

# Competition from South American Pork Production

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## ■ Introduction

The ongoing growth of the world population has made researchers ask where food will be produced in the future. What areas will have land and water availability for food production based on plant and animal proteins? Which foods can be produced on a large scale in order to satisfy the needs of the world population and, particularly, the current 800 million of destitute people? This article aims at analyzing the present situation of pork production in the world, its growth perspectives, its capacity to contribute to the production of animal protein of a high biological value, and the role of South America in face of the challenge of the increasing world hunger.

## ■ The Swine Industry in the World Today

In 2003, pig producers around the world produced 98.5 million tons of pork, with a herd of approximately 1 billion animals. Asia was the largest producer (55% of the world production), with 54.4 million tons. The European continent was in second place, with 26% of the production (25.9 million tons). The Americas followed with 17 % (16.7 million tons), Africa with 0.78% (0.77 million tons), and Oceania with 0.56% (0.55 million tons)(**Table 1**).

**Table 1. Pork world production per continent, 2004.**

<b>Continent</b>	<b>Production (million tons)</b>	<b>%</b>
Asia	54.44	55.27
Europe	25.96	26.25
America	16.78	17.04
Africa	0.77	0.78
Oceania	0.55	0.56
World	98.50	100.00

(Source: L.Roppa, 2004)

## ■ Main World Producers

China is, by far, the largest producer of pork, with 46 million tons of production accounting for 46.7% of total production in the world. China is also the largest individual consumer in terms of quantity, as most of its production is consumed by its population of more than 1.3 billion inhabitants. As can be seen in **Table 2**, the 10 largest producing countries in 2003 deliver 87.3 % of world production. Together, they produced 86 million tons of pork. Brazil is the only South-American country among the 10 largest producers of pork.

**Table 2. Main world producers of pork (million tons, 2003)**

<b>Country</b>	<b>million tons, 2003</b>
China	46.04
EU-15	18.12
USA	9.06
Brazil	2.69
Poland	2.05
Canada	1.95
Vietnam	1.80
Russia	1.67
Philippines	1.38
Japan	1.26

(Source: L.Roppa, 2004)

## ■ World Pig Meat Consumption

If we divide the world production of pork (98.5 tons) by the population in the planet (estimated at 6.3 billion people in the beginning of this year), we can conclude that consumption was around 15.6 kg per capita. This number is very impressive, putting pork as the first preference of people globally, with the title of “the most consumed meat in the world”.

In fact, pork has occupied this position since 1976, when it first exceeded beef. In 2003, as can be seen in **Table 3**, chicken consumption was in the second place, with 10.31 kg, and beef was third, with 9.34 kg per capita.

**Table 3. World pig meat production and consumption, 2003**

<b>Meat</b>	<b>Production (million tons)</b>	<b>Consumption (kg per person)</b>
Pork	98.5	15.62
Chicken	65.0	10.31
Beef	58.9	9.34
Others	31.09	4.93
<b>TOTAL</b>	<b>253.3</b>	<b>40.20</b>

(Source: L.Roppa. 2004)

Chicken reached second place, exceeding beef, only in 1996. Its consumption has grown at a higher rate than pork consumption, but it is not expected that chicken will surpass pork, at least in this decade, due to the growth of the economy in China, a country which traditionally prefers foods based on pork.

Is the consumption of pork stable or has it grown lately? In the last 14 years (1990 to 2003), pork consumption by the world population has grown at a rate of 1.3% a year. (**Table 4**)

**Table 4. Evolution of the world consumption of pork, 1970-2003**

<b>Year</b>	<b>Consumption / person</b>
1970	9.20
1980	11.70
1990	13.20
2003	15.62

(Source: L.Roppa. adapted from Pig International e FAOstat)

## ■ What will be the World Production of Pork in 2015?

According to FAO, the world population will be 7.28 billion in 2015. There are two procedures to estimate the production of pork by 2010. The first assumes that the consumption per capita will remain the same (15.62 kg), and the second, that consumption will keep on growing 1.3% a year. In the second case, pork consumption per capita will be 18 kg in 2015.

