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## LAC and growth in the demand for meat worldwide

*The so-called Livestock Revolution is driven by demand, and demands answers from governments and the private sector to satisfy consumers increasingly concerned about health, nutrition and the environment.*

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Meat production in developing countries will grow four times faster than in developed countries. By 2020, these countries will produce 60% of the meat and 52% of the milk in the world. China and India will be the number one producers of meat and milk, respectively.

**P**opulation growth, urbanization and, in particular, higher incomes in developing countries have stimulated demand for foods of animal origin, especially meat. In response, governments and the private agricultural sector must adopt the policies and make the long-term investments needed to satisfy consumers concerned about their nutrition, the environment and public health.

In contrast with the Green Revolution, which was driven by supply, the “Livestock Revolution” is being driven by demand. The term Livestock Revolution refers to the technological changes that are taking place to meet the world demand for meat.

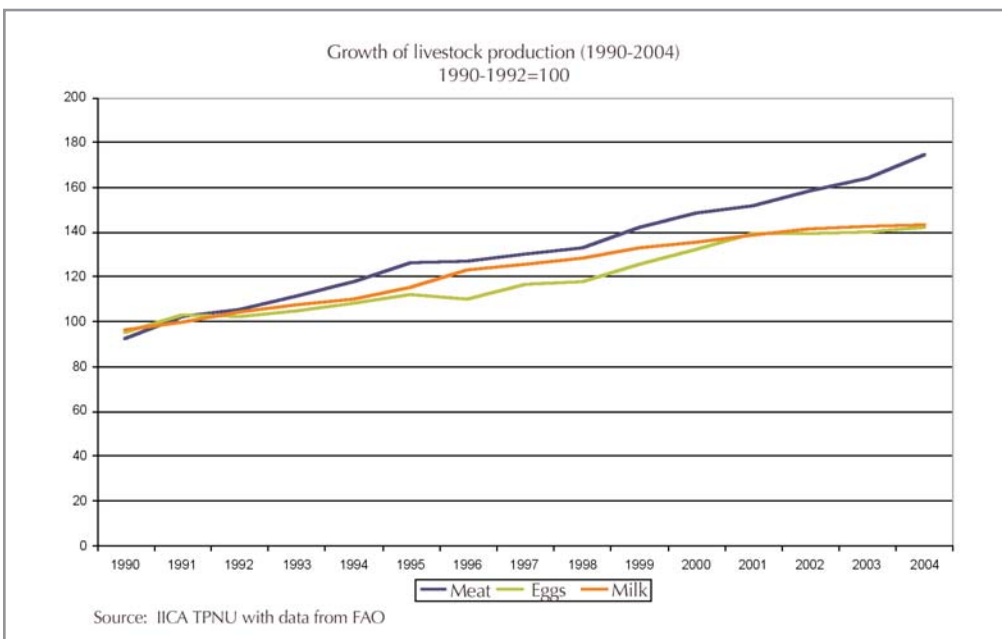
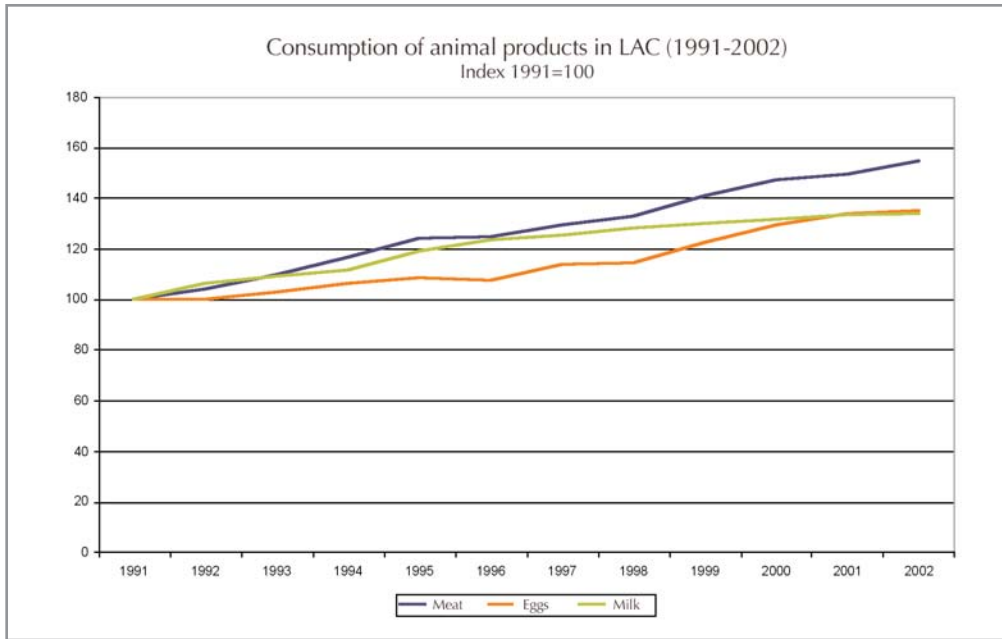
The inhabitants of the developed countries get an average of 27% of their calories and 56% of their proteins from products of animal origin. In developing countries, the average is 11% and 26%, respectively.

