

Trends in dietary patterns of Latin American populations

Tendencias en el consumo de alimentos en poblaciones latinoamericanas

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Abstract *It is important to characterize the level and magnitude of changes in food consumption patterns in Latin American populations as they undergo demographic and developmental transitions because of the effects of such changes on the development and progression of chronic diseases. This paper examines trends in food intake across regions in Latin America. Although trends in apparent food consumption differ in magnitude and timing, the overall patterns of change are remarkably consistent. Intakes of total fat, animal products, and sugar are increasing, even while there have been rapid declines in the intake of cereals, fruit, and some vegetables. The costs of the increased prevalence of chronic disease associated with these dietary changes are already affecting health systems still coping with malnutrition and infectious disease. Because this pattern of change is predictable, it is important to learn from the experiences gained in countries that are more advanced in the transition. Efforts to educate the population on the importance of a healthy diet and to issue policies to improve the availability of a healthy food supply can help to reduce the rapid escalation of obesity and chronic diseases.*

Key words *Food Consumption; Dietary Habits; Diet; Nutrition Transition*

Resumen *A la vez que las poblaciones latinoamericanas atraviesan por sus transiciones demográficas y de desarrollo, es importante caracterizar las dimensiones de los cambios que se producen simultáneamente en los patrones de consumo de alimentos de estas poblaciones. Este trabajo examina las tendencias en consumo de alimentos en América Latina, aunque estas tendencias se diferencian en tiempo de ocurrencia y magnitud, los patrones globales son muy consistentes. El consumo de grasas totales, productos animales y azúcares está en aumento y al mismo tiempo se está disminuyendo la ingesta de cereales, frutas y algunos vegetales. Los costos de la creciente prevalencia de enfermedades crónicas asociadas con estos cambios en el consumo están afectando a los sistemas de salud, que aún luchan contra la malnutrición y las enfermedades infecciosas. Debido a que estos patrones de cambios en el consumo de alimentos son predecibles, es importante aprender de las experiencias adquiridas por países más avanzados en la transición. Esfuerzos por educar a la población sobre la importancia de una dieta saludable, así como para establecer políticas para mejorar el suministro de alimentos saludables, podrían contribuir a disminuir la rápida escalada de obesidad y enfermedades crónicas.*

Palabras-clave *Consumo de Alimentos; Hábitos Alimentarios; Dieta; Transición Nutricional*

Introduction

The effects of globalization and urbanization on the food supply have influenced dietary patterns and lifestyle behaviors among traditional population groups throughout the world. In turn, there is evidence that these changes are contributing to increased prevalence of nutrition-related chronic diseases. It is therefore important to characterize these dietary and lifestyle changes in Latin American populations as they undergo these demographic and developmental transitions, and to understand their potential effects on the development and progression of chronic diseases such as obesity, diabetes, hypertension, and cardiovascular disease.

Latin America, defined by the Pan American Health Organization (PAHO, 2000) as the Andean Region (Bolivia, Colombia, Ecuador, Peru, and Venezuela), Brazil, Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama) and Mexico, the Latin Caribbean (Cuba, Dominican Republic, Haiti, and Puerto Rico), and the Southern Cone (Argentina, Chile, Paraguay, and Uruguay), is a region of great diversity in geography, population, and level of economic development. These countries are, therefore, at different gradients in the health and nutrition transitions currently underway worldwide.

Without being exhaustive, this paper examines trends in food intake across regions in Latin America. Although large disparities in food access and food consumption patterns exist across population groups within regions and countries, particularly between urban and rural areas, detail on food intake and dietary behavior at this level is not widely available, and the magnitude of this description exceeds the scope of this review. We therefore limit this discussion mainly to regional descriptions, grouping the Latin American countries as defined by PAHO, with the exception that we include only Cuba and the Dominican Republic in the Latin Caribbean. Using data from public databases, primarily the Food and Agriculture Organization (FAO) food balance sheets for Latin American countries (FAO, 2001a), we graphed trends in food availability and food use across regions. We supplemented this information with illustrations from specific countries, as available from published studies of dietary patterns.

Nutrition and epidemiologic transitions

The demographic, technologic, economic, and environmental processes occurring simultaneously across the world have strong effects on the food supply. These forces, along with rapid urbanization and increasingly fluid international borders, are having an unprecedented effect on food availability, with a general trend toward greater processing of the food supply. Latin America is no exception to this nutrition transition, which has been described in numerous parts of the world (Popkin et al., 1996, 1999, 2001; Tucker & Buranapin, 2001). However, the stage and speed of this transition differ across countries in the Latin American region, from countries like Chile where, during the 1990s, even the low-income population did not face widespread dietary deficits (Vio & Albala, 2000), to countries like Guatemala, where disparities in food intake remain large between the rural and urban populations (Solomons, 1997).