We may consider that the first possibility is pessimistic, and the second, optimistic. If we multiply both perspectives by the population in 2015 (7.28 billion people), the conclusion is that the world production of pork to meet estimated demands will be between 113 million tons (pessimistic) and 130 million tons (optimistic).

## ■ Where will Swine Production Grow in the World?

If we need to increase world production by 30 million tons in the next 11 years in order to provide for the population growth and to reduce hunger, where are the most appropriate places with the right conditions to achieve this increase in production?

A document called "Agriculture towards 2010" by FAO tries to answer this disquieting question through well grounded statistics, which evaluated the current trend based on the history of the last few years. This study shows that, in 1978, 60% of pork was produced by developed countries, and that only 40% by the developing countries. However, this percentage has changed dramatically in the last few years, as there has been a higher rate of increase of pork production in the developing countries. The conclusions of this FAO report is that, in 2010, the situation will be the opposite from what it was in 1978, and that 60% of the world pork will be produced in developing countries. **Table 5** shows this clear trend, based on data of the last years.

**Table 5. World pork production in developed and developing countries (million tons, 1995-2003)** (Source: L. Roppa. 2004)

	World	Developed	Developing
1995	78.88	36.09	42.75
2000	90.90	37.18	53.73
2003	98.50	39.10	59.40
Growth, %	25.27	8.25	39.73
Growth/year, %	2.8	0.91	4.41

In the last 8 years (1995-2003), world production of pork grew 25 % (from 78.88 to 98.50 million tons). If we analyze this growth in the greatest world producers, we will see that it increased 38.7% in China. 12.3% in the EU-15 (European Union). 11.9% in the USA. 53.1% in Canada and 83.5% in Brazil. China and Brazil, due to their continental dimensions and grain production capacity. are prominent among the group of Developing countries.

### ■ **Key Conditions for Pork Production in the Future**

There are many essential conditions for a country which aims at being a big pork producer in the future. If we had to stress only four, we would choose the following: environment preservation. concern with animal welfare. water availability (for drinking and grain production), and land availability to store waste and to produce basic grains for swine feeding.

The first two conditions are cultural and fortunately are already accepted as essential standards in some regions of the world, especially in Europe. The trend is to increase the adoption of these practices because it is a fair demand by the consumers themselves. Environmental preservation is a basic need to our own survival, making this requirement unquestionable. As to the other two conditions (water and land availability), some comments, which may be critical to the growth of production in some areas of the world, must be made.

**Water.** Our planet consists of 71% water and 29% land. However. 97.24% of the water is saline (oceans) and cannot be drunk by man or animals. as it is. Fresh water represents just 2.76% of the remaining water in the planet. However, not all of it is available, as 2.14% is in bound form in the glaciers. What is left, and this is not much, is water stored in underground aquifers (0.61%). and in rivers. lakes. moisture in the soil and in the atmosphere (0.01%). There are a few countries which have the privilege of having abundant fresh water. Today, about 1 billion people have no access to potable water, and 11.000 children die everyday around the world due to problems related to the lack of water or its bad quality. Thus, water availability is an essential and limiting factor to pig production. Regions with higher water availability have better conditions for producing, not only swine, but also other raw materials (grains) essential to their feeding.

**Land.** One of the greatest limitations for the growth of swine production is waste. A pig defecates the equivalent of 2.5 people, and the use or storage of this waste is becoming a serious problem in large farms. One way of using this waste is as fertilizer. Therefore, countries with large areas of land and adequate climate will have the advantage of using the waste as fertilizer in crops and of producing grains for feeding the pigs at a lower cost. When we look around our planet for available areas for grain crops, we can see that there are just a few,

and are decreasing every year. The sweeping forest destruction and fires have accelerated the process of desertification. According to the Times World Atlas (1996 edition) this is alarming in Africa and Australia. as 75 and 65% of their land, respectively, suffer this problem. The continents with lower desertification are Europe (29%). North America (29%) and South America (31%).

