

Factors influencing pulse consumption in Latin America

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In Latin America, pulse consumption ranges from 1 kg/capita per year (Argentina) to 25 kg/capita per year (Nicaragua). Common beans account for 87% of the total. The differences between countries, regions or groups of population within the same country can be explained by the following factors: (1) beans are very nutritious; (2) beans and maize are traditional foods and the habit of consuming them is deeply rooted in many people and communities; (3) the rural population eats more pulses than the urban population, due to geographical constraints that limit exchanges and favour consumption of locally produced foods; (4) income level, beans are still the poor man's meat; and (5) other factors, such as consumers' taste, the constraints on cooking beans, etc. The evolution of the consumption level in the future will depend on the urbanization of the population, access to processed foods and income level. Health issues would be an argument for maintaining or increasing the current consumption level.

Pulses: Beans: Consumption

Introduction

Pulses, together with cereals, have fed humans for millennia. Grains of chickpeas, peas, lentils or beans have been found in the traces of former civilizations, such as those of the Egyptians, Incas and Aztecs. These protein sources have been replaced progressively by animal products and their current contribution to protein supply is low, especially in industrialized countries.

In western Europe, pulse consumption does not exceed 3.5 kg/capita per year (FAOSTAT, 2001), with great regional disparities. In other parts of the world, such as Latin America, India or Central Africa, pulse consumption is much higher, ranging from 10 kg/capita per year in South America and India to more than 40 kg/capita per year in Burundi (FAOSTAT, 2001).

Regular pulse consumption is now promoted by health organizations in Western countries because it helps reduce the risks for diseases such as cancer, diabetes or coronary heart disease (Geil & Anderson, 1994; Leterme, 2002). In this regard, it is interesting to study the factors that explain the still high pulse consumption in other countries or continents. The present work discusses the factors that influence pulse consumption in Latin America.

Pulse consumption in Latin America

The average annual consumption of pulses per capita is

detailed by country in Table 1. The southern countries of the subcontinent are poor pulse consumers. Argentina, although an important bean producer, is the lowest consumer, partly due to the high level of meat consumption. Bolivia, Chile and Uruguay also present low rates of pulse intake. On the contrary, Brazil has, by far, the highest pulse intake per capita, essentially in the form of black beans. In this country, bean consumption is decreasing rapidly, mainly because of the young population and the fact that children eat fewer beans than adults. The consumption in the other countries ranges from 3.8 to 7.6 kg/capita per year. It is worth mentioning that in most of the Andean countries, beans account for less than 50% of the total pulse consumption.

Pulse consumption is higher in Central America and Mexico, but great differences are observed between the Central American countries: it ranges from 5 kg/capita per year in Costa Rica to more than 25 kg/capita per year in neighbouring Nicaragua. The latter has one of the highest bean consumption levels in the world.

However, the data provided by the Food and Agriculture Organization (FAO) may present some discrepancies with national statistical data. For example, the Costa Rican Ministry of Health, cited by Rodriguez-Castillo & Dumani-Echandi (2000) indicates a much higher level: 11.3 kg/capita per year *v.* the 5 kg/capita per year announced by FAO. Some local consumption may not appear in the official surveys, which would mean that consumption might be higher than indicated by official statistics.

Abbreviations: FAO, Food and Agriculture Organization.

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Table 1. Pulse and bean consumption in Latin America in 1999 (FAOSTAT, 2001)

	Pulses (kg/capita per year)	Beans (kg/capita per year)
South America		
Argentina	1.1	0.0
Bolivia	2.7	0.4
Brazil	16.1	15.7
Chile	3.0	1.1
Colombia	6.2	3.7
Ecuador	3.8	1.4
Paraguay	7.6	7.1
Peru	7.6	2.7
Uruguay	3.1	1.3
Venezuela	5.5	4.1
Total	10.3	8.9
Central America		
Belize	18.4	18.4
Costa Rica	5.0	4.7
El Salvador	11.9	11.9
Guatemala	10.8	7.7
Honduras	7.2	7.2
Mexico	12.6	10.9
Nicaragua	25.1	25.0
Panama	6.4	2.4
Total	12.3	10.7

Factors explaining pulse consumption in Latin America

Nutritional quality of pulses for humans

Common beans (*Phaseolus vulgaris*) contain about 60 % of carbohydrates, two-thirds of which in the form of starch, from 22 to 25 % of proteins and a very low fat content (El-Tabey Shehata, 1992). They are also a valuable source of dietary fibre, calcium, iron and vitamins, such as folate. Compared to cereals, they are seen as a valuable source of protein that supplements well the low quality of cereal proteins. They are especially rich in lysine but somewhat deficient in methionine and tryptophan. A cereal:pulse ratio ranging from 1:2 to 1:4 on a dry matter basis, covers the human requirements for energy and essential amino acids (Food and Agriculture Organization, 1997; Briend, 1998). Surveys carried out in rural communities of the Andes and Central America confirm that beans are perceived as a food of great nutritional value, which

people consider an important staple food (Tapia, 1985; Ruiz de Londoño *et al.* 2000).