There is evidence that modernization was already affecting food patterns of Latin American populations by the 1980s in a way that was similar to what had occurred decades before in developed countries (Tagle, 1988). Historically, the new changes in food consumption patterns were costly, and only people in medium to high socioeconomic levels were able to afford them (Tagle, 1988). A wide gap appeared between population groups who could afford more expensive, usually highly processed, foods and the poorer groups that maintained their traditional diets of mostly cereals, vegetables, roots, and grains. At the same time, disparities in health conditions associated with diet began to emerge, including substantial increases in the prevalence of cardiovascular disease (CVD), diabetes, obesity, and hypertension among those who adopted the "Western diet" (Vio & Albala, 2000), with persistence of high rates of undernutrition, micronutrient deficiencies, and infectious disease morbidity among those maintaining the "traditional diet" (Solomons, 1997).

Similar to the phenomenon of a nutrition transition, Latin American countries are also at different stages in the epidemiologic transition. Differences in mortality profiles remain notable across the region. However, by the early 1980s, coronary heart disease was already the number one cause of death in Argentina, Belize, Chile, Costa Rica, Cuba, Panama, Paraguay, the Dominican Republic, Uruguay, and Venezuela, with mortality rates (number of deaths per 100,000 population) ranging from 58 in the Dominican Republic to 245 in Argentina in 1981 (Valiente et al., 1987).

Data from PAHO's *Country Health Profiles* (PAHO, 1998) reveal that in Guatemala, leading causes of death in 1994 still included infectious diseases, nutritional deficiency, and conditions related to pregnancy and delivery (45% of total deaths), while in Costa Rica the leading causes of death were already cardiovascular disease (31%), neoplasms (20%), and unintentional lesions or accidents (12%). In Panama, a country at an intermediate stage of development, the leading causes of death were accidental injuries and violence (15%), malignant tumors (14%), cerebrovascular disease (11%), and myocardial infarction (7%) in 1995 (PAHO, 1998). Changes in mortality rankings are occurring rapidly. In Mexico, the proportion of CVD deaths contributing to total mortality increased from less than 2% in 1960 to about 14% in 1992. During the same period, the proportion of deaths due to pneumonia decreased from 13% to 5%, and deaths attributed to diarrhea decreased from 14% in 1960 to 3% by 1990 (Romieu et al., 1997).

Major food consumption trends in Latin America

Inequalities in availability of energy sources

Data generated with the *PAHO Tables Generator System* and based on FAO food country datasheets for the years 1990 and 1999 (PAHO, 2002) show a wide range across countries of energy (daily kilocalories per capita) available for consumption (Figure 1). In 1999 these ranged from about 3,000kcal for Argentines, Brazilians and Mexicans, to less than 2,300kcal for Bolivians and Venezuelans. Trends within countries varied, with a notable decrease in energy availability for Cubans between 1990 and 1999. Decreases were also noted in Venezuela and Guatemala. On the other hand, Peru showed a major increase in available energy, moving from less than 2,000kcal in 1990 to over 2,500 in 1999. More modest increases were observed in the other Latin American countries (Figure 1). Regionally, countries in the Southern Cone tended to have more available energy than those in the Andean region, Central America, or the Caribbean. All of these countries had lower energy supplies relative to the United States, which was estimated to have 3,754kcal/capita available in 1999. By 1995, the available energy in the United State was the highest in the world, exceeding the world average by more than 30% (Rosen, 1999).

The relation between available energy and level of socioeconomic development is illustrated for a selected group of countries within the Latin American region in Figure 2. The association between socioeconomic status (SES) and actual food consumption has also been demonstrated. In Honduras, analysis of the rural component of a national food survey revealed energy intakes of 1,337, 1,599 and 2,131 kcal, for low, middle and high SES groups, respectively. In addition to energy, intake of a wide variety of nutrients was also associated with SES levels (Flores, 1975).

Main food contributors to total energy in Latin American countries for the mid 1990s are presented in Table 1. Cereals represent the main contributor to dietary energy, ranging from 59, 56, and 53% in Guatemala, El Salvador, and Nicaragua, respectively, to less than 30% in Argentina and Uruguay. Root crops and tubers were important components of the energy supply in Paraguay (16%) and Peru (13%). Sugars contributed between 10%, in Paraguay, to 24% of energy, in Cuba. Vegetable oil contributions ranged from 5% in Guatemala and El Salvador, and 6% in Bolivia, Peru, and Uruguay, to as high as 19% in Ecuador. Meats were important energy contributors in Uruguay (22%) and Argentina (17%), but were much less evident in El Salvador (2%), Honduras (3%), Nicaragua (3%), and Peru (4%).