### ■ Pork Production in South America

South America had a herd of 57.65 million animals in 2003. This amount represented more than 6% of the world swine herd (956.056 million). As to pork, it produced 4.107 million tons in 2003, accounting for 4.2 % of total world production. In **Table 6**, we can compare the South American pork production with the main economic blocks, with special emphasis on China, due to its indisputable world participation.

**Table 6. Pork production in the large economic blocks, 2003**

	<b>Million tons</b>
China	45.560
EU 15	18.123
NAFTA	12.058
South America	4.107

(Source: L.Roppa. 2004)

**Table 7** shows South American pork production. Brazil, fourth world power in this sector, has 65% of South American pork production. Chile is in the second place, with an efficient and modern pig production industry, producing 8.8% of the total. Argentina comes in third place with 5.2% of pork production, and has a promising future due to its extensive grain production (corn and soybean).

**Table 7. South America pork production, 2003**

<b>Country</b>	<b>Production (million tons).</b>
Brazil	2.696
Chile	0.365
Argentina	0.216
Venezuela	0.210
Paraguay	0.156
Ecuador	0.146
Colombia	0.110
Bolivia	0.104
Peru	0.085
Uruguay	0.017
French Guyana	0.001
Suriname	0.001
Guyana	0.0005
<b>Total</b>	<b>4.107</b>

(Source: L.Roppa. 2004)

### ■ **Main Advantages of Swine Production in South America**

Some South-American countries have very interesting competitive advantages as compared to other areas around the world. Their present participation within the continent shows which are the most, and which are the least competitive, countries. Common characteristics and advantages of all these countries (low cost of land, facilities and labor, favorable weather and the possibility to increase domestic consumption) should be emphasized. As individual advantages, Brazil and Argentina are stressed due to their superior grain production (corn and soybeans). Bolivia and Paraguay are good producers, and the countries around these four producers benefit from imports at lower production costs. This is becoming increasingly possible due to the advance of the negotiations for the establishment of a free trade agreement among South-American countries (ALCSA).

### ▪ **The Advantage of Low Density of Swine per Km<sup>2</sup>**

We can have a better understanding of the positive perspective of growth in swine production in this region by comparing the characteristics of China, USA, EU, Canada, Brazil and South America (**Table 8**). South America has only 3.2 pigs per square kilometer, compared to 37.6 in EU-15, clearly demonstrating the possibilities of production expansion. Also, due to its low consumption per capita, this growth does not have to be necessarily based on exports, but rather on the domestic market. Brazil stands out among South-American countries because of its low production cost and as having only 4.1 pigs per square kilometer. It is important to associate these characteristics to the fact that Brazil is eradicating Foot and Mouth Disease, and that it is free of Classic Swine Fever in some regions, also does not have PRRS.

**Table 8. Comparative advantages among the greatest world swine producers, 2003**

	China	USA	EU 15	Canada	South Am.	Brazil
Area, 1000 km <sup>2</sup>	9.596	9.629	3.238	9.976	17.844	8.511
Pigs, million head	454.4	59.1	121.8	12.4	57.6	35.4
Pigs/km <sup>2</sup>	47.3	6.1	37.6	1.2	3.2	4.1
Consumption, kg/person/year	33.7	30.1	43.8	31.0	10.2	12.4
Production cost, US\$/kg/LW	0.85 – 1.20	0.75- 0.85	1.00- 1.20	0.75- 0.85	0.55- 1.10	0.55- 0.65

(Source: L.Roppa. 2004)

### ▪ **The Advantage of Water Availability**

Only 31% of the South American continent has desert areas or areas in desertification. This is an important competitive advantage as compared to Asia, Africa and Oceania, which have 45, 65 and 75%, respectively. In fact, only 4% of the South-American territory has desert or arid climate. Another advantage is its fresh water availability. Just Brazil alone has 8% of all the fresh water available in the planet, and 80% of this water is in the Amazon.

