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The Single Nutrient Deficiency Diseases

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Commentary

This new science of single nutrient deficiency diseases also led to fortification of selected staple foods with micronutrients, like iodine in salt and niacin (vitamin B3) and iron in wheat flour and bread.8910 These approaches proved to be effective at reducing the prevalence of many common deficiency diseases, including goiter (iodine), exophthalmia (vitamin A), rickets (vitamin D), and anemia (iron). Foods round the world have since been fortified with calcium, phosphorus, iron, and specific vitamins (A, B, C, D), counting on the composition of local staple foods.

As one of the good accidents of nutrition history, this new science and specialize in single nutrients and their deficiencies coincided with the good Depression and Second war, a time of widespread fear of food shortages. This led to even further emphasis on preventing deficiency diseases [1]. For example, the primary recommended dietary allowances (RDAs) were immediate results of these concerns, when the League of countries, British Medical Association, and therefore the United States government separately commissioned scientists to get new minimum dietary requirements to be prepared for war. these first RDAs were announced at the National Nutrition Conference on Defense, providing new guidelines for total calories and selected nutrients including protein, calcium, phosphorus, iron, and specific vitamins. These historical events established a precedent for nutrition research and policy recommendations to specialize in single nutrients linked to specific disease states.

Calorie malnutrition and specific vitamin deficiencies fell sharply in high income countries due to economic development and enormous increases in low cost processing of staple foods fortified with minerals and vitamins [2]. At an equivalent time, the rising burdens of diet related non-communicable diseases began to be recognized, resulting in new research directions. Attention included two areas: dietary fat and sugar.

Early ecological studies and small, short term interventions, most prominently by Ankle Keys, Frederick Stare, and Mark Heisted, contributed to the widespread belief that fat was a major contributor to heart disease. At the same time, work by John Yadkin and others implicated excess sugar in coronary disease, hypertriglyceridemia, cancer, and dental caries. Ultimately, the emphasis on fat won scientific and policy acceptance, embodied in the US Senate committee report Dietary Goals for the United States, which recommended low fat, low cholesterol diets for all. This wasn't without controversy: the US National Academy of Sciences Food and Nutrition Board reviewed the info and concluded that insufficient evidence existed to limit total fat, saturated fat, and dietary cholesterol across the population [3].

Some interpret these controversies as evidence of industry influence, et al. as natural disagreement and evolution of early science. More relevant is that both the dietary fat and sugar theories relied on a nutritional model developed to deal with deficiency diseases: identify and isolate the only relevant nutrient, assess its isolated physiological effect, and quantify its optimal intake level to stop disease. Unfortunately, as subsequent research would establish, such reductionist models translated poorly to non-communicable diseases.

In less wealthy countries, the most objectives of nutrition policy and proposals during this era remained on increasing calories and selected micronutrients. In some ways, foods became viewed as a delivery vehicle for essential nutrients and calories. Accordingly, agricultural science and technology emphasized production of low cost, shelf stable, and energy dense starchy staples like wheat, rice, and corn, with corresponding breeding and processing to maximally extract and purify the starch [4]. As in high income nations, these efforts were accompanied by fortification of staple foods as well as food assistance programmers to promote survival and growth of infants and young children in vulnerable populations.

Scientists focused on malnutrition disagreed on the relative role of total calories and protein in infant and child diseases like marasmus and kwashiorkor—also termed "the protein-calorie deficiency diseases." Support for the "protein gap" concept led to extensive industrial development of protein enriched formulas and complementary foods for developing countries. Other scientists supported the first role of calorie insufficiency and believed that protein enriched formulas and foods shouldn't replace breast milk [5]. As one prominent scientist wrote in 1966, "Millions of dollars and years of effort into developing these [high protein] foods would fare better spent on efforts to preserve the practice of breast feeding being abandoned everywhere."

The debate essentially ended when in leading scientists within the US and London independently concluded from the scientific evidence that a scarcity of food was the most problem: "The concept of a worldwide protein gap is not any longer tenable the matter is especially one among quantity instead of quality of food."

This conclusion influenced subsequent efforts to tackle malnutrition in developing countries. For example, a proper UK advisory committee on international nutrition aid recommended that, "the primary attack on malnutrition should be through the alleviation of poverty aid should be directed to projects which will generate income among the poor, even where such projects don't have any marked effect on the value of the country concerned" [6].

However, the sooner decades of uncertainty had fostered a multinational industry that continued to market formula and baby foods in low income countries supported their protein content and nutrient fortification. In addition, nutrient supplementation strategies remained effective at preventing or treating endemic deficiency

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diseases. Thus, despite the shift in scientific thinking to specialize in economic development, substantial emphasis remained or maybe accelerated on providing sufficient calories, most frequently as starchy staples, plus vitamin fortification and supplementation.

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Conflicts of Interest

The author has no known conflicts of interested associated with this paper.

References

1. Hetzel BS (1983) Iodine deficiency disorders and their eradication. Lancet 2:1126-1129.
2. Cobra C, Rusmil MK, Rustama D, Suwardi SSD, Permaesih D, et al. (1997) Infant survival is improved by oral iodine supplementation. J Nutri 127: 574-578.
3. Thilly C, Lagasse R, Roger G, Bourdoux P, Ermans AM (1980) Impaired fetal and postnatal development and high perinatal death rate in a severe iodine deficient area. Thyroid Res Austr Acad Sci 20-23.
4. Haas JD, Brownlie T (2001) Iron deficiency and reduced work capacity: a critical review of the research to determine a causal relationship. J Nutri 131: 676S-688S.
5. Gibson RS, Hotz C, Temple L, Yeudall F, Mtitimuni B, et al. (2000) Dietary strategies to combat micronutrient deficiencies of iron, zinc, and vitamin A in developing countries: Development, implementation, monitoring, and evaluation. Food Nutri Bull 21: 219-231.
6. Darnton-Hill I, Nalubola R (2002) Fortification strategies to meet micronutrient needs: successes and failures. Proc Nutr Soc 61: 231-241.