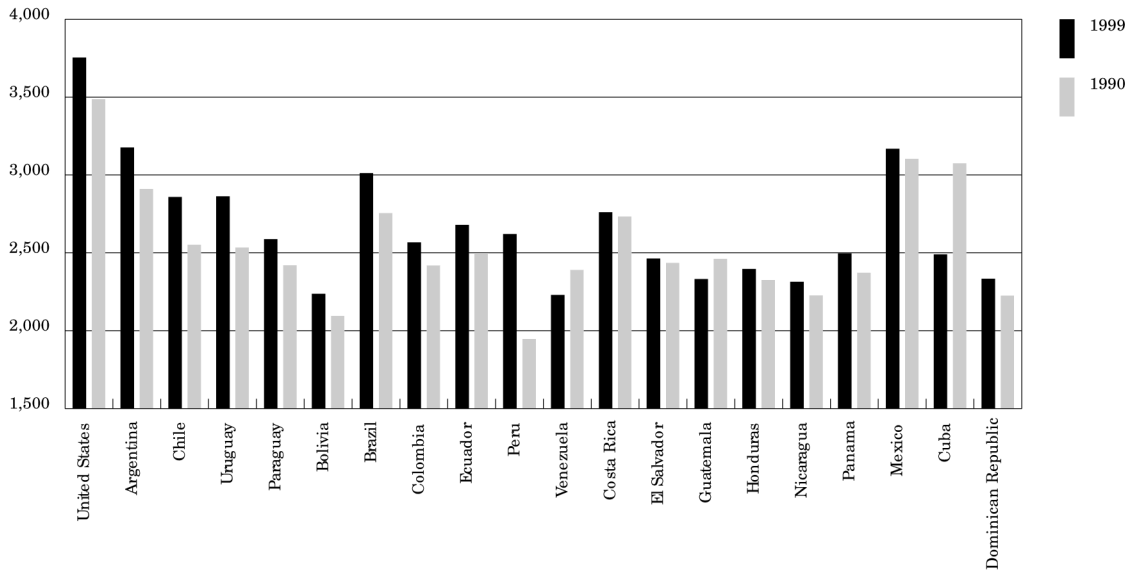
Declines in consumption of cereals

The period from 1970-1972 to 1995-1997 has seen rapid changes in the food supply of the region (Rosen, 1999). Although cereals are still the largest energy source in Latin American diets, their use has declined. As shown in Figure 3, the use of cereals, roots, and legumes declined from almost 52% of energy in 1995 to about 45% in 1999. At the same time, animal protein (meat, poultry, fish, eggs, milk, and dairy products) increased from 14% to 17%. Contributions from sugar also increased. However, there are wide variations in trends across sub-regions. For example, the relatively large declines in proportion of energy from cereals observed in Brazil, Mexico, Central America, the Latin Caribbean, and the Southern Cone are in contrast to small increases in cereal use in the Andean Region (Figure 4).

Longitudinal changes in the contribution of cereals to total energy intake were also observed among rural communities in Mexico (Aguirre-Arenas et al., 1998) The proportion of energy from cereals in four rural communities in 1984 ranged from 72% to 49%, but had de-

Figure 1

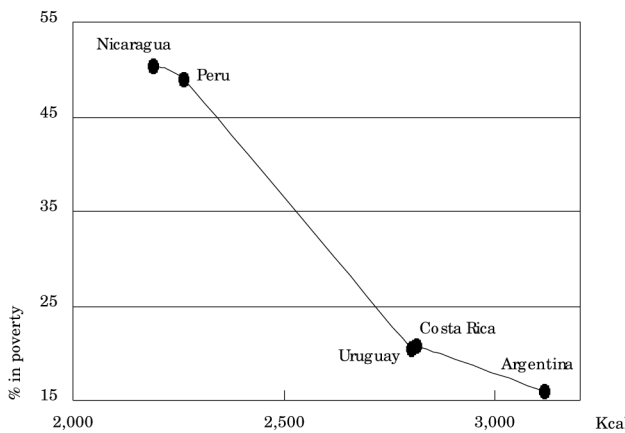
Available energy (daily kilocalories per capita) in Latin America in 1990 and 1999. Comparison with the United States.



Data source: Data tabulated with the PAHO table generator, years 1990 and 1999 (PAHO, 2002).

Figure 2

Availability of energy and national levels of poverty (in % of total population). 1994-1996.



Adapted from FAO Country Nutrition Profiles (FAO, 2001b).

clined to a range from 49% to 36% in 1996. Moreover, people from those rural communities increasingly shifted from their traditional homemade corn tortillas, the main contributor of energy, to commercially processed corn tortillas during this period. Interestingly, in 1984, the use of industrialized foods (including processed meats, canned tuna, powdered milk, yogurt, instant coffee, powdered chocolate, and mayonnaise) was notably absent from the diets of the population in those rural communities, while in 1996, processed foods contributed between 6% and 13% of total energy intake (Aguirre-Arenas et al., 1998).