## ■ The Advantage of Land Availability for Crops

Land dimensions and low desertification provide this region of the planet with a huge potential for food production. Despite producing only 4.2% of the world pork, South America stands out in grain production. As can be seen in **Table 9**, Brazil is now the world's second producer of soybeans and the third in corn production. Argentina is the fourth largest producer of corn and the third largest producer of soybeans.

**Table 9. World largest producers of corn and soybeans, 2003**

	Extension (1.000 km <sup>2</sup> )	Production (1.000 ton)	
		Corn	Soybeans
USA	9.80	228.8	67.3
China	9.59	120.2	16.4
Brazil	8.51	42.6	52.0
Argentina	2.78	14.9	35.0

(Source: L. Roppa. 2004.)

Which South-American countries can expand their agricultural area? Due to present use of land in South-American countries, it is possible to conclude that Argentina, Brazil and Paraguay already use their cropland well and have a high potential for expansion. In Brazil, due to its dimensions, the possibilities of expansion suggest the excellent potential for increased pork production in this area. In Brazil, with more than 47.6% of the land of South America, agriculture has a great general potential for growth, as this country uses only 14% of its potentially arable land area. (**Table 10**)

**Table 10. Agricultural areas used in main countries**

	Agricultural Area, million hectare	Already Used, million hectare	Already Used, %
World	4.974	1.364	27.4
USA	418	176	42.1
EU-15	140	73	52.1
Brazil	370	52	14.0

(Source: L. Roppa. 2003.)

## ■ Advantages of Low Production Costs

Due to self-sufficiency in grain production and the low cost of its facilities, labor and land, several South-American countries have competitive prices as compared to other regions of the world. In **Table 11**, the production costs of some countries around the world are listed, according to a study published by Rasmussen (2002) and Rabobank (2004). It can be seen that Brazil has the lowest production cost compared to other countries. Furthermore, it must be mentioned that in grain producing areas in Brazil (Central Western region), the production cost reaches USD 0.50 per kg live weight (or USD 0.76 per kg carcass weight), one of the lowest production costs in the world.

**Table 11. Production costs per country**

Country	Rasmussen. 2002. (USD/ kg carcass weight)	Rabobank. 2004 (Euros/ kg carcass wt)
United Kingdom	1.30	-
China	-	1.35
Holland	-	1.30
Poland	-	1.18
Denmark	1.19	-
France	1.18	-
Canada	0.97	1.13
USA	1.07	1.15
Brazil	0.90	0.99

(Source: Rasmussen, 2002 and Rabobank, 2004.)

The production costs of some South-American countries are listed in **Table 12**, according to information given to the author by the Breeders Association of each country. The numbers are clear and show the excellent competitiveness of some South-American countries to compete in the global pork market.

**Table 12. Production cost in main swine producing countries of South America, 2004**

Country	(US\$/ kg live weight)
Brazil	0.60
Argentina	0.60
Chile	0.70
Venezuela	0.85
Peru	0.97
Colombia	1.10

(Source: L. Roppa. based on each country's Breeders Association data, 2004)

### ■ Main Problems of Swine Production in South America

Some of the main problems of swine production in South America are inherent to the economies of developing countries. In this sense, credit difficulties, high taxes, economic instability and high interest rates are factors which hinder an accelerated growth of production. Among the remaining problems, the traditional *low consumption of pork* is emphasized. In South America, the population prefers to eat beef and chicken and pork consumption is indeed very low. This is a problem today, but it may be a great opportunity in the future. If we compare what happens in Brazil with the rest of the world (**Table 13**), we will see opposite situations – the meat preferred around the world is pork, with 44% of total meat consumption, whereas in Brazil pork accounts for only 14.7% of meat consumption. In the case of beef, it is just the opposite – it is the most consumed meat in Brazil (43.3%), and the least in the world (26.5%).

