
Nutrition education in a world of limits*

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It is an honor and a great pleasure for me to be here this morning. Somehow it seems like a very long time and a very long way from the first week of December in 1978 when I had a letter asking whether I would be interested in speaking at the Jubilee ANZAAS. From the beginning it was not only your country which interested me, but your theme 'Science for a sustainable society'. For I spend a great deal of time thinking about what a sustainable food supply will look like—so much time that some of my colleagues have suggested, not always in a friendly tone—that I ought to get on with nutrition education and stop 'mucking about' in environmental issues.

I have long been convinced, however, that nutrition education and the environment are intimately linked. I teach a course called nutritional ecology to nutrition education students and I want to talk to you this morning about that linkage. I am going to begin by raising the question of what nutrition education is or ought to be and then go on to discuss why I think an understanding of world limits is a central piece of the content nutrition educators need to be dealing with.

I would like to begin by asking a question—a very important question, I think, but often neglected. Why do we have to have nutrition education at all? Obviously people survived for millennia before nutrition became a science—or a word. They survived by the cultural transmission of eating patterns which kept them alive. 'We must suppose', as Margaret Mead told the American Dietetic Association thirty years ago, 'that in any culture which had too bad a pattern, the people perished . . . each pattern has been based on an empirical nutritional science; if it doesn't include at least the absolutely essential nutrients, the people would not have survived. No one knew what they were doing, no one knew why they ate the things they ate, but gradually, over a period of time, viable patterns have been established'.

Now let me add a few caveats. One cannot argue that these traditional diets were

optimal—merely that they represented patterns compatible with survival through the reproductive years—else they would never have become traditional. It has sometimes been suggested that uncorrupted 'primitives' have some sort of body wisdom which leads them to seek out and consume the foods they require, but there is little evidence that such a body wisdom ever existed. Even in the most 'natural' situations children would need to be protected—probably by maternal constraints—from consuming poisons. And given such protection, the child would still be vulnerable to fatal mistakes if the environment contained anything except completely 'natural' foods—since that is all evolution could have provided for. In short, what children survive on—and have always survived on—is cultural wisdom, not body wisdom. They follow the traditions of their group.

And now, not at all gradually, over a comparatively short period of time, those traditional patterns have been drastically modified or eliminated altogether, not only in the developed countries like our own but in almost every part of the world. In the U.S. in a span of fifty years, the number of products in the marketplace has doubled, and redoubled, redoubled and then redoubled again. Hunters and gatherers knew and ate an astonishingly large number of different living things—perhaps as many as 800. The contemporary shopper in my country, devoting considerably less time and mental space to the task of food acquisition than did her predecessors, is supposed to choose wisely from 12 000 items, most of which did not exist in her grandmother's time and most of which bear an obscure, remote and/or tenuous relationship to anything one might hunt or gather.

The hunter-gatherer child who went digging with 'Mom' or hunting with 'Dad'

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gradually learned where to get food and how to distinguish between the edible and nourishing and the non-edible and dangerous. The contemporary child in my country joining 'Mom' for a stroll through the colored aisles of the supermarket learns to nag for 'Count Chocula' and 'Mars Bars', and, in the local fast food shop, masters the litany of ordering a 'Big Mac' and fries. Indeed, it has even been suggested by one author that food and ritual are mixed in such places just as they were in primitive societies. In a recent issue of the *Journal of American Culture*, author Conrad Kottak argues that McDonald's restaurants have become the United States' equivalent of holy places where our entire behavior is ritualised. In a McDonald's, as in church, he points out you know who is going to be there, you know what you're going to be asked to say, you know what is going to be said to you, and you know what you are going to do. All of which gives a great deal of security to people in a society where so much change is chronic.