Increased consumption of refined foods, with declines in complex carbohydrate and fiber

A uniform characteristic of recently accelerated dietary changes is the inclusion of more refined foods and less complex carbohydrate. These changes in food consumption patterns are linked to globalization and the rapidly increasing accessibility to “modern” highly processed foods, which are easily moved across regions. In addition, changes in lifestyle, with more

Table 1

Main food contributors to the energy supply in Latin America countries.

Country	Year	Available energy sources, per capita, in energy percent (%)							
		Cereals	Roots & Tubers	Sugars	Legumes	Meat	Milk & Eggs	Vegetable oil	Animal fat
Argentina	1993-1995	29	4	14	1	17	10	12	3
Bolivia	1996-1998	40	8	13	3	11	4	7	4
Brazil	1994-1996	31	5	18	6	11	7	11	2
Chile	1996-1998	39	4	16	2	12	7	10	2
Colombia	1996-1998	33	7	20	4	7	8	10	1
Costa Rica	1994-1996	35	1	22	5	6	9	11	2
Cuba	1994-1996	34	5	24	6	6	6	9	2
Dominican Republic	1994-1996	29	3	17	4	7	6	16	2
Ecuador	1996-1998	35	3	15	2	6	7	19	3
El Salvador	1994-1996	56	2	15	4	2	6	5	3
Guatemala	1994-1996	59	0	18	4	8	5	5	1
Honduras	1994-1996	48	0	16	4	3	7	10	2
Mexico	1994-1996	46	1	16	5	8	6	9	2
Nicaragua	1996-1998	53	1	17	7	3	4	10	1
Panama	1994-1996	41	2	15	3	6	7	10	5
Paraguay	1993-1995	27	16	10	5	13	6	8	4
Peru	1996-1998	38	13	14	4	4	4	7	4
Uruguay	1994-1996	30	4	11	1	22	12	7	4
Venezuela	1996-1998	36	3	17	2	7	6	14	1

Adapted from FAO Country Nutrition Profiles (FAO, 2001b).

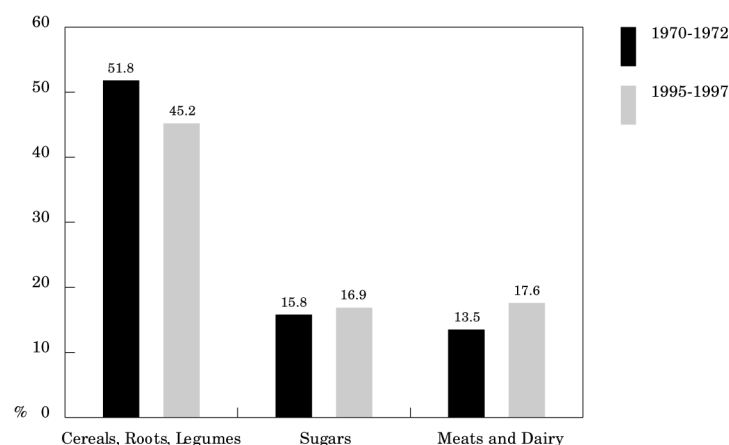
of the population working outside the home, could increase their consumption of ready-to-eat meals, including high-fat snacks.

Trends in availability of total carbohydrates for Latin American countries are presented in Figure 5. Brazil shows the greatest decline in the proportion of total energy from carbohydrates, from over 70% in 1964-1966 to less than 60% in 1994-1996, while Central America and Caribbean countries have had less dramatic declines, maintaining energy from carbohydrates at around 65% of their total energy. Mexico and countries from the Southern Cone and Andean Region had moderate declines in carbohydrate intake. However, decreases in energy from carbohydrates are due mainly to declines in cereals, starchy foods, and legumes (Figure 4). Sugars, as energy contributors (Figure 3), are increasing in Latin America.

In Central America, fiber intake has traditionally been high due to high consumption of vegetable products, particularly corn and beans. During the 1960s, Salvadorian people had the highest reported intake of dietary fiber in the region, while Panama had the lowest fiber intake. In all countries, the use of fiber-rich foods decreased over time, from 1969 to