Tradition and culture

Culture represents one of three predominant approaches used to explain food use and nutritional health, together with economy and psychology (McIntosh, 1996). According to Rozin (1998), the best predictor of the food preferences, habits and attitudes of any particular human would be information about his ethnic group and native cuisine, rather than any biological measure that one might imagine. Finally, McIntosh (1996) affirms that cuisine remains strongly rooted, even after language and other customs disappear during inclusion processes.

Beans, together with maize, were the staple food for the pre-Colombian civilizations, such as the Aztecs, Mayas and Incas, and remain so for the rural Indian communities of the Andes and Central America. Many authors have underlined the similarity in food habits between the native Indians and their ancestors (Tejada, 1979; Hurtado, 1984). Table 2 shows that food consumption in general, and pulse consumption in particular, have not changed very much for 35 years in rural communities of different Central American countries. Moreover, bean consumption is remarkably constant throughout the seasons, contrary to that of other foods, such as fruits, which are not available the whole year (Flores & Flores, 1984). The maintenance of culture and food habits is favoured by the geographical isolation of many communities, due to the topography of the regions (mountains) and the strong willingness of these communities to maintain traditions.

The fondness of Hispanic populations for beans is reflected by the increase in bean consumption in the United States, which is only explained by the increase of the Hispanic population in this country (Lucier *et al.* 2000). Hispanic food habits and culture could even be adopted by other communities through restaurants or cultural mixing.

Urbanization and geographical constraints

Most of the South American countries are confronted by rural exodus and poorly planned development of urban zones. Rural exodus is caused by socio-economical factors,

Table 2. Average daily food consumption per person in rural areas of Guatemala, Panama and Honduras throughout time (g/capita per day)

	Guatemala			Panama		Honduras	
	1961*	1977†	1987‡	1952†	1961*	1961*	1979†
Dairy products (ml)	10	93	21	82	47	136	210
Meat and eggs	38	41	66	91	91	54	53
Pulses	58	47	65	54	54	56	64
Vegetables and fruits	86	112	189	126	78	175	108
Cereals	494	685	530	289	189	367	308
Others	53	162	78	137	123	69	58

* Source: Flores (1961).

† Source: Flores & Flores (1984).

‡ Source: Alarcón & Adrino (1991).

such as poverty, lack of employment and, in the case of Colombia, violence generated by the armed conflict. As a result, 80 % of the population lives in urban areas. In Central America, 50 % of the population still lives in the country (FAOSTAT, 2001).

Urbanization changes people's lives. They are out of home the whole day, must buy their food outside, etc. This modifies their food habits too: they have more choice, less time to cook, processed foods and meat are available and the pressure of the media is intense. Overall, incomes are also higher.

As a consequence, bean consumption is lower in urban areas. In Costa Rica, for example, the daily bean consumption reaches only 28 g beans/capita per day in town v. 43 g/capita per day in the rural communities (Rodríguez-Castillo & Dumani-Echandi, 2000). However, when incomes are comparable between both groups, the difference is lower (Alarcón & Adrino, 1991).

Many communities in the Andes and in Central America are also quite isolated in regions of difficult access. Exchanges are limited, which impedes diversification, and the composition of the diet depends mainly on local production. The latter depends on soil quality and climate. Temperature and precipitation vary according to the altitude: beans are produced roughly between 1500 and 3000 m above sea level. The limitation of exchanges partly explains why pulse consumption is higher in rural communities.

Income

Beans are also called the poor man's meat because they are a cheap source of protein. People with a low income usually turn towards bean or pulses when they can no longer afford meat. On the contrary, meat consumption increases with income. In case of extreme poverty, however, cereals are preferred to beans, due to their lower price. In South America, it is estimated that people in social strata with low income consume on average 20 % more beans than those with the highest income (S. Beebe, personal communication).