In any case, the child who goes to the supermarket or the fast food shop is learning his culture's foodways. But in these places, the parents' mandated choices are based on no carefully accumulated tribal wisdom. They are based on some vaguely held ideas about the limitless goodness of meat and the painful necessity of vegetables, on some poorly remembered concepts of 'nutritional balance', on a commercially encouraged fascination with micronutrients—fascination which enables endless products made largely of refined flours, sugar and fat, and a few million dollars' worth of vitamins and minerals, to be sold in the United States as 'nutritious'. The choices are based on 'whatever tastes good' to 'Dad' and the children, and on the fact that a product is 'new'.

We have fully separated palatability from nutrition, as John Yudkin has pointed out, so that unlike other animals we are no longer assured of getting what we need so long as we just eat what we want. In short, we need nutrition education because, in my country at least, we have raised at least one generation which knows astonishingly little about the sources and kinds of foods on which humanity has survived through millennia. Indeed, we, in the United States, who are somewhat more 'advanced' than

other countries, may have more than one such generation—we are now into a generation of 'cooking age' daughters to whom 'Minute Rice' is just like mother used to make.

So what is nutrition education? It is to a very large extent the replacement of folk wisdom, about which foods are 'good' to eat, with wisdom acquired in some other manner, about which foods are 'good' to eat. Now I want to spend much of the rest of my talk by dealing with the question of which foods, in the last fifth of the 20th century, are 'good' to eat—using the word 'good' in its broadest sense. Before I do so, however, I want to deal with the question which always seems to spring to mind—namely, where does nutrition come into all this? If you spend all your time talking about foods, you're not going to have enough time to talk about nutrients. One of the things I have learned in the last decade is that where the public is concerned, useful nutrition education is probably not merely a watered down version of what we teach our graduate students, but something quite different. It is, as I said earlier, a mechanism whereby people can learn what foods are good for them to eat in a society which has eliminated the traditional routes whereby such information was communicated.

We tend, as professionals, to assume that the appropriate mechanism is an increase in what we call knowledge. And very often in academic circles, we define knowledge as something that television, for example, does not convey. We say television is not a good medium for 'teaching' people anything—'anything' being what we define as knowledge, like the fact that normal body temperature is 98.6°F. We academics do not define knowledge as what I would call body wisdom, or the things we know about someone when we say we 'know' that person. We do not define knowledge as what you can do as a result of watching your mother skim jam or watching your father dig for a bandicoot. This is not knowledge as we define it.

It was our kind of academic knowledge Margaret Mead was talking about when she observed that while people used to eat certain foods ritually because they had been given to them by their mother's brother, we can now eat them because we know they contain certain nutrients. 'Now that we have

nutritional science', she wrote, 'it is possible to go a step further. We don't need to rely on habit and custom quite as much and we can raise our habits to a higher level'. We can choose foods, in other words, not on the basis of habit, but of knowledge.

We in nutrition like to believe that is so, since it gives us a justification for transmitting to others some portion of the arcane biochemical information we have so arduously acquired. It would be exciting for all of us if the public really wanted to know more about nutrition science. It would be rewarding to professionals if there were widespread interest in the mysteries of nutrient interaction and the intricacies of cellular metabolism. Surely every profession wishes for a level of public curiosity about its own field at least sufficient to permit the public to admire the professionals' superior level of mastery. But such admiration is, alas, not to be bestowed on us. In my country at least, we nutritionists are doomed to suffer conversations with strangers who, on learning our identities, rush to tell us how zinc helped them, never thinking to ask us (in our superior wisdom) whether it *should* have. Graduate students at my university pay \$450 to sit through a non-majors course in nutrition science. They are intensely interested in learning whether or not they should take vitamin C for a cold, but much, much less interested in learning even the basics of ascorbic acid absorption, metabolism, and excretion—or of scientific methodology—which might help them resolve that question. Indeed, in the real world it is hard for even professional nutritionists to cope with the disparity between what they have had to learn to graduate and what they really get to use. Or, as one of our graduates put it, 'Sometimes when I sit there telling that fat lady not to eat chocolate cake, I ask myself why I had to learn the Krebs Cycle'.

The simple fact is that in the real world many more people want to know about chocolate cake than want to know about the Krebs Cycle. Indeed, in the real world there are more experts in chocolate cake than there are nutritionists. So I find myself repeating to my nutrition colleagues, who seem to want to teach everyone about nutrients, that much as we might wish to make the average citizen into a mini-nutrition scientist, we are not going to suc-

ceed in doing so. And if what we are concerned about is, as I think it should be, helping people eat 'right', then it should be clear to us, of all people, that knowledge of nutrition does not bear any necessary relationship to healthful responsible eating.

What, then, ought to be the appropriate content of nutrition education in the last fifth of the 20th century? What do people need to know, and do about food as we begin to close in on the year 2000? Since future prediction is perhaps as risky an undertaking as one can imagine, no sensible person would be so bold as to suggest she has an absolute answer for that question. It does seem clear, however, that the overriding problem where food is concerned is what to do about the fact that, while some of us are chronically overfed, much of the world still has to worry about where the next meal is coming from. It seems clear that the world-food-population problem is not going to be resolved, in time, 1) unless we can find some way to overcome distributional inequities of a variety of sorts and 2) unless we sustain the earth's capacity to produce food so that there will be something to distribute equitably. If we run out of food or of the inputs required to maintain its production, we shall have more to worry about than nutrition education.

This topic is one to which I have addressed some considerable thought and research (indeed I have put together a book), but I shall be forced to deal with it this morning very cursorily. And I shall have to assume that if you find the ideas startling and unsubstantiated, you may wish to conclude, graciously, that substantiation is available elsewhere.

By the standards which seem appropriate to apply to the final fifth of a century which has changed as rapidly as this one, no education can be a quality education unless it is designed to equip children to live in their future—not our future—but theirs. Therefore, every educator has an obligation to become a futurist. Every educator has some obligation to project present trends into the future and take it as his or her task to prepare the young people for whom he or she is responsible to meet the world as it will be. Where food is concerned, I see no evidence that we are doing this.

I can speak from personal experience only of American children and their parents,

exist economically as we are, we must try by might and main to remain stupid.

Our problem is that as living human organisms we are utterly dependent on complex foodstuffs for survival—and to make those foodstuffs we are utterly dependent upon the continued functioning of a feeding web—an as-yet-untathomable set of biological interconnections maintaining the flows of energy and materials through living matter. . . . It is not the limited availability of things that is our most serious problem. It is the limited tolerance to disruption of processes. What will stop us in the end is not the fact that we cannot find more energy, fix more nitrogen, mine more potash, or impose more technological fixes; our problem is that in the process of doing so we are threatening to impair the very food-producing systems we are striving to "improve".

It is urgent that governments and peoples around the world be brought quickly to an understanding of where we really stand so that people who live in every sort of ecosystem on the globe can begin to work toward the establishment of sustainable food-producing systems suited to their bioregions. We are only beginning to understand, as energy prices continue to rise toward a level that will reflect their true value in historical terms, the irrationality of food systems, like our own, which consume more energy than the calories they provide. We will need to help people learn to examine the food habit changes, primed by a growth oriented world-wide food industry, which have led whole peoples to come to depend on foods (exotic to their regions) which are grown many hundreds and often many thousands of miles away from where they are consumed.

The thought that the world may lurch from energy crisis to energy crisis, from apparent food shortages to apparent food glut without understanding the constraints that underlie all these surface changes, is terrifying. How, indeed, will any sort of democratic system survive if the free and educated citizens of the most developed nations of the world do not understand the economic, social, political, and—most importantly—the biological systems on which they are all entirely dependent for food? Unfortunately, at this moment in time, formal education seems not merely to be