Figure 3

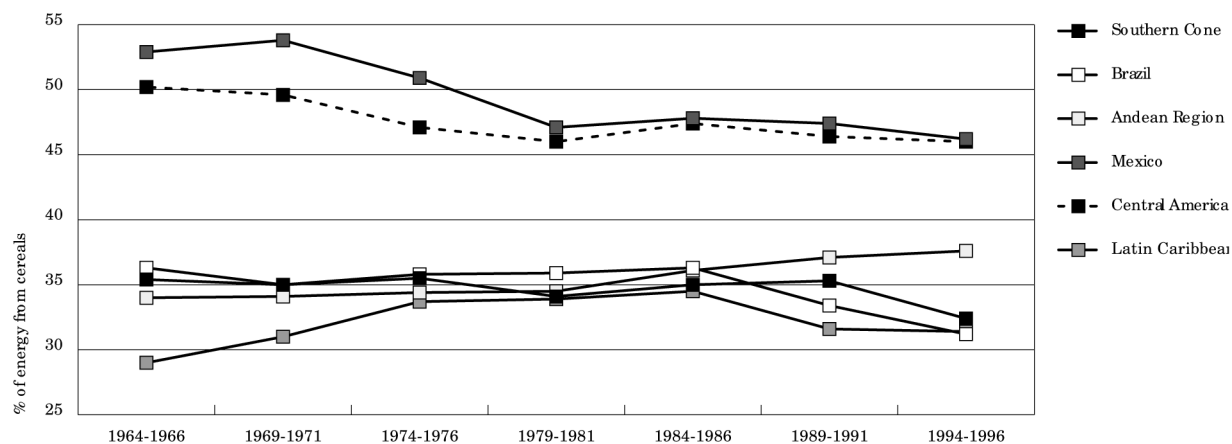
Main food contributors to total energy in Latin America, 1970-1972, 1995-1997.



Adapted from Rosen (1999).

Figure 4

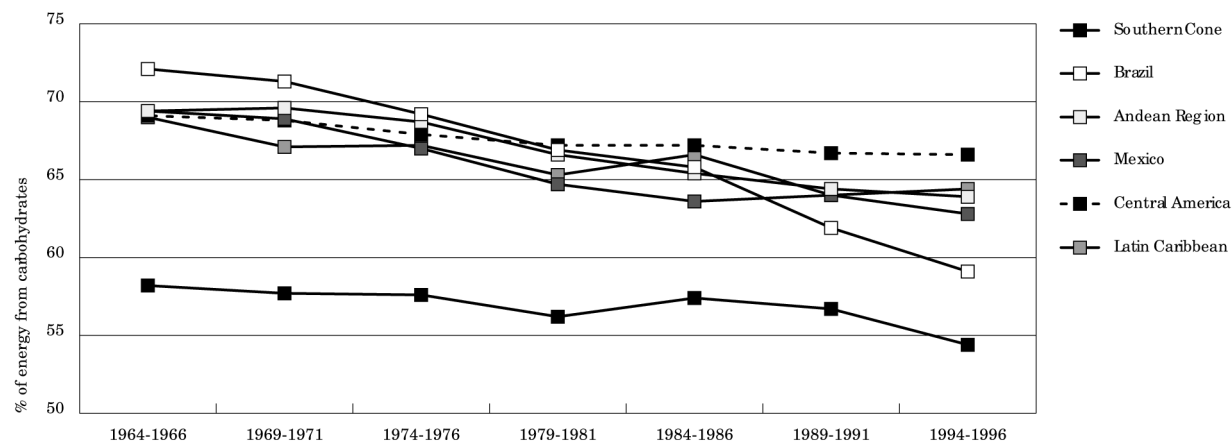
Trends in contribution of cereals to total energy in Latin America. 1964-1996.



Source: Country Food Balance Sheets, 1964-1996 (FAO, 2001a).

Figure 5

Trends in carbohydrate availability (as % energy) in Latin America, 1964-1996.



Source: Country Food Balance Sheets, 1964-1996 (FAO, 2001a).

1986 (Acevedo & Bressani, 1990). Complex carbohydrate and fiber intake have been shown to protect against CVD mortality and morbidity (Ludwig et al., 1999; Pereira & Pins, 2000). Consumption of beans, one of the staple foods in most Latin American diets, seems to be beneficial, through, among other factors, its significant contribution to dietary fiber. Intake of legumes four or more times per week, as compared to use of legumes once or less per week, was shown to be protective against risk of coronary heart disease in the National Health and Nutrition Examination Survey Epidemiologic Follow-up Study (Bazzano et al., 2001).

Increases in meat and animal product consumption

As cereal intake declined, consumption of meat and other animal products increased from the 1960s through the 1990s (Figure 6). The contribution of meats to total energy intake has consistently been greatest in the Southern Cone where, by 1994-1996, meats contributed more than 15% of total energy. However, meat consumption has long been high in this beef-producing region; in the 1960s it contributed almost that much (14%) to energy availability. The greatest increase in meat consumption during this 30-year period was observed in Brazil, from 5% of energy to about 10%. Throughout the region, animal protein has increasingly replaced