### *Meat production and consumption in LAC*

In Latin America and the Caribbean (LAC), meat production increased by 80% and milk and egg production by 40% between 1991 and 2004. However, over the same thirteen years, milk exports grew six fold, meat exports doubled, and egg exports were erratic. Also, meat imports in the region doubled, as did those of eggs, although somewhat erratically.

Consumption of animal products in LAC grew steadily between 1991 and 2002. (See graphs.) Beef consumption grew steadily, but consumption of milk stagnated, especially toward the end of the period. Egg consumption also grew steadily.

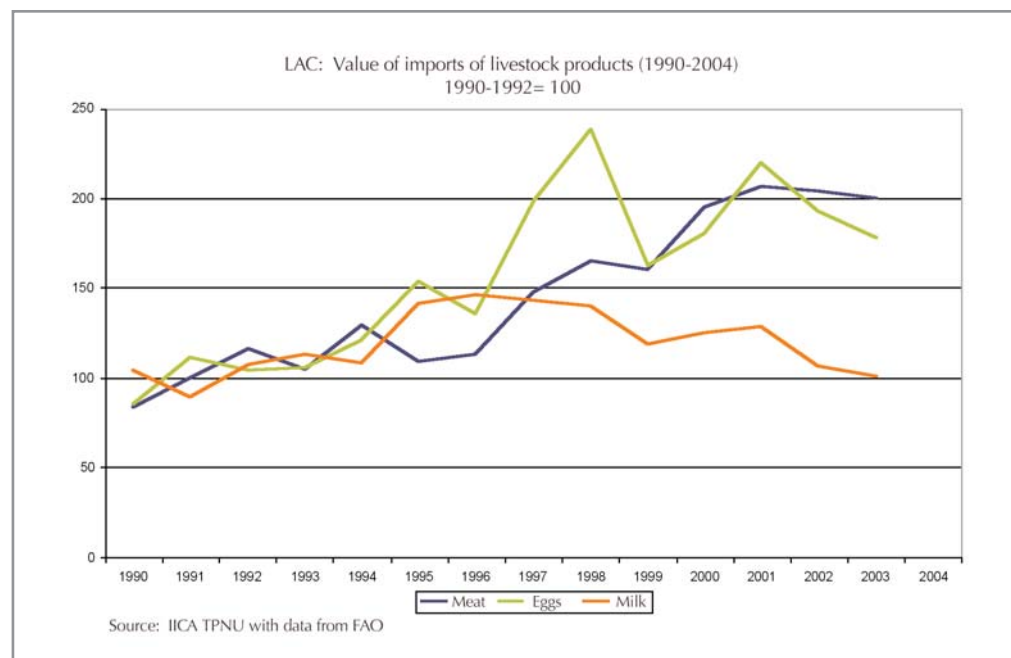
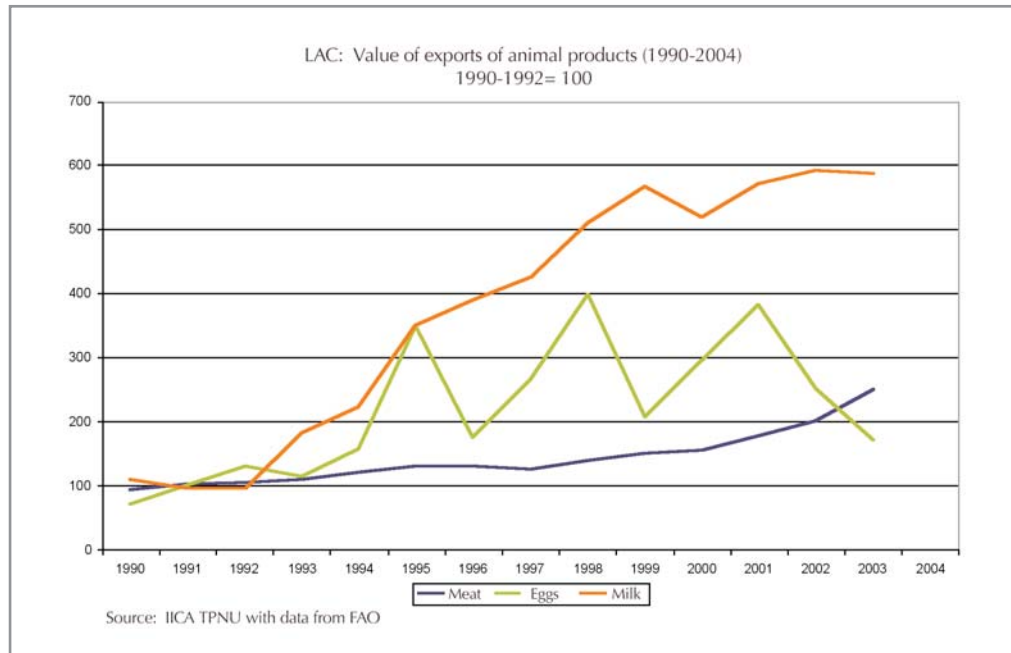
These levels of consumption for meat, eggs and milk meant greater production and erratic international trade. Milk exports grew more rapidly and steadily than those of meat. Egg exports were erratic for this period.



