Structural changes in the Brazilian poultry sector 1995 to 2005[1]

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SUMMARY

Between 1995 and 2005, Brazil became a world agricultural powerhouse. Agriculture was no longer viewed as something of the past, but as a segment in which Brazil could excel due to its natural conditions. Meats are among the leading "new" agricultural products that have contributed to this change, and in this period the country consolidated a position as one of the major poultry producing and exporting countries in the world.

The interdependence of international markets requires that producers for export adapt to demands that differ from those prevailing in their immediate markets (e.g. 100 percent vegetable feeds; GMO-free feeds; traceability to grandparents; constant audits of quality assurance, food safety, ethics, environment, animal welfare, etc; and slaughtering according to different religious precepts), thus forcing the sector to develop the production flexibility that in the long run enhances its competitiveness.

The paper discusses the importance of the poultry sector for the economy of Brazil, and how it has evolved in a country where bovine meat has been historically dominant. Supported by abundant statistics, it shows the growing importance of poultry to the country at both the national and international levels.

It describes the factors that have contributed to this evolution, points out the contribution of the sector's concept of hunting and defending "in a pack" as one of key factors accounting for Brazil's leading position, regardless of the fierce competition among the leading local companies. As occurs in most major producing countries, the poultry business is moving towards concentration. There is an incipient presence of foreign capital attracted by the unique competitiveness of the segment – a presence that is expected to expand in the coming decade.

It establishes the origins of the poultry industry and its march towards the Centre-West Region, describes the production systems and presents the future perspectives for this industry in the a country rich in grains, water and which has immense reserves of agricultural land. It counterpoints this positive scenario with concerns regarding the insufficiency of public investments in infrastructure, education and budgetary limitations affecting the public agricultural research and organization that are not in line with the sector's progress.

[1] This report was prepared as background information for the international conference *"Poultry in the 21st* century – avian influenza and beyond", but was not part of the originally published proceedings.

Rich in detailed statistics, the paper contributes to an understanding of how Brazil became a world poultry leader. Without advocating a Brazilian model, it presents the author's views regarding factors that have permitted a developing country to face subsidized competitors from developed countries, some which might be emulated by other developing countries.

1 THE CHANGING POULTRY SECTOR

1.1 The relative importance of the sector

In 2005, Brazil was the third largest agricultural and food exporter in the world, behind only the United States of America and European Union (EU) (25 countries). Described as an "agricultural powerhouse", the country has the potential for continued growth. In addition to its current 62 million hectares (153 million acres) of arable land, Brazil has an estimated 90 to 107 million hectares of potential arable land. The country also has one of the world's largest reserves of water. A document published by Brazil's Ministry of Agriculture and Livestock[2] states that the country is using one-third of its potential arable land (Table1).

TABLE 1
Brazil Use of the Land in 2005

	In million of hectares	% over total area	% used in agriculture
Brazil total area	**851**		
Protected areas	55	6.46%	
Cities, lakes, roads	20	2.35%	
Other uses	38	4.47%	
subtotal	738	86.72%	
Amazon Forest	345	40.54%	
Pastures	220	25.85%	33.73%
Annual Cultures	47	5.52%	
Permanent Cultures	15	1.76%	
Cultivated Forests	5	0.59%	
Available area for agriculture w/out Amazon Forest	106	12.46%	

Source: MAPA (2007a)

[2] MAPA (2007a).

Agribusiness was responsible for 23.2 percent (R$540.1 billion)[3] of Brazil's gross national product (GNP) (R$2 332.936 billion)[4] in 2006; this figure is estimated to reach R$564.36 billion or 23.3 percent in 2007.[5] Brazil is a significant world exporter of soybeans, sugar, coffee, orange juice, tobacco, and bovine and poultry meats. It figures among the ten largest world producers of 40 different agricultural products.

TABLE 2

Brazil - Country Rank in the World Production of Agricultural Commodities - 2005

Commodity	World Rank	Commodity	World Rank
Beans, Dry	1	Persimmons	4
Coffee, Green	1	Pineapples	4
Mate	1	Avocados	5
Oranges	1	Cocoa Beans	5
Papayas	1	Eggs, excluding Hen	5
Sugar Cane	1	Lemons and Limes	5
Bananas	2	Indigenous Turkey Meat	6
Cassava	2	Jute-Like Fibres	6
Indigenous Cattle Meat	2	Cow Milk, Whole, Fresh	7
Indigenous Chicken Meat	2	Hen Eggs	7
Soybeans	2	Buckwheat	8
Tobacco Leaves	2	Fruit Tropical Fresh nes	8
Cashew Nuts	3	Indigenous Horse Meat	8
Castor Beans	3	Mangoes	8
Maize	3	Rice, Paddy	9
Pepper,White/Long/Black	3	Tomatoes	9
Tang.Mand.Clement.Satsma	3	Figs	10
Coconuts	4	Natural Rubber	10
Cocoons, Reelable	4	Onions, Dry	10
Indigenous Pigmeat	4	Sorghum	10

Source: FAO, Economic and Social Department, The Statistics Division, Major food and Agricultural Commodities and Producers http://www.fao.org/es/ess/top/topproduction.html?lang=en&country=21&year=2005

[3] MAPA (2007b).

[4] IPEA – Instituto de Pesquisa Econômica Aplicada (Research Institute of Applied Economics), (http://www.ipea.gov.br/default.jsp) IPEADATA, Sinopse macroeconômica (Macroeconomic synopsis).

[5] MAPA (2007a).

Agribusiness exports in 2006 (US$49.428 billion) represented 36 percent of all Brazilian exports. In 2006, agriculture contributed US$42.7 billion to the country's US$46.1 billion balance of trade surplus.

TABLE 3

BRAZIL - AGRIBUSINESS TRADE[6] *US$ millions*

TRADE	2005			2006			Change	
	EXPORTS	IMPORTS	BALANCE	EXPORTS	IMPORTS	BALANCE	EXPORTS	IMPORTS
Total trade	118 308	73 599	44 709	137 471	91 394	46 077	16.2%	24.2%
All other products	74 707	68 415	6 292	88 043	84 588	3 455	17.9%	23.6%
Agrobusiness	43 601	5 184	38 417	49 428	6 806	42 622	13.4%	31.3%
Share (%)	36.85	7.04		35.95	7.45		-2.4%	5.7%

It is not an overstatement to say that agribusiness exports allowed Brazil to accumulate its foreign currency reserves (US$177 060 million in November 2007)[7] and that it has been decisive in enabling the country to reduce its international debt to levels acceptable to the international finance community. Meat is presently the third most important of Brazil's agribusiness exports and is one of the main sources of foreign trade surplus.

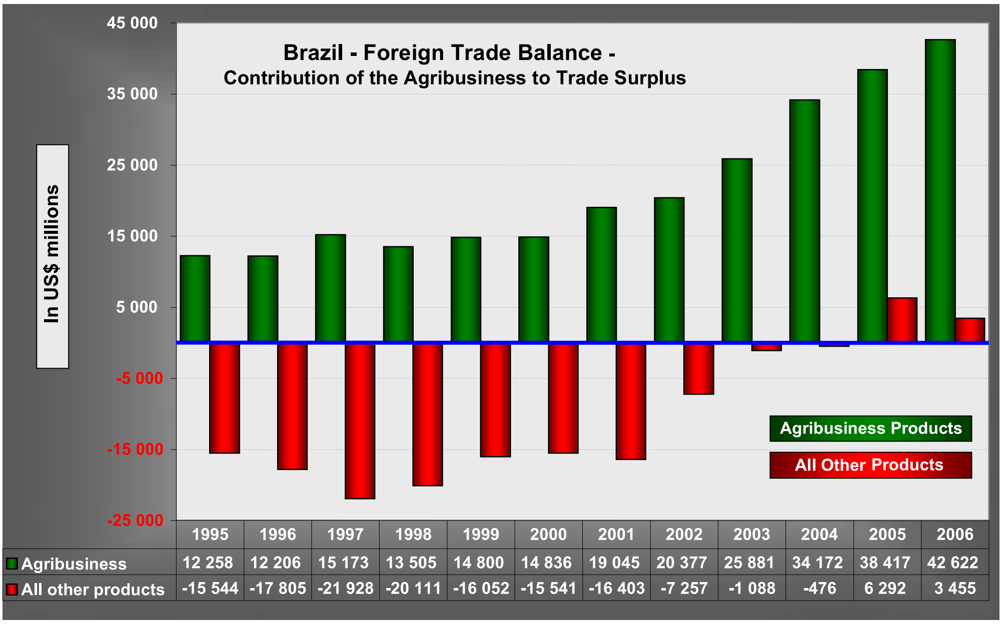
[6] Source: data from ALICE-WEB (or simply ALICE) – Análise das Informações de Comércio Exterior (Foreign Trade Information Analysis), a database available via the Internet developed by the Secretaria de Comércio Exterior - SECEX (Secretary of Foreign Trade), from the Ministério do Desenvolvimento, Indústria e Comércio Exterior – MDIC (Brazilian Ministry of Economic Development, Industry and Foreign Trade). ALICE-Web is updated on a monthly basis with statistics on Brazilian exports and imports obtained from the Sistema Integrado de Comércio Exterior - SISCOMEX – (Foreign Trade Integrated System), governmental management system of the Brazilian foreign trade. (http://aliceweb.desenvolvimento.gov.br/default.asp).

This table was elaborated by MAPA/SRI/DPIA (Agribusiness International Relations Secretariat, Agribusiness International Promotion Department, General Coordination of Export Organization – CGOE). Data are available on their Web site, under "Indicadores e Estatísticas, Balança Comercial, Balança Comercial do Agronegócio" (Indicators and Statistics, Balance of Trade, Agribusiness Balance of Trade), 2005/2006 (http://www.agricultura.gov.br:80/portal/page?_pageid=33,5020270&_dad=portal&_schema=PORTAL).

[7] Source: Banco Central do Brasil BACEN (Brazil's Central Bank) (http://www.bcb.gov.br/?INDICATORS).

FIGURE 1

Contribution of agribusiness to Brazil's trade surplus, 1995–2006



Source: elaborated with data from ALICE (Análise das Informações de Comércio Exterior) (http://aliceweb.desenvolvimento.gov.br/default.asp).

TABLE 4

Brazil – Agribusiness Exports – Meats – 2005-2006

Brazil exports of main agribusiness products	**2005**		**2006**	
Total agribusiness exports	USD 43 600 934,00		USD 49 427 574,00	
	US$ 000	**% total exports**	**US$ 000**	**% total exports**
MEATS	**7 976 561**	**18.3%**	**8 346 452**	**16.9%**
		% meat exports		**% meat exports**
Bovine meat	2 419 103	21.6%	3 134 436	37.6%
Bovine meat processed	613 718	5.6%	724 493	8.7%
Chicken meat	3 324 209	54.9%	2 922 633	35.0%
Chicken meat processed	184 339	1.7%	280 781	3.4%
Turkey	168 251	2.2%	112 104	1.3%
Pork	1 123 151	11.5%	990 118	11.9%
Other meats	143 790	2.5%	181 887	2.2%

Source: elaborated with data from ALICE (http://aliceweb.desenvolvimento.gov.br/default.asp).

Poultry meat exports represented 58.8 percent of the country's meat exports in 2005, a percentage that dropped to 39.7 percent in 2006 – Brazil suffered severely as a result of drops in demand caused by highly pathogenic avian influenza (HPAI) in some of its main export markets, such as Europe, the Middle East and the Far East. In 2006, beef exports represented 46.3 percent of Brazil's total meat exports. Preliminary figures for 2007 indicate that poultry and beef will each represent 40 percent of total meat exports.

This fundamental change that took place during the period between 1995 and 2005 has provided the Brazilian agribusiness entrepreneur with more stable economic conditions under which to operate. It may be hard for a foreign entrepreneur, above all those from developed countries, to appreciate the importance of stability to their Brazilian counterparts. Nonetheless, it is a major change and will certainly contribute to enhancing, if not their competitiveness, then at least the rules of engagement.

It would perhaps help to understand the importance of economic stability if we consider that from 1975 to 1995 the Brazilian entrepreneur had to cope with an economy in which inflation reached as high as 84 percent a month, and in which eighteen zeros were cut from the national currency (which changed name six times).

The new stability is most certainly among the top structural differences between the Brazil of 1995 and that of the present day. Agribusiness is at the root of this structural change, and meats are among the leading "new" agricultural products that have contributed to this shift. The poultry-meat sector was the first to show how international markets could leverage the growth of an entire sector and positively influence internal consumption through constant innovation, high quality standards and product differentiation. Brazilian meat exports followed the road opened by the poultry sector, and soared by 506 percent in terms of tonnes and 459 percent in terms of US$ FOB (free on board) value during the period between 1996 and 2006.

TABLE 5
Brazilian Meat Exports – 1996-2006

	All Meats		***Bovine***		***Pork***		***Poultry***	
	US$ FOB 000	**tonnes**	**US$ FOB 000**	**tonnes**	**US$ FOB 000**	**tonnes**	**US$ FOB 000**	**tonnes**
1996	1 493 879	811 368	430 628	134 306	128 821	59 751	890 978	571 578
2000	1 893 808	1 450 735	755 183	312 066	173 800	123 880	904 096	917 470
2005	7 976 561	5 029 646	3 032 821	1 366 775	1 123 151	579 413	3 676 799	2 957 783
2006	8 346 452	4 916 388	3 858 929	1 502 200	990 118	484 217	3 315 518	2 791 950
% Growth								
2006/1996	**458.7%**	**505.9%**	**796.1%**	**1018.5%**	**668.6%**	**710.4%**	**272.1%**	**388.4%**
1996			28.8%	16.6%	8.6%	7.4%	59.6%	70.5%
2000			39.9%	21.5%	9.2%	8.5%	47.7%	63.2%
2005			38.0%	27.2%	14.1%	11.5%	46.1%	58.8%
2006			46.2%	30.6%	11.9%	9.8%	39.7%	56.8%

Source: Alice.

There are other reasons to begin this paper by stressing the importance of poultry exports to the country's trade surplus. The various Brazilian authorities that interact with the poultry industry have recognized this importance, and relations are considerably better than they were in the past.

The poultry industry has always had close relations with the Ministry of Agriculture and with the Ministry of Foreign Relations. These relations were conducted through its main associations, União Brasileira de Avicultura (UBA) (Brazilian Poultry Union) and Associação Brasileiras do Produtores e Exportadores de Frango (ABEF) (Brazilian Chicken Producers and Exporters Association).

Until the early 1990s, state organizations or agencies were more active in inspection and control of the industry. This reflected the heavy intervention and involvement of the state in the economy during the military regimes that held power between 1964 and 1985. Private entrepreneurs were not regarded very positively by state organizations which in many instances had the power to control almost every aspect of the life of a company, including decisions regarding to whom and at what prices products could be marketed.

The state totally controlled exports and had the power to deny authorization for sales if the product in question was needed to assure internal supply or if they judged the export price to be insufficient. From 1978, the shortage of foreign currency became acute; import permits were extremely hard to obtain, and a parallel market of foreign currency boomed. Authorities would examine every single export operation to see whether exporters were keeping foreign money abroad.

Many key products had special state agencies which controlled every aspect of the activity; examples included the – Instituto Brasileiro do Café (IBC) (Brazilian Coffee Institute) and the Instituto do Açúcar e do Alcool (IAA) (Alcohol and Sugar Institute). Fortunately, there was no Brazilian Institute of Poultry or of Meat, probably because agriculture and livestock were perceived by the authorities to be less relevant "raw materials" or "basic products". The military regime saw industrialization as the top priority for the country's economy, and thus grains and meat were "things of the past". We had no Institute of Meat, but state-owned trading houses would compete with the private companies.

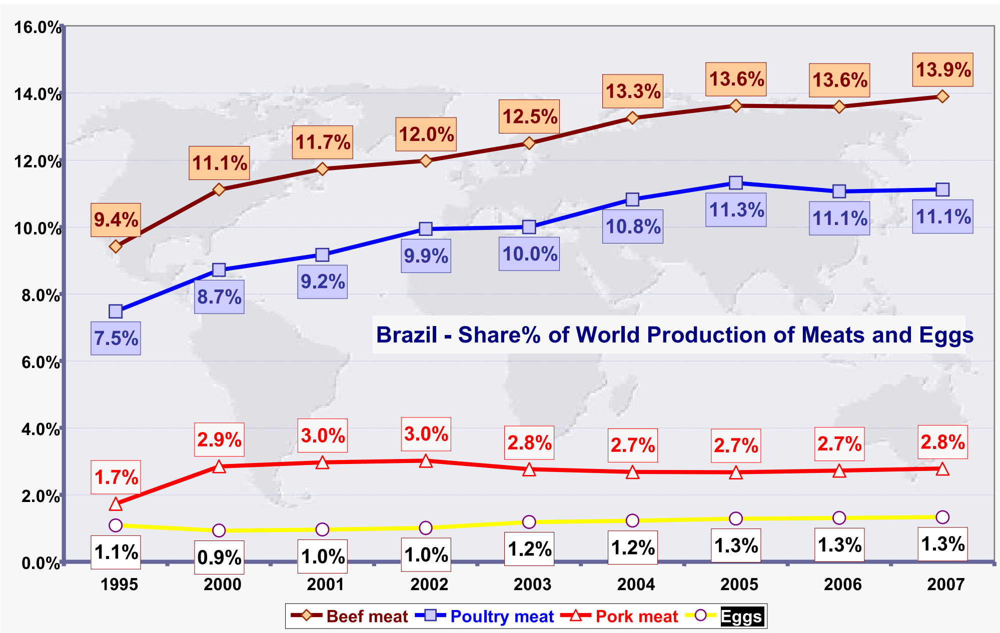
Professor Delfim Netto, Finance Minister (1967–1974) and Economic Planning Minister (1979–1985), pursued a policy of promoting exports as opposed to merely restricting imports. He granted fiscal and financial incentives to exporters, along with more flexibility in authorizing imports. For an industry which depended on essential micro-elements for feed production and which was eager to import modern equipment, this was particularly attractive.

The early 1990s brought changes – with the principles of the market economy starting to prevail, along with the extinction of fiscal and finance incentives to export. From 1995 onwards, a policy of reducing state intervention in the economy and of privatization of state-owned companies gave rise to a new era in relations between state agencies and the private sector. During the period 1995 to 2005, these relations evolved towards cooperation, establishment of joint action strategies and development of synergies. Several ministers with experience in the private sector helped to achieve this structural change – and results were obtained. Agriculture was no longer viewed as a thing of the past, but as a sector in which Brazil could excel thanks to its natural conditions.