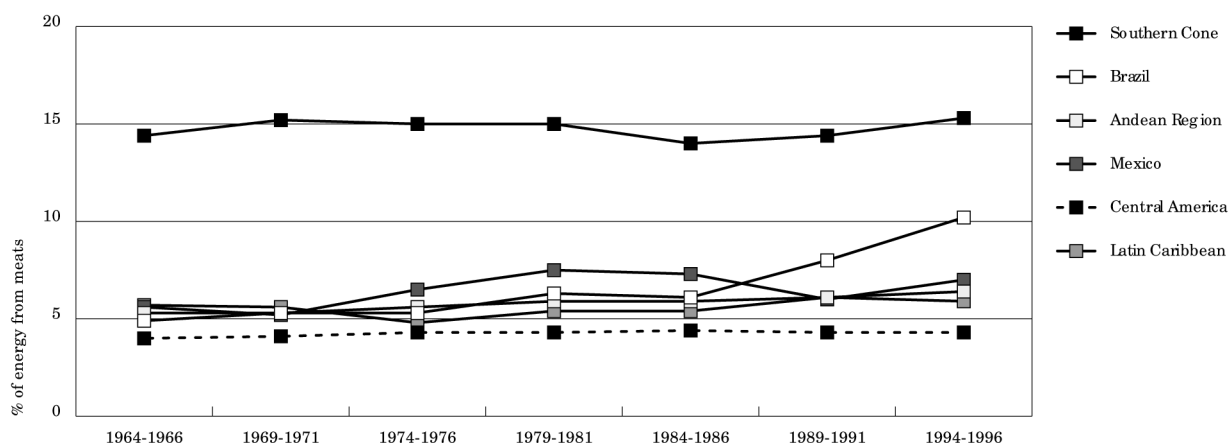
vegetable protein, most dramatically in Mexico and Brazil, where animal protein increased 50% from the 1960s to the 1990s (Table 2). These longitudinal increases in the proportion of animal protein in Brazil have also been observed in a study comparing food consumption patterns in urban regions (Monteiro et al., 2000).

Consumption trends in Chile illustrate the regional trend towards increasing intake of meats at the expense of lower intake of cereals (Vio & Albala, 2000): in the 1980-1995 period, Chileans consumed 6% less bread in 1995 as compared to their intake during 1980. At the same time, they increased their consumption of beef, pork, and poultry by 43%, 140%, and 94%, respectively. Interestingly, consumption of fish decreased by 2% (Vio & Albala, 2000). Results of a published study from Mexico are consistent with these observations. Mexicans from rural areas consumed fewer cereals in 1989 (302g per capita) than in 1979 (413g per capita), while their intake of animal products increased 6% during this period (1979-1989) (Ruiz & Rivera, 1996).

This decrease in cereals and increase in animal products in Latin America is substantiated by dietary surveys of fat and cholesterol intake. A recent study with urban adolescents in Costa Rica showed that about 50% had cholesterol intake higher than 100mg/1,000kcal, 45% consumed less than 10g fiber/1,000 kcal, and

Figure 6

Trends in contribution of meats to total energy in Latin America, 1964-1996.



Source: *Country Food Balance Sheets, 1964-1996* (FAO, 2001a).

Table 2

Trends in the proportion of total protein from vegetable and animal protein. 1964-1996.

	Southern Cone	Brazil	Andean Region	Mexico	Central America	Latin Caribbean
Vegetable protein (%)						
1964-1966	47.7	68.5	62.1	73.6	68.2	58.2
1974-1976	48.0	63.6	60.2	67.4	63.1	59.1
1984-1986	47.9	59.8	58.7	62.9	64.7	57.4
1994-1996	41.7	51.4	57.3	60.7	64.9	56.3
Animal protein (%)						
1964-1966	52.3	31.5	37.9	26.4	33.2	41.8
1974-1976	52.0	36.4	39.8	32.6	36.8	40.9
1984-1986	52.1	40.2	41.3	37.1	35.3	42.6
1994-1996	58.3	48.6	42.7	39.3	35.1	43.7

Source: *Country Food Balance Sheets, 1964-1996* (FAO, 2001a).

about 30% had higher than recommended intakes of total and saturated fat (Monge-Rojas, 2001).

Over-consumption of fats

High fat intakes have been associated with a variety of disease risks. Saturated and trans-fats, in particular, are major factors in the development of cardiovascular events, through their effects on lipoprotein concentrations (Schaefer, 2002). In a study conducted in Costa Rica comparing rural vs. urban adults, the more atherogenic plasma lipid profile of the urban group was influenced by higher saturated fat intakes (Campos et al., 1991). High fat diets are also associated with diabetes risk (Marshall et al., 1991). A case-control study of men with lung cancer and healthy controls in Uruguay revealed an increased risk for cancer with total fat intake (De Stefani et al., 1997a). In another report from the same study, the authors reported significantly greater lung-cancer risk associated with higher intake of fat-rich foods, including fried foods, dairy products, and desserts (De Stefani et al., 1997b).