**Table 13. Comparison of meat consumption in the world and Brazil, 2003**

	World		Brazil	
	kg/person	%	kg/person	%
<b>Pork</b>	15.62	44.3	12.4	14.7
<b>Chicken</b>	10.31	29.2	35.4	41.9
<b>Beef</b>	9.34	26.5	36.5	43.3

(Source: L. Roppa. 2003)

**Table 14** shows pork consumption in South American countries and compares it to some developed countries with higher income per capita. Chile has the

largest consumption in the continent (18.9 kg per person per year) and it is the only South American country in which consumption is higher than the world average. These figures show the growth potential of the swine industry, because if a country such as Brazil, with its 180 million inhabitants, jumped from its present 12.4 kg pork consumption to the world average, an increase of 576,000 tons of pork would be necessary. This means that Brazil can dramatically increase its production merely by providing for its domestic market.

**Table 14. Pork consumption in South America, 2003**

<b>Country</b>	<b>kg/person</b>
Chile	18.9
Brazil	12.4
Uruguay	10.2
Argentina	7.0
Peru	3.8
Colombia	2.6
World	15.6
Europe	43.8
USA	30.1

(Source: L.Roppa. with Breeders Association data, 2003)

There are several causes for this low consumption of pork in Brazil: Higher price as compared to chicken, the buying power of the population, higher retail profit margins as compared to chicken, less publicity, lower use in food services, not as easy to cook, higher consumption of further processed products and taboos related to its quality.

The solutions of these problems demand:

- Improvement of the economy of these countries to increase buying power;
- Discussion of profit margins with the large retailers. In Brazil, the profit of the supermarkets on pork is twice the profit in France;
- Increasing fresh pork consumption. In South America. 70% of the pork is eaten as salami, hams, pancetta and other further processed products. This makes it difficult to increase consumption, as further processed products are more expensive and their sales are limited to social classes with higher buying power. As these people are a minority in South America, a great part of the population is deprived of pork consumption due to its high price;

- Improving the presentation of fresh pork cuts and develop ready-to-cook products adapted to the modern consumer, who has little time to prepare food;
- Certifying the origin of the meat through legitimate organizations, in order to guarantee the purchase by the consumer of a good quality product originating from modern and healthy farms;
- Breaking taboos against pork. One of the most important taboos which inhibits pork consumption, is the lack of knowledge of the qualities of the pork produced today;
- All genetic, nutrition and management advances must be disseminated in constant marketing campaigns and in lectures to health professionals and human nutritionists.

## ■ South-American Exports of Pork

South-American exports are very small and represent only 4.2% of world exports. More than 95% of this volume is exported by Brazil (80%) and Chile (15%). whereas the remaining countries are importers. Argentina is the largest importer in the continent. Import trade is done mostly within South America, provided by Brazil and Chile. Brazil is one of the main exporters in the world, with the 4<sup>th</sup> position in the past two years (**Table 15**).

**Table 15. Primary world and South America pork exporters, 2003**

Country	1000 ton
EU-15	1,658
Canada	975
USA	762
Brazil	492
Chile	77

(Source: USDA-ABIPECS, 2003)

In order to become a large pork exporter, South America must intensify its efforts in the following areas:

- Improvement of carcass quality;
- Intensification of Foot and Mouth Disease and Swine Pest eradication campaigns in the countries still plagued by these diseases;
- Restriction of the use of antibiotics;

- Provision of animal welfare through improved facilities and management practices. satisfying consumer and animal demands;
- Environmental protection through good waste management and careful planning of facilities. Protection of water sources and correct use of land. avoiding the misuse of these competitive advantages;
- Working at the international political level to decrease the subsidies given by developed countries to their agriculture, in order to open the market for countries with higher competitive power.

## ■ Conclusion

Based on all the above, the competitiveness of some South American countries as compared to the rest of the world becomes evident. Their climate, land and water availability, grain production and low production costs, determine their competitiveness. South America has a great potential to increase its pork production, not only to provide for the domestic market. but also to expect a larger participation in world exports. Therefore, the continent has the necessary conditions to accept the challenge of a growing demand for food, and the inevitable growth of the world population.