Total per capita consumption of meat in developed countries is 40.3 kg and in developing countries 29.7 kg.

Meat and egg imports were more dynamic than those of beef. The value of milk imports showed a down-

ward trend. Of course, it is necessary to take into account the seasonality of prices and sudden changes.



## Causes for growth in demand for beef in the region

**Urbanization:** LAC is the most urbanized region in the developing world, reaching 75% in 2000. Some 380 million people live in cities and another 127 million in rural areas. There are 52 cities with populations in excess of one million inhabitants, some with more than 5 million (ECLAC). The urban population is expected to reach 85%. Of course, there are variations: in South America, the urban population is almost 80%; in Central America, 67% and in the Caribbean 63%. What is important is the fact that, even though urban poverty exists, eating habits change as the population becomes more urban. In particular, more animal products are consumed.

**Per capita income.** Even though per capita income did not increase significantly in LAC between 1990 and 2003, income levels there were average by world standards. In countries with high per capita incomes in 2003, such as Barbados (\$9.255), Antigua and Barbuda (\$9.197), Argentina (\$7.164), St. Kitts and Nevis (\$7.427), Trinidad and Tobago (\$7.520), Mexico (\$5.792), Chile (\$5.195) and Uruguay (\$5.235), increases in the demand for meat were more likely. However, in countries such as Haiti (\$467), Honduras (\$926), Guyana (\$942), Nicaragua (\$766), Ecuador (\$1.367) and Guatemala (\$1.674) significant increases in demand were not expected because of their low per capita income levels.

**Income distribution.** The Gini coefficients, which measure the distribution of income and change little over time, paint a picture of the impact of the concentration of income on the consumption of meat. Countries with higher values, such as Brazil (60,1%), Guatemala (59,6%), Paraguay (59,1%), Colombia (57,2%), Chile (56,5%), Panama (57,1%), Mexico (57,7%) and Honduras (57,7%), in which per capita income levels are high, have income distribution structures that make it impossible to translate such incomes into greater meat consumption. The exceptions are Mexico, Chile and Panama, which have more clearly defined social policies.

