

Read the most recent information on hunger in “The state of food security and nutrition in the world 2020”  
<http://www.fao.org/publications/sofi/2020/en/>



Read more: [https://www.ifpri.org/sites/default/files/ghi/2014/feature\\_1818.html](https://www.ifpri.org/sites/default/files/ghi/2014/feature_1818.html)

# Main deficiencies causing hidden hunger

*“The hidden hunger due to micronutrient deficiency does not produce hunger as we know it. You might not feel it in the belly, but it strikes at the core of your health and vitality”.*

Kul C. Gautam. Former deputy executive director, UNICEF

# Effects on health - Iron deficiency

Iron deficiency is the most common state of deficiency in developed and low-income countries.

1.6 billion people are affected by iron deficiency globally.

Children aged 0–5 years, women of childbearing age, and pregnant women are particularly at risk.

Severe anaemia contributes to:

- Death of women in childbirth
- Babies to be born dead, physically disabled or with brain damage
- Impaired motor and cognitive development



# Effects on health - Zinc deficiency

Zinc is part of every cell of the body and plays a vital role in many biochemical functions, over 200 enzymes require zinc for their activities.

1.2 billion people are affected worldwide by zinc deficiency.

Some consequences from zinc deficiency are:

- Severe growth failure/stunting
- Hypogonadism with delayed sexual maturation
- Anaemia
- Geophagia
- Risks during pregnancy

# Effects on health - Folate deficiency

Folate deficiency is, together with iron and zinc, widespread globally.

Folate is a type of vitamin B and deficiencies of other B vitamins like B12 also commonly occur.

Depletion of folate before and during early pregnancy is a major cause of serious birth defects.

# Effects on health - Vitamin A deficiency

Vitamin A is the most common deficiency among the 20 highest ranked countries in Hidden Hunger Index.

1.9 billion preschool children and 19 million pregnant women are affected by vitamin A deficiency worldwide

Vitamin A deficiency may cause:

- Severe visual impairment and blindness
- Increased risk of severe illness and death from common infections such as diarrhoea and measles in preschool age children
- Night blindness and increased risk of death in pregnant women

# Effects on health - Iodine deficiency

Iodine deficiency does not correlate with other micronutrient deficiencies.

1.8 million persons are affected globally by iodine deficiency.

Lack of iodine may lead to:

