

**Abstract of a major presentation at the
International Conference**

Forging Effective Strategies to Combat Iron Deficiency

**Atlanta, GA USA
7-9 May 2001**

**Organized and sponsored by:
ILSI Center for Health Promotion
Centers for Disease Control and Prevention
Emory University
Micronutrient Initiative**

**(Additional information and publications from this Conference can be
found at the website of the International Life Sciences Institute
(<http://www.ilsa.org/>)**

Research Priorities

Dr. Sean R. Lynch

Professor of Medicine, Department of Internal Medicine, Eastern Virginia Medical School

Hampton, Virginia, USA

There are five major research priorities at the present time. The first is the development of better approaches to determining how much of the burden of anemia encountered in developing countries is the result of iron deficiency. The overall prevalence of anemia, particularly if mild anemia is included in the estimate, is a poor screening tool for iron deficiency and iron deficiency anemia because of the considerable overlap in population studies between individuals with iron deficiency and those who have an adequate iron status. Prevalence estimates are also confounded by the presence of anemia due to other causes such as malaria and other infectious disorders. While iron deficiency is undoubtedly one of the major causes of anemia on a worldwide basis, the assumption that mild anemia is indicative of iron deficiency in all individuals has led to considerable confusion, and probably accounts to some extent for the apparent failure of many intervention programs. The tools for identifying and quantifying iron deficiency in populations where inflammatory disorders are not a major factor are available, but they need to be adapted for application in the field. More research is needed to determine how best to identify iron deficiency in the presence of inflammatory and infectious disorders.

The second priority is the evaluation of the potential efficacy of the fortification strategies that are currently being implemented or planned at a national level in several regions of the world. The major concern here is the widespread use of elemental iron powders. The bioavailability of the powders used in many of these programs has not been established. There is an urgent need to determine the bioavailability of these iron powders. A simple laboratory screening test that correlates closely with bioavailability could then be developed for setting appropriate quality control standards for producers of food grade elemental iron powders. The evaluation of the bioavailability of elemental iron powders has been hampered in the past by the technical difficulties of producing a representative isotopically labeled product. However, reliable data should now be obtainable without the use of isotopes because sensitive tools have been developed for measuring small changes in iron status in human volunteers. Furthermore, it will be necessary to evaluate only a few products since there are a limited number of manufacturers of food grade elemental iron powders.

The third priority is the development of better strategies for ensuring adequate iron status in early infancy, especially the first year of life. Recent experimental evidence strongly supports a causal relationship between early iron deficiency and problems with later cognitive and emotional development as well as poor academic performance. Studies reported from African countries suggest that the mother's iron status during pregnancy may also have an important impact on infant iron sufficiency during this critical period. This clearly merits further evaluation. Improved low-cost methods for the delivery of iron

to infants in the form of fortified foods or iron supplements added to meals just before consumption need to be developed. It may also be necessary to ensure better bioavailability in complementary food vehicles. The development of a simple cheap method to reduce phytate content is an attractive option.

The fourth priority is the design of combined strategies for the elimination of anemia. In addition to the provision of absorbable iron, they should include malaria and helminth control as well as attention to other potential nutritional deficiencies including vitamin A, vitamin B₁₂ and folic acid. There is little doubt that such strategies must be tailored to particular countries or regions, but there is an urgent need for a much more systematic approach to the problem.

The final priority is the development of genetically engineered foods with improved nutritional qualities. This is particularly important for many populations that rely on subsistence farming and do not have access to commercial foods. Fortification cannot be targeted to these people and frequently delivery systems for supplemental iron are least effective in such settings.