Total fat and saturated fat intake has increased dramatically in Latin America (Albala et al., 2001). However, differences across sub-regions are evident (Figure 7). Countries in the Southern Cone, who have traditionally obtained more than 25% of energy from fats, approached 30% by the 1990s. Brazil had the most rapid increase in energy percent from fat, from just over 16% to about 28% in 30 years. At the baseline period (1964-1966), Brazil had the

lowest proportional fat intake in the region, but by 1994-1996 it approached the percentages seen in the Southern Cone. Fat intake in other sub-regions increased steadily, although at lower rates than Brazil. The estimated consumption of saturated fat and cholesterol is presented in Table 3. These data are based on country data from FAO food balance sheets for the period 1964-1996 (FAO, 2001a) calculated to estimate crude percent contributions from saturated fat to total energy intake and daily mg of cholesterol with values from the U.S. Department of Agriculture food database (USDA, 2001).

Current dietary guidelines in some Latin American countries, including Mexico, Chile, Costa Rica, and Panama (De Chavez et al., 1993; MINSAL, 1995; MINSAL, 1997; Universidad de Costa Rica, 1995), are consistent with U.S. dietary guidelines (USDA, 2000), recommending less than 10% of energy from saturated fat and less than 300mg of cholesterol/day. By the 1990s only countries in the Southern Cone exceeded both these recommendations on a mean basis. Cholesterol availability in Mexico also exceeded 300mg/d.

There is hope for reversal of the trends seen in Latin America. U.S. data for adult Americans indicate that the proportion of energy derived from fat declined from about 42% in 1965-1966 to about 36% in the 1980s (USDHHS, 1993). A decrease to an overall 34% was observed in *National Health and Nutrition Examination Survey III* (NHANES III) (McDowell et al., 1994).

Figure 7

Trends in fat intake (as % energy) in Latin America, 1964-1996.

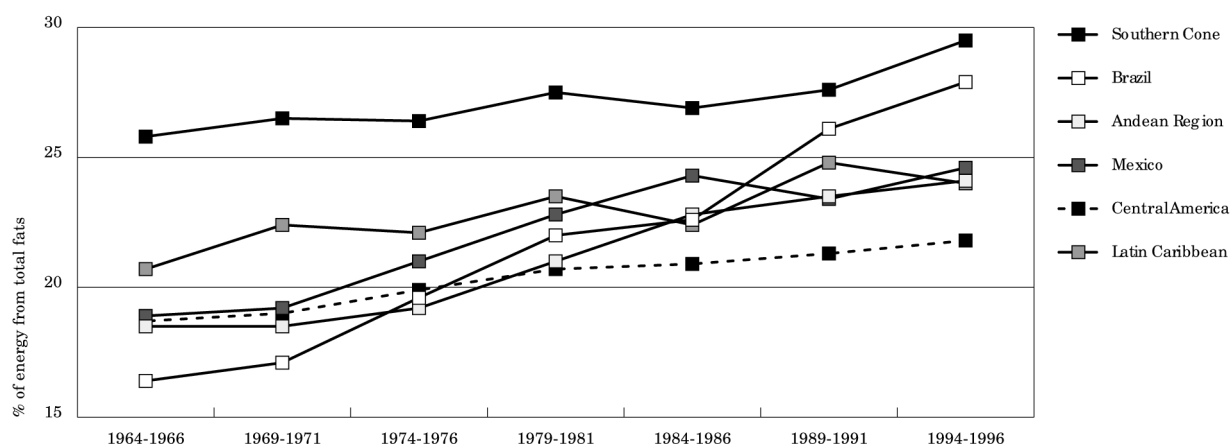
Source: *Country Food Balance Sheets, 1964-1996* (FAO, 2001a).

Table 3

Daily availability of cholesterol and saturated fat in Latin America, 1964-1996.

	Southern Cone	Brazil	Andean Region	Mexico	Central America	Latin Caribbean
Cholesterol (g/day)						
1964-1966	293	142	148	148	160	176
1974-1976	294	169	168	211	195	220
1984-1986	297	218	183	289	192	232
1994-1996	346	275	204	320	191	183
Saturated fat (% energy)						
1964-1966	9.4	5.9	6.5	4.4	6.5	6.8
1974-1976	9.2	6.1	6.4	6.0	7.0	7.7
1984-1986	9.3	6.4	6.5	6.3	6.5	7.4
1994-1996	11.0	8.1	6.4	6.6	6.1	6.7

Changes in the consumption of fruits and vegetables

Current trends in the dietary intake of Latin Americans show reduced consumption of fruits and vegetables and an increase in fats (especially saturated fats) and sugar. Lower consumption of fruits and vegetables may place Latin Americans at increased risk for chronic diseases. Studies have shown, for example, that consumption of vegetables may be inversely associated with the risk of type 2 diabetes mellitus (Ford & Mokdad, 2001; Williams et al., 1999). In addition, risk of several cancers has been inversely associated with intake of fruits and vegetables (Chen et al., 2002; De Stefani et al., 2001; La Vecchia et al., 2001). In Chile, a significant protective effect of carotene-rich vegetables for lung cancer was observed in a case-control study, while a lower intake of fruits, vegetables, and antioxidants was noted in women with uterine cancer (MINSAL, 1997).