Countries such as Jamaica (41,1%), Bolivia (42,0%), Peru (46,2%) and Costa Rica (47,0%), with the lowest Gini coefficients in the region, could translate their per capita incomes into greater meat consumption.



**Human poverty indices.** Human poverty indices help identify those countries in which meat consumption could be affected by income levels. In countries with low levels of poverty, such as Barbados (2,6%), Trinidad and Tobago (3,5%), Uruguay (4,0%), Costa Rica (4,1%), Panama (9,0%), Guyana (10,2%), Colombia (10,5) and Mexico (10,6%), consumption could increase. On the other hand, in countries with high levels of poverty, such as Haiti (46,1%), Guatemala (28,3%), Nicaragua (28,1%), Honduras (24,1%), Bolivia (21,1%), El Salvador (20,6%) and the Dominican Republic (17,7%) smaller increases in demand could be expected.

**Remittances.** An increase in remittances is a reflection of the great waves of migration of the 1990s. Remittances are very important for some countries of the region, where they are the second or third most important source of income. In general, no less than 85% of them are used for consumption rather than production. In this regard, they lead to increases in consumption, especially that of foods of animal origin.

In 2003, workers from LAC sent a record 38 billion dollars to family members throughout the Americas, according to the Inter-American Development Bank, which is attempting to get financial institutions to reduce the costs of making transfer so that poor people can receive more money. According to the IDB, in Latin America, remittances surpassed foreign direct investments and government aid combined.

In 2003, Mexico, which received more than 13 billion dollars in remittances, was the largest benefici-



*Policies have encouraged overstocking per unit of surface or deforestation, by shielding producers and consumers from the true costs of environmental degradation.*

ary, while Brazil was in second place with more than 5 billion. El Salvador and Guatemala receive on average 2 billion each per year. The average remittance per person is between 200 and 300 dollars per month.

The actual figure, however, may be as high as 40 to 42 billion dollars. The World Bank estimated remittances worldwide at 93 billion dollars, with LAC accounting for one third.

**Annual consumption per inhabitant.** In the developing countries, annual per capita consumption of beef is 6.5 kg., and in the developed countries 23kg. This indicates that great opportunities still exist to increase consumption in developing countries. Total per capita consumption of meat in developed countries is 40.3 kg, and in developing countries 29.7 kg.

### *Supply and its impacts*

**Interaction among subsectors of agriculture.** The expected increase in livestock production by 2020 will demand the production of an additional 292 million metric tons of grain for animal feed. This could have an impact on grain prices worldwide. Livestock production competes with agricultural activities, especially for land, and with wooded areas, as well as with the consumption of grains and marine products (fish meal) and slaughter by-products (blood and bone meal). Also, livestock production competes for labor, financial resources, transportation services, etc.

An increase in the price of beef worldwide leads to a reduction in consumption, and to its replacement with other meats, such as pork, chicken or fish. Initially, the increase in per capita income in developing countries minimizes the influence education and knowledge of medical discoveries may have on decisions related to consumption, and favors the consumption of red meat over white meats and fish.

In developing countries, increases in the price of beef create shortages in the short term because it takes time for production to catch up to demand and because producers prefer to sell on foreign markets at higher prices.

It is important to take into account that, in order to increase meat production, it is first necessary to import live animals for reproduction and breeding stock. Then it is necessary to increase the national livestock herd in order to meet the increases in internal and external demand. This, of course, would also create a demand for veterinary services and funding for livestock infrastructure.

**Grains, inputs for livestock farming.** It will be necessary to produce an additional 293 million metric tons of grains if the increases in meat production are to be possible by 2020. The only way to accomplish this, without further increasing the price of grains, is through the safe use of the new agricultural biotechnologies.

**Sanitary regulations.** One of the main challenges to be overcome in order to increase global trade of livestock products is the prevention of animal diseases, such as foot and mouth disease, bovine spongiform encephalopathy, avian flu, classic swine fever, etc.