1.2 Brazil and the world – selected animal products

One of the consequences of the new relations between the state agencies and the private sector, which prevailed after 1995, was that they helped Brazil to become one of the world's major meat producers. By 2005, Brazil represented 13.6 percent of world beef production and 11.3 percent of world poultry production.

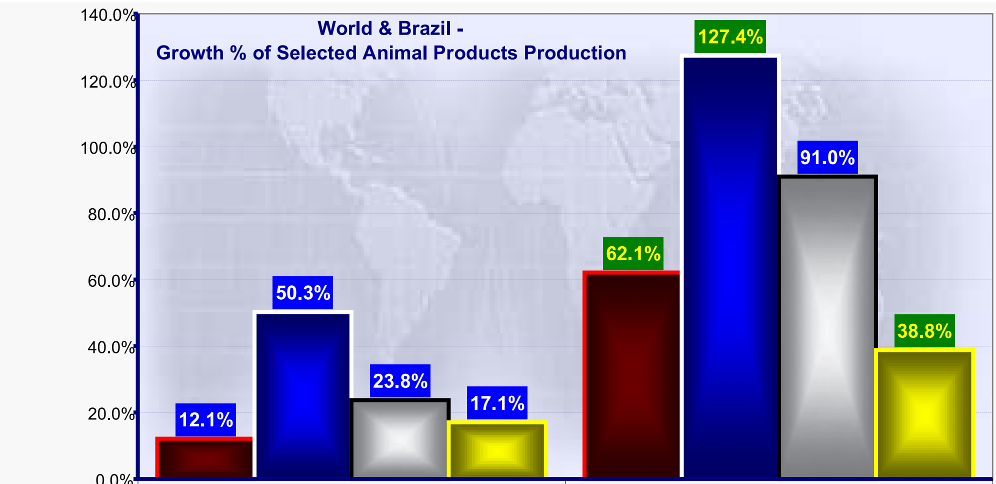
FIGURE 2
Brazil's share of world meat and egg production



Source: elaborated with data from OECD.Stat.

During the period 1995 to 2005, Brazilian beef production grew by 62.1 percent, as compared to 12.1 percent growth in world beef production. Poultry production grew by 127.4 percent, as compared to 50.3 percent for the world as a whole. Pork production grew by 91.0 percent as compared to 23.8 percent for the world as a whole. From 1995 to 2005, Brazilian beef, poultry meat and pork production grew, respectively, at 5.1, 2.5 and 3.8 times the world growth rate. Egg production grew at 2.3 times the world growth rate.

FIGURE 3
Meat production growth 1995 to 2005 – world and Brazil

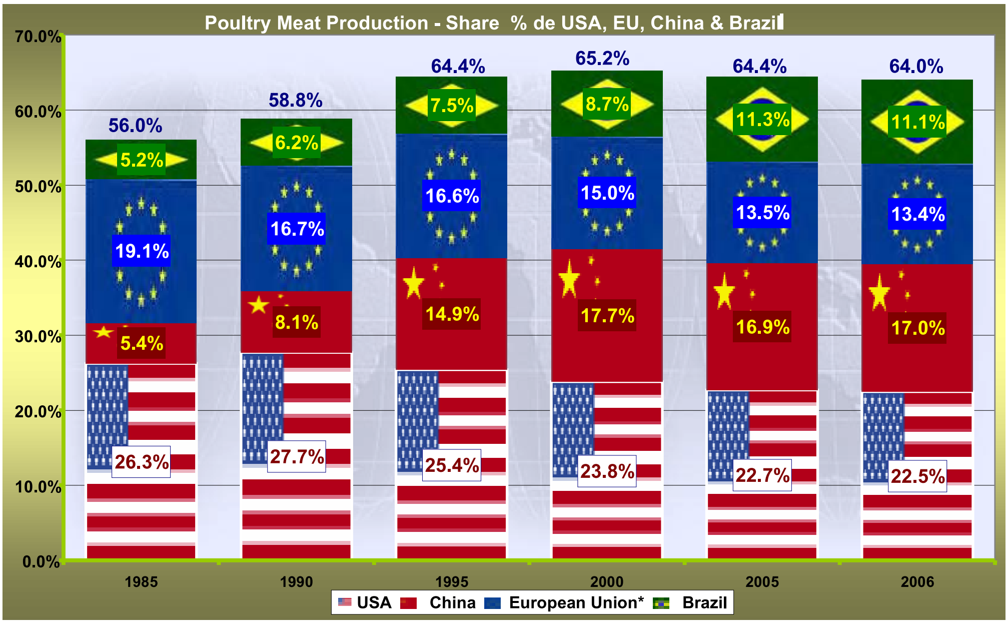


	World	Brazil
Beef meat	12.1%	62.1%
Poultry meat	50.3%	127.4%
Pork meat	23.8%	91.0%
Eggs	17.1%	38.8%

Source: elaborated with data from OECD.Stat.

Poultry-meat production is highly concentrated in a few countries. Until the early 1990s, the United States of America and the EU (15 countries) accounted for about 45 percent of production. During the 1990s, both China and Brazil acquired a significant share of world production. Almost two-thirds of world poultry production now comes from only four countries, among which Brazil and China had the highest accumulated growth in production during the period 1995 to 2005. The growing importance of Brazil and China has contributed to the migration of poultry-meat production from developed to developing countries – a process which is forecast to continue in the future.

FIGURE 4
Market share of poultry meat production – selected countries, 1985–2006



**European Union – 25 countries from 1995 onwards.*
Source: figures for the years 1985 and 1990 are from FAOSTAT. Figures for 1995 to 2006 are from OECD.Stat.

TABLE 6
Poultry production accumulated growth – world and selected countries, 1995–2005

World	50.3%
United States	34.1%
European Union-25	22.5%
Brazil	127.4%
China	70.9%
Other Countries	41.2%

Source: : OECD.Stat

Among the four leading countries, it is the United States of America and Brazil that have the natural conditions (arable land, photosynthesis and water) to maintain leading positions in the coming decades.

1.3 Brazilian meats and the international market

The expansion of Brazilian meat production during the period 1995 to 2005 surpassed both the country's population growth and the growth of internal consumption, which in 2005 reached 85.5 kg/per capita/year compared to a per capita availability of 114.4 kg/year.

TABLE 7
Meat production, trade and consumption balance, selected years, 1995 to 2007[8]

	Total Main Meats* in 000 tonnes	1995	2000	2002	2004	2005	2006	2007
+	PRODUCTION	11 010	15 075	17 841	19 778	21 114	21 469	22 757
+	IMPORTS	271	106	103	55	51	33	103
-	EXPORTS	770	1 678	3 171	4 921	5 745	5 534	5 441
=	Apparent Consumption	10 512	13 503	14 773	14 912	15 420	15 967	16 418
	Population (million)	155.8	169.5	173.4	182.1	184.6	187.2	187.7
	Per capita kg/person/year	67.47	79.67	85.20	81.91	83.53	85.28	87.47
	Export/Production	7.0%	11.1%	17.8%	24.9%	27.1%	25.8%	28.3%
	Production per capita	70.67	88.94	102.89	108.64	114.38	114.67	121.24

** Beef + Pork + Chicken + Turkey*

Brazil has generated a meat production surplus that permitted the country to expand its meat exports by 646.3 percent between 1995 and 2005. The country has a tradition of exporting meat (mainly beef). Historical texts describe canned and dried beef being sold to foreign vessels and even shipped abroad during the nineteenth century. In contemporary trade history, Brazilian beef is present from 1961 onwards; the first chicken-meat operations date from 1975.

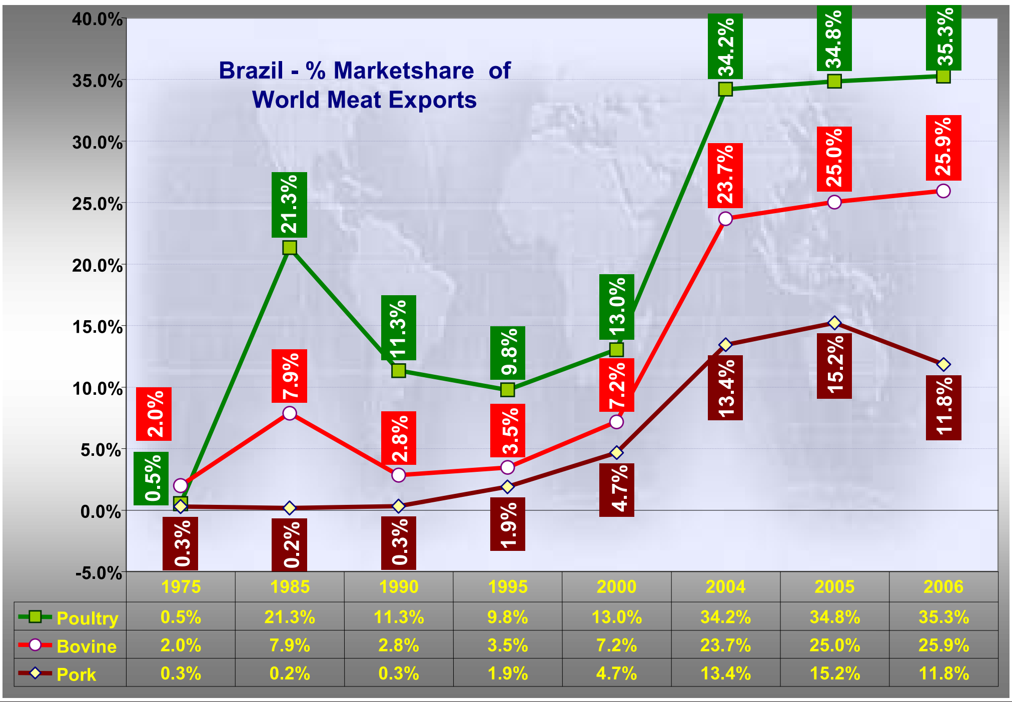
While the international presence of Brazilian beef has been constant since 1961, the country's market share has oscillated between 2 percent and 5 percent. The focus of the

[8] Source: elaborated by ODConsulting. Population data are from IBGE – Instituto Brasileiro de Geografia e Estatística (Brazilian Institue of Geography and Statistics). For 1995 and 2000 they are based on the Demographic Census 2000. In December 2007 IBGE announced some preliminary results of a national census conducted in cities under 100 000 inhabitants. According to the census, the Brazilian population has grown at a much lower rate and is estimated at 183 987 291 for 2007. As this figure is not yet definite and is being debated, for the purpose of this study we have used projections made by IBGE based on the 2000 census, including the figure for 2007. The years 2004 to 2006 are based on data available from the PNAD – Pesquisa Nacional por Amostra de Domicílios (National Survey by Home Samples), conducted by IBGE, which may be found on their Web site (http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2005/tabsintese.shtm and http://www.ibge.gov.br/home/estatistica/populacao/trabalhoerendimento/pnad2006/tabsintese.shtm).

beef entrepreneur was the domestic market. In contrast, poultry (with a few exceptions normally caused by government interference) continuously expanded its market share. The classic example government interference was the "Cruzado Economic Plan" of 1986, when the government tried to curb inflation by freezing domestic prices and restricting exports to ensure supply. The plan had the lack of success predictable for an attempt to control inflation and promote income distribution by decree. Several heterodox economic plans followed, with similar degrees of success, but without the negative repercussions imposed by the official announcement in 1986 that Brazil would no longer be an exporter of food, but rather an importer. Indeed, Brazil imported unprecedented quantities of beef and pork in the years 1986 and 1987; our chicken importers took the official statement seriously and started to develop alternative sources of supply.

Disregarding this incident and others of minor consequence, poultry exports have shown constant annual growth and an ongoing quest for new markets. Poultry exports have been a success story and have shown that a model of growth based to a large extent on international marketing can serve as a lever for domestic production and consumption.

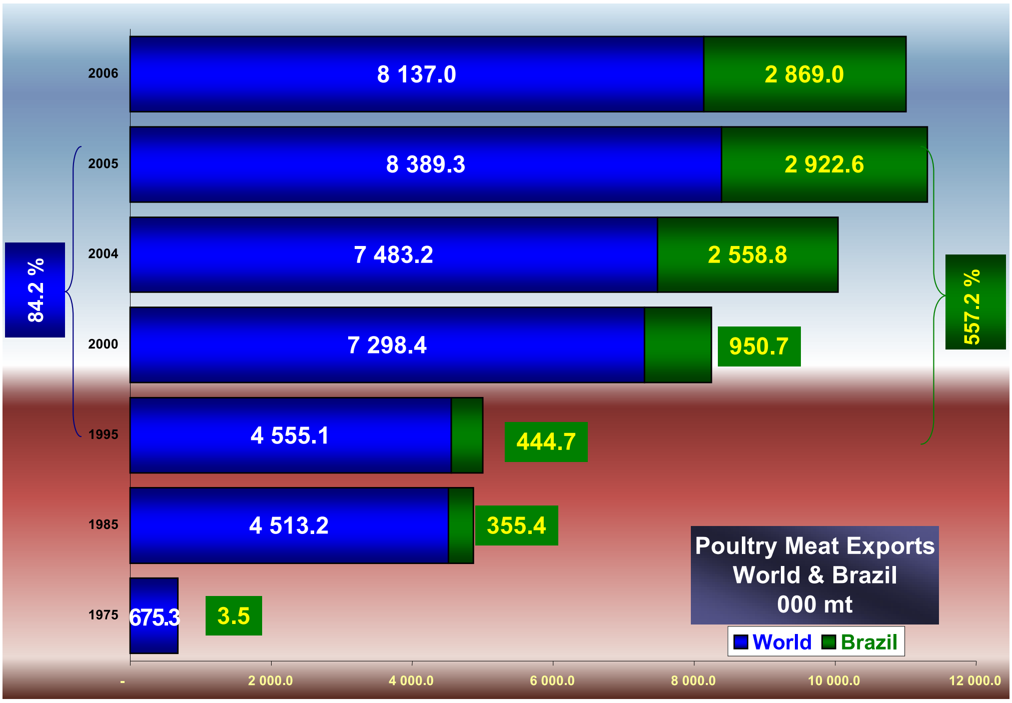
FIGURE 5
Brazil's share in world meat exports, 1975–2006[9]



[9] Elaborated from FAOSTAT data for 1965 to 1975. Data for 1985 to 2006 are from the Commodity Markets, Policy Analysis and Projections Service (ESTM), Trade and Markets Division, of FAO, May 2007. Data on Brazilian exports for the years 1995 to 2006 have been corrected according to those published by various Brazilian associations. We have used FAOSTAT and FAO ESTM figures because of their comprehensiveness as they cover 200 countries. The Prodution, Supply and Distribution (PSD) database of the Foreign Agriculture Service (FAS) of the Unites States Department of Agriculture (USDA) is of incredible quality, but in contrast to FAOSTAT it covers only selected countries, normally the main players. Using PSD database, the Brazilian share in world meat exports would be more prominent, but not in a realistic way. FAOSTAT may have its limitations in terms of updating data, a Herculean task considering the number of countries involved, but in our opinion is the most complete.

During the period 1995 to 2005, Brazilian poultry exports expanded 5.5 times, and the country moved to a leading position in poultry exports, particularly chicken meat.

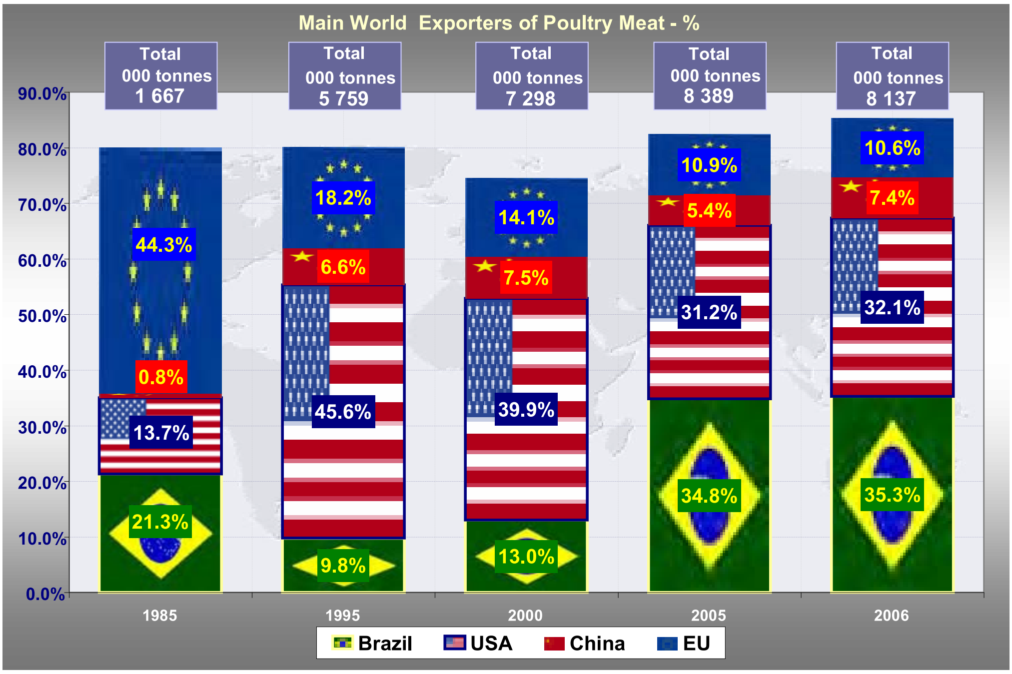
FIGURE 6
Brazilian and world poultry-meat exports, 1975 to 2006



Source: See footnote to Figure 5

Figure 7 shows the predominant role currently enjoyed by the United States of America and Brazil, which together represent more than two-thirds of world supply. As noted above, these two countries have the natural conditions to sustain poultry production and generate exportable surplus over the long term. This factor is of extreme importance given that future demand for poultry meat is likely to be concentrated primarily in the developing countries of Asia and Africa, which for the most part are situated in areas where there are shortages of water or arable land.

FIGURE 7
Market shares of the world's major poultry exporting countries



Source: figures for the years 1985 and 1990 are from FAOSTAT. Figures for 1995 to 2006 are from OECD.Stat.