Consumers' preference

The decision whether or not to consume a specific food depends on the factors described above, but also on everybody's own taste. However, even in this case, tradition still has a strong influence. For example, colour and grain size are the two main factors used to choose beans. In Brazil and Guatemala, people eat almost exclusively small black beans, in Nicaragua only small and medium-sized red beans, in Peru mainly cream-coloured or white beans, in Colombia mostly large red beans, etc. When asked why they prefer black or red beans, both Guatemalans and Nicaraguans say they are more tasty and nutritious than any other beans (Tapia, 1985; Diamant *et al.* 1989). On the contrary, when there is no tradition of bean consumption, colour is not an important criterion of choice. For example, in the city of Santa Cruz, Bolivia, where bean regional implantation is very recent, no particular

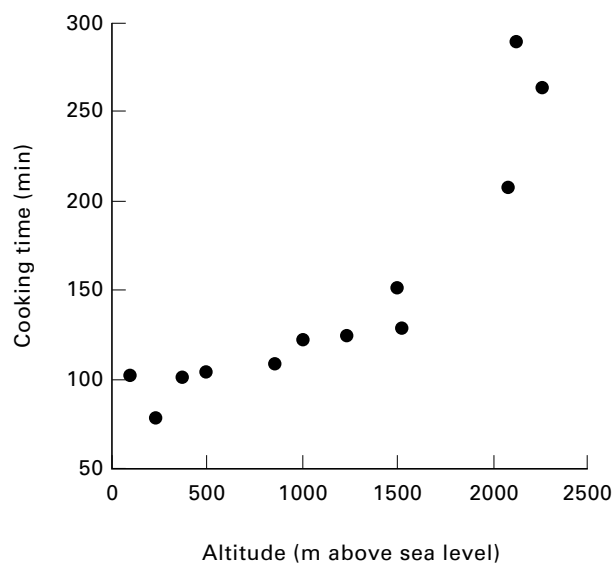


Fig. 1. Cooking time of beans as affected by altitude (after Diamant *et al.* 1989; Bressani & Chon, 1996).

colour preference has been observed (Manrique Vargas, 1994).

Softness is generally the third factor influencing the consumer's choice. This is related to cooking time, which is a main concern when people do not have a pressure cooker, especially in the Andes and in Central America. Cooking time increases with the altitude: it requires more or less 100 minutes to cook beans at altitudes lower than 1000 m above sea level but nearly triple that at altitudes higher than 2500 m above sea level (Fig. 1) (Diamant *et al.* 1989; Bressani & Chon, 1996), which is the case for cities such as Bogota, Quito or La Paz. When people refer to softness, they also want to avoid beans having been stored for a while and presenting the hard-to-cook defect. The latter has different causes and affects cooking time as well as the digestive processes (El-Tabey Shehata, 1992).

Finally, when asked why they were not keen to consume beans, 59 % of the people of the city of Santa Cruz replied that they did not like them and 12 % that it caused them problems of flatulence (Manrique Vargas, 1994). Women of the urban area of San José, Costa Rica, also claimed that beans cause intestinal problems, that they are too 'heavy' to be eaten at night and make people fat (Rodríguez-Castillo & Dumani-Echandi, 2000).

Discussion

Bean consumption is deeply rooted in the habits of the populations of many countries in Latin America, with the exception of southern countries, such as Argentina. The difficulties of growing pulses in some regions explain the heterogeneous distribution only partly. For instance, Argentina is a big producer but a poor consumer. In the highlands, i.e. the Andes and part of Central America, the isolation of rural communities limits food exchange and favours local food consumption, including beans. This isolation also favours the maintenance of tradition

and culture. The Indian communities are deeply attached to their traditions. Beans, together with maize, have been a staple food for centuries. Traditions and habits can also explain the great differences in consumption observed between neighbouring countries such as Costa Rica (5 kg/capita per year) and Nicaragua (25 kg/capita per year), or in bean colour preference.

However, the fast-developing urbanization occurring in South America might contribute to changing the trends. People change their life-style, have less time to cook, more choice of food, access to processed foods and are under the influence of the advertising media. A change like that observed in the southern countries of western Europe (Italy, Greece, Portugal, etc.) might be observed in South America in the future. In these countries, due to commercial pressure, people are abandoning the so-called Mediterranean diet, based on vegetables, pulses, fruits, grains, fish, olive oil and wine, and prefer sweet drinks, processed foods, fast food, etc. (Usher, 2001). This evolution will depend on economic development, but if a decline in pulse consumption is observed, it could hardly be re-established by health arguments, since people are often not concerned about the relationship between health and nutrition. For example, Rodríguez-Castillo & Dumani-Echandi (2000) studied an educative campaign to promote bean consumption among the urban population of San José, Costa Rica. Although people were aware of the nutritive value of beans, they explain the decrease in bean consumption by their new life-style (less time to cook, women at work, etc.), the flatulence problem or their weight.

Conclusions

Pulses, in particular common beans, are still a staple food for the majority of the Latin American population. The stability of consumption throughout time can be explained by the weight of tradition, especially in isolated rural regions. Future evolution will depend on the evolution of the standard of living and of the urbanization of the population. An increase of income and of the urban population could reduce the global rate of pulse consumption markedly.

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