The greatest sanitary risks of animal products in developing countries come from animal-borne diseases, microbial contamination from unsanitary handling of foods and the accumulation of residues from pesticides and antibiotics in the food chain.

**Environment.** It is necessary to establish regulatory mechanisms to address the environmental problems caused by livestock production. The lack of public policies will not stop the Livestock Revolution, but the design, implementation and development of institutions, as well as the development of capabilities, may ensure that it is compatible with the development of agriculture, economic growth, poverty alleviation, sustainability and food and nutritional security in LAC.

The effects of the Livestock Revolution on the environment must be a matter of concern. Livestock generally contribute to environmental sustainability in mixed farming systems where there is a proper balance between crop intensification and the breeding of livestock. In such systems, the livestock provide the dung and the draught power needed for intensive agriculture.



*Even though urban poverty exists, eating habits change when the population is urbanized, especially toward the consumption of greater quantities of animal products.*

A sustained increase in per capita income in developing countries is channeled primarily at beef (income elasticity of high demand), because it is considered a luxury item.

However, higher concentrations of animals in peri-urban area, to meet the growing demand for meat and milk in urban areas, have caused degradation of pasturelands and contamination problems. Also, policies have encouraged overstocking per unit of surface or deforestation, by shielding producers and consumers from the true costs of environmental degradation. In high-intensity production systems, the large quantities of greenhouse gases and the excessive concentrations of nutrients produced by livestock constitute hazards for the environment. That contamination must be reflected in the financial costs for the producer and consumer.

In this regard, it is necessary to apply regulations aimed at addressing the sanitary and environmental problems caused by livestock production, and to develop institutions to ensure compliance with same.

### *Demand for meat and the consumer*

**Consumption patterns.** Consumption patterns are hard to establish and equally hard to change. Increases in income certainly allow for changes in consumption patterns, perhaps more for reasons of status than out of awareness of healthy lifestyles. It is important to point out that when the middle-income population increase their consumption of beef or meat in general, they also continue traditional consumption habits, such as the consumption of tortillas or bread.

Advertising plays an important role in the creation of consumption patterns, except in the case of staple foods, such as meat, where it has little or no role to play. Farmers and ranchers do not advertise, but the food industry does. Thus, increases in income are destined primarily for foods, beverages and tobacco products. However, advertising for beverages and tobacco products generates more consumption than advertising for foods.

Also, it is necessary to consider that the increase in consumption of meat in LAC is aligned with other agricultural and non-agricultural subsectors; for example, substitute or complementary goods. To begin with, to earmark more income for the consumption of meat implies not consuming plant protein, such as beans.

Complementary goods to the consumption of meat, especially beef, are salads, potatoes and beverages, such as wine and beer, primarily. The consumption of same will increase as consumption of meat increases. The consumption of firewood, charcoal, gas and spices will also increase, having an impact on the agricultural sector and the vegetable and forestry subsectors.

### *Prices, a sensitive issue*

Meat consumption is highly sensitive to changes in price, because there are other options for consuming protein, including plant protein. This means that very high meat prices cause shifts to substitute goods such as fish, eggs, cheese, beans, etc. It is not easy to replace beef with pork, chicken or fish. They are imperfect substitutes. The impact of increased per capita income is felt most in beef consumption, which has greater income elasticity than pork or chicken.

Meat prices between 1990 and 2005 have been erratic, especially from 1995 to 2002, and due to a drop in prices in 2003. However, consumption and production of beef have remained steady, and have even increased, thanks to increases in consumers' incomes.

### *Livestock farming, poverty, employment and public policies*

**Poverty.** On other continents, such as Africa and Asia, the landless poor in rural areas, especially



women, earn a greater proportion of their incomes from livestock farming, in comparison with wealthier people in the same areas. Livestock farming yields organic fertilizers and the draught power for the poor and the opportunity to exploit community pasture areas, to have savings and assets that can be used as collateral for loans and to diversify income.

The livestock revolution could make a significant contribution to the alleviation of poverty over the next 20 years. It is important to recall that, while LAC and many developing countries have increased consumption of meat, there are other nations where, according to the latest UNDP report, a large percentage of children under two years of age die of malnutrition.