Documented production and export data for beef, chicken, turkey, ducks and geese, pork and sheep indicate in 2005 respectively 115.6 kg and 84.31 kg for a population 184.6 million. *There are no reliable data available on meats of equines*, asinines, mules, buffalo, quail, guinea fowl and other commercially produced wild birds, ostrich, rabbit, game, caprine and other meats. Although FAO (2006), forecasts decelerating growth in world aggregate consumption of meat, an annual growth of 2.4 percent in poultry is still predicted for the period between1990/1991 and 2030. A shift in meat preference towards poultry (mainly chicken) meat will continue. Several factors contribute to this shift, including:

- the absence of major religious restrictions on eating poultry;
- poultry meat's reputation for being lower in fat, healthier and containing easy-to-digest protein;
- changing consumption patterns from economic vegetarianism to higher animal protein intake as income increases;
- poultry meat's enhanced availability, whether via the expansion of local production or via an increasingly dynamic international trade; and
- the fact that, of all meats, chicken meat is the most water efficient and requires the least time to be ready for consumption[10].

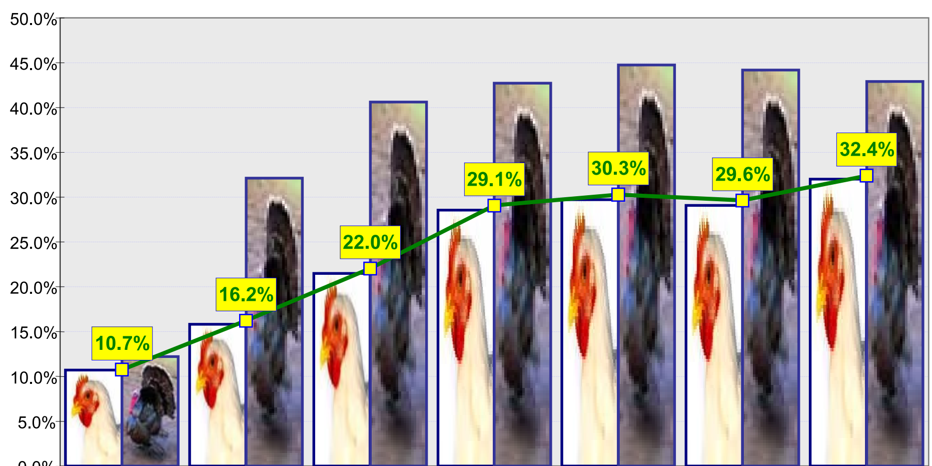
[10] Source: UNESCO (2006) – page 258, Chapter 7: "Water for food, agriculture and rural livelihoods" prepared by FAO and IFAD.

Although, as FAO (2006), notes, many low-income countries have not raised their incomes or their demand for poultry products, and recognizing that averages conceal as much as they reveal, projections by many international organizations (e.g. the World Bank) indicate rising incomes in most parts of the world and falls in the number of people living on less than US$2 per day.

Many researchers affirm that until people reach an income of US$8 per day, additional income is used to enhance the diet.[11] After passing this barrier, the additional income is used to improve clothing, housing, transport, education and leisure. More than one paper (e.g. Delgado et al., 1999) example, has established that increases in income are accompanied by higher intakes of animal protein, particularly meats.

We consider that the future perspectives for international demand for poultry meat are positive. Future demand for meat will depend on developing countries, where income increases will be used primarily to enhance the diet. A more equitable income distribution – needed in many Latin American countries, Brazil included – will also positively affect demand for meat. Brazil is currently witnessing that even minor efforts to diminish income disparities and to reduce the number of destitute individuals can have an effect on demand. International trade will be a driver of change, as it will enhance the availability of meats in areas that lack the natural conditions to produce them.

FIGURE 8
Share of exports in Brazil's poultry production[12]



	1995	2000	2002	2004	2005	2006	2007
Chicken	10.7%	15.8%	21.5%	28.5%	29.7%	29.1%	32.0%
Turkey	12.2%	32.1%	40.6%	42.7%	44.7%	44.2%	42.9%
Poultry	10.7%	16.2%	22.0%	29.1%	30.3%	29.6%	32.4%

[11] This statement was made by Professor Dr. Robert Thompson, during the World Agricultural Forum 2005 Congress, in his presentation "The Doha Round: making trade work for economic development and growth".

[12] Chicken data are based on UBA (http://www.uba.org.br/) and ABEF (http://www.abef.com.br/default.php). Figures for 2007 are projected.
Turkey-meat figures are based on UBA Annual Reports 2004/2005 (page 66), 2005/2006 (page 55) and 2006/2007 (page 61) for the years 2002 to 2006. Figures for the years 1995 and 2000 are from Supply and Distribution (PSD) online database of the United States Department of Agriculture's Foreign Agricultural Service's, (http://www.fas.usda.gov/psdonline/psdHome.aspx). Figures for 2007 are based on Foreign Agricultural Service, Official Estimates.

The fact that, in 2005, Brazil accounted for two-thirds of global poultry meat exports has major structural implications. This market position gives the Brazilian poultry industry an international dimension which, because of the country's lack of bargaining power, it would not otherwise have. Some 146 countries import Brazilian poultry meat. Brazil has become highly dependent on the international market. The country exported 10.7 percent of its poultry production in 1995; by 2005 this percentage had reached 30.3 percent.

From 1995 to 2005, Brazil evolved from being a significant supplier in the international poultry market to being one of the major suppliers. Presently, almost two-thirds of the country's poultry production depends on international trade. This is a considerable structural change. A number of points should be noted:

- The strength of the country's poultry sector in the international scene has been enhanced, compensating to some extent the country's lack of power in international commercial negotiations.
  The interdependency of international markets requires that producers for export adapt to demands that differ from those prevailing in their immediate markets (e.g. 100 percent vegetable feeds; GMO-free feeds; traceability to grandparents; constant audits of quality assurance, food safety, ethics, environment, animal welfare, etc; and slaughtering according to different religious precepts), thus forcing the sector to develop the production flexibility that in the long run enhances its competitiveness;
- Constant demand for product innovation determines investments in research and development, and almost constant updating or renovation of slaughterhouses and processing plants. This constant innovation attracts more clients both internationally and domestically and creates a virtuous circle.
- Developed-country consumers tend to concentrate their demand on some very specific cuts (e.g. Europeans just want white meat, preferably breast filets; Japanese consumers prefer dark meat, preferably boneless legs). The industry is forced to look for markets for the remaining cuts, and ends up targeting the Brazilian domestic market as Brazil is the fourth largest poultry market in the world.

1.4 Market demand

Brazil is historically a beef country and bovines constituted an important element of economic cycles in colonial days – as a source of food and leather and as a means of transport in the sugarcane plantations. Brazilians understand that "meat" (carne) means beef, and up to today are very surprised when they are served poultry or pork when invited for a "meat meal".

Brazil's meats balance – beef and pork

TABLE 8

Brazil's beef and pork production, trade and consumption balance – selected years, 1995 to 2007

	Beef in 000 tonnes	1995	2000	2002	2004	2005	2006	2007
+	PRODUCTION	5 400	6 650	7 300	8 350	8 750	8 950	9 200
+	IMPORTS	261.5	99.9	100.7	53.3	49.2	30.0	100.0
-	EXPORTS	285.1	591.9	1 006.0	1 854.4	2 197.6	2 200.0	2 420.0
=	Apparent Consumption	5 376	6 158	6 395	6 549	6 602	6 780	6 880
	Population	155.8	169.5	173.4	182.1	184.6	187.2	187.7
	Per capita kg/person/year	34.51	36.33	36.88	35.97	35.76	36.21	36.65
	Export/Production	5.3%	8.9%	13.8%	22.2%	25.1%	24.6%	26.3%
	Production per capita	34.66	39.23	42.10	45.86	47.40	47.80	49.01

Source: 1996-2005 Abiec - Conselho Nacional da Pecuária de Corte - Per capita consumption . 2006 by USDA

	Pork in 000 tonnes	1995	2000	2002	2004	2005	2006	2007
+	PRODUCTION	1 470	2 556	2 872	2 620	2 708	2 830	2 987
+	IMPORTS	9.0	5.0	2.0	1.0	1.0	2.0	2.0
-	EXPORTS	40.0	135	476	508	625	465	600
=	Apparent Consumption	1 439	2 426	2 398	2 113	2 084	2 366	2 389
	Per capita kg/person/year	34.51	14.31	13.83	11.61	11.29	12.64	12.73
	Export/Production	2.7%	5.3%	16.6%	19.4%	23.1%	16.4%	20.1%
	Production per capita	9.44	15.08	16.56	14.39	14.67	15.11	15.92

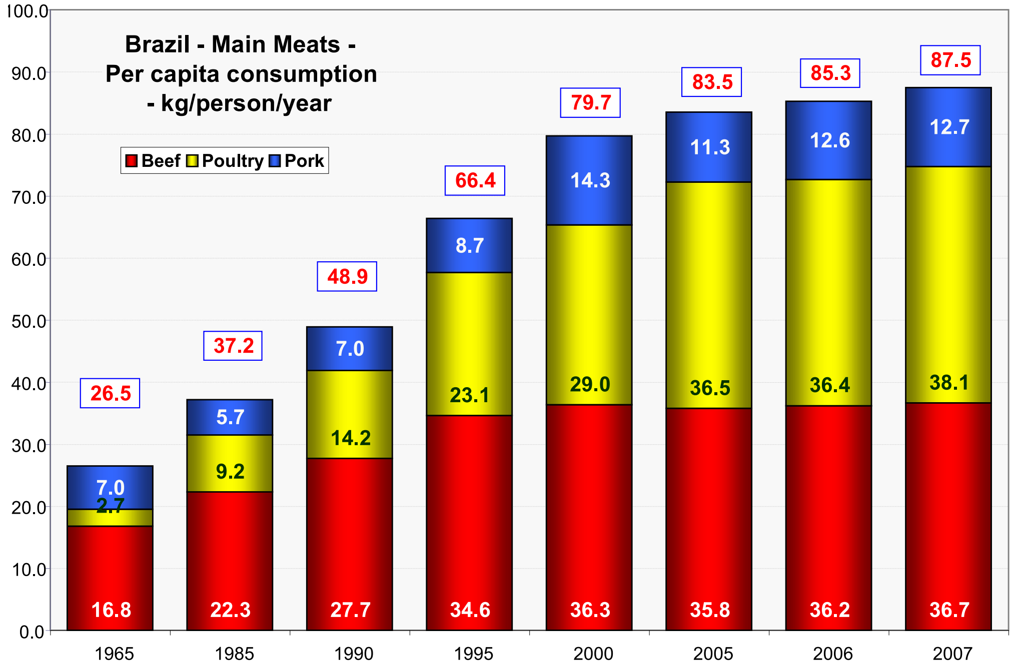
Source: Abipecs 1996-2006

Until the mid 1980s beef was less expensive than chicken to the extent that a popular Brazilian humorist used to say in the 1950s that "when a poor person eats chicken, it is because one of the two is ill". Actually, until the end of the 1960s, the access of the Brazilian consumer to poultry meat consisted of some discarded layers from the incipient egg industry and some backyard production. Data on chicken-meat prices for this period are consequently unavailable, but we can obtain an idea of the relative prices if we consider that in 1946 1 kg of beef was sold in the city of São Paulo at Cr$6.00[13] (average price of all cuts), while a dozen of eggs were sold for Cr$12.00. In 1956, the figures were, respectively, Cr$40.30 and Cr$ 33.00 (Arashiro, 1989, page 158).

[13] Cr$ = cruzeiro.

The situation has considerably changed since then. Figure 9 shows the evolution of per capita consumption of the three main meats from 1965 to preliminary data for 2007; it illustrates the progress of poultry in Brazilian meat consumption.

FIGURE 9
Brazil's meat consumption per capita, 1965 to 2007



Source: elaborated with data from ABEF (http://www.abef.com.br/default.php), UBA (http://www.uba.org.br/); ABIEC and ABIPECS.

TABLE 9
Evolution of per capita consumption in Brazil

	Δ% 1965/2005	Δ% 1995/2005
Beef	112.9%	3.4%
Poultry	1 251.0%	57.9%
Pork	61.3%	30.3%
Total	215.2%	25.9%

Source: elaborated with data from ABEF (http://www.abef.com.br/default.php), UBA (http://www.uba.org.br/); ABIEC and ABIPECS.

In a traditional beef country, poultry meat has achieved preponderance in meat intake. Between 1965 and 2005, per capita consumption of poultry meat in Brazil grew 5.8 times faster then total meat consumption and 11 times faster than beef consumption. Several factors have contributed to this change. Poultry-meat production has increased in scale and become increasingly more economical; complementarities to the export market have permitted a broad differentiation of products, stimulating people to consume poultry meat several times a week.

As Brazilian exports have diversified in terms of markets and products – mostly parts – they have helped to enhance the domestic market. Product variety and special cuts became available to the Brazilian consumer thanks to the fact that the industry found in the Brazilian market a channel to dispose of the non-exported parts of the chicken. Brazil is a cultural melting pot, and its cuisine has been subject to the influences of all the immigrants that have come to the country. This unified diversity values all parts of the bird, including feet, wing tips, backs, necks and offal.

Complementary between the Brazilian domestic market and the export market, and their interdependency, is among the pillars of the competitiveness and growth of Brazilian chicken production. This became particularly true when the country started to export to Europe, a market that today only values the chicken breast filet, which represents 9 percent of the weight of a live chicken.

The capacity of the industry to find value in all parts of the bird has been another pillar of Brazilian competitiveness in poultry-meat production. Non-edible offal is transformed into "poultry meal" – highly valued by the pet care industry. Feathers, thanks to their high protein content (more than 80 percent), are transformed into meals and exported to aquaculture feed manufacturers.

In an industry characterized by progressively lower margins, producers must obtain good value for the whole bird. More than once in our experience it is the by-products that render positive the monthly results of a poultry operation. As margins go down the poultry industry cannot afford to lose anything and should preferably find markets that would value even the noise that the flocks make.

One of the merits of the Brazilian poultry sector has been to realize that it is unsustainable to produce a whole bird and to use only part of it. It is not unusual for a meat packing business involved in exports to have some 300 different products, including both on-the-bone and boneless cuts. Many of these products are developed just to provide an economic use for a poultry part generated by the export of another part.

Between 1995 and 2005, several industrialized poultry-meat products became available to Brazilian consumers. The leading poultry companies in Brazil have a various poultry-meat products in their portfolios, ranging from very basic and traditional raw whole birds to ready-to-eat products. Chicken became abundant, low priced, easy to prepare and consume, and available in hundreds of forms – with options appealing to every segment of the consumer market.

Chicken meat moved from being the Sunday family lunch of 1960s and 1970s to being an everyday meal. During the period between 1995 and 2005 it consolidated its leadership as the meat most frequently consumed by Brazilians of every income level.

Poultry-meat balance

If meat for the Brazilian consumer means beef, then poultry means chicken – which represents 97 percent of the poultry consumed in Brazil.

TABLE 10

Brazil's chicken meat production, trade and consumption balance – selected years, 1995 to 2007

	Chicken in 000 tonnes	1995	2000	2002	2004	2005	2006	2007
+	PRODUCTION	4 050	5 732	7 449	8 494	9 297	9 336	10 189
+	IMPORTS	0.6	0.6	0.6	0.3	0.6	0.6	0.8
-	EXPORTS	433.7	906.7	1 599.9	2 424.5	2 762.0	2 713.0	3 258.4
=	Apparent Consumption	3 617	4 826	5 850	6 069	6 535	6 623	6 932
	Population	155.8	169.5	173.4	182.1	184.6	187.2	187.7
	Per capita kg/person/year	23.22	28.47	33.74	33.34	35.40	35.37	36.93
	Export/Production	10.7%	15.8%	21.5%	28.5%	29.7%	29.1%	32.0%
	Production per capita	26.00	33.82	42.96	46.65	50.36	49.86	54.29

Source: Chicken data are based on UBA and ABEF. Figures for 2007 are projected.

TABLE 11

Brazil's turkey meat production, trade and consumption balance – selected years, 1995 to 2007

	Poultry in 000 tonnes	1995	2000	2002	2004	2005	2006	2007
+	PRODUCTION	90	137	220	315	359	353	380
+	IMPORTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-	EXPORTS	11.0	44.0	89.2	134.3	160.7	156.1	163.0
=	Apparent Consumption	79	93	130	180	199	197	217
	Per capita kg/person/year	0.51	0.55	0.75	0.99	1.08	1.05	1.16
	Export/Production	12.2%	32.1%	40.6%	42.7%	44.7%	44.2%	42.9%
	Production per capita	0.58	0.81	1.27	1.73	1.95	1.89	2.02

Source: Turkey meat figures are based on UBA Annual Reports 2004/2005 (page 66), 2005/2006 (page 55) and 2006/2007 (page 61) for the years 2002–2006. Figures for the years 1995 and 2000 are from the Production, Supply and Distribution (PSD) online database of the United States Department of Agriculture's Foreign Agricultural Service' (http://www.fas.usda.gov/psdonline/psdHome.aspx). Figures for 2007 are based on Foreign Agricultural Service, Official Estimates.

Consumption of turkey is very limited, and is mostly concentrated around the Christmas period, although turkey hams and other industrialized products have been gaining popularity since the 1990s.

TABLE 12
Brazil's poultry meat production, trade and consumption balance – selected years, 1995 to 2007

	Poultry in 000 tonnes	1995	2000	2002	2004	2005	2006	2007
+	PRODUCTION	4 140	5 869	7 669	8 808	9 656	9 689	10 569
+	IMPORTS	0.6	0.6	0.6	0.3	0.6	0.6	0.8
-	EXPORTS	445	951	1 689	2 559	2 923	2 869	3 421
=	Apparent Consumption	3 696	4 919	5 980	6 250	6 734	6 820	7 149
	Per capita kg/person/year	23.72	29.02	34.49	34.33	36.48	36.43	38.09
	Export/Production	10.7%	16.2%	22.0%	29.1%	30.3%	29.6%	32.4%
	Production per capita	26.58	34.63	44.23	48.38	52.31	51.75	56.31

Source: Poultry figures are the sum of chicken and turkey meats.

Consumption of ducks and geese is insignificant (annual total of 5.796 tonnes in 2006);[14] it is concentrated in restaurants and in some states of the South Region that are influenced by German immigrants. Quail are mostly used for producing eggs, which are quite popular among Brazilian consumers. Some barbecue restaurants offer quail meat. Selected restaurants serve guinea fowl, but all these meats represent something foreign to the average Brazilian consumer.

The progress of the poultry sector would not have been achieved if based only in exports. The existence of a potent domestic market, mainly for chicken/broiler meat, was fundamental.

