

Acceptance of the Howland Award: Childhood Nutrition—50 Years Later

LEWIS A. BARNES

University of South Florida, College of Medicine, Tampa, Florida 33612

Just 25 years ago I addressed this audience to introduce my mentor, Dr. Paul Gyorgy for the Howland Award, and just 15 years ago I sat in this audience to hear my role model, Dr. Charles Janeway, tell how overwhelmed he was at hearing that he had received the Howland Award. Compared with these giants, imagine my embarrassment at hearing Grant Morrow introduce me, or when Frank Oski called to tell me that I had been chosen to receive the award. I asked him the basis of the choice. He said I was the oldest member of the APS who could still stand and talk.

Whatever the reason for my being nominated, one factor is that I was at the right place at the right time. Almost all my teachers were inspiring. In addition to Dr. Janeway, Sidney Gellis kept us all on our toes, or on our knees reaching for the pearls. Drs. James Gamble and Bill Wallace taught me precision (Table 1). Fred Robbins, Jim McKay, and Dav Cook were hard taskmasters as chief residents. My subsequent bosses were also supportive. John Mitchell, Al Gellhorn, and Donn Smith were generous deans to Pediatrics, and Phil Farrell and Jaime Frias, as chairmen, allowed me unbelievable freedom. In fact, they rarely knew where I was. The vice president of Medical Affairs at University of South Florida, Ronald Kaufman, is an ex-student who heeds the Hippocratic Oath in reference to teachers. My experience as a chairman in Florida was unique since the three chairmen at that time, Gerry Schiebler, Bill Cleveland, and I, covered over each of our many deficiencies.

In Boston, I was introduced to the magic of breast milk (Fig. 1) and in Philadelphia this was fostered. Furthermore, in Philadelphia I was blessed with getting fantastic students. Not only Grant Morrow, Professor and Chairman at Columbus, but also Frank Oski, Mr. Pediatrics and Professor and Chairman at Hopkins; the late Bill Mellman, Professor and Chairman of Pediatrics and Human Genetics at Penn; the late Spike Miller, Professor and Chairman at University of California, Davis; and Jim Stockman, President of the American Board of Pediatrics. Mike Kaback, formerly Chairman at University of California, San Diego, made his claim to fame as a student by dropping his experimental cells on the floor, scooping them up, and winning 1st prize in research. Also memorable was Stephan Ladisch, who put ether in a refrigerator and blew up the whole lab, only to become Director of Oncology at George Washington Children's Center. Maria Delivoria, an early appointee, proved that low-birth-weight infants were not required to breathe since she could do that for them.

Also notable was the appearance in my lab of Nobel laureate Richard Kuhn (Table 2), who watched me separate crystals and said that his grandmother had better equipment when we isolated and identified methylmalonate in vitamin B₁₂-deficient rats, or when my then 6-year-old daughter visited the lab and Frank Oski drew my blood for vitamin E level and my daughter

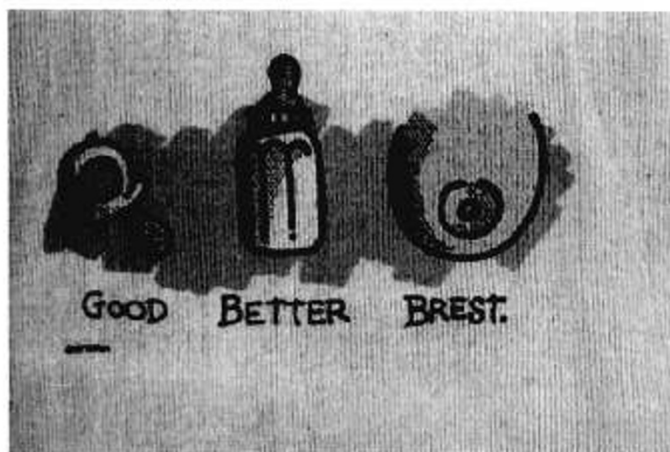


Fig. 1.

Table 2

It's only the lead reindeer
 who gets a change in scenery.

Table 3

Some time you'll come to a fork in the road.
 Take it.

(Yogi Berra)

Table 4. *The four food groups*

Canned
 Frozen
 Instant
 Lite

Table 5. *The four food groups*

Vegetables and fruits
 Meat, poultry, etc.
 Dairy, milk
 Cereals

Table 1

Cholesterol has replaced smoking
 as the leading cause of statistics.

disappeared, having just passed out. Incidentally, Frank bragged about how beneficial vitamin E was to him, but his level was almost 0 since the preparation he was taking was unabsorbable (Table 3).

My ex-students at Wisconsin, Frank Greer, John Pellett, Elaine Mischler, and Ted Goodfriend, were very protective and kept me out of too deep trouble.