- Brain damage in newborns
- Reduced mental capacity during childhood

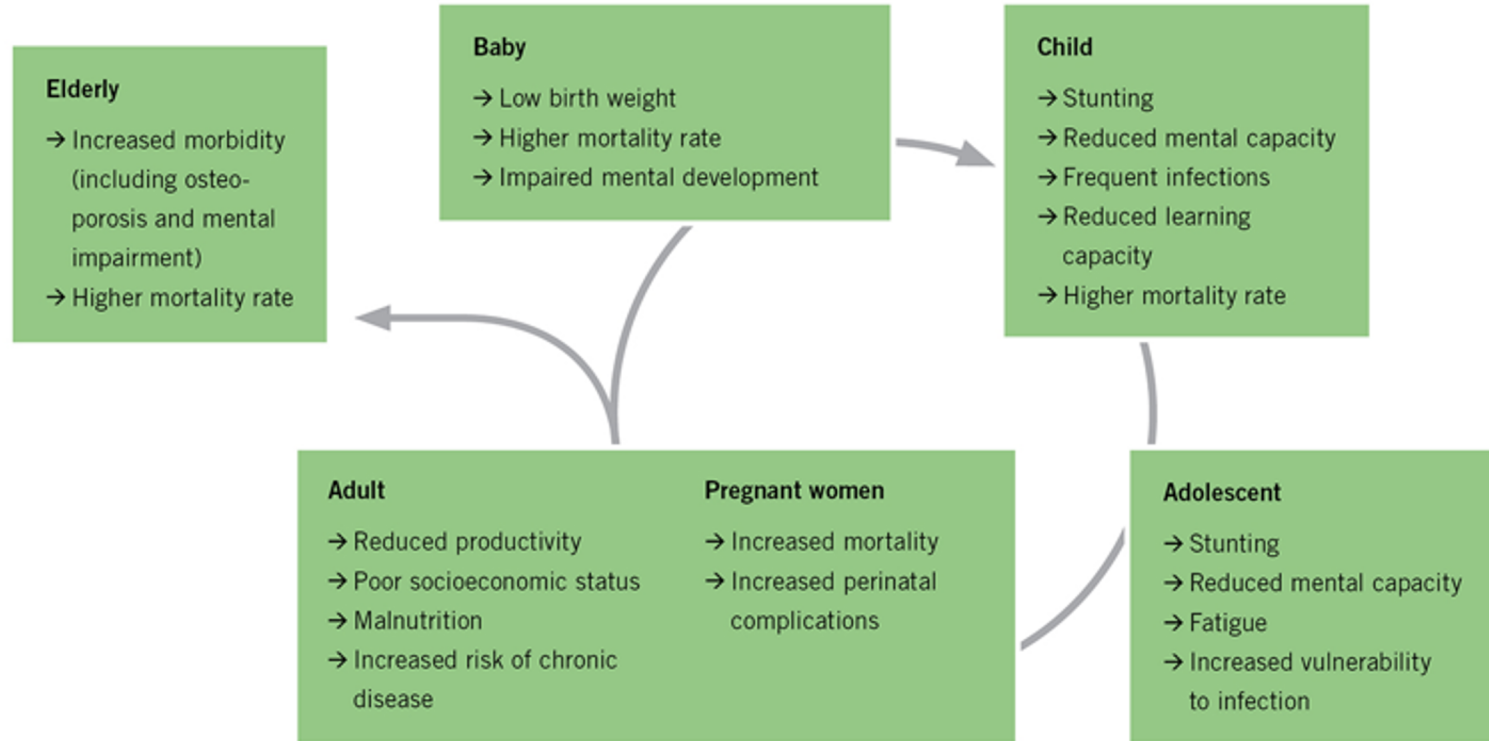
# Effects on health- non-communicable diseases

Changing from traditional diets to greater energy-dense, processed, micronutrient-poor foods, causes large increase in body weight and other non-communicable diseases.

Read more: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7366309/pdf/42506\\_2019\\_Article\\_34.pdf](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7366309/pdf/42506_2019_Article_34.pdf)



# Consequences of micronutrient deficiencies throughout the life cycle



Read more: [https://www.ifpri.org/sites/default/files/ghi/2014/feature\\_1818.html](https://www.ifpri.org/sites/default/files/ghi/2014/feature_1818.html)

# Social and Economic Development

Micronutrient deficiency not only affects health and physical and mental development of people, but also hinders the social and economic development of countries.

Countries where a large share of the population is affected by vitamin and mineral deficiencies cannot realize their economic potential (Stein 2013; Stein and Qaim 2007).

Poor people disproportionately suffer from micronutrient deficiencies, and bear the long-term negative effects that constrain socioeconomic development (Darnton-Hill et al. 2005).

Read more: <https://www.who.int/health-topics/nutrition>



# Solutions

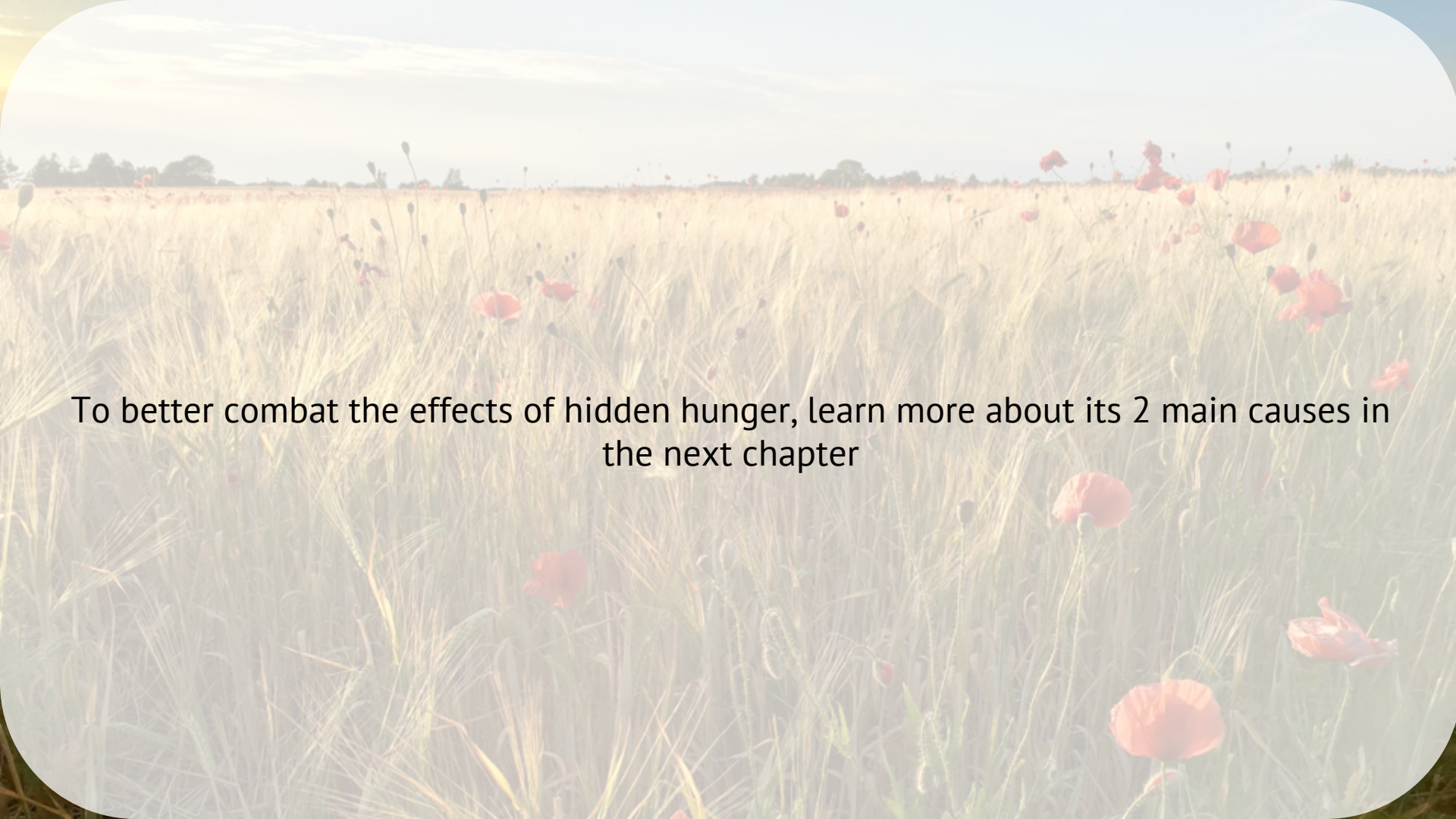
An integrated system approach to reduce hidden hunger could potentially serve as a sustainable opportunity for development.



Read more: The Role of Food and Nutrition System Approaches in Tackling Hidden Hunger. Burchi et al. Int. J. Environ. Res. Public Health  
<https://pubmed.ncbi.nlm.nih.gov/21556191/>





A wide-angle photograph of a field of tall, golden-yellow grass. Scattered throughout the field are numerous red poppies, some in full bloom and others as buds. The background shows a distant treeline under a pale, overcast sky. The entire image is framed within a rounded rectangle.

To better combat the effects of hidden hunger, learn more about its 2 main causes in the next chapter