In 2006, HPAI generated a food scare (in some instances, food panic would be a more appropriate expression) among consumers in many of the countries to which Brazil exports. Importers from these countries requested postponements of shipments or in some instances cancelled orders. Suddenly, the Brazilian domestic market was flooded with broiler meat produced for export.

The consequence was a depression of local prices to the level of total loss. The industry reacted by diminishing lodging of day-old chicks, reducing production by means of slaughter at an earlier age and finally by diminishing prices in the domestic market to avoid logistical and financial costs associated with the lots cancelled by importers.

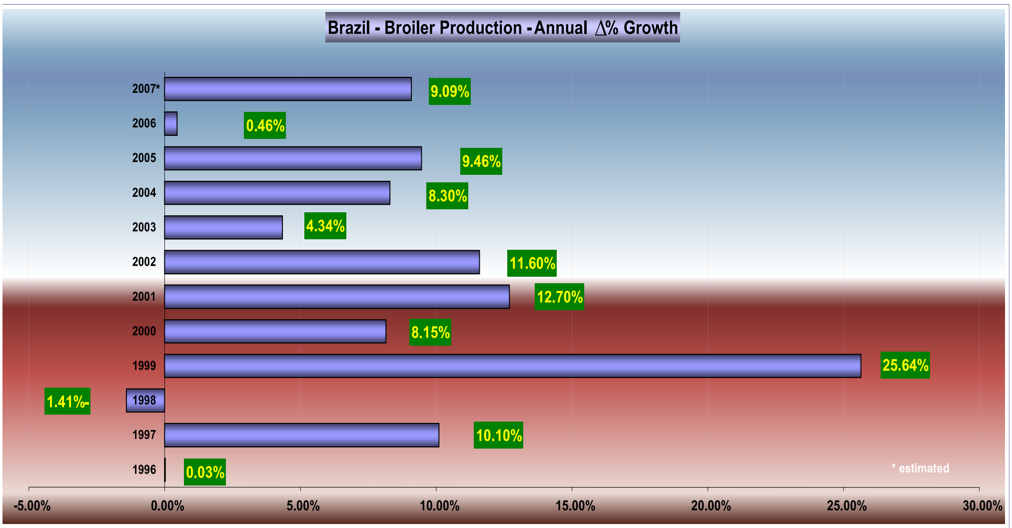
From November 2005 to March 2006, the Brazilian domestic market absorbed 15.6 percent more broiler meat than it did during the same period the in the previous year – not a small amount for a country that consumes 540 000 or 550 000 tonnes per month. Producers did not celebrate the prices that prevailed during that period, but they sold the their products in the domestic market until the measures taken to reduce output produced their effects.

[14] Data from UBA Annual Reports.

The end result was that broiler meat output had one of its lowest annual increases – 0.5 percent higher in 2006 than in 2005. However, the poultry sector survived this tough test and demonstrated the power of the Brazilian domestic market. During the last quarter of 2006, international demand accelerated and perspectives for a good year in 2007 were confirmed with a forecasted growth of 9.09 percent for broiler production, 19.9 percent for exports and 3.03 percent for the domestic market.

During the period from 1995 to 2005, Brazilian broiler exports averaged an annual growth rate of 18.13 percent while the domestic market averaged 7.91 percent – resulting in an average annual growth rate of 9.79 percent for total production.

FIGURE 10
Annual growth of Brazil's broiler production, 1996 to 2007



Source: UBA and ABEF.

Table 13 presents the average annual composition of Brazil's chicken-meat balance and per capita consumption from 1995 to preliminary figures for 2007. Data on per capita consumption may slightly differ from those obtainable from other sources, including poultry associations such as UBA, ABEF and APINCO (Association of Day-Old Chick Producers). Most poultry statistics do not consider that Brazil does import poultry meat, including chicken (although in small quantities). We have included imports of chicken parts – most commonly "chicken hearts", which are an extremely popular "churrasco" appetizer. Actually, Brazilian consumers will pay as much for chicken hearts as they do for chicken breast filets, if not more. The popularity of chicken hearts explains imports from neighbouring countries.

TABLE 13
Brazil's chicken/broiler meat production, trade and consumption balance, 1995 –2007

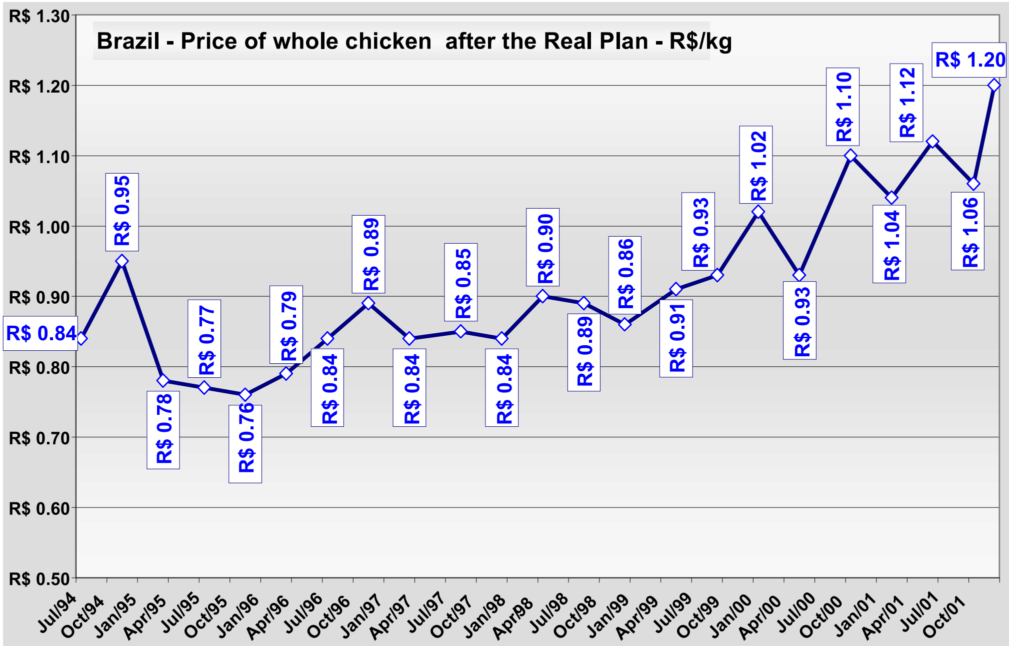
Annual Total	Per capita Consumption	Production (+)	Import (+)	Exports (-)	Domestic Availability =
	kg/inhabitant	tonnes	tonnes	tonnes	tonnes
1995	22.78	4 050 449	649.3	433 744	3 617 354
1996	21.61	4 051 561	695.1	568 794	3 483 462
1997	23.29	4 460 925	1 284.8	649 356	3 812 654
1998	22.79	4 398 186	1 190.0	610 6751	3 788 701
1999	28.19	5 526 044	243.0	770 552	4 755 735
2000	29.62	5 976 523	649.3	906 746	5 070 426
2001	31.58	6 735 696	139.4	1 249 288	5 486 567
2002	33.58	7 516 923	622.2	1 599 923	5 917 643
2003	33.11	7 842 950	266.8	1 922 043	5 921 175
2004	33.47	8 493 854	319.1	2 424 520	6 069 653
2005	35.53	9 381 130	550.0	2 845 945	6 535 735
2006	35.52	9 340 120	551.5	2 717 533	6 623 094
2007	36.54	10 246 267	767.2	3 286 774	6 960 260

Source: Data on production and exports are from UBA and ABEF. Import data from Aliceweb.

In Appendix 1, the data summarized in Table 13 are presented on a monthly basis for the years from 2005 to 2007. The tables in Appendix 1 also include the maximum, minimum and average price at the São Paulo wholesale market. Prices are in US$ per kg of whole chicken, including liver and gizzard, neck, feet and head.

Chicken meat is sold in all types of retail outlet, from major national supermarket chains to small individually owned and operated shops. Supermarkets frequently use chicken meat as a way to attract consumers to their shops through promotions and pricing. Chicken meat became a symbolic indicator of "consumer price stability" after the Real Plan of 1994/1995. Brazilians were used to almost daily corrections in prices of their foodstuffs and the fact that the price of chicken stood for years below R$1/kg helped to create confidence in the new currency.

FIGURE 11
Average whole-chicken prices received by producers



Source: elaborated with data from FGV – Fundação Getúlio Vargas (Getulio Vargas Foundation), IBRE – Instituto Brasileiro de Economia (Brazilian Institute of Economics) (http://www.fgvdados.fgv.br/).
Prices received by producers indicate the average for the whole country.

Brazil's eggs balance

Brazil is among the world's five largest markets for meat and is the seventh largest table-egg producer. Nonetheless, per capita consumption of eggs in Brazil ranks below sixtieth in the world, despite the fact that this is the lowest-priced animal protein on the local market.

Prejudices, misinformation and lack of a coordinated promotion effort are factors frequently invoked to explain the low levels of consumption. In a country where under nourishment is still present, fears and the desire to control cholesterol restrict the intake of eggs. However, per capita consumption is growing due to the affordability of eggs, good horizontal distribution and isolated promotional efforts on the part of some state-level associations.

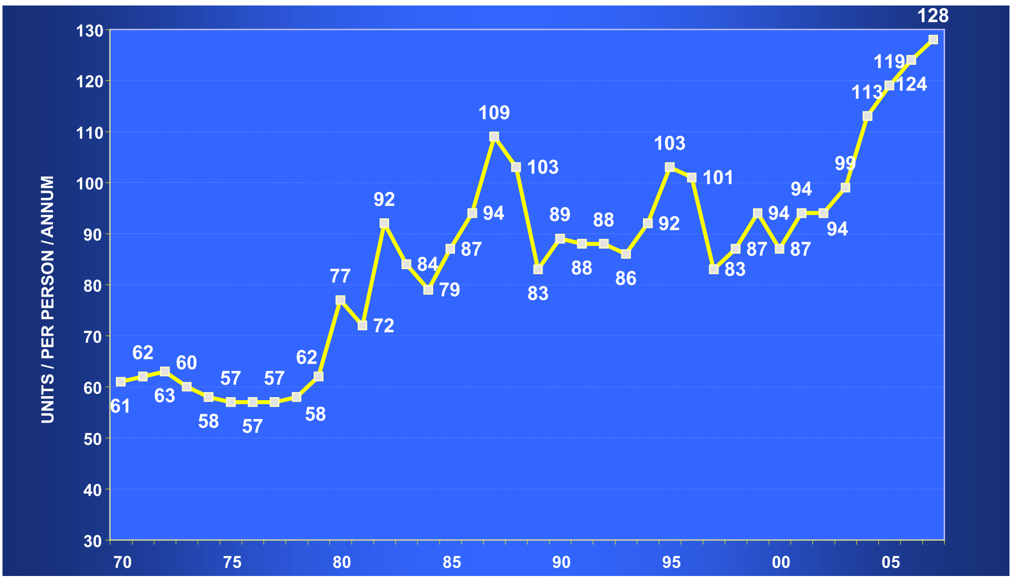
TABLE 14
Brazil's egg production, trade and consumption balance – selected years, 1995 to 2007

	Eggs in millions	1995	2000	2002	2004	2005	2006	2007
+	PRODUCTION	16 066	14 796	16 488	20 818	22 328	23 575	24 892
+	IMPORTS	0	4	7	4	3	5	5
-	EXPORTS	12	15	108	214	394	382	382
=	Apparent Consumption	16 054	14 686	16 388	20 609	21 937	23 199	24 516
	Population	155.8	169.5	173.4	182.1	184.6	187.2	187.7
	Per capita eggs/person/year	103	87	94	113	119	124	128
	Export/Production	0.1%	0.8%	0.7%	1.0%	1.8%	1.6%	1.5%
	Production per capita	103	87	95	114	121	126	133

Source: egg production, APA – Associação Paulista de Avicultura (São Paulo State Poultry Association) and UBA; export-import data from ALICE.

Brazil does not import table eggs – import figures thus represent only eggs for reproduction purposes (pure-line parent and grandparent stock, etc.) and for the production of vaccines and similar purposes. The export figures include eggs for consumption, fertile eggs and eggs used for medical purposes. Export figures also include, in egg equivalents, the export of manufactured products such as frozen liquid eggs, dried eggs and pasteurized eggs.

FIGURE 12
Brazil's per capita egg consumption, 1970–2007



Source: egg production, APA – Associação Paulista de Avicultura (São Paulo State Poultry Association) and UBA; Export-import data from ALICE. Figures elaborated by José Carlos Teixeira Consultoria Ltda

In Brazil, the market for brown eggs represents some 30 percent of total consumption, with white eggs having distinctly lower prices at retail level. Consumers usually buy eggs in packs of a dozen. Eighteen-unit packs are also available, as in recent years are packs of four and six units – a response to the declining number of persons per household, mainly in the big cities. Special eggs (enriched with vitamins, antibiotic free, mineral enriched, etc) can also be bought. Both the egg trade and industry adopt the "carton box with 30 dozens" as their unit for prices

Quail eggs are extremely popular. Statistics from the Brazilian Institute of Geography and Statistics (IBGE) indicate that 8 million quail layers are in production, with a monthly production of 8 million eggs. There is no specific association of quail-egg producers and UBA's reports do not cover this activity.[15]

Summary

- From 1995 to 2005, Brazilian agribusiness exports boomed and generated considerable trade surplus, permitting the country to balance its international debt and build up foreign currency reserves. Meats were the third most important agribusiness product exported and poultry was the leader in meat exports.
- Brazil's improved international financial standing and the control of inflation gave rise to unprecedented stability in the national economy. This stimulated production, exports and local demand. Poultry production expanded by 133.2 percent, exports by 557.2 percent and domestic demand by 82.2 percent over the period 1995 to 2005.
- Brazil consolidated a position as one of the world's major poultry-producing countries. Among the leading countries, the United States of America and Brazil have the natural conditions (arable land, photosynthesis and water) to retain this leading position during the coming decades.
- From 1995 to 2005, relations between the poultry industry and the agencies and organs of the state evolved towards cooperation, synergy and the establishment of joint action strategies – with very positive results.
- From 1995 to 2005, Brazil developed from being a significant supplier in the international poultry market to being one of the major suppliers. The country is responsible for one-third of world exports and almost one-third of the country's poultry production depends on the international market. This is a considerable structural change with consequences that affect all aspects of the poultry sector and have given the industry an international dimension.
- In a traditional beef-consuming country, poultry meat has achieved preponderance in meat intake. From 1965 to 2005, per capita consumption of poultry meat in Brazil grew 5.8 times more than total meat consumption and 11 times more than beef consumption; it has become the country's most consumed meat.
- Complementarity and interdependence between exports and the domestic market

[15] "Avicultura Industrial" Web site (http://www.aviculturaindustrial.com.br/site/dinamica.asp?id=27890&tipo_tabela=produtos&categoria=codorna) 5 July 2007

enhanced the country's competitiveness in poultry meat, creating a virtuous cycle.

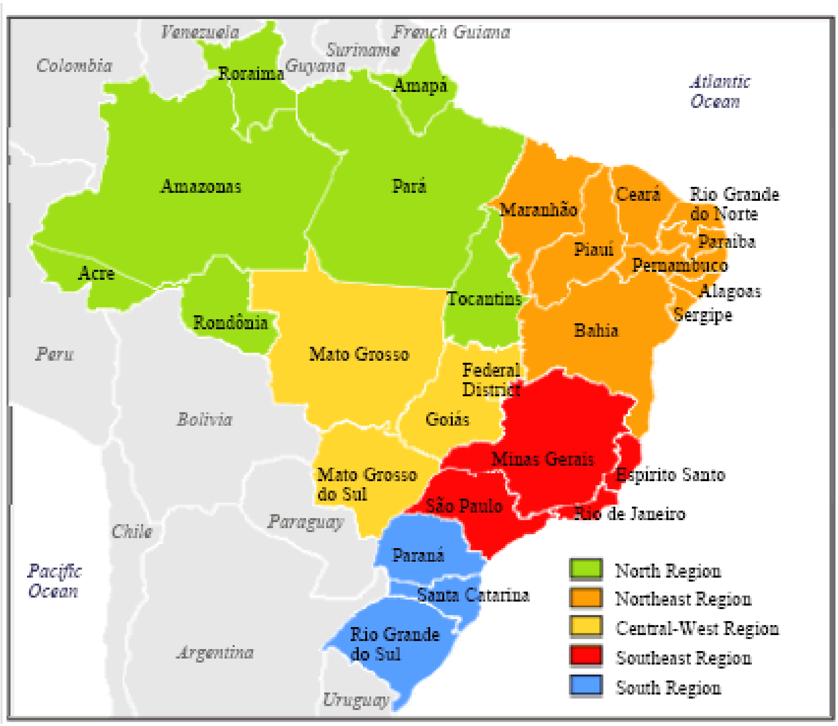
- Over the period 1995 to 2005, the Brazilian poultry industry maximized commercial uses of the bird's weight. In an industry that is faced with progressively declining margins this was essential for competitiveness and to sustain a position as one of the world's main poultry-meat producers and exporters.

1.5 Changes in the geographical location of commercial production

Brazil's regions and federated states

Brazil is a federal republic, comprising 26 states and the Federal District. The states are integrated into five regions. The borders of each region – North, Northeast, Southeast, South and Centre-West – coincide with the borders of the states that they comprise. Brazil's total official area is of 8 514 876.599 km².

FIGURE 13
Political map of Brazil – regions and federated states



Location of Brazil's livestock

In Section 1.4., we discussed the growing contribution of chicken/broiler meat to the animal-protein intake of Brazilians. These changes have, naturally, had an impact on Brazilian livestock populations. The "chicken for meat" flock grew by 50.1 percent between 1995 and 2005. At the end of the period it represented 63.1 percent of the Brazilian "herd" in terms of number of head, against 55.7 percent in 1995. The figures from the PPM (Pesquisa Pecuária Municipal – Municipal Livestock Research) 2006 show that this growth is continuing.

