

A photograph of a woman and two children laughing joyfully outdoors. The woman is in the center, wearing a yellow top and a straw hat. A young girl is on her back, also wearing a straw hat and a colorful top. An older woman is on the left, wearing a white straw hat and a blue top. They are all smiling broadly against a bright blue sky with light clouds.

**SIEMENS**

Women's health depends on a lifetime  
of answers—one test at a time.

Women and Nutrition

[www.siemens.com/women-and-nutrition](http://www.siemens.com/women-and-nutrition)

Answers for life.

# Women and Nutrition

Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child, and maternal health; stronger immune systems; safer pregnancy and childbirth; lower risk of noncommunicable diseases (such as diabetes and cardiovascular disease); and longevity.<sup>1</sup>



### **What Is Nutrition?**<sup>1</sup>

A balanced diet is vital for good health and well-being. Food provides our bodies with the energy, protein, essential fats, vitamins, and minerals to live, grow, and function properly. We need a wide variety of different foods to provide the right amounts of nutrients for good health. An unhealthy diet increases the risk of many diet-related diseases.

Women produce half of the world's food and 60–80% of all food in developing countries. Women are the key to tackling the problem of hidden hunger and achieving nutrition security. It is essential that women have access to the right levels of nutrition to maximize their own productivity and, as mothers, to give birth to and care for healthy children.

A child's first 1000 days—from conception to 2 years of age—are the most important in terms

of mental and physical development. If children don't get the nutrients they need from their mothers during this period, their development can be seriously impaired, thus affecting an entire generation.

Malnutrition in all its forms is a major contributor to disease and early death for mothers and children. Undernutrition, including vitamin and mineral deficiencies, contributes to about one-third of all child deaths and impairs healthy development and lifelong productivity. At the same time, growing rates of obesity are linked to a rise in chronic diseases. The result is a double burden of malnutrition.

### **A Life Course Approach**<sup>2</sup>

Nutrition affects the overall health of women from adolescence through the reproductive years and middle age to the elder years. At each milestone, women experience physical changes

requiring nutritional interventions that lay a foundation for a continuum of healthy life.

### **During Menstruation**

Hormonal changes that occur during menstruation alter the metabolism to burn more energy. The blood loss that occurs during menstruation may cause iron levels to decrease, resulting in mild anemia. This can be circumvented by including red meat, legumes, nuts, eggs, fortified cereals, and dark leafy vegetables in the diet.

### **During Pregnancy and Lactation**

A woman's blood volume increases dramatically to help nourish the baby and keep her own body healthy. It is critically important to add iron-rich foods and iron supplements to facilitate an increase in the production of red blood cells.

Because iron supplements may interfere with the absorption of zinc, zinc supplements are also commonly



recommended. Leavened whole-grain products, liver, eggs, red meat, and seafood are all good sources of zinc.

Much of the calcium needed for a developing baby can be drawn from the mother's body, but pregnant women should be sure to replace calcium through supplements to ensure that they do not experience bone loss. A diet balanced with milk, yogurt, and cheese can help keep mother and baby healthier throughout the pregnancy and early months.

Folic acid plays a crucial role in the proper development of a baby's nervous system. Folic acid supplements are normally recommended even before pregnancy occurs to ensure that there is plenty available during early embryonic development. In addition to supplements, folic acid can be found in red meat, liver, egg yolks, and green leafy vegetables.

Breast milk is extraordinarily concentrated with nutrients, and since all the nutrients come from the mother, she must restore them regularly to avoid developing deficiencies. It is particularly important to continue to supplement calcium, iron, folic acid, and all the vitamins recommended during pregnancy. Magnesium and vitamin B6 are crucial during breastfeeding. It is also important to include protein in the diet and remain very well hydrated.

### During Menopause

One of the major concerns for women during menopause is the development of osteoporosis. The loss of estrogen can lead to a significant loss of bone mass, leaving the bones brittle. Measures for maintaining healthy bones should begin earlier in life with intake of calcium through dairy products. Vitamin D can increase absorption of calcium, so its inclusion in the diet can also help decrease the risk of developing a calcium deficiency. Diets that are low in salt, alcohol, and caffeine can also

help improve calcium retention. Maintaining a healthy body composition and exercising regularly can also help reduce the risk of developing osteoporosis after menopause.

It is essential to promote positive nutrition practices by encouraging a varied and balanced diet among women throughout all life stages to ensure their health and well-being, as well as that of their offspring.