**Employment.** The comparative advantage of raising beef cattle LAC, especially in the South, lies in the use of natural pasturelands. This type of production is not labor intensive like agriculture. However, the forward and backward linkages, especially in grain production and stall feeding, are labor intensive. Also, processing for consumption and exportation are labor intensive, even though industrial processes are in general capital intensive.

**Public policies.** Governments must design public policies that will ensure that market distortions do not displace the poor from the only market that is growing. Incentives for livestock production benefit the poor, by helping to make up for the lack of protein and micro-nutrients in the diet of many developing countries. Increased consumption of meat and milk can provide the poor with the same amount of nutrients, protein and calories as a large amount of vegetables and grains.

*The lack of public policies will not stop the Livestock Revolution, but the design, implementation and development of institutions, as well as the development of capabilities, may ensure that it is compatible with the development of agriculture, economic growth, poverty alleviation, sustainability and food and nutritional security in LAC.*

### *China, major producer and consumer*

China has become the largest producer and consumer of animal products in the world. It consumes 50% of the meat exported in the world. Per capita consumption of meat grew from 9.4 kg to 17.7 kg between 1981 and 2002. In the same period, per capita consumption of eggs increased from 1.3 kg to 4.7 kg. In urban areas, the figures are 20.5 kg to 32.5 kg (meat), and 5.2 kg to 10.6 kg. (eggs).

There has been a shift from grains to livestock products in China. Consumption of grains fell from 230 kg per capita to 185 kg between 1985 and 2002.

Meat consumption in China is expected to increase from 35 to 85 million metric tons between 1993 and 2020. In Latin America, the increase would be from 21 million in 1993 to 39 million in 2020. In both cases, consumption is expected to double.



## Forecasts for 2005

Exports from Australia, South America and India will increase. The European Union, due to internal problems, will consolidate its position as a net importer.

The production and consumption of poultry will be affected by the presence of bird flu.

Production and consumption of pork will remain unchanged, with an expected increase of 1% in 2005.

Total meat consumption in developing countries is expected to increase from 88 million metric tons in 1993 to 188 million in 2020. The largest increases in consumption are expected in China and LAC.

With the entry into force of the Free Trade Agreement between the United States of America, Central America and the Dominican Republic, most of the meat will come from the United States, especially pork, chicken and fine cuts of beef, due to the quotas negotiated. Also, inputs for livestock farming, such as yellow corn, will be provided only by the United States.

## Conclusions

1. World demand for animal products will continue to grow over the next ten years, especially in China and LAC. This will be due to higher incomes as a result of economic growth, to increases in the volume of remittances and to accelerated urbanization in LAC. In the case of China, it will be due to strong economic growth, and current low per capita consumption levels.
2. The countries of LAC, especially those in the Southern Cone, have the opportunity to expand production and exports of meat to China, and to the other countries of the region.
3. Food safety regulations will be a determining factor in ensuring uninterrupted intra- and inter-regional trade of animal products.
4. The timely design of sound public policies will create the proper business climate, foster the active

participation of the private sector and allow for the development of ad hoc institutions to meet the challenge of greater consumption of animal protein.

5. Additional income received in the form of remittances will continue to be a factor in increased demand for animal products, especially in Central America.
6. Livestock production could compete for space with the production of bio-energy, or use as inputs the by-products and sub-products of the bio-energy industry.

## Recommendations

1. To facilitate the dissemination of information on increases in world demand for livestock products, as well as analyses on trends in consumption and production.
2. To foster discussion of policies aimed at ensuring that the desired increase in livestock production is achieved while respecting the environment and fostering the safe use of living modified organisms.
3. To identify the public, private and public-private institutions that can facilitate the restructuring of agricultural production, to meet the challenge of greater consumption of livestock products, achieve regional food security and tap the opportunities for trade with China.
4. To identify the changes in production that are required to expand livestock areas, gradually promoting the consumption of animal protein through eggs, chicken, pigs and beef, as well as the consumption of smaller species, such as goats and sheep, and of other species in the Andean region (cuy, alpaca, ducks, geese, etc.)

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