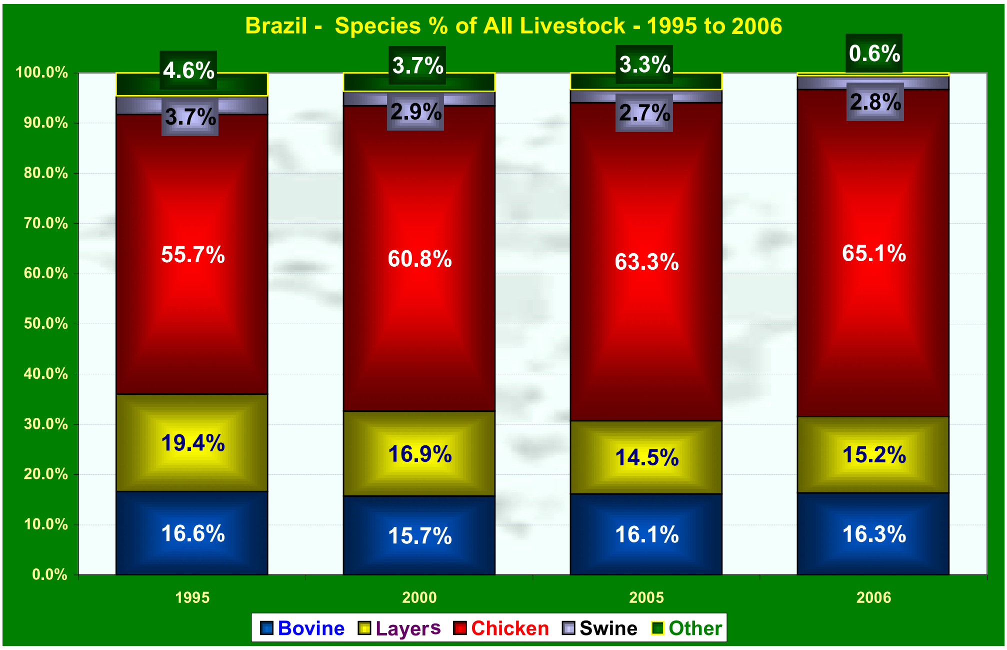
TABLE 15
The Brazilian herd – 1995, 2000 and 2005

		Brazilian Herd in heads		Δ%
	1995	2000	2005	1995/2005
Total IBGE[1]	971 239 013	1 083 984 733	1 282 839 110	32.1%
Chicken for Meat	541 163 942	659 245 547	812 467 900	50.1%
Layers	188 367 357	183 494 626	186 573 334	-1.0%
Quail	2 939 376	5 775 181	6 837 767	132.6%%
Bovine	161 227 938	169 875 524	207 156 696	28.5%
Swine	36 062 103	31 562 111	34 063 934	-5.5%
Horses	6 394 145	5 831 817	5 787 249	-9.5%
Asses	1 344 155	1 242 177	1 191 533	-11.4%
Mules	1 990 108	1 347 855	1 388 665	-30.2%
Buffaloes	1 641 950	1 102 551	1 173 629	-28.5%
Rabbits	499 854	375 573	303 640	-39.2%
Ovine	18 336 432	14 784 958	15 588 041	-15.0%
Caprine	11 271 653	9 346 813	10 306 722	-8.6%

Source: data on the Brazilian livestock herd are from "Pesquisa Pecuária Municipal – PPM" (Municipal Livestock Research) 2005 and 2006 from IBGE – Brazilian Institute of Geography and Statistics. IBGE figures do not include geese, ducks, guinea fowl or turkeys and the total herd size corresponds to the listed species. Data are extracted from IBGE's databank SIDRA – Sistema IBGE de Recuperação Automática (IBGE Automatic Data Recuperation System).

IBGE conducted an Agricultural and Livestock Census in 2006 and very recently (December 2007); preliminary tables have been published. They scale up the figures for chickens and layers to 1 244 260 280, or 84.8 percent of a total herd of 1 467 915 832 head for all species. This census considerably reduces the estimate for the number of bovines and contradicts all estimates made by both official and private organizations and associations connected to the cattle industry. It also registers reductions in the pig, ovine and caprine herds. In terms of pigs, the figures contradict a very recent work conducted by ABIPECS (Brazilian Association of the Pork Meat Producer and Exporter Industries).[16]

FIGURE 14
Size of the Brazilian herd – main species, 1995 to 2006



Source: IBGE-SIDRA.

Location of the "chickens for meat" flock

This section presents a discussion of the location of Brazil's "chickens for meat" flock (distribution by region) and how this changed over the period 1995 to 2005 (also including data for 2006).

Table 16 shows the evolution of the size of the "chickens for meat" flock according to IBGE's Agricultural and Livestock Censuses and Researches. It indicates that the South Region is the largest chicken producer and that the Centre-West Region is experiencing a true boom in chicken production.

[16] cf. Arashiro (1989).

TABLE 16
Size of Brazil's "chickens for meat" flock – by region

	Brazilian Chicken Herd Size (heads)				Δ%
	1995	**2000**	**2005**	**2006**	**1995/2005**
Brazil	541 163 942	659 245 547	812 467 900	821 541 630	50.1%
North	22 487 547	18 972 976	18 219 721	18 167 075	-19.0%
Northeast	71 128 493	76 503 803	84 818 301	82 099 458	19.2%
Southeast	145 545 294	186 288 544	223 620 923	229 072 756	53.6%
South	273 485 220	326 615 968	402 957 183	409 923 190	47.3%
Center-West	28 517 388	50 864 256	82 851 772	82 279 151	190.5%

	1995	**2000**	**2005**	**2006**
North	4.2%	2.9%	2.2%	2.2%
Northeast	13.1%	11.6%	10.4%	10.0%
Southeast	26.9%	28.3%	27.5%	27.9%
South	50.5%	49.5%	49.6%	49.9%
Center-West	5.3%	7.7%	10.2%	10.0%

Sources: "Pesquisa Pecuária Municipal – PPM" (Municipal Livestock Research) 2005 and 2006 from IBGE – Brazilian Institute of Geography and Statistics. Data for 2000 and 1995 are from IBGE's SIDRA Sistema IBGE de Recuperação Automática (IBGE Automatic Data Recuperation System) (http://www.sidra.ibge.gov.br/bda/acervo/acervo2.asp?e=v&p=PP&z=t&o=21). SIDRA data are based on Agricultural and Livestock Censuses and for the most recent years on data from PPM.

Data from IBGE may differ from those published by various poultry associations. The reason for this lies in the methodology, as IBGE bases its figures on Livestock Census and Researches from which it projects figures until it conducts the next census or research.

Censuses are not the best way to monitor livestock species that have short lifecycles, such as chickens for meat which are slaughtered at a maximum of 45 days old. A census or research will provide a snapshot of the population during period in which it is carried out, which is just fine for animals that have medium or long lifecycles, but is rather inadequate for chickens. Besides, hens can be used either as layers or for meat production; layers can be used either for egg production or for reproduction. It is difficult for statisticians to account for the peculiarities of each activity.

Associations collect figures from their member companies or farmers on a monthly basis, and members have a direct interest in supplying precise data as they will guide estimations of the feed requirements of the sector, the quantities of meat or eggs that will be available in the market, etc. – all factors that influence the economics of the poultry keeping. If members provide "cosmetic" figures, i.e. figures that are over or under the actual ones, they are likely to realize before long that lying to oneself can be a costly exercise.

Many associations are highly respected for the figures they keep and more and more official agencies and ministries use them or conduct joint studies – an example of the significant structural change referred to above.

To estimate long- and short-term chicken/broiler meat production data of parent stock and lodging of day-old chicks are required. To verify the accuracy of the estimations, it is necessary to have data on the numbers of birds slaughtered and the quantity of meat produced.

From 1995 to 2005, according to poultry association statistics, the lodging of parent stock for meat production in Brazil increased by 66.1 percent, led by the Centre-West Region with a growth of 179.6 percent, followed by the South Region with 83.1 percent growth. The South Region leads with 56.2 percent of the total number of lodged parents in 2005.

TABLE 17

Lodging of parent stock for meat production – by region, 1995–2006

Region	1995	2000	2005	2006	Δ% 1995/2005	% 1995	% 2005
North	69 927	107 880	32 400	49 369	-53.7%	0.3%	0.1%
Northeast	1 631 089	2 142 997	2 242 004	2 467 732	37.5%	7.4%	6.1%
Southeast	8 067 855	8 078 280	10 867 776	10 923 417	34.7%	36.6%	29.6%
South	11 262 550	15 205 005	20 621 154	21 379 958	83.1%	51.0%	56.2%
Center-West	1 037 191	2 001 393	2 900 173	3 577 762	179.6%	4.7%	7.9%
Brazil - Total	22 068 612	27 535 555	36 663 507	38 398 238	66.1%	100.0%	100.0%
Exports	887 717	934 206	1 124 036	1 122 940	26.6%	4.0%	3.1%

Source: UBA statistics and annual reports (www.uba.org.br).

In approximately the same period, the lodging of day-old chicks increased by 81.2 percent, again led by the Centre-West Region with a 264.8 percent increase from 1996[17] to 2005, followed by the South Region with 85.9 percent; the latter region accounted for 54.5 percent of the total in 2005.

[17] Statistics for lodging of one-day chicks per Region are only available at UBA databank from 1996 onwards.

TABLE 18
Day-old chicks lodged in Brazil – by Region, 1996-2006 (head)

Region	1996	2000	2005	2006	Δ% 1996/2005
North	36 294 546	39 878 004	60 705 453	65 312 980	67.3%
Northeast	239 709 124	278 468 361	353 018 748	374 339 278	47.3%
Southeast	806 174 721	893 400 868	1 239 082 545	1 205 195 105	53.7%
South	1 373 917 566	1 801 457 105	2 554 250 391	2 441 449 495	85.9%
Center-West	132 429 375	232 864 251	483 050 637	484 899 886	264.8%
Total Domestic	2 588 525 332	3 246 068 589	4 690 107 774	4 571 196 744	81.2%
Exports	4 600 350	8 099 950	5 771 200	5 354 900	25.5%
Total Brazil	2 593 125 682	3 254 168 539	4 695 878 974	4 576 551 644	81.1%

Region	1996	2000	2005	2006
North	1.4%	1.2%	1.3%	1.4%
Northeast	9.3%	8.6%	7.5%	8.2%
Southeast	31.1%	27.5%	26.4%	26.4%
South	53.1%	55.5%	54.5%	53.4%
Center-West	5.1%	7.2%	10.3%	10.6%

Sources: UBA and APINCO (Association of Day-Old Chick Producers). Published in UBA's Annual Reports and available in its data bank.

These tables demonstrate that most of the production is concentrated in the South Region, but they also show that the Centre-West Region is gaining strength. It is not an exaggeration to say that chicken production is moving to the Centre-West Region towards Brazil's new agricultural frontier following grain production.

A brief history of the geographical distribution of the Brazilian poultry industry

As briefly described above, until the late 1960s or early 1970s the Brazilian poultry industry focused on egg production and was concentrated around the major cities. For this reason, the main producing states at the time were São Paulo, Minas Gerais and Rio de Janeiro, all in the Southeast Region. Dr Haroldo Vasconcellos[18] recalls an article about the "industrial poultry industry in Brazil" in World's Poultry Science Journal, April–June 1957, which stated:

[18] Dr Haroldo Vasconcellos, MD during the week and poultry farmer at the weekends, one of the pioneers of the layer industry in Brazil, responsible for Project ETA 42 which in 1957 began technical cooperation with poultry professionals from the United States of America.

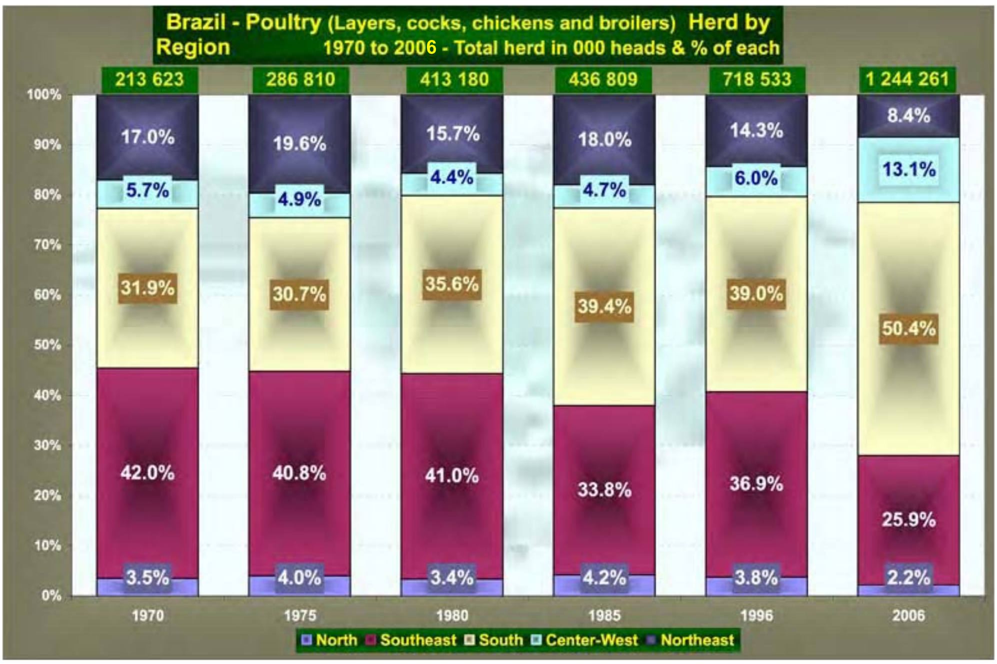
"The Brazilian poultry industry is mainly concentrated around the cities, such as Rio de Janeiro, Sao Paulo and Belo Horizonte, within a circle of 125 miles.

Within the geo-economic areas of these cities, there are hundreds of small poultry farms with capacities of 1 000 to 10 000 head and some big organizations with up to 100 000 head."[19]

The egg producers would sell the live layers directly to the consumer at the end of the birds' productive cycle. It was also a habit for those living in houses with backyards to raise their own chickens, even in the major cities. Later this practice ceased as cities grew larger and houses started to give way to apartments. "Avícolas", shops where live chickens were sold, became popular at this time. Some of these "avícolas" started to have facilities for slaughtering the chicken chosen by the consumer; and in the 1960s, the first slaughter-houses appeared.

Statistics from IBGE's Livestock Censuses show that by the 1970s the South Region occupied second place in terms of the size of its poultry flock, while the Southeast Region prevailed thanks to its proximity to the main centres of urban consumption such as Rio de Janeiro, São Paulo and Belo Horizonte.

FIGURE 15
Brazil's poultry flock by region, 1970 to 2006



Source: elaborated with data from IBGE Livestock Census 1970, 1975, 1980, 1985, 1996 and 2006. Figures include layers, cocks, chickens and broilers for meat. IBGE s Livestock Censuses do not include turkeys, geese, ducks or quail.

[19] Statement by Dr Vasconcellos in Arashiro (1989: pp. 205– 212).

Dr Haroldo Vasconcellos[20] states that during the visit of poultry technicians from the United States of America to Brazil most of the Southeast Region's poultry entrepreneurs and leaders were convinced that they knew all about poultry. According to Dr Vasconcellos, the project[21] was successful in places where the poultry sector was not yet developed. He specifically quotes as a success story the State of Rio Grande do Sul were farmers kept 30 to 100 head of chicken, males for meat and females for eggs.

Breeding of small animals was practised in the South Region thanks to the Italian and German immigrants who brought the tradition with them from their old countries. Some of these immigrants established themselves in hilly country in the State of Rio Grande do Sul, where the land could be bought for very affordable prices as it was unsuitable for extensive cattle breeding, which was the main economic activity of Rio Grande do Sul and which was then concentrated in big properties in the Pampa.

The immigrants would buy properties of 10 to 20 ha which would be cultivated by the family, growing various crops (maize, tobacco, fruits, grapes for wine, etc), complementing the activity mostly with pigs and chickens, and keeping one or two cows for milk.

As the family grew up and the sons established families of their own, they would sell the small family properties in order to buy larger stretches of land in new virgin areas. This migration process took farmers first to the western parts of the States of Santa Catarina and Paraná. With them moved the tradition of breeding small animals and processing their meats. In the 1970s, thanks to Government incentives, this migration also affected the Centre-West Region. More details on this governmental programme are presented below. It is interesting to note that this migration is an ongoing movement towards the Centre-West of the country, and even led to emigration, as many of the farmers bought land in the border regions of Paraguay and Bolivia.

Most of the main Brazilian poultry companies have their origins in the states of the South Region. They suffered from very poor transport infrastructure connecting them to their main markets, which were then the cities of Rio de Janeiro, São Paulo and Belo Horizonte. As roads improved in the 1960s and 1970s, the South Region began to have easier access to the main urban market centres of the Southeast Region. Thanks to its more favourable natural conditions for production, the South Region's companies started to add frozen chicken to their pork-fat and meat trade.

The 1970s and 1980s were a period of very high inflation rates, with retail prices for food being corrected weekly or even, in some instances, daily. This factor helped to change the habits of the Brazilian consumer, used at the time to consuming "hot" chicken or at most refrigerated chicken. Price differences taught them to consume frozen products, which came mostly from the South Region. Refrigerated chicken was delivered to retailers two or three times per week and with almost every delivery its price went up to reflect rising costs.

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[20] Statement by Dr Vasconcellos in Arashiro (1989: pp. 205– 212).

[21] The governments of Brazil and the United States of America came to an agreement by which Brazil would receive assistance and projects for its agriculture. This agreement was denominated ETA (Escritório Técnico de Agricultura – Brasil/EUA ((Agricultural Technical Office – Brazil/USA)) and the poultry-specific project was denominated ETA Project 42.

The 1980s were also the days when supermarkets expanded considerably in the major urban centres. The supermarkets would buy large quantities of frozen chicken and keep its price stable until the next delivery as a means to increase customer flow. The price difference between the frozen and fresh and/or refrigerated product was enough to make the consumers learn to consume frozen products, even though in any market research the same consumers would always declare preference for fresh products.

The attractiveness of the prices of frozen chicken also helped to make it accessible to medium-low and low-income segments of the population, who started to consume the product outside the traditional family Sunday lunch – thus enlarging the overall basis of demand for poultry. This change in consumption habits contributed to the migration of chicken production from the Southeast Region towards the South Region. The leading Brazilian poultry companies from the South Region also contributed to Brazilian poultry exports from the early stages.

As Brazilian exports diversified in terms of markets and products – mostly parts – exports helped to enhance the domestic market. Product variety and special cuts became available to the Brazilian consumer, thanks to the fact that the Brazilian market provided the industry with a channel to sell chicken parts that were not exported.

Leading chicken companies and their contribution to the leadership of the South Region

An overview of the main poultry producers in Brazil helps to understand the process of migration of chicken meat production towards the South Region. Table 19 shows the leading chicken producers in Brazil from 1995 to 2006 based on the number of birds slaughtered per annum. After the name of each company, there are sets of two letters that represent the Federal States where those companies have production facilities. Notice that nine out of the ten largest chicken producers in Brazil are companies from the South Region. Notice also the number of companies established after 2000, many of them in the State of Paraná (PR), South Region, a state that has experienced impressive growth in poultry-meat production during the 1995 to 2005 period.