and I suspect that we are—where food awareness is concerned—at the extreme end of a spectrum which starts at one end with a so-called primitive agriculturist (or hunter-gatherer) and ends in an American supermarket. Yet everywhere in the world, humanity is destroying, usually unknowingly, the underpinnings of its own survival; whether it is in impoverished settlements at the edge of the desert where grazing animals nibble down the last of the plant life, thus year by year extending the lifeless sands, or whether it is in the United States midwest, where year after year we lose two bushels of topsoil producing one bushel of corn. While there has been widespread debate, and some limited action, in regard to an understanding generally subsumed under the title *Limits to growth*, the fact remains that the world's educators have no more come to terms with the implications of that understanding than have the world's politicians. We have environmental education and energy education in my country—specialties which provide work for teachers who in a time of declining child populations might otherwise be unemployed. But there is little evidence of widespread understanding that we are not talking about whether we can find enough more energy or mining that we are not talking about whether we have destroyed the fragile biological systems which we depend on to provide us with all those things which, unlike transistor radios and digital watches, are critical to our survival. Those things include enough food that is safe to eat, enough water that is safe to drink (and to use to grow food) and enough air that is safe for animals (including humans) to breathe and benign for plants to absorb.

At this point in the history of the earth there is perhaps nothing that is more critical for children and their parents to learn than that all human sustenance ultimately comes from plants, or *ultimately*, from the sun by way of chlorophyll. Our dependence on chlorophyll is so total that a poetic Chinese physiologist called it 'The Green Thrallidom'; or our feigned ignorance—about the systems on which we are dependent is disturbing. The mythologies we allow ourselves to sustain our pleasant lives seem to confirm Jules Henry's suspicion that 'in order to

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failing to teach the right lessons; it seems often determined to teach the wrong ones. We who are educators do this implicitly, by behaving in a manner—our accustomed manner—which denies the existence of a real crisis. We do it explicitly by teaching concepts which are accurate only within the very narrow confines of single disciplines but take no account of the world outside of them. And we do this in both developed and developing countries.

A recent story in the *New York Times* reported on 2000 Indian students who are studying advanced technical skills at an institute of technology. This 'MIT of India' sits on a 1000-acre richly landscaped campus with three swimming pools. The Institute also sits on a desert in a country where water is a critical agricultural and social limit. How acutely do the students at this institute perceive India's water problem? Gandhi once said that all meetings of persons gathered to solve India's problems should be held sitting on the ground in villages, not sitting on soft chairs in air-conditioned city rooms. But then, of course, it is only recently in the United States that one is not thought a fanatic if one questions the appropriateness of serving large slabs of roast beef at world hunger banquets.

It is difficult to act as if there were a crisis when everyone else seems to be staying calm. It is also difficult to *teach* as if there were a crisis. The reasons why we keep 'teaching' trees while the forests die around us is a topic too vast to seriously approach. What I should like to do in closing is to suggest some of the reasons why change has been and will continue to be difficult.

To begin with, there is the problem of specialisation. Useful nutrition education in the final decades of the twentieth century may need to include information regarding

not only how food grows and where, but how it is processed and why, with what effect on its price and nutritional quality, with what cost in energy and other resources. Nutrition education may have to concern itself not only with what people eat, how they eat it, and how what they eat affects them, but indeed with whether they have anything to eat at all—and if not, why not. Most nutrition educators will instantly recognise that they do not know enough to teach all this. But they may have no choice; if they don't teach it no one else will. Nevertheless, to teach so broadly is to risk being called a generalist which is to risk academic disdain.

Moreover, teaching the whole truth, teaching people about who eats and who does not, and why, and about what ought not to be eaten as well as what ought to, will make nutrition a politically charged subject, a subject that, more than mathematics or reading or even history or social studies, will collide early on with powerful economic interests. So the second reason why change will be difficult has to do with power. So long as nutrition can be defined as the study of nutrients and how the body uses them, nutrition will remain a harmless field. The study of food as a chemical system is considerably less threatening to the status quo than the study of a food as a piece of an economic system. To teach the right things—simply to ask the right questions—is likely to prove unsettling to industry. However, not to do so is to continue to settle for ineffectualness.

Finally, most of us would rather plan than change. Most of us would rather not do what we are not trained to do. Unfortunately, no one is properly trained to avert an apocalypse. Those of us who wish to avert it will simply have to use whatever skills we have to try to do so.