### The Global Burden of Malnutrition in Women<sup>1</sup>

The importance of food and nutrition in human development is widely recognized in both high-income and middle- to low-income countries. Malnutrition in all its forms imposes an intolerable burden not only on national health systems but also on the entire cultural, social, and economic fabric of nations, and is the greatest impediment to the fulfillment of human potential. Investing in nutrition therefore makes economic sense because it reduces healthcare costs, improves productivity and economic growth, and promotes education, intellectual capacity, and social development for present and future generations.

- Maternal undernutrition, common in many developing countries, leads to poor fetal development and higher risk of pregnancy complications. Together, maternal and child undernutrition account for more than 10% of the global burden of disease.
- A key indicator of chronic malnutrition is stunting—when children are too short for their age group compared to the WHO child growth standards. According to 2011 figures, about 165 million children globally are stunted as a result of not enough food, a vitamin- and mineral-poor diet, inadequate child care, and disease. As growth slows, brain development lags, and stunted children learn poorly. Stunting rates among children are highest in Africa and Asia. In eastern Africa, 42% were affected as of 2011.

- Wasting is a severe form of malnutrition resulting from acute food shortages and compounded by illness. About 1.5 million children die annually due to wasting. Rising food prices, food scarcity in areas of conflict, and natural disasters diminish household access to appropriate and adequate food, all of which can lead to wasting. Wasting demands emergency nutritional interventions to save lives.
- Essential vitamins and minerals in the diet are vital to boost immunity and healthy development. Vitamin A, zinc, iron, and iodine deficiencies are primary public-health concerns. About 2 billion people are affected by inadequate iodine nutrition worldwide. More than one-third of preschool-age children globally are vitamin A-deficient, a leading cause of preventable blindness.
- Nutritional problems in adolescents start during childhood and continue into adult life. Anemia is a key nutritional issue in adolescent girls. Preventing early pregnancies and assuring adequate intake of essential nutrients in developing girls can reduce subsequent maternal and child deaths and stop the cycle of malnutrition from one generation to the next. Globally, anemia affects 42% of pregnant women.
- The rise in overweight and obesity worldwide is a major public-health challenge. People of all ages and backgrounds face this form of malnutrition. As a consequence, rates of diabetes, cardiovascular disease, and other diet-related conditions are escalating worldwide.

### Risk Factors<sup>3</sup>

Micronutrient deficiencies are risk factors for many diseases and can contribute to high rates of morbidity and mortality. Even moderate levels of deficiency can have detrimental effects on human health. Micronutrient deficiency is widespread in industrialized nations, but even more so in the developing regions of the world. Around the world, 2 billion people suffer from micronutrient deficiency, also known as “hidden hunger.”

Young children and women of reproductive age are among those most at risk for developing micronutrient deficiencies. The three most common forms of micronutrient malnutrition are iron, vitamin A, and iodine deficiency.

### Siemens Diagnostic Solutions for Nutritional Assessment

	ADVIA Centaur® Systems	ADVIA® Chemistry Systems	Dimension® Systems	Dimension® EXL™ Systems	Dimension Vista® Systems	IMMULITE® Systems	Other Siemens Systems
Albumin		•	•	•	•	•	•
B12	•			•*	•	•	
Calcium		•	•	•	•		
Ferritin	•	•	•	•	•	•	•
Folate	•			•*	•	•	
Iron		•	•	•	•		
Prealbumin		•	•	•	•		•
RBC Folate	•					•	
Retinol-binding Protein					•		•
S Transferrin					•		•
Total Iron-binding Capacity		•	•	•	•		
Transferrin		•	•	•	•		•
Vitamin D	•			•*			

\*Under development. Not available for sale. Future availability cannot be guaranteed. Product availability may vary from country to country and is subject to varying regulatory requirements.

### Symptoms

Poor nutrition can put women at nutritional risk and result in malnutrition and poor health. Eye, hair, nail, mouth, and skin symptoms are among the early outward warning signs of vitamin and mineral deficiencies.