TABLE 19
Leading chicken-producing companies in Brazil

Company	*Chicken (heads per annum)*				Rank	Rank
	1995	2000	2005	2006	in 1995	in 2005
Sadia SC-PR-MG-MT-RS-DF	323 719 000	382 162 664	629 209 878	645 452 443	1	1
Perdigão SC-RS-PR-GO-MT	146 018 351	290 796 007	498 850 657	530 111 245	2	2
Seara[1] SC-PR-SP-MS	131 610 112	177 954 712	277 320 934	257 490 544	3	3
Frangosul RS-MS	113 962 704	196 557 668	237 068 234	214 471 190	4	4
Avipal RS-MS-BA	94 535 406	136 578 075	208 096 594	174 229 179	5	5
Dagranja PR-MG	69 910 173	94 174 078	117 199 849	114 665 884	7	6
Aurora SC-RS	33 754 206	74 215 694	91 826 334	108 743 902	10	7
Diplomata PR-RS-SC	23 347 119	21 833 666	90 754 483	87 636 118	15	8
Penabranca SP	82 118 762	109 416 570	82 155 225	75 173 127	6	9
Copacol PR	30 969 028	39 187 172	72 080 048	70 089 917	11	10

Table 19 - Leading chicken-producing companies in Brazil

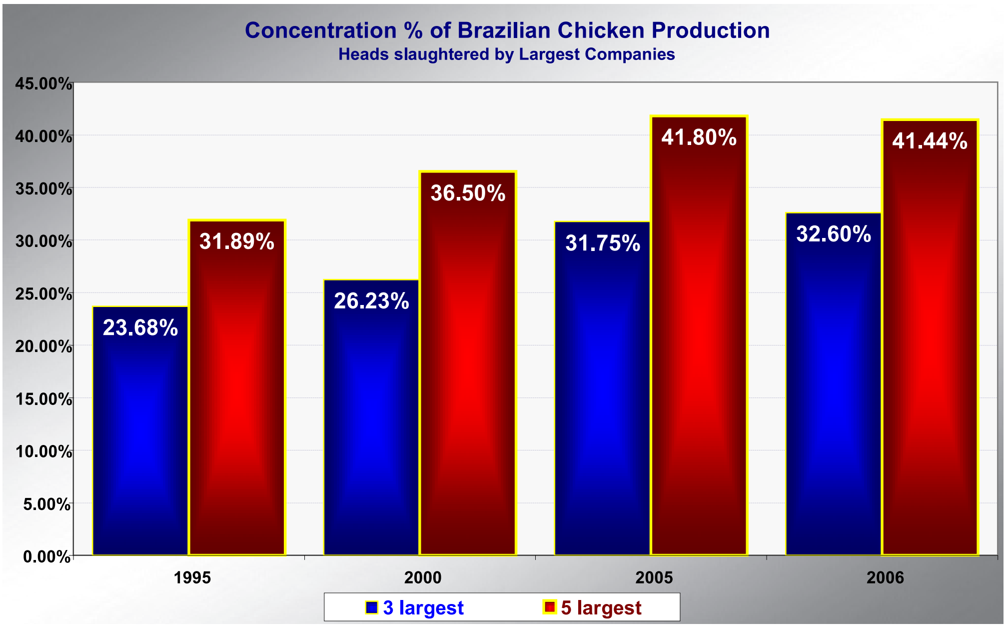
Company	1995	Chicken (heads per annum) 2000	2005	2006	Rank in 1995	Rank in 2005
Rio Branco / Pif Paf MG-RJ	27 084 859	35 249 912	53 192 295	53 733 755	13	11
Frango Sertanejo SP	26 649 376	48 759 901	48 255 906	40 431 245	14	12
Frango Forte SP			48 255 906	55 348 664	...	13
Big Frango/Jandelle PR	11 295 174	21 929 122	48 193 500	49 152 408	30	14
Kaefer Avicultura PR-RO			47 976 472	46 765 711	...	15
Rei Frango SP			45 777 144	51 151 583	...	16
C.Vale PR			42 408 783	48 231 895	...	17
Penasul RS			42 325 268	44 206 550	...	18
Coop. Agroindl. Lar PR			41 075 461	44 899 115	...	19
Ad'oro SP	12 571 196	26 854 971	37 361 755	38 293 177	27	20
Avícola Céu Azul SP	7 229 057	10 971 249	37 103 020	47 163 399	44	21
Anhambi MT-PR		12 345 741	35 222 181	36 844 129	...	22
Reginaves RJ			34 981 484	38 356 394	...	23
Mat. Avíc. Flamboiã SP	9 360 529	21 279 051	33 630 590	33 128 238	33	24
Avícola Paulista SP	8 985 905	18 613 701	32 865 286	25 405 227	34	25
São Salvador GO		11 137 310	32 411 121	37 980 277	...	26
Coopavel PR	11 904 254	30 735 920	32 202 400	29 181 736	28	27
Coperguaçú SP	14 346 569	17 050 123	31 404 872	34 008 781	21	28
Nutriza GO		18 845 176	31 033 287	31 545 647	...	29
Agrovêneto SC		14 826 189	27 313 146	28 488 956	...	30
Avícola Felipe PR		15 054 871	25 948 112	23 353 578	...	31
Macedo Agroindustrial SC	12 898 431	17 337 624	25 732 727	18 730 507	26	32
Comaves PR-MS	14 780 592	28 289 921	25 371 320	23 985 266	20	33
Coop. Languirú RS	13 403 140	15 354 702	24 053 657	24 345 320	25	34
Gonçalves & Tortola PR			22 491 460	23 707 362	...	35
Coroaves PR	15 441 116	18 332 660	21 872 592	22 618 712	18	36
Asa Alimentos DF-GO-TO			21 636 506	20 612 932	...	37
Francap MG	6 745 048	14 401 848	21 115 438	22 171 485	45	38
Frangoeste SP	8 710 848	14 386 934	19 875 689	19 467 728	36	39
Coop. Holambra SP	13 596 441	16 860 283	19 847 930	19 301 571	22	40
Jaguafrangos PR			19 079 358	20 659 231	...	41
Nogueira Rivelli MG			18 745 645	20 419 360	...	42
Abat. Aves Ideal SP		8 894 573	18 612 494	27 275 835	...	43
Polifrigor SP		9 615 924	18 233 778	18 066 595	...	44
Frinal RS	11 780 128	17 815 055	18 172 072	19 612 660	29	45
Agrofrango SC		8 828 964	15 776 702	14 546 717	...	46
Notaro Alimentos PE		9 824 940	14 156 698	14 958 081	...	47
Palmali SP			13 603 752	16 507 381	...	48
Votuporanga SP			13 603 752	14 803 174	...	49

Table 19 - Leading chicken-producing companies in Brazil

Company	Chicken (heads per annum) 1995	2000	2005	2006	Rank in 1995	Rank in 2005
Avivar Alimentos MG			11 240 612	15 984 120	...	50
Minuano RS	35 384 499	35 052 630	...	...	9	
Chapecó SC-SP	66 140 341	86 563 540			8	
Batavo PR	27 397 252	17 565 298			12	
Coagri MS	21 101 490				16	
Só Frango DF	19 645 495	22 235 960			17	
Agroeliane SC-MS	15 141 814				19	
Rezende MG		38 141 133			...	
COTREL RS	13 559 546	31 015 713			24	
Coopervale PR		27 627 146			...	
COTREFAL PR		23 240 069			...	
Frig. Nicolini RS		21 703 487			...	
Osato Alimentos SP	10 421 054	18 111 366			31	
Gale Agroindustrial GO		15 411 161			...	
Maristela	13 569 846	13 898 323			23	
Piratini MS	9 734 626				32	
CAESP - SP	8 739 196				35	
Granja Itambi SP	8 489 437				37	
Frango Mineiro MG	8 314 317				38	
Frig. Avic. Lindóia MG	7 971 771				39	
Caldana SP	7 841 305				40	
Sto. Ant. Louveira SP	7 722 346				41	
Frig. Avic. Tanabi SP	7 536 816				42	
Ito Aves SP	7 451 542				43	
Granjas Mara SP	6 733 848				46	
Cogran MG	6 459 599				47	
Avic. Dacar SP	6 111 285				48	
Três Pontes SP	5 774 616				49	
Avic. Paulo Dias SP	4 608 699				50	
Subtotal	1 602 578 264	2 357 038 797	3 476 722 407	3 493 508 051		
Other	937 121 877	887 201 824	950 011 587	902 805 291		
TOTAL	2 539 700 141	3 244 240 621	4 426 733 994	4 396 313 342		

Sources: UBA (http://www.uba.org.br/) and ANAB (National Association of Slaughterhouses) for 1995. Data for 2000 to 2006 are from UBA databank or Annual Reports.

FIGURE 16
Concentration of Brazilian chicken meat production



Source: Source: UBA Annual Reports

Table 19 shows that in Brazil, as in most main producing countries, the poultry business is becoming more concentrated. The three largest Brazilian chicken-meat companies accounted for 23.7 percent of production in 1995 and 31.8 percent in 2005. In the last quarter of 2007, Perdigão announced that it had purchased AVIPAL, the fifth largest chicken-meat producer; soon afterwards, Sadia announced the purchase of a medium-sized company situated in the State of Goiás, Centre-West Region. The five largest Brazilian chicken-meat producers are also the five main exporters

.

TABLE 20
Brazil's largest chicken-meat exporters in 1995 and 2005

Chicken Meat Company	1995 EXPORTS Tons	Share	2005 EXPORTS Tons	Share
Sadia	124 607	29.05%	733 784	25.78%
Perdigão	100 335	23.39%	495 146	17.40%
Seara	69 641	16.23%	353 269	12.41%
Doux Frangosul	45 246	10.55%	286 805	10.08%
Avipal	38 710	9.02%	215 813	7.58%
Subtotal	378 540	88.24%	2 084 817	73.26%
Other Companies	50 448	11.76%	761 129	26.74%
Total Exports	428 988		2 845 946	

Sources: ABEF (www.abef.com.br).

Turkey production is concentrated in the hands of three companies, Sadia, Perdigão and Frangosul. The two leading poultry companies have been investing in new production facilities in the Centre-West Region – following the grain production towards this new agricultural frontier.

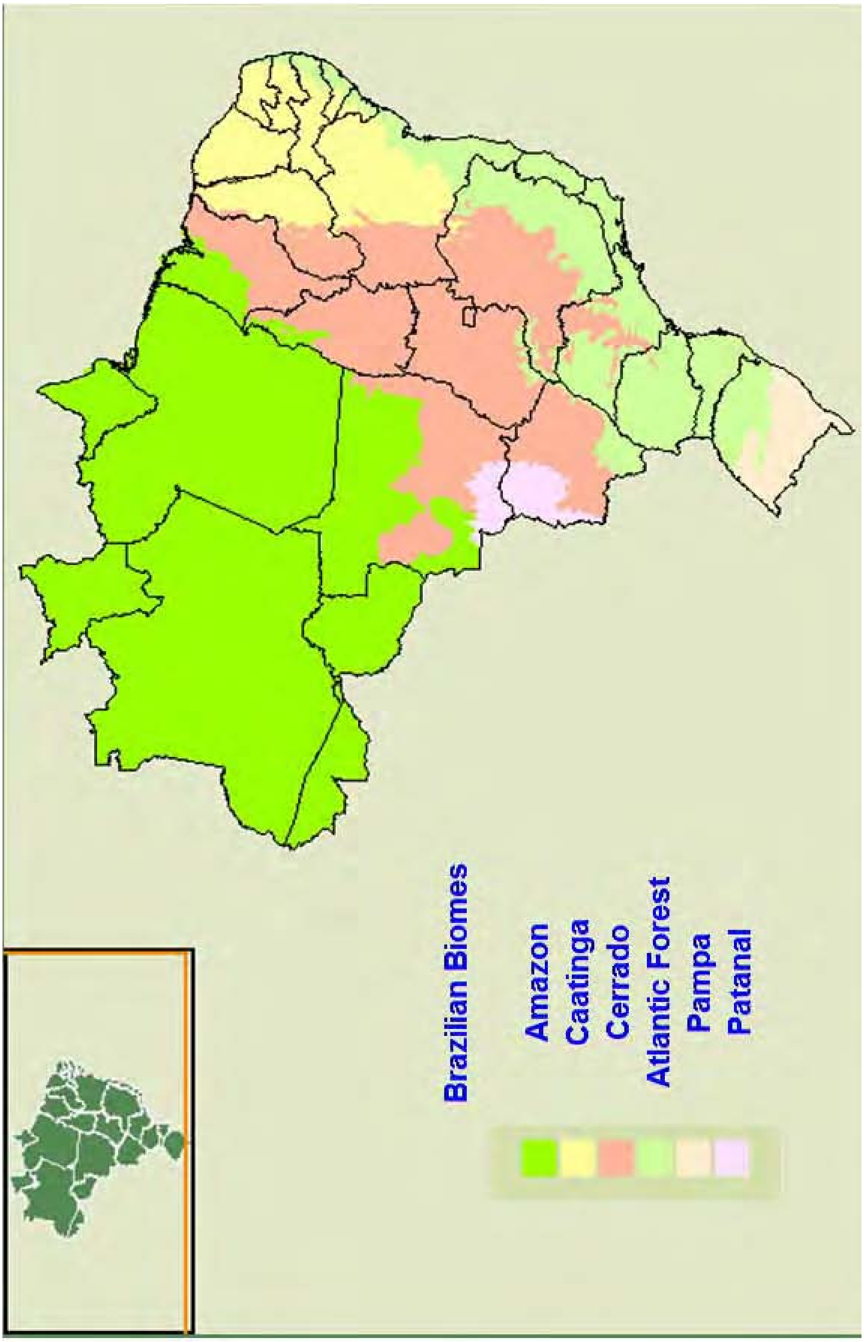
The reasons for the dynamism of the Centre-West Region

Grazing is the prevailing production system for bovines in Brazil, and the Centre-West Region with its extensive pastures has always been the leader in terms of cattle numbers (34.7 percent of the national bovine herd in 2005).[22]

Most of the territory of the Centre-West Region is in the Cerrado. Cerrado is the second largest Brazilian biome, with 204 million hectares; it has major significance for Brazilian and world agriculture, being both an important biodiversity reserve and a potential food-producing region. It occupies 24 percent of the total area of the country and includes 13 Brazilian states and in the Federal District.

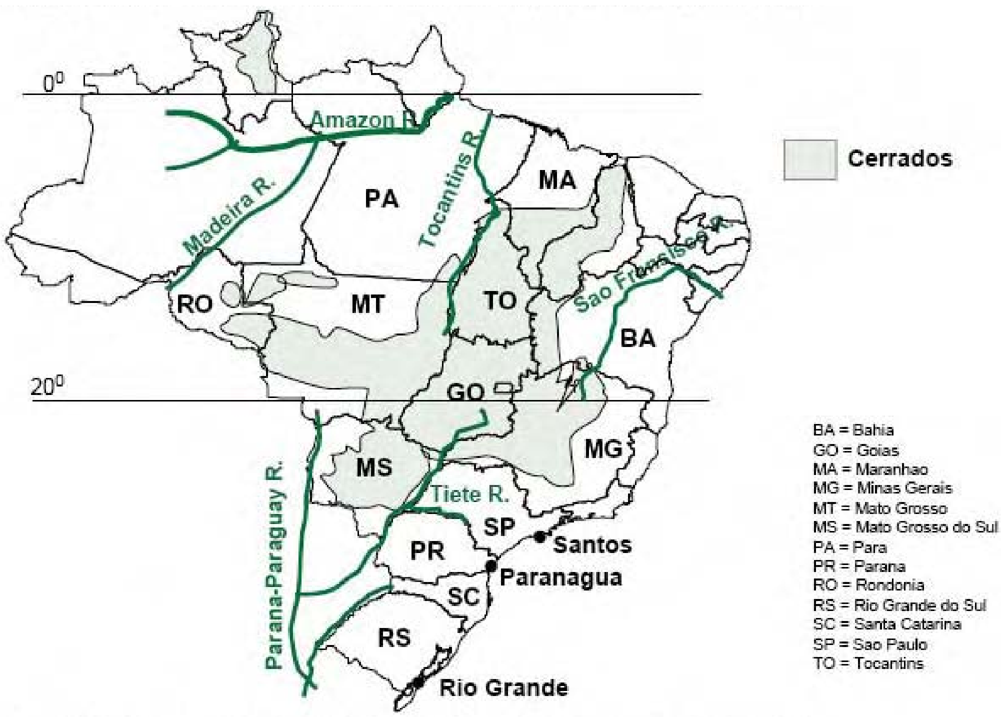
[22] IBGE's SIDRA (http://www.sidra.ibge.gov.br) PPM 2005.

FIGURE 17
Brazilian biomes



Source: IBGE's Mapas interativos (Interactive maps) (http://mapas.ibge.gov.br/biomas2/viewer.htm).

FIGURE 18
Cerrado biome



During the 1970s, in line with the official government policy of promoting the development of the interior of Brazil, resources were allocated to agricultural and livestock research and for technical assistance to farmers, with the objective of solving the main problems that limited the occupation of the Cerrado region. In this context, Embrapa created, in 1975, "Embrapa Cerrados" to study and identify the major agricultural limitations affecting the Cerrados (Empraba, 2005). The accomplishments of this body include new and cheaper forms of animal feed, new high-productivity forages, integration between agriculture and livestock breeding for the renewal of grazing lands, increased use of the native flora of the Cerrado and the reduction of harvest losses caused by climatic factors.