Table 4 shows changes in fruit and vegetable intake from 1964 to 1996. Vegetables, as contributors to total energy, have declined in the Andean Region, Central America, and the Latin Caribbean, while modest increases have

been noted in the Southern Cone, Brazil, and Mexico. In these countries, however, the modest increases in energy intake from vegetables have been outweighed by decreases in intake of starchy roots and fruits. Data from the National Food Consumption Survey in Mexico showed that daily per capita intake of fruits and vegetables by the rural population decreased 4% between 1979 and 1989 (Ruiz & Rivera, 1996). In Brazil, data for the country as a whole, and for the Southeast and Northeast urban regions, show marked decreases, as well as differences among regions, in the contribution of root crops and fruits to total energy intake from 1961-1962 to 1987-1988 (Mondini & Monteiro, 1994). These decreases in consumption of root crops and fruits across urban regions in Brazil were also observed in later studies from 1988 to 1996 (Monteiro et al., 2000).

Discussion

During the latter half of the 20th century, there have been significant shifts in food consumption patterns throughout the world. Remarkably, these changes have followed similar pat-

Table 4

Latin American trends in energy available from vegetables, starchy roots and fruits.

	Southern Cone	Brazil	Andean Region	Mexico	Central America	Latin Caribbean
Vegetables (% energy)						
1964-1966	1.8	0.7	1.8	0.6	1.7	0.9
1974-1976	1.8	0.7	1.5	0.7	0.7	1.1
1984-1986	1.8	0.8	1.2	1.0	1.1	1.0
1994-1996	2.5	0.9	1.2	0.9	0.7	0.8
Change	0.7	0.2	(-0.6)	0.3	(-1.0)	(-0.1)
Starchy roots (% energy)						
1964-1966	8.5	11.2	10.9	0.9	1.4	8.0
1974-1976	7.9	8.6	9.8	0.8	1.3	5.3
1984-1986	7.5	6.3	7.7	0.8	1.3	3.2
1994-1996	6.5	4.9	6.4	0.8	1.3	3.8
Change	(-2.0)	(-6.3)	(-4.4)	(-0.1)	(-0.1)	(-4.1)
Fruit (% energy)						
1964-1966	0.3	4.3	10.4	3.3	4.1	11.6
1974-1976	0.3	4.2	9.0	3.1	5.0	9.3
1984-1986	0.3	4.0	7.2	3.5	3.6	8.2
1994-1996	0.3	2.5	2.4	1.9	1.8	2.8
Change	0.0	(-1.8)	(-7.9)	(-1.4)	(-2.3)	(-8.9)

Source: *Country Food Balance Sheets, 1964-1996* (FAO, 2001a).

terns in diverse countries, although this transition is occurring at different rates, associated with level of development (Popkin et al., 2001). Although some of the changes have been beneficial, including increased adequacy and variety of foods, the transition has quickly progressed beyond this to include dietary patterns that promote chronic disease. In Latin America, as elsewhere, traditional food patterns rich in complex carbohydrates, micronutrients, fiber, and phytochemicals are being replaced with diets high in refined sugars, animal products, and highly processed foods.

In many Latin American countries this transition has been so rapid that the dual problem of widespread undernutrition persists in the same populations in which more refined diets are leading to obesity and chronic disease. Nutritional deficits remain highly prevalent among young children and childbearing-age women living in remote rural and marginalized urban neighborhoods. On the other hand, more affluent groups are affected by the benefits, but also the disadvantages, of modernized societies, with increasingly sedentary lifestyles, abundant access to industrialized, highly processed foods, and subsequent increases in chronic disease risk (Valiente et al., 1987).

The nutrition transition in Latin America is at different stages across the region, but in most cases the changes are consistent and predictable. Because this pattern of change is predictable, it is important to learn from experience in countries that are more advanced in the transition. The costs of rapidly increasing obesity and chronic diseases are already affecting health systems still coping with malnutrition and infectious disease. The experience of more developed countries suggests that with the progression of the nutrition transition, the burden of obesity, diabetes, heart disease, and cancer continues to increase.

Extensive research, primarily in more developed countries, shows the benefits of a diet rich in fruits, vegetables, and whole grains, moderate in animal products, and low in saturated fat. Efforts to educate the population on the importance of a healthy diet and policies to improve the availability of a healthy food supply can help to reduce the rapid escalation of obesity and chronic disease. At the same time that maternal and child programs continue to improve nutritional status among populations at risk of undernutrition, the speed of the transition to diets leading to obesity and chronic disease demands aggressive simultaneous efforts to promote healthy lifestyle programs that prevent these conditions.

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