Other symptoms may include

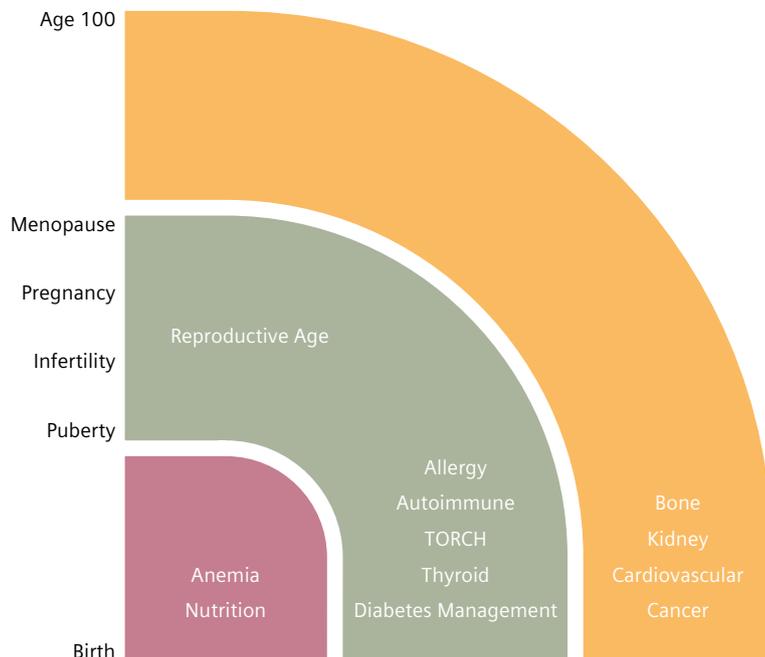
- Low energy
- Fragile bones
- Obesity
- Extreme weight loss

### Related Diseases and Conditions

The major causes of death, illness, and disability in which diet and nutrition play an important role include coronary heart disease, stroke, hypertension, atherosclerosis, obesity, some forms of cancer, type 2 diabetes, osteoporosis, dental caries (tooth decay), gall bladder disease, dementia, and nutritional anemia.

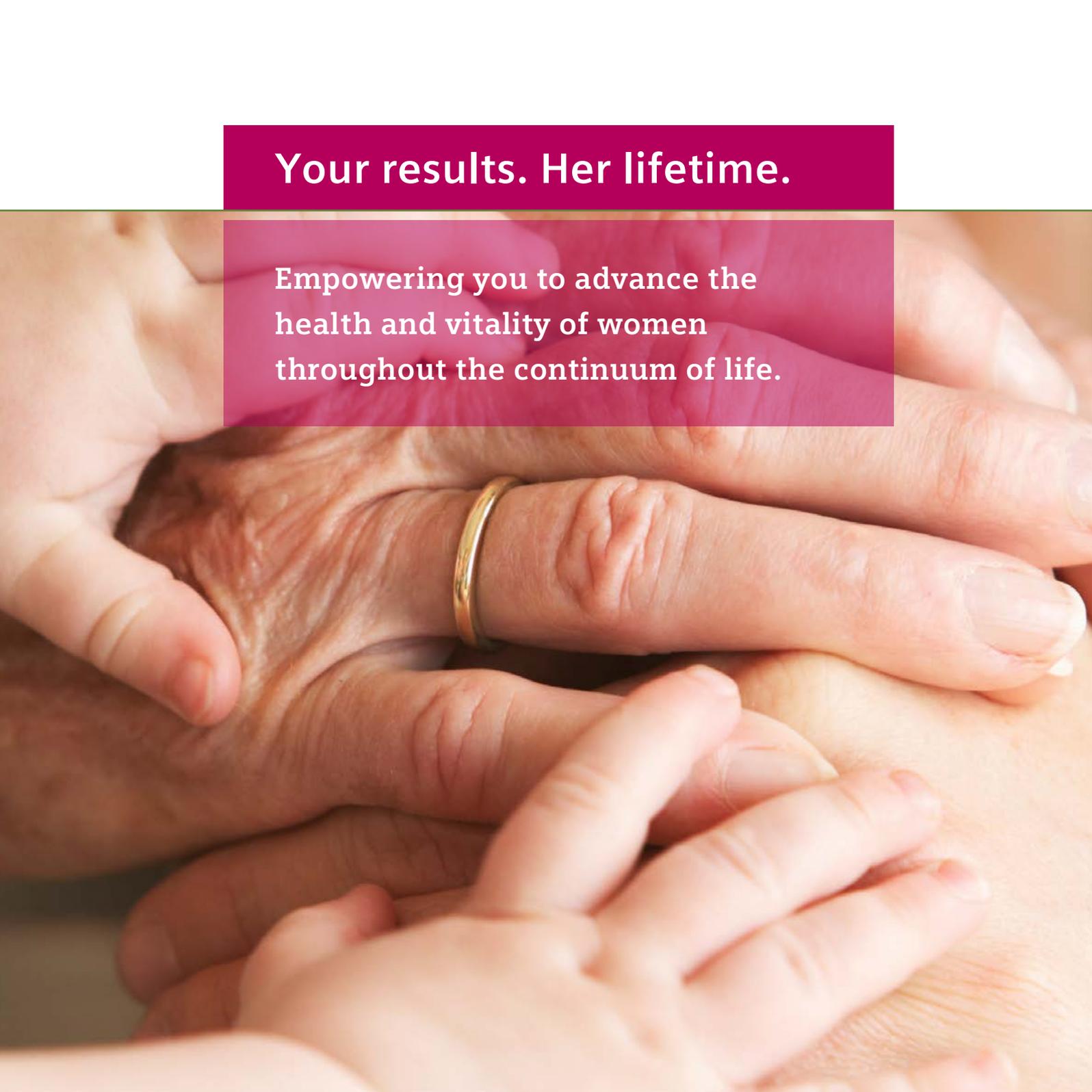
### Women's Lifetime Health Continuum

Throughout a woman's lifetime, there are a number of conditions and diseases that affect her differently, or to a greater extent, than men. Many of these conditions and diseases are interconnected, where the onset of one leads to a greater risk of developing another. With an enhanced understanding and focus on the unique healthcare needs of women, healthcare providers across the continuum of care can be better equipped to prevent, detect, and treat the most threatening diseases affecting their female patients throughout all stages of their lives.



### References

1. World Health Organization [Internet]. [cited 2014 August] Available from: <http://www.who.int/features/factfiles/nutrition/en/>
2. Patients Medical Overview of Nutritional Deficiencies [Internet]. [cited 2014 August] Available from: <http://www.patientsmedical.com/healthaz/nutritiondeficiencies/default.aspx>
3. United Nations System Standing Committee on Nutrition [Internet]. [cited 2014 August] Available from: <http://www.unscn.org/en/home/why-nutrition-is-important.php>
4. United Nations System Standing Committee on Nutrition. 6th Report on the World Nutrition Situation: Progress in Nutrition. ISSN1564-3786. Available from: [http://www.unscn.org/files/Publications/RWNS6/report/SCN\\_report.pdf](http://www.unscn.org/files/Publications/RWNS6/report/SCN_report.pdf)
5. Ghassemi H. Women, food and nutrition—issues in need of a global focus. Prepared for the Division of Family Health, World Health Organization, Geneva, Switzerland.



**Your results. Her lifetime.**

Empowering you to advance the health and vitality of women throughout the continuum of life.

Siemens Healthcare Diagnostics, a global leader in clinical diagnostics, provides healthcare professionals in hospital, reference, and physician office laboratories and point-of-care settings with the vital information required to accurately diagnose, treat, and monitor patients. Our innovative portfolio of performance-driven solutions and personalized customer care combine to streamline workflow, enhance operational efficiency, and support improved patient outcomes.

ADVIA, ADVIA Centaur, Dimension, Dimension Vista, IMMULITE, and all associated marks are trademarks of Siemens Healthcare Diagnostics Inc. All other trademarks and brands are the property of their respective owners.

Product availability may vary from country to country and is subject to varying regulatory requirements. Please contact your local representative for availability.

Order No. A91DX-CAI-141156-GC1-4A00  
09-2014 | All rights reserved  
© 2014 Siemens Healthcare Diagnostics Inc.

**Global Siemens Headquarters**

Siemens AG  
Wittelsbacherplatz 2  
80333 Muenchen  
Germany

**Global Siemens Healthcare  
Headquarters**

Siemens AG  
Healthcare Sector  
Henkestrasse 127  
91052 Erlangen  
Germany  
Telephone: + 49 9131 84 - 0  
[www.siemens.com/healthcare](http://www.siemens.com/healthcare)

**Global Division**

Siemens Healthcare Diagnostics Inc.  
511 Benedict Avenue  
Tarrytown, NY 10591-5005  
USA  
[www.siemens.com/diagnostics](http://www.siemens.com/diagnostics)

**[www.siemens.com/diagnostics](http://www.siemens.com/diagnostics)**