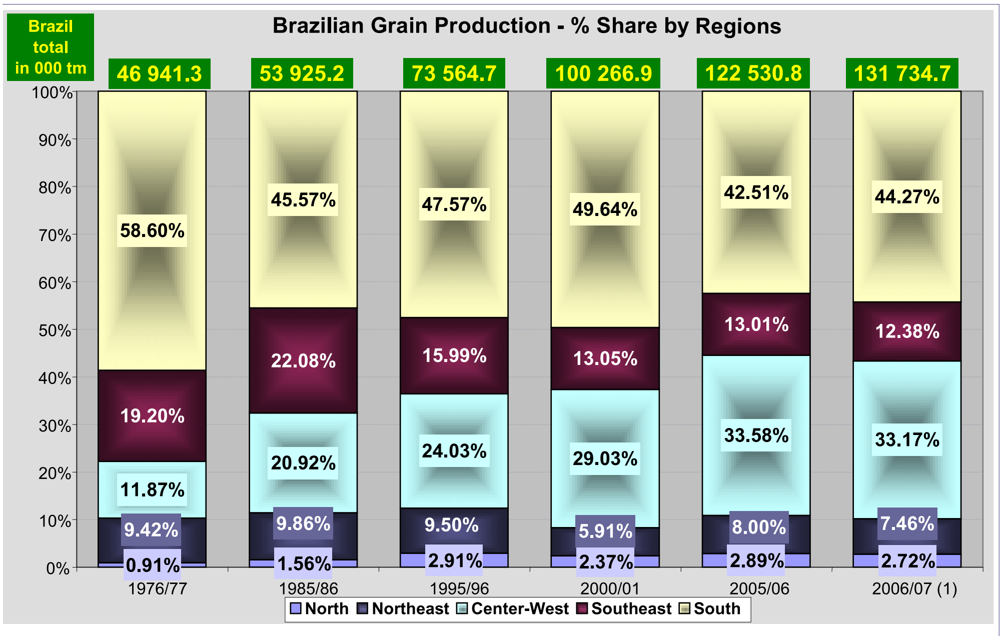
Embrapa estimates that with their present stock of technologies it is possible to produce 350 million tonnes of food in the potential agricultural area of the Cerrados (equivalent to two-thirds of the total area).

"The conquest of the Cerrado was one of the major achievements of twentieth-century tropical agriculture and can be considered a model to be emulated in other developing regions of the world, especially in South America and Africa, which have ecosystems similar to the Brazilian savannas."[23]

[23] Embrapa (2005) pages 5 and 6, extracts from the introduction.

The increasing importance of the Centre-West Region for agriculture and livestock becomes evident if we examine the evolution of Brazilian grain production. From the crop year 1976/77 to 2005/2006, Brazilian grain production expanded by 280.6 percent, while the equivalent figure for the Centre-West Region was 684.1 percent.

FIGURE 19
Brazil's grain production by regions



Source: Source: CONAB – Companhia Nacional de Abastecimento (National Company for Food Supply) (http://www.conab.gov.br) (state company within the structure of the MAPA).

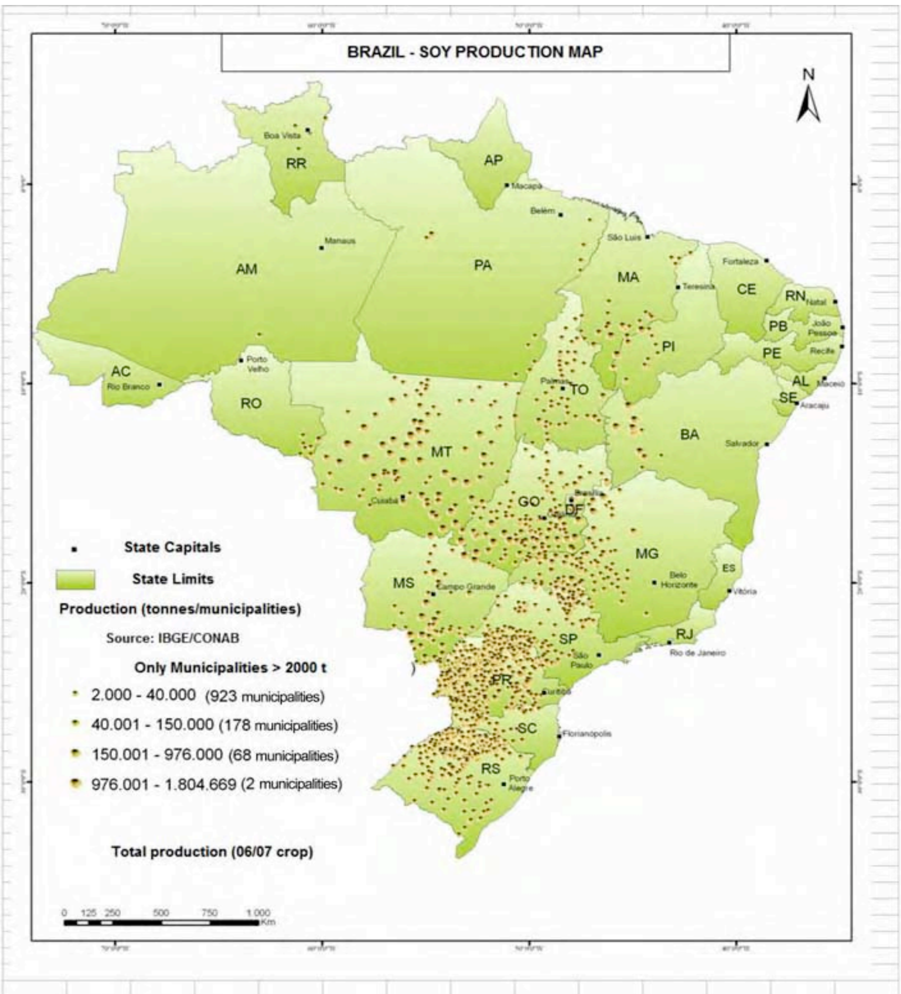
Soybean and maize are the two main sources of feed ingredients used for poultry and pork production in Brazil. In the period being analyzed, soy production in the Centre-West Region expanded by 5 027.7 percent against 353.1 percent for the country as a whole and 112.0 percent for the South Region, birthplace of soy in Brazil.

TABLE 21
Brazil's soy production by region (1 000 tonnes)

	1976/77	1985/86	1995/96	2000/01	2005/06	2006/07(1)
North	-	0.5	14.2	216.6	1 255.2	1 064.5
Northeast	-	155.5	921.9	2 075.9	3 560.9	3 867.2
Center-West	540.0	5 027.5	8 846.4	17 001.9	27 824.7	26 494.8
Southeast	875.0	1 687.5	2 274.5	2 873.9	4 137.1	4 005.4
South	10 730.0	6 336.5	11 132.7	16 263.5	18 249.2	22 944.5
Brazil	12 145.0	13 207.5	23 189.7	38 431.8	55 027.1	58 376.4

Source: CONAB – Companhia Nacional de Abastecimento (National Company for Food Supply) (http://www.conab.gov.br) (state company within the structure of the MAPA). [1] Preliminary

FIGURE 20
Map of soy production in Brazil



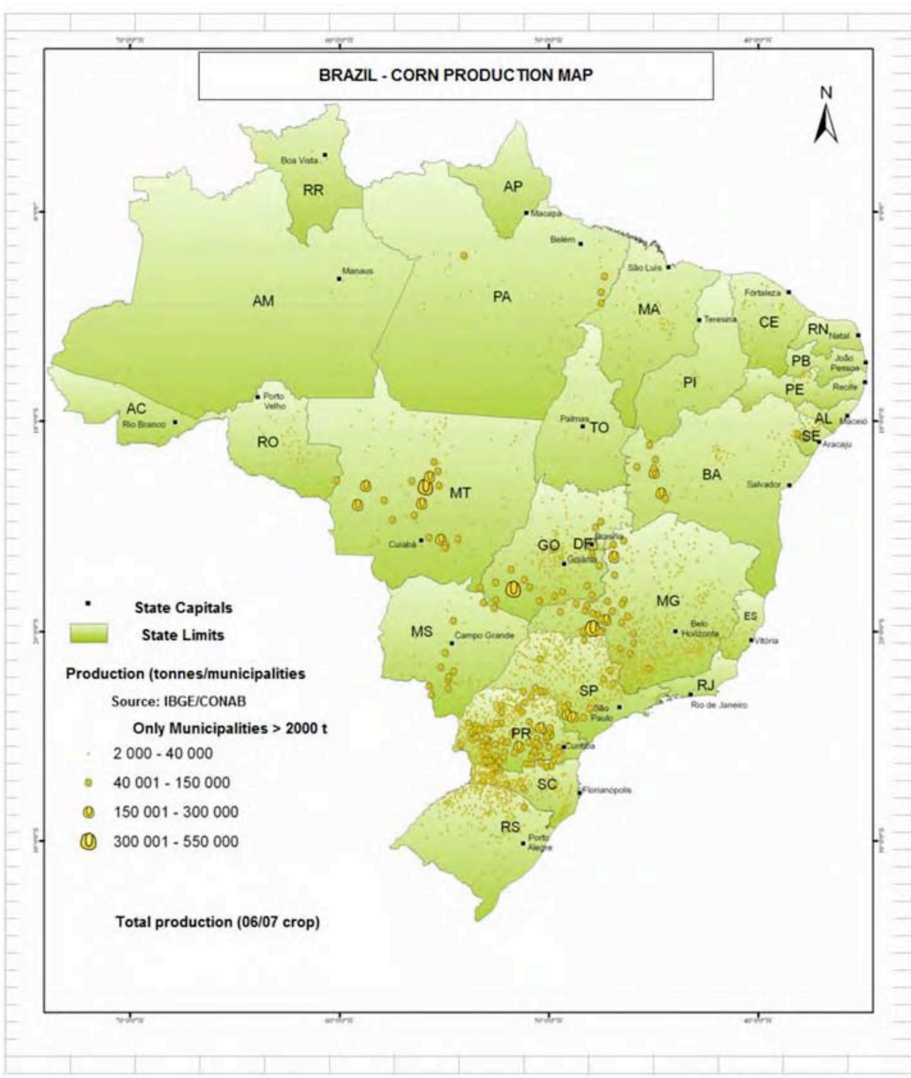
Source: Conab – SigaBRASIL (Brazilian Agriculture Geographic Information System) (http://www.conab.gov.br/conabweb/geotecnologia/sigabrasil/mapa_producao_agricola/soja.jpg).

TABLE 22
Brazil's maize production by region (1 000 tonnes)

	1976/77	1985/86	1995/96	2000/01	2005/06	2006/07[1]	2007/08[1]
North	118. 3	381. 5	963. 5	916. 2	1 129. 2	1 243. 0	1 192. 2
Northeast	1 645. 4	1 809. 6	2 948. 2	1 988. 3	3 242. 4	3 106. 2	4 164. 6
Center-West	1 941. 5	3 139. 6	6 767. 6	8 234. 3	9 592. 2	12 994. 1	14 145. 9
Southeast	5 565. 5	6 727. 8	7 651. 9	8 591. 9	9 651. 9	10 353. 2	10 400. 1
South	9 985. 0	8 206. 3	14 073. 5	22 559. 0	18 899. 2	23 673. 4	23 466. 6
Brazil	19 255. 7	20 264. 8	32 404. 7	42 289. 7	42 514. 9	51 369. 9	53 369. 4

Source: CONAB. [1] Preliminary

FIGURE 21
Map of maize production in Brazil



Source: Conab – SigaBRASIL (Brazilian Agriculture Geographic Information System) (http://www.conab.gov.br/conabweb/geotecnologia/sigabrasil/mapa_producao_agricola/milho.jpg).

Maize was until recently used for crop rotation because of its relatively modest international price. During the period from 1976 to 2005, maize production in the Centre-West grew by 569.3 percent, against 137.1 percent in the South (the leading region in terms of production) and 166.8 percent for the country as a whole. The relatively recent increase in international maize prices resulting from its use in ethanol production in the United States of America is giving rise to new interest in maize production in Brazil.

Feed normally represents around 65 percent of poultry production costs. To remain competitive, poultry production follows grain production. Tables 23, 24 and 25 present the production costs of a live broiler in ten different Brazilian states, in four different regions. Each table calculates the costs in accordance with the type of broiler house used. In all three tables, two states of the Centre-West Region, Mato Grosso (MT) and Goiás (GO) have the lowest production costs, followed by Paraná (PR) in the South Region. The differences are fundamentally due to feed costs.

TABLE 23
Cost of live broilers - Climate Controlled Broiler Houses

Cost Items	RS	SC	PR*	PE	CE	SP	MG	MT	MS	GO
		South Region		Northeast Region		Southeast Region			Center-West Region	
1. Fixed Costs (A)										
1.1 - Depreciation of Installations	R$ 0.022	R$ 0.025	R$ 0.039	R$ 0.056	R$ 0.056	R$ 0.029	R$ 0.039	R$ 0.057	R$ 0.057	R$ 0.040
1.2 - Depreciation of Equipments	R$ 0.071	R$ 0.072	R$ 0.062	R$ 0.089	R$ 0.089	R$ 0.087	R$ 0.062	R$ 0.098	R$ 0.098	R$ 0.042
1.3 - Remun. o/average capital f/ Inst. & Equip.	R$ 0.034	R$ 0.036	R$ 0.042	R$ 0.060	R$ 0.060	R$ 0.087	R$ 0.042	R$ 0.064	R$ 0.064	R$ 0.039
1.4 - Remuneration o/Turning Capital	R$ 0.002	R$ 0.001	R$ 0.001	R$ 0.002	R$ 0.002	R$ 0.003	R$ 0.001	R$ 0.002	R$ 0.002	R$ 0.001
(=) Total Fixed Costs of Contract Farmer	***R$ 0.129***	***R$ 0.134***	***R$ 0.144***	***R$ 0.206***	***R$ 0.207***	***R$ 0.206***	***R$ 0.144***	***R$ 0.221***	***R$ 0.221***	***R$ 0.122***
2. Variable Costs (B)										
2.1 - Litter	R$ 0.032	R$ 0.033	R$ 0.045	R$ 0.065	R$ 0.087	R$ 0.044	R$ 0.056	R$ 0.012	R$ 0.048	R$ 0.020
2.2 - Heating	R$ 0.021	R$ 0.043	R$ 0.011	R$ 0.012	R$ 0.022	R$ 0.040	R$ 0.018	R$ 0.021	R$ 0.009	R$ 0.014
2.3 - Electrical Power	R$ 0.019	R$ 0.019	R$ 0.014	R$ 0.018	R$ 0.074	R$ 0.016	R$ 0.022	R$ 0.098	R$ 0.068	R$ 0.014
2.4 - Water	R$ 0.015	R$ 0.008	R$ 0.000	R$ 0.016	R$ 0.006	R$ 0.001	R$ 0.015	R$ 0.001	R$ 0.001	R$ 0.001
2.5 - Contract farmer manpower	R$ 0.083	R$ 0.034	R$ 0.053	R$ 0.068	R$ 0.037	R$ 0.051	R$ 0.030	R$ 0.050	R$ 0.050	R$ 0.048
2.6 - Loading Manpower	R$ 0.018	R$ 0.019	R$ 0.025	R$ 0.010	R$ 0.007	R$ 0.013	R$ 0.010	R$ 0.015	R$ 0.021	R$ 0.020
2.7 - Maintenance Cost of Installations	R$ 0.017	R$ 0.018	R$ 0.021	R$ 0.030	R$ 0.030	R$ 0.022	R$ 0.021	R$ 0.032	R$ 0.032	R$ 0.020
2.8 - Insurance	R$ 0.002	R$ 0.002	R$ 0.003	R$ 0.004	R$ 0.004	R$ 0.003	R$ 0.003	R$ 0.004	R$ 0.004	R$ 0.002
2.9 - Sundry Costs	R$ 0.010	R$ 0.009	R$ 0.009	R$ 0.011	R$ 0.013	R$ 0.010	R$ 0.009	R$ 0.012	R$ 0.012	R$ 0.007
(=) Total of Variable Costs of Contract Farmer	***R$ 0.217***	***R$ 0.185***	***R$ 0.181***	***R$ 0.233***	***R$ 0.280***	***R$ 0.200***	***R$ 0.184***	***R$ 0.245***	***R$ 0.245***	***R$ 0.146***
(=) Total Costs of Contract Farmers	**R$ 0.346**	**R$ 0.319**	**R$ 0.325**	**R$ 0.439**	**R$ 0.486**	**R$ 0.406**	**R$ 0.328**	**R$ 0.466**	**R$ 0.466**	**R$ 0.268**
3. Fixed Costs (C)										
3.1 - Remuneration o/Turning Capital	R$ 0.020	R$ 0.021	R$ 0.018	R$ 0.024	R$ 0.027	R$ 0.044	R$ 0.022	R$ 0.019	R$ 0.022	R$ 0.019

4.Variable Costs (D)										
4.1 - One-day chicks	R$ 0.550	R$ 0.580	R$ 0.560	R$ 0.700	R$ 0.580	R$ 0.600	R$ 0.660	R$ 0.520	R$ 0.520	R$ 0.640
4.2 - Feed	R$ 2.265	R$ 2.225	R$ 1.954	R$ 2.720	R$ 2.493	R$ 2.143	R$ 2.193	R$ 1.725	R$ 2.318	R$ 1.800
4.3 - Veterinary Products	R$ 0.010	R$ 0.008	R$ 0.012	R$ 0.031	R$ 0.042	R$ 0.014	R$ 0.009	R$ 0.011	R$ 0.011	R$ 0.010
4.4 - Transport	R$ 0.093	R$ 0.136	R$ 0.053	R$ 0.016	R$ 0.460	R$ 0.158	R$ 0.054	R$ 0.221	R$ 0.055	R$ 0.078
4.5 - Funrural (Tax)	R$ 0.070	R$ 0.077	R$ 0.072	R$ 0.086	R$ 0.098	R$ 0.077	R$ 0.094	R$ 0.122	R$ 0.122	R$ 0.081
4.6 - Technical Assistance	R$ 0.009	R$ 0.006	R$ 0.007	R$ 0.008	R$ 0.022	R$ 0.024	R$ 0.010	R$ 0.036	R$ 0.009	R$ 0.043
4.7 - Sundry Costs	R$ 0.148	R$ 0.150	R$ 0.131	R$ 0.176	R$ 0.183	R$ 0.149	R$ 0.149	R$ 0.130	R$ 0.149	R$ 0.131
(=) Total of Variable Costs	***R$ 3.150***	***R$ 3.182***	***R$ 2.790***	***R$ 3.738***	***R$ 3.878***	***R$ 3.170***	***R$ 3.170***	***R$ 2.765***	***R$ 3.184***	***R$ 2.783***
(=) Total Costs of Agroindustry	**R$ 3.170**	**R$ 3.203**	**R$ 2.808**	**R$ 3.762**	**R$ 3.878**	**R$ 3.214**	**R$ 3.192**	**R$ 2.784**	**R$ 3.206**	**R$ 2.802**
(=) Total Fixed Cost (A + C)	**R$ 0.149**	**R$ 0.155**	**R$ 0.162**	**R$ 0.230**	**R$ 0.234**	**R$ 0.250**	**R$ 0.166**	**R$ 0.240**	**R$ 0.243**	**R$ 0.141**
(=) Total Variable Cost (B + D)	**R$ 3.367**	**R$ 3.367**	**R$ 2.971**	**R$ 3.970**	**R$ 4.158**	**R$ 3.370**	**R$ 3.354**	**R$ 3.010**	**R$ 3.429**	**R$ 2.929**
(=) Total Cost	***R$ 3.516***	***R$ 3.521***	***R$ 3.133***	***R$ 4.201***	***R$ 4.391***	***R$ 3.620***	***R$ 3.520***	***R$ 3.250***	***R$ 3.672***	***R$ 3.070***
(=) Cost per kg of broiler	***R$ 1.470***	***R$ 1.531***	***R$ 1.360***	***R$ 1.901***	***R$ 1.756***	***R$ 1.510***	***R$ 1.290***	***R$ 1.230***	***R$ 1.390***	***R$ 1.230***
Feed Conversion	1.890	1.870	1.840	2.030	1.910	1.950	1.880	1.860	1.860	1.890
Final Broiler Weight	2.400	2.300	2.300	2.210	2.720	2.400	2.600	2.650	2.650	2.500

Source: the CONAB Web site (http://www.conab.gov.br/conabweb/index.php?PAG=213) publishes production costs for broilers and pigs, along with several other costs of both summer and winter crops, permanent crops, etc. Broiler costs are calculated in cooperation with Embrapa Suínos e Aves (Pigs and Poultry). Paraná State costs are calculated in cooperation the Department of Rural Economy (DERAL) of the State Secretary of Agriculture and Food Supply (SERAL). These data permit farmers to compare their costs with the averages and to obtain knowledge of the cost structure of the whole chain.

