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**Location:** STORAGE/ARIEL ✓

**Journal Title:** The journal of interdisciplinary history.

**Volume:** 14 **Issue:** 2

**Month/Year:** 1983 **Pages:** ?

**Article Author:**

**Article Title:** DIET AND THE LOCALIZATION ..

**Imprint:** [Cambridge, Mass., M.I.T. Press] 1970 99

**ILL Number:** 33072724



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Gretel H. Pelto and Pertti J. Pelto

## **Diet and Delocalization:**

**Dietary Changes since 1750** During the past two centuries virtually all of the populations in the world have experienced dramatic changes in their dietary patterns. In the industrialized countries changes in food patterns have been associated with improved levels of nutrition and public health, although some nutrition-related diseases are increasing. Similar processes of change in the less industrialized nations, however, have often had serious negative effects. We examine here some of the primary processes of change in food resources and distribution over the past 250 years, focusing on three main transformations that have had profound effects on global eating patterns. Our primary thesis is:

First, the general direction of transformations in food use throughout the world in the past two or three centuries has involved an increasingly rapid "delocalization" of food production and distribution. By "delocalization" (discussed more fully below) we refer to processes in which food varieties, production methods, and consumption patterns are disseminated throughout the world in an ever-increasing and intensifying network of socio-economic and political interdependency. From the point of view of individuals and families at any one place on the globe, delocalization means that an increasing portion of the daily diet comes from distant places usually through commercial channels.

Second, in the industrialized nations, delocalization has been associated with an increase in the diversity of available foods and the quantity of food imports, and, therefore, with improved diets. In earlier periods this improvement of diet, especially through diversification, primarily benefited the upper social classes, but

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0022-1953/83/020507-22 \$02.50/0

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during the twentieth century the effects have diffused to a wide spectrum of people in the "developed" world.

Third, in the less industrialized countries of the world, the same processes of delocalization have tended to produce opposite effects on dietary quality, except for the elite. Until recent times many peoples in the Third World have been primarily dependent on locally produced food supplies, which remained largely outside the networks of commerce. As these populations have been drawn more and more into full commercial participation, economic and political forces have encouraged concentration on one or two main cash crops, with an accompanying deterioration of food diversity, as well as a loss of local control over the distribution system. Thus, world-wide food distribution and food-use transformations have occurred at the expense of economically marginal populations.

These general ideas about changes in food availability and dietary patterns have been discussed for a number of years. Here we present them in a manner that is intended to encourage historical research on these associations. To date there has been relatively little careful empirical investigation of the relationships among social change, dietary change, and nutritional status and health. Research questions need to be framed in a manner that permits hypothesis-testing and a refinement of the general model.<sup>1</sup>

THREE MAJOR PROCESSES OF DIETARY CHANGE     The dramatic transformations in dietary patterns that have taken place in the past two and a half centuries are one key aspect of the much larger picture of massive social and economic change that has affected all parts of the world. The specific dimensions have varied widely in relation to particular historical, political, and ecological conditions, but the basic food-use changes of interest to us have largely come about as a result of three fundamental developments:

1. A world-wide dissemination of domesticated plant and animal varieties.
2. The rise of increasingly complex, international food distribution networks, and the growth of food-processing industries.

1 Cf. Alan Berg, *The Nutrition Factor* (Washington, D.C., 1973); Frances Moore Lappé and Joseph Collins, *Food First* (Boston, 1977).

3. The migration of people from rural to urban centers, and from one continent to another, on a hitherto unprecedented scale, with a resulting exchange of culinary and dietary techniques and preferences.

Each of these processes has been powerfully influenced by national and international politico-economic forces, cultural and religious movements, and other factors. One fundamental sector of great importance has been the development of new technologies; in particular, transportation and communications technologies have played major roles.

Our rationale for focusing on the three processes listed above rests on a view of the basic elements of delocalization as they affect the behavior of particular local communities. That is, if we picture the dietary possibilities of people in a French rural commune, a small valley in Mexico, or an island in Polynesia, their food selections will change if:

a. New plant and animal varieties are introduced to the community for local production, or locally produced foods are removed from the community for sale elsewhere.

b. New foods are made available through commercial or governmental channels.

c. The people themselves move to a new area, or they receive immigrants from elsewhere, resulting in cultural exchange of culinary/dietary preferences.

Changes may also occur because of purely local developments of new food production or preparation techniques, but such occurrences are generally much less frequent.

Throughout our discussion of dietary change we confront the philosophical question of basic causes. Attempting to isolate clear, necessary and sufficient causes may have some utility in relatively simple systems. However, human behavior is more understandable if we conceptualize a system of complex, interconnected forces (including biological, psychological, economic, political, technological, and other factors), so that a focus on one component as a prime mover rests more on philosophical or stylistic preference rather than on demonstrable, empirical evidence. Understanding the developments in human food use patterns of the past 250 years depends, first of all, on sorting out the

primary (descriptive) trends and processes, leaving for the future the search for the more or less clear prime movers.

**THE CONCEPT OF DELOCALIZATION** The concept of delocalization, which is central to our analysis of changes in human dietary patterns, is one major aspect of all the historical changes to which people give various labels such as modernization, development, progress, acculturation, and so on. In using the term delocalization we are focusing attention on one fundamental, apparently unidirectional tendency in human history, particularly of more recent centuries. Delocalization has many different facets, but there are two that are most important for our discussion here.

First, there is the delocalization that results in the reduction of local autonomy of energy resources, due to dependence on gasoline-driven equipment for transportation, local industry, and other essential processes. In recent times this loss of local energy autonomy has been quite striking in the remoter areas of the globe where motor-driven boats, snowmobiles, and other equipment have been widely adopted.

Second, in more complex urban centers, delocalization is evidenced in the increased sensitivity (of prices, costs, etc.) to political fluctuations in any sector of the world energy and food network, as can be seen, for example, in the world-wide impact of Soviet grain purchasing policies, OPEC price manipulations, coffee and sugar production levels, and the beef consumption demands of the international fast-food industry.

**DELOCALIZATION AND FOOD SYSTEMS** One way to gain an understanding of delocalization in matters of human food use is to consider the opposite—local autonomy. In small-scale hunting and gathering societies, such as those of the Inuit (Eskimo) and the San peoples of the Kalahari, or among our ancestors of pre-agricultural times, the great bulk of food supplies and other energy resources had to be obtained from the immediate local environment. For that reason hunting-gathering societies have always been rather small—usually no more than 300 to 400 persons in the local group (often much less), with population densities that seldom exceeded ten persons per 100 square miles.

Among a great many small-scale cultivator peoples of central Africa, the Amazon rainforest areas, and the South Pacific, local

groups have been largely dependent on their own food and energy resources, although some trading of food and other goods has been common between coastal and inland peoples, and between animal-keeping pastoralists and their more sedentary neighbors; occasionally, trade has been widespread among the various islands of the South Pacific.

Despite the presence of small-scale regional trading, human societies of earlier times were, to a considerable extent, unaffected by the state of food supplies in other areas. If crops failed or herds were decimated by disease in any particular area, famine was the usual result; there was no way to send for disaster relief.

In contrast to small-scale, semi-autonomous communities, peasant populations in Europe, Asia, and Latin America, in past centuries, have been a good deal more dependent on at least some commercial exchanges with other regions and nations. A common feature of peasant societies, however, has been the dependence on a wider marketing system for the purchase of non-food supplies and equipment, in exchange for which local peasant peoples were able to transfer their surplus food production, thus feeding not only themselves but the non-food producing people of the cities. A large proportion of the peasant family's food needs were met from their own farm, even though they were dependent on the commercial system for iron equipment, some clothing, a few luxury items, and (in recent decades) special foods such as sugar, salt, tea or coffee, and spices.

Before the fifteenth century there was a slow and gradual dissemination of certain major crops and food animals into ever-wider parts of the world. For example, the wheat, barley, and dairy food complex spread into all parts of Europe, south into Africa, and eastwards into Asia, from the presumed origins in the Far East. A similar process of diffusion occurred with the rice-growing complex in East and South Asia. These slow processes of diffusion certainly had significant effects on food systems in the world but the impact of changes precipitated by the age of discovery were dramatic and rapid.

**WORLD-WIDE DISSEMINATION OF DOMESTICATED PLANTS AND ANIMALS** Beginning with Columbus' voyages to the New World, and other fifteenth-century expeditions into hitherto unknown parts, Europeans acquired knowledge about food crops and pro-

duction systems that was formerly unavailable to them. At the same time, European settlers, missionaries, and adventurers spread the knowledge (and requisite seeds and other materials) of both Old World and New World animal domesticates to other parts of the world. By the beginning of the seventeenth century the boundaries of the various plant and animal species were transformed, as the major crops and animals were introduced into different ecological zones. By 1700 maize, rice, wheat, barley, oats, and potatoes, as well as cattle and other livestock had spread throughout most of the world, whereas earlier each of these food sources had been grown by only a segment of the world's population.

The consequences of the world-wide dissemination of domesticated plants and animals were dramatic. In Europe the slow but steady adoption of maize, potatoes, and other American cultigens began to have powerful effects by the eighteenth century. The addition of potatoes to the basic subsistence economy has been seen by some researchers as a cause of major changes in demographic patterns. For example, Vanderbroek has claimed that potatoes sustained rapid population expansion in the southern Netherlands in the middle of the eighteenth century. His data indicate that potato cultivation grew rapidly in the 1740s and 1750s, returning a five times greater yield per acre than wheat, which had previously been the main crop. Rapid population increases in that part of the Netherlands contrasts, in his view, with slower population growth in areas where potatoes were not adopted at that time.<sup>2</sup>

In approximately the same period the potato spread to northern Europe, where in Sweden, Finland, and Russia its cultivation was seen as an important hedge against famine. Governmental and private groups propagandized on behalf of potato cultivation, and free seed potatoes were made widely available. In Finland at the end of the eighteenth century the Finnish Economics Society distributed free seed potatoes and gave monetary prizes and medals to potato growers. "A famine and epidemic in 1765 persuaded Catherine the Great of the potential importance of the tuber to

2 Christian Vanderbroek, "Aardappelteelt en Aardappelverbruik in de 17e en 18e Eeuw," *Tijdschrift voor Geschiedenis*, LXXXII (1969), 49-68.



Russia, and her government launched a campaign to encourage its cultivation. However, the potato did not become a major crop in central Russia until after the crop failures of 1838 and 1839.”<sup>3</sup>

Some writers may have exaggerated the importance of the potato in the economics of Europe, but considerable weight may be given to the remarks of Morineau, who noted that “. . . the potato, thanks in part to its very real advantages, became the only short-term solution (to increased food needs) everywhere in Western Europe. This it remained, despite some periods of blight, as long as new granaries had not opened in other parts of the world and until, in due course, agricultural science was able to produce much higher grain yields than the traditional agriculture.”<sup>4</sup>

Negative consequences of the role of potatoes have been noted, particularly in the great potato famines in Ireland in the nineteenth century.

Ho and other scholars consider American cultigens to have been central to the growth of ecological carrying capacity in China. Ho suggests that by the end of the eighteenth century rice cultivation areas (the wetlands) and the dry region lands of millet and wheat had neared their limits of production, so that any further expansion of Chinese population would have been at the cost of increased nutritional deficiencies and periodic famine. However, the adoption of maize and sweet potatoes significantly increased the food supply.<sup>5</sup>

In presenting these observations concerning the world-wide diffusion of major cultigens, we do not need to subscribe to the theory that new foods caused population expansions in various regions of the world. In fact, it would appear that the causal arrows have often been in the opposite direction, in that population pressures have triggered the intensification of food production techniques. It is plausible that both types of situations have occurred repeatedly in different human populations: at times the fortuitous importation of new food crops or production methods

3 Alfred W. Crosby, Jr., *The Columbian Exchange* (Westport, Conn., 1972), 184.

4 Michel Morineau, “The Potato in the Eighteenth Century,” in Robert Forster and Orest Ranum (eds.), *Food and Drink in History* (Baltimore, 1979), 17–36.

5 Ping-ti Ho, *Studies on the Population of China, 1368–1953* (Cambridge, Mass., 1959). Crosby, *Columbian Exchange*, 199–200.

has occurred before population expansion; in other circumstances the reverse has happened.<sup>6</sup>

Europe and Asia were not the only continents that experienced large-scale changes in food production as a result of contacts with new cultigens. Africa was an early recipient of new production ideas, in part because slave traders introduced maize and other crops to West Africa in order to provision their ships. Maize was introduced so early in some parts of Africa that some researchers have argued for its aboriginal development there.<sup>7</sup>

In the Americas the powerful influences of wheat, barley, and other Old World crops have been overshadowed by the effects of the massive infusion of meat animals. Before the coming of the Europeans, the natives of North and South America had only turkeys, dogs, llamas, chickens, and guinea pigs as sources of meat. The meat of pigs, cattle, sheep, and other food animals were quickly included in the diet of both the European settlers and the native inhabitants.

**THE RISE OF COMMERCIAL FOOD DISTRIBUTION NETWORKS** A second major process in the delocalization of food occurs with the proliferation of commercial food distribution systems, which now affect virtually all societies. Food patterns in formerly remote communities are powerfully affected by the presence of commercially distributed food.

The growth of commercial food distribution networks has been intricately related to the development of food processing technologies. Food processing involves a wide spectrum of manipulation, from relatively simple preservation, such as canning and freezing, to the preparation of cooked, ready-to-eat meals and a variety of snack foods. The great expansion in commercial food processing has taken place in the twentieth century, although

6 Ester Boserup, *The Conditions of Agricultural Growth* (Chicago, 1965). William T. Sanders, "Population, Agricultural History, and Societal Evolution in Mesoamerica," in Brian Spooner (ed.), *Population Growth: Anthropological Implications* (Cambridge, Mass., 1972), 101-153.

7 Carl O. Sauer, *Seeds, Spades, Hearths, and Herbs* (Cambridge, Mass., 1952). Cf. Michael D. Gwynne, "The Origin and Spread of Some Domestic Food Plants of Eastern Africa," in H. Neville Chittick and Robert I. Rotberg (eds.), *East Africa and the Orient: Cultural Synthesis in Pre-Colonial Times* (New York, 1975), 248-271.

important developments occurred throughout the nineteenth century. French, British, and American inventors all contributed to the development of hermetically sealed canning processes in the 1830s and 1840s, followed by the processing of condensed milk and the mechanization of biscuit making.<sup>8</sup>

Prior to the nineteenth century the scope and scale of commercial operations in foodstuffs were limited. The larger and more important commercial houses dealt mainly in a few specialized items—coffee, sugar, spices, tea, salt, and alcoholic beverages. Some researchers have claimed that liquor and beer were practically the only foodstuffs for which production was responsive to demand before the latter half of the nineteenth century. However exaggerated such a statement, it does serve to highlight the importance of the commercial enterprises, and the more complex food marketing, that came into existence in the middle of the last century.<sup>9</sup>

**SUGAR: THE COMMERCIAL FOOD PAR EXCELLENCE** Sugar is one processed food item that has played a major role in dietary transformations since the eighteenth century. The history of sugar documents the growing significance of commercial food marketing over the past 200 years. Like many other food products, cane sugar was known and used for centuries in some parts of the world before it rose to prominence in European trade. Gourmets of ancient India knew sugar, and there was some cultivation of sugar cane in Arab Spain and southern France in the eighth century. However, it was a rare and costly luxury until cane production was initiated in the New World.

The special conditions of the Americas, which combined favorable growing conditions, large acreages, and the importation of relatively low-cost (slave) labor, brought about rapid increases in production. During the eighteenth century it was still a costly commodity, but as production increased there was a fairly steady drop in price, and public demand for sugar rose rapidly. The use

8 Waverly Root and Richard de Rochemont, *Eating in America* (New York, 1976), 158; James P. Johnston, *A Hundred Years of Eating: Food, Drink, and Family Diet in Britain Since the Late Nineteenth Century* (Montreal, 1977), 33.

9 Maurice Aymard, "Toward the History of Nutrition," in Forster and Ranum. *Food and Drink*, 1-16.

of by-products of the sugar cane process in the manufacture of rum contributed to the profitability of the sugar business. By the early years of the nineteenth century the average per capita consumption of sugar in the United States had risen to twelve or thirteen pounds per year. From that point the rise was relatively steady to 1929, when a peak of 109 pounds per capita per year was reached. During the Great Depression sugar intake decreased but rose again with better economic times. Patterns of consumption in England were similar, with a peak in 1960 of 112 pounds per capita per year.<sup>10</sup>

**MIGRATION: RURAL TO URBAN AND CROSS-NATIONAL POPULATION MOVEMENTS** The processes of change discussed thus far all refer to the transfer of ideas and materials—the food products themselves—from one area to another, accompanied by mechanisms of interdependency. The third mechanism is, superficially at least, different because the basic feature is the movement of persons. Migration to urban areas from rural regions, and movements from one nation or continent to another, introduce an additional dimension—food preferences and food knowledge are transferred by the migrants themselves. The migrants may exert their influence simply as individuals (or groups of individuals) with specific food preferences, but they also introduce change by actions, such as the establishment of food stores, restaurants, or other special enterprises.

Ethnic foods were introduced by migrants in earlier centuries and especially in America in the nineteenth century. There is a dual feature to the impact of migrant peoples on dietary practices: on the one hand, emigrés from distant places often preserved their traditional food patterns, so that, for example, Italian immigrants in major United States cities were soon able to maintain their consumption of pasta, sausages, olive oil, and other products in neighborhood cafes and restaurants, as well as in their homes; on the other hand these ethnic foods became available to non-Italians

10 Root and Rochement, *Eating in America*, 418; Richard O. Cummings, *The American and His Food* (Chicago, 1940); Chris Wardle, *Changing Food Habits in the U.K.* (London, 1977).

as well, and the growingly sophisticated urban-dwellers could select from a variety of different cuisines.

In most cases the old ethnic diets were not maintained in their traditional forms. Working hours—in factories, shops, and offices—soon made the old schedules (e.g. the large midday meal that is common in many European countries) difficult to continue. Even strongly held religious food patterns (e.g. among orthodox Jews) had to be modified to meet the new conditions.

One of the first ecumenical movements in ethnic food adoption was the spread of French cooking as a high prestige practice among upper-class and middle-class people around the world. Equally significant in influencing multi-cultural sophistication in food has been the spread of Chinese restaurants, which can be found in most major cities of the world today. Many of the international exchanges manifested in ethnic restaurants and grocery stores testify to the final phases of the colonial era, during which increasing numbers of families from “the colonies” established ethnic enclaves and food patterns in Europe: Indonesians in Holland, Indian restaurants and shops in England, and Moroccan and other North African coffee houses in France.

The latest phases of world-wide ecumenical sharing of cuisine (as opposed to dissemination of the raw materials) has taken the form of an accelerated development of international cooking at home. Also, visible today throughout the world is the rapid spread of multi-national, fast-food chains.

**MECHANISMS OF CHANGE AND CONSUMPTION TRENDS**      The three main processes outlined above have been vehicles by which long-standing dietary patterns have been more and more radically altered in practically all parts of the world. The results of these changes are reflected in consumption statistics and nutrient profiles, which show, for example, continuing increases in the percentages of sugar consumed as diets become “modernized.” In the United States the consumption of flour and cereal products dropped from 680 pounds per capita per year in 1910 to 450 pounds in 1970. During the same period vegetable fat consumption increased from 20 grams per capita per day to nearly 50 grams. Viewed in terms of nutrient consumption (rather than types of foods) in the period from 1910 to 1970 iron has declined

from 15.2 mg. per capita per day to 8.0 mg. while riboflavin increased from 1.86 mg. to 2.46 mg.; another eight vitamins showed similar increases during that sixty-year span.<sup>11</sup>

It is difficult to find adequate statistical information on dietary changes in small-scale, non-modern societies because of the paucity of careful, quantitative studies. However, some of the main dimensions of change can be inferred from recent ethnographic studies. For example, in the Alaskan Eskimo community of Napaskiak, Oswalt noted that "everyone regards certain [store foods] as absolute necessities. These include sugar, salt, flour, milk, coffee, tea, tobacco, and cooking fats. Other foods frequently purchased include various canned meats and fish, crackers, candy, carbonated beverages, canned fruits, potatoes, onions, and rice." Similarly, among the Miskito Indians of Nicaragua, store-bought foods already accounted for over 30 percent of the diet in 1969, when Nietschmann made a detailed analysis of their food system. The store purchased foods, including sugar, flour, beans, rice, and coffee, had captured two thirds of the Miskito food economy by 1973, mainly because of the depletion of the green sea turtles, which are now sold to international food companies rather than consumed locally. Since the purchased foods are quite different in nutrient content from the wild foods that they replace and are especially high in carbohydrates, the Miskito, like virtually all small-scale societies, are undergoing rapid dietary change.<sup>12</sup>

The Eskimo and Miskito examples are particularly illustrative because they clearly reflect two different aspects of the worldwide commercial food system: in the Miskito situation commercial food distributors have taken away a primary food resource—the sea turtles—thus forcing the local people to change their food patterns. In the North Alaskan situation the emphasis is on the increased availability of modern foods in the local stores. Even in cases where local traditional food resources are not depleted, the availability of sugar, flour, canned goods, and other store food has a powerful effect on diets.

11 United States Dept. of Agriculture, Report No. 138 (Washington, D.C. (1974); Willis A. Gortner, "Nutrition in the United States—1900 to 1974," *Cancer Research*, XXXV (1975), 3246–3253.

12 Wendell Oswalt, *Napaskiak: An Alaskan Eskimo Community* (Tucson, 1963), 102; Bernard Nietschmann, *Between Land and Water* (New York, 1973).

DELOCALIZATION AND THE FINNISH FOOD SYSTEM Changes in food use brought about by delocalization are clearly revealed in Finland, which was transformed from an underdeveloped nation into an urban, industrialized society from the 1930s to 1970. Until 1940 the great majority of Finnish families were rural; the major cities, other than Helsinki, were little more than overgrown market centers. In 1950 the infant mortality rate was still 43 per 1,000; before the war it had been considerably higher. In other health and welfare statistics, as well as in its income and occupational profile, Finland contrasted sharply with the more industrialized nations of Europe and America.

The traditional Finnish dietary pattern was heavily dependent on dairy products. Finland still ranks as the leading nation in the world in per capita milk consumption, in addition to which Finns consume large amounts of butter, cheese, buttermilk, and viili, a fermented milk product, which is somewhat akin to yogurt.

Grain products made up another major portion of the diet. Rye, oats, and barley had been the most important cereals in earlier centuries, with increasing amounts of wheat in the nineteenth and twentieth centuries. Potatoes were eaten practically every day in considerable quantity, a pattern that continues today for most of the population. Meat, and to a lesser extent fish, although consumed in modest quantities, have been important sources of protein.<sup>13</sup>

In the pre-World War II Finnish diet a major source of vitamin C was the wild lingonberry (and other berries), gathered in large quantities and stored for use throughout the winter. Also characteristic was a lack of green vegetables and fresh fruit, other than berries. Throughout the 1950s the supplies of imported fresh fruit in Finnish grocery stores was irregular.

During the 1960s the commercial food system changed drastically, as large supermarkets were established by several cooperative associations and by private entrepreneurs. Frozen foods, food freezers in stores and in homes, and many other technological features were introduced. A rapid expansion of the network of paved roads also contributed to these developments. At the same time, Finnish nutritionists and government policy-makers

13 I. Talve, *Suomen Kansanomaisesta Ruokataloudesta* (Turku, 1973).

mounted extensive informational campaigns to increase the consumption of vegetables and fruit and decrease the intake of saturated fats and sugar. The nutrition information programs were fueled, in part, by the realization that Finland had, until very recently, the highest rates of cardiovascular disease in the world.<sup>14</sup>

Food consumption trends from 1950 to 1973 show the interesting changes that have occurred during the recent decades of delocalization (see Table 1). These changes reflect delocalization both within the Finnish economy, and in relation to world-wide markets. Much of the increase in fruit and vegetables represents greatly expanded imports from Eastern Europe and the Mediterranean countries, made possible by the expansion of the modern European trucking network equipped with refrigeration, air conditioning, and other technological features. Meanwhile producers in Finland have begun to use artificially heated greenhouses (relying on new developments in plastic sheeting) to grow cucumbers and tomatoes, which are now in great demand since the introduction of salads into the Finnish diet.

From 1940 to 1970 Finnish farm families gave up most aspects of their earlier self-sufficiency in basic foods. In short, they changed from being peasants to being commercial farmers. The highly developed system of producers' cooperatives played a major part in these changes, augmented by the growth of private

Table 1 Consumption Trends in Finland, 1950-1973 (annual per capita consumption)

ITEM	YEAR					
	1950	1955	1960	1965	1970	1973
Wheat(ks)	81.5	86	75	70	65	60
Meat	60	60	60	60	60	60
Sugar(ks)	28.3	38	40	40	45	45
Rye	48	42	39	32	25	24
Butter/margarine	22	22	22	22	22	22
Fruit/vegetables	33	48	53	52	65	81

SOURCE: *Elinolosuhteet 1950-1975* [Living Conditions 1950-1975], Central Statistical Office of Finland, 86.

14 Ancel Keys, *Seven Countries: A Multivariate Analysis of Death and Coronary Heart Disease Rates* (Cambridge, Mass., 1980).



food-producing companies. Meat animals, milk, and cereal grains are now delivered directly to the cooperatives or to private buyers. In turn, the farmers buy back selected meat products at a members' discount. Certain parts of slaughtered animals (including the blood), that were routinely used in the family food economy, are now unavailable or must be purchased in processed form from the cooperatives. Blood pancakes and bloodbread, for example, are now generally made from packaged mixes. Even butter and cheese are usually purchased from the cooperatives to which the farmers sell their raw milk, unlike the pre-war days, when families prepared a large share of their own basic foods, from barn and field to the dinner table.

The changes in utilization of home-produced food in Finnish farming households represents delocalization at the local, or micro-level. Thus delocalization refers not only to the increased availability of foods from distant lands; it also means the giving up of local community control to the regional and national food-processing systems.

Although the impact of delocalization in terms of making new foods available was more dramatic in Finland than in some other Western European countries, the general process has been much the same throughout the industrialized world. The example of Finland is instructive because the major changes have occurred largely in the past fifty years, nearly a century later than in most parts of Western Europe. There have been major differences in some aspects of delocalization, as the pattern of land tenure, differences in international trading networks, and political processes have all strongly affected the course of developments in food distribution and dietary patterns.

**DELOCALIZATION IN THE THIRD WORLD**      A major feature of food delocalization in the nineteenth and twentieth centuries has been the transformation of food systems in non-industrialized areas as they have become involved in supplying some of the food needs of Euro-American communities. Sugar plantations were among the first manifestations of a rapidly developing commerce in food products. A large-scale banana trade developed later, mainly in the twentieth century. Shipments of bananas, like many other fruits and vegetables, could not become major world trade commodities until the development of effective storage technologies, in addition to faster shipping times.

In countries such as Jamaica the economic livelihood of many small farmers became tied to the fluctuations in world prices of bananas (or other cash crops), as well as to government policies of encouragement or discouragement of farm production. Jamaica is highly delocalized in terms of food resources, as most of the daily diet depends on imports from North America and other sources. The significance of delocalization for the Jamaican (as an example of the effects of modernization in Third World countries) is illustrated by events in the 1970s. As analyzed in a study by Marchione in the mid-1970s, the cost of food in Jamaica (not adjusted to take account of inflation) soared as a result of the oil crisis and other factors in international markets. In the period from 1973 to 1975 the retail price of wheat flour increased 142 percent, corn meal 100 percent, salt cod 75 percent, rice 65 percent, and sugar 60 percent. Banana prices, however, paid to local, mostly small-scale producers, did not rise.<sup>15</sup>

Marchione studied the impact of a nutrition program in the St. James area of Jamaica during this period and found that world market forces resulted in a return to subsistence crop-growing by many farmers. The expected negative effects of highly inflationary food prices appear to have been offset by increases in home-grown foods. Instead of declining, the nutritional status of small children in the St. James area improved during this period. The research design of the evaluation study made it possible to determine that it was mainly the farmers' food production responses to market conditions, rather than the local nutrition education program, that brought about improved nutritional status in the children.

It is also important, Marchione suggests, to note that during this period the climate of commerce in food was affected by the Jamaican government's policy of striving for greater national self-sufficiency. "Jamaican government policies to ban food exports, levy taxes on foreign-owned bauxite companies, create public service jobs and redistribute or force idle land into production represent concerted efforts to gain local control of energy forms and flows; i.e. power."<sup>16</sup>

<sup>15</sup> Thomas J. Marchione, "Food and Nutrition in Self-Reliant National Development," *Medical Anthropology*, I (1977), 57-79.

<sup>16</sup> *Ibid.*, 73.

Another striking example of the negative consequences of delocalization is the widespread adoption of beef cattle production in many parts of Latin America in response to the growth of hamburger and other fast-food merchandizing in the United States. In Guatemala, beef production nearly doubled from 1960 to 1972, yet domestic per capita consumption of beef fell by approximately 20 percent during the same period. In Costa Rica during the same period total production of beef rose from 53.3 to 108 million pounds, yet the amount available for domestic consumption remained constant (34.8 million pounds), resulting in a reduction of nearly one third in beef consumption while exports climbed from 17.5 to 73.7 millions of pounds.<sup>17</sup>

Analyzing the impact of this large-scale shift to beef production, DeWalt found that large areas of forest in Honduras were being cut down to make room for cattle. From 1952 to 1974 the forested area in southern Honduras was reduced from approximately 74,000 to only 41,000 hectares. During the same period the land area in permanent crops actually declined. DeWalt comments that the "implications of the conversion of southern Honduras into a vast pasture for export-oriented cattle production . . . are the following: first in the long run fewer individuals will have access to land on which to produce their own subsistence crops. Employment opportunities in the local region will decline because livestock raising is less labor intensive than grain crop production. The permanent and temporary migration that these processes produce can only exacerbate the already explosive social, economic, and political situation that exists in Central America."<sup>18</sup>

These cases are intended to illustrate how world-wide delocalization of food production and distribution has created a complex web of interrelations, changes which place local food-producing populations in serious jeopardy, particularly if they are dependent for their livelihood on one or two principal cash crops. In the developing world, delocalization results in a loss of food resources and flexibility as productive agricultural land is put to use for cash crops in competition with land use for local food production, and national food systems become increasingly de-

17 Billie R. DeWalt, "The Cattle are Eating the Forest," unpub. ms. (1981).

18 *Ibid.*, 24-25.

pendent on the developed nations for shipments of grain and other basic foods.

DIETARY DIVERSITY, NUTRITIONAL STATUS, AND DELOCALIZATION  
Good nutrition depends on adequate consumption of calories, protein, fats, vitamins and minerals. Whereas a sufficient intake of calories (and, to some extent, protein and fat) depends on quantity of food consumed, adequate consumption of other nutrients depends on the utilization of foods that are high in these substances. Because vitamins and minerals are differentially distributed in food, it is generally felt that more varied and diverse diets are more likely to be adequate from a nutritional perspective. A "mixed portfolio" also seems advisable on ecological grounds and may provide some protection from overexposure to mildly toxic components of foods.

When delocalization results in an expanded food supply and greater diversity of available foods, one would hypothesize that there should be an improvement in nutritional status, whereas a reduction in diversity, as well as in the quantity of available foods should be associated with a decline in nutritional status. In the industrialized world, it appears that there have generally been significant improvements in nutrition in the past century. There are several lines of evidence to support this statement. The major vitamin-deficiency diseases have now virtually disappeared in developed countries and, although mineral-deficiency diseases are still prevalent, they tend to be much less severely manifested than in developing countries. Except for anorexia nervosa, obesity rather than emaciation is the primary problem of caloric consumption.

Another indicator of improved nutrition is the secular growth trend that makes modern Europeans and North Americans seem like giants compared to the average size of people in the seventeenth and eighteenth centuries. In 1876 Charles Roberts, a doctor employed in a British factory, noted that "a factory child of the present day at the age of nine years weighs as much as one of ten years did in 1833 . . . each age has gained one year in forty." This comparison was possible because a large-scale program of measurements of children was carried out in 1833 to provide evidence for Parliament to consider the effects of child labor. "At that time, working boys aged ten years averaged 121 cm. in height com-