Among the other students to whom I am grateful and who have demonstrated their value manifold are people like the late Dave Cornfeld, formerly Vice-Chairman at Pennsylvania; Lester Baker, Director of Endocrinology; Charles Stanley, head of me-

Food Guide Pyramid

A Guide to Daily Food Choices



Fig. 2.

Table 6. *Evaporated milk formula*

Evaporated milk	13 ounces
Karo syrup	2 ounces
Water	17 ounces
	32 ounces

Table 7. *Probable premature essentials*

Vitamin E
β -Carotene
Long-chain polyunsaturated fatty acids
Iron
Zinc
Others

Table 8. *Feeding goal evaluations*

Old	New
Life	Development
Growth	Behavior
	Intelligence
	Degeneration

tabolism; Walt Tunnessen, Director of Residency Training there; Charles Hertz, very involved in delivery of care at reasonable cost; Lawrence Naiman, Director of a Red Cross Blood Bank; Burt Lubin, Director of Research at Oakland; my present associates and ex-students Allen Root and John Curran, both Vice-Chairmen at Tampa; John Malone, Professor and Director of Diabetic Research; Ted Tedesco, Professor of Pediatrics and Cytogenetics; Jim Hallock, a Dean and Vice Provost; Doug Barrett, the first student of University of South Florida to become a Department Chairman; George Bissett, who stops arrhythmias by putting kids' heads in ice; Dave Hannon, who examines hearts on a tilt table; and my ex-student and present collaborator, Jane Carver. Aree Valyasevi, a longtime student and colleague, rejuvenated pediatrics in Thailand and for many years stimulated nutrition research there.

I also consider myself lucky to have lived professionally through many changes in infant and childhood nutrition. People say only babies like change. Maybe that's why I've enjoyed them.

Fifty years ago, the main thrust for infant feeding was the recommendation that the best feeding for infants was mother's milk. This has not changed. Fifty years ago, childhood nutrition was governed by the "basic four" (Tables 4 and 5). This has been modified by the United States Department of Agriculture pyramid (Fig. 2).

In the intervening 50 years, a few notable changes have occurred, hopefully with improved results. Many mothers were called on to work in factories during World War II, and breast feeding declined. The standard infant formula of that era was an evaporated milk formula (Table 6) that was generally satisfactory but resulted in some illnesses including diarrhea in about 10% of infants. Formulas that more closely simulated human milk were developed with decreased protein, a single sugar, and substitution of vegetable fat for butter fat. Complications related to the formula and morbidity markedly decreased to present levels. For those intolerant of cow's milk, soy-based or hydrolyzed protein milks were developed, using techniques developed propositiously. The importance of delaying introduction of supplemental food was recognized. Foods for those with inborn errors of metabolism were created. Nutrition for children with diabetes became more rational.

A major change occurred as a corollary to the development of packaged formulas. With evaporated milk as the standard feeding of the bottle-fed, every hospital with a delivery room was required to have an infant formula room. These rooms were generally 200-400 square feet, contained a bottle washer and autoclave, and usually had a nurse or nurse's aide on duty part of the day to prepare formulas, a cross that hospital administrators had to bear.

Major changes occurred in the feeding of prematurely born infants. The standard formula of that era was a high-protein, low-fat milk, which resulted in azotemia, hyperelectrolytemia, and diarrhea in as many as 50% of premature infants. Almost no premature infants with birth weights less than 1500 grams survived. About 40 years ago, formulas similar to present formulas for term infants were given to the premature infants with dramatic improvement in outcome of infants with birth weights of 1500 grams or more. Although not universally accepted, agreement was reached regarding requirements for growth.

About 30 years ago, neonatologists found a new weapon for respiratory therapy. Survival of premature infants with birth weights less than 700 grams is now common, requiring reinvestigation of nutritional needs of these very-low-birth-weight infants, a process presently in evolution. Vitamin E, other antioxidants including β -carotene, long-chain polyunsaturated fatty acids, inositol, iron, zinc, other trace minerals (Table 7), and other trace substances are under investigation and require appropriate definition.

The next 50 years will undoubtedly bring even more striking nutritional changes. Until now, the main goals of feeding were measured by life and growth. Already, new, more sophisticated measures are being introduced, particularly those related to behavior, development, and delay of degeneration and degenerative diseases (Table 8). DNA technology will bring new foods, special foods to modify the genes of the host will be developed, and dietary neurotransmitters will be used effectively. Concomitantly, expectations of what nutrition can and cannot do will become more rational toward making a healthier and better (?) world.

Before concluding, I must note that anything I accomplish is not possible without the unquestioning support of my family, and reiterate that any kudos I may receive are entirely due to the productivity and accomplishments of my students.