TABLE 24
Costs of live broiler production – automatic broiler houses

Cost Items	RS	SC	PR*	PE	CE	SP	MG	MT	MS	GO
		South Region		Northeast Region		Southeast Region			Center-West Region	
1. Fixed Costs (A)										
1.1 - Depreciation of Installations	R$ 0.027	R$ 0.032	R$ 0.023	R$ 0.045	R$ 0.036	R$ 0.034	R$ 0.033	R$ 0.042	R$ 0.042	R$ 0.042
1.2 - Depreciation of Equipments	R$ 0.065	R$ 0.078	R$ 0.066	R$ 0.111	R$ 0.088	R$ 0.071	R$ 0.057	R$ 0.075	R$ 0.075	R$ 0.038
1.3 - Remun. o/average capital f/ Inst. & Equip.	R$ 0.036	R$ 0.042	R$ 0.034	R$ 0.060	R$ 0.048	R$ 0.083	R$ 0.037	R$ 0.048	R$ 0.048	R$ 0.039
1.4 - Remuneration o/Turning Capital	R$ 0.002	R$ 0.002	R$ 0.001	R$ 0.003	R$ 0.003	R$ 0.003	R$ 0.002	R$ 0.002	R$ 0.002	R$ 0.001
(=) Total Fixed Costs of Contract Farmer	***R$ 0.130***	***R$ 0.153***	***R$ 0.124***	***R$ 0.220***	***R$ 0.176***	***R$ 0.191***	***R$ 0.129***	***R$ 0.167***	***R$ 0.167***	***R$ 0.120***
2. Variable Costs (B)										
2.1 - Litter	R$ 0.040	R$ 0.042	R$ 0.057	R$ 0.175	R$ 0.104	R$ 0.051	R$ 0.071	R$ 0.014	R$ 0.053	R$ 0.021
2.2 - Heating	R$ 0.026	R$ 0.055	R$ 0.013	R$ 0.020	R$ 0.027	R$ 0.047	R$ 0.023	R$ 0.023	R$ 0.010	R$ 0.015
2.3 - Electrical Power	R$ 0.023	R$ 0.023	R$ 0.016	R$ 0.030	R$ 0.074	R$ 0.016	R$ 0.027	R$ 0.108	R$ 0.075	R$ 0.015
2.4 - Water	R$ 0.017	R$ 0.010	R$ 0.001	R$ 0.025	R$ 0.014	R$ 0.001	R$ 0.015	R$ 0.001	R$ 0.001	R$ 0.001
2.5 - Contract farmer manpower	R$ 0.104	R$ 0.044	R$ 0.067	R$ 0.110	R$ 0.070	R$ 0.059	R$ 0.039	R$ 0.055	R$ 0.055	R$ 0.050
2.6 - Loading Manpower	R$ 0.023	R$ 0.020	R$ 0.025	R$ 0.015	R$ 0.008	R$ 0.015	R$ 0.012	R$ 0.014	R$ 0.019	R$ 0.021
2.7 - Maintenance Cost of Installations	R$ 0.018	R$ 0.021	R$ 0.017	R$ 0.030	R$ 0.024	R$ 0.021	R$ 0.018	R$ 0.024	R$ 0.024	R$ 0.019
2.8 - Insurance	R$ 0.002	R$ 0.003	R$ 0.002	R$ 0.004	R$ 0.003	R$ 0.002	R$ 0.002	R$ 0.003	R$ 0.003	R$ 0.002
2.9 - Sundry Costs	R$ 0.013	R$ 0.011	R$ 0.010	R$ 0.020	R$ 0.016	R$ 0.011	R$ 0.010	R$ 0.012	R$ 0.012	R$ 0.007
(=) Total of Variable Costs of Contract Farmer	***R$ 0.266***	***R$ 0.228***	***R$ 0.208***	***R$ 0.428***	***R$ 0.341***	***R$ 0.223***	***R$ 0.217***	***R$ 0.254***	***R$ 0.252***	***R$ 0.151***
(=) Total Costs of Contract Farmers	**R$ 0.400**	**R$ 0.382**	**R$ 0.330**	**R$ 0.648**	**R$ 0.517**	**R$ 0.410**	**R$ 0.350**	**R$ 0.420**	**R$ 0.420**	**R$ 0.270**
3. Fixed Costs (C)										
3.1 - Remuneration o/Turning Capital	R$ 0.020	R$ 0.021	R$ 0.018	R$ 0.029	R$ 0.030	R$ 0.044	R$ 0.022	R$ 0.019	R$ 0.022	R$ 0.019

4.Variable Costs (D)										
4.1 - One-day chicks	R$ 0.550	R$ 0.580	R$ 0.560	R$ 0.700	R$ 0.580	R$ 0.600	R$ 0.660	R$ 0.520	R$ 0.520	R$ 0.640
4.2 - Feed	R$ 2.265	R$ 2.225	R$ 1.954	R$ 3.066	R$ 2.675	R$ 2.143	R$ 2.193	R$ 1.725	R$ 2.318	R$ 1.800
4.3 - Veterinary Products	R$ 0.011	R$ 0.010	R$ 0.013	R$ 0.026	R$ 0.044	R$ 0.015	R$ 0.011	R$ 0.011	R$ 0.011	R$ 0.011
4.4 - Transport	R$ 0.099	R$ 0.165	R$ 0.061	R$ 0.025	R$ 0.456	R$ 0.162	R$ 0.048	R$ 0.238	R$ 0.060	R$ 0.076
4.5 - Funrural (Tax)	R$ 0.070	R$ 0.077	R$ 0.072	R$ 0.098	R$ 0.106	R$ 0.077	R$ 0.090	R$ 0.122	R$ 0.122	R$ 0.081
4.6 - Technical Assistance	R$ 0.011	R$ 0.008	R$ 0.008	R$ 0.018	R$ 0.027	R$ 0.027	R$ 0.013	R$ 0.040	R$ 0.010	R$ 0.045
4.7 - Sundry Costs	R$ 0.148	R$ 0.152	R$ 0.132	R$ 0.193	R$ 0.191	R$ 0.149	R$ 0.149	R$ 0.131	R$ 0.149	R$ 0.131
(=) Total of Variable Costs	***R$ 3.150***	***R$ 3.215***	***R$ 2.800***	***R$ 4.126***	***R$ 4.079***	***R$ 3.170***	***R$ 3.160***	***R$ 2.787***	***R$ 3.190***	***R$ 2.784***
(=) Total Costs of Agroindustry	**R$ 3.170**	**R$ 3.236**	**R$ 2.818**	**R$ 4.154**	**R$ 4.079**	**R$ 3.214**	**R$ 3.182**	**R$ 2.806**	**R$ 3.212**	**R$ 2.803**
(=) Total Fixed Cost (A + C)	**R$ 0.150**	**R$ 0.174**	**R$ 0.140**	**R$ 0.248**	**R$ 0.206**	**R$ 0.240**	**R$ 0.150**	**R$ 0.190**	**R$ 0.190**	**R$ 0.140**
(=) Total Variable Cost (B + D)	**R$ 3.420**	**R$ 3.444**	**R$ 3.010**	**R$ 4.554**	**R$ 4.420**	**R$ 3.390**	**R$ 3.380**	**R$ 3.040**	**R$ 3.440**	**R$ 2.940**
(=) Total Cost	***R$ 3.570***	***R$ 3.618***	***R$ 3.150***	***R$ 4.802***	***R$ 4.626***	***R$ 3.630***	***R$ 3.530***	***R$ 3.230***	***R$ 3.630***	***R$ 3.080***
(=) Cost per kg of broiler	***R$ 1.490***	***R$ 1.573***	***R$ 1.370***	***R$ 1.921***	***R$ 1.699***	***R$ 1.510***	***R$ 1.360***	***R$ 1.220***	***R$ 1.370***	***R$ 1.230***
Feed Conversion	1.890	1.870	1.840	2.030	1.910	1.950	1.880	1.860	1.860	1.890
Final Broiler Weight	2.400	2.300	2.300	2.500	2.720	2.400	2.600	2.650	2.650	2.500

Source: the CONAB Web site (http://www.conab.gov.br/conabweb/index.php?PAG=213) publishes production costs for broilers and pigs, along with several other costs of both summer and winter crops, permanent crops, etc. Broiler costs are calculated in cooperation with Embrapa Suínos e Aves (Pigs and Poultry). Paraná State costs are calculated in cooperation the Department of Rural Economy (DERAL) of the State Secretary of Agriculture and Food Supply (SERAL). These data permit farmers to compare their costs with the averages and to obtain knowledge of the cost structure of the whole chain.

TABLE 25
Costs of live broiler production – manual broiler houses

Cost Items	RS	SC	PR*	PE	CE	SP	MG	MT	MS	GO
		South Region		Northeast Region		Southeast Region			Center-West Region	
1. Fixed Costs (A)										
1.1 - Depreciation of Installations	R$ 0.029	R$ 0.034	R$ 0.028	R$ 0.044	R$ 0.017	R$ 0.034	R$ 0.024	R$ 0.044	R$ 0.044	R$ 0.048
1.2 - Depreciation of Equipments	R$ 0.044	R$ 0.034	R$ 0.035	R$ 0.073	R$ 0.028	R$ 0.043	R$ 0.029	R$ 0.053	R$ 0.053	R$ 0.033
1.3 - Remun. o/average capital f/ Inst. & Equip.	R$ 0.044	R$ 0.034	R$ 0.035	R$ 0.073	R$ 0.028	R$ 0.043	R$ 0.029	R$ 0.053	R$ 0.053	R$ 0.033
1.4 - Remuneration o/Turning Capital	R$ 0.002	R$ 0.002	R$ 0.002	R$ 0.005	R$ 0.003	R$ 0.003	R$ 0.002	R$ 0.002	R$ 0.002	R$ 0.001
(=) Total Fixed Costs of Contract Farmer	***R$ 0.119***	***R$ 0.104***	***R$ 0.100***	***R$ 0.194***	***R$ 0.076***	***R$ 0.123***	***R$ 0.084***	***R$ 0.152***	***R$ 0.152***	***R$ 0.115***
2. Variable Costs (B)										
2.1 – Litter	R$ 0.043	R$ 0.045	R$ 0.067	R$ 0.175	R$ 0.120	R$ 0.051	R$ 0.071	R$ 0.014	R$ 0.055	R$ 0.024
2.2 - Heating	R$ 0.027	R$ 0.060	R$ 0.016	R$ 0.018	R$ 0.031	R$ 0.047	R$ 0.023	R$ 0.024	R$ 0.010	R$ 0.017
2.3 - Electrical Power	R$ 0.022	R$ 0.022	R$ 0.017	R$ 0.029	R$ 0.078	R$ 0.014	R$ 0.025	R$ 0.091	R$ 0.063	R$ 0.016
2.4 - Water	R$ 0.017	R$ 0.010	R$ 0.001	R$ 0.024	R$ 0.016	R$ 0.001	R$ 0.016	R$ 0.001	R$ 0.001	R$ 0.001
2.5 - Contract farmer manpower	R$ 0.111	R$ 0.047	R$ 0.080	R$ 0.293	R$ 0.095	R$ 0.059	R$ 0.039	R$ 0.058	R$ 0.058	R$ 0.058
2.6 - Loading Manpower	R$ 0.024	R$ 0.022	R$ 0.025	R$ 0.020	R$ 0.010	R$ 0.015	R$ 0.012	R$ 0.013	R$ 0.018	R$ 0.025
2.7 - Maintenance Cost of Installations	R$ 0.015	R$ 0.015	R$ 0.013	R$ 0.024	R$ 0.009	R$ 0.017	R$ 0.011	R$ 0.021	R$ 0.021	R$ 0.020
2.8 - Insurance	R$ 0.002	R$ 0.002	R$ 0.002	R$ 0.003	R$ 0.001	R$ 0.002	R$ 0.001	R$ 0.003	R$ 0.003	R$ 0.002
2.9 - Sundry Costs	R$ 0.013	R$ 0.011	R$ 0.011	R$ 0.029	R$ 0.018	R$ 0.010	R$ 0.010	R$ 0.011	R$ 0.011	R$ 0.008
(=) Total of Variable Costs of Contract Farmer	***R$ 0.274***	***R$ 0.234***	***R$ 0.232***	***R$ 0.615***	***R$ 0.378***	***R$ 0.216***	***R$ 0.208***	***R$ 0.236***	***R$ 0.240***	***R$ 0.171***
(=) Total Costs of Contract Farmers	**R$ 0.390**	**R$ 0.338**	**R$ 0.330**	**R$ 0.809**	**R$ 0.454**	**R$ 0.340**	**R$ 0.290**	**R$ 0.390**	**R$ 0.390**	**R$ 0.290**
3. Fixed Costs (C)										
3.1 - Remuneration o/Turning Capital	R$ 0.021	R$ 0.021	R$ 0.018	R$ 0.036	R$ 0.032	R$ 0.044	R$ 0.022	R$ 0.020	R$ 0.022	R$ 0.020

4.Variable Costs (D)										
4.1 - One-day chicks	R$ 0.550	R$ 0.580	R$ 0.560	R$ 0.700	R$ 0.580	R$ 0.600	R$ 0.660	R$ 0.520	R$ 0.520	R$ 0.640
4.2 - Feed	R$ 2.265	R$ 2.225	R$ 1.954	R$ 3.554	R$ 2 675	R$ 2.143	R$ 2.193	R$ 1.725	R$ 2.318	R$ 1.800
4.3 - Veterinary Products	R$ 0.011	R$ 0.010	R$ 0.014	R$ 0.029	R$ 0.047	R$ 0.015	R$ 0.010	R$ 0.012	R$ 0.012	R$ 0.011
4.4 - Transport	R$ 0.124	R$ 0.188	R$ 0.079	R$ 0.080	R$ 0.637	R$ 0.182	R$ 0.069	R$ 0.256	R$ 0.064	R$ 0.095
4.5 - Funrural (Tax)	R$ 0.070	R$ 0.077	R$ 0.072	R$ 0.109	R$ 0.106	R$ 0.077	R$ 0.090	R$ 0.122	R$ 0.122	R$ 0.081
4.6 - Technical Assistance	R$ 0.012	R$ 0.008	R$ 0.010	R$ 0.035	R$ 0.031	R$ 0.027	R$ 0.013	R$ 0.042	R$ 0.011	R$ 0.052
4.7 - Sundry Costs	R$ 0.149	R$ 0.153	R$ 0.133	R$ 0.221	R$ 0.201	R$ 0.150	R$ 0.150	R$ 0.132	R$ 0.149	R$ 0.132
(=) Total of Variable Costs	**R$ 3.180**	**R$ 3.241**	**R$ 2.820**	**R$ 4.727**	**R$ 4.276**	**R$ 3.190**	**R$ 3.190**	**R$ 2.809**	**R$ 3.196**	**R$ 2.811**
(=) Total of Variable Costs	***R$ 3.150***	***R$ 3.182***	***R$ 2.790***	***R$ 3.738***	***R$ 3.878***	***R$ 3.170***	***R$ 3.170***	***R$ 2.765***	***R$ 3.184***	***R$ 2.783***
(=) Total Costs of Agroindustry	**R$ 3.201**	**R$ 3.262**	**R$ 2.838**	**R$ 4.764**	**R$ 4.276**	**R$ 3.234**	**R$ 3.212**	**R$ 2.829**	**R$ 3.218**	**R$ 2.831**
(=) Total Fixed Cost (A + C)	**R$ 0.140**	**R$ 0.125**	**R$ 0.120**	**R$ 0.230**	**R$ 0.107**	**R$ 0.170**	**R$ 0.110**	**R$ 0.170**	**R$ 0.170**	**R$ 0.140**
(=) Total Variable Cost (B + D)	**R$ 3.450**	**R$ 3.475**	**R$ 3.050**	**R$ 5.342**	**R$ 4.654**	**R$ 3.410**	**R$ 3.400**	**R$ 3.050**	**R$ 3.440**	**R$ 2.980**
(=) Total Cost	***R$ 3.590***	***R$ 3.601***	***R$ 3.170***	***R$ 5.572***	***R$ 4.761***	***R$ 3.580***	***R$ 3.510***	***R$ 3.220***	***R$ 3.610***	***R$ 3.120***
(=) Cost per kg of broiler	***R$ 1.500***	***R$ 1.565***	***R$ 1.380***	***R$ 1.990***	***R$ 1.763***	***R$ 1.490***	***R$ 1.350***	***R$ 1.220***	***R$ 1.360***	***R$ 1.250***
Feed Conversion	1.890	1.870	1.840	2.100	1.910	1.950	1.880	1.860	1.860	1.890
Final Broiler Weight	2.400	2.300	2.300	2.800	2.720	2.400	2.600	2.650	2.650	2.500

Source: the CONAB Web site (http://www.conab.gov.br/conabweb/index.php?PAG=213) publishes production costs for broilers and pigs, along with several other costs of both summer and winter crops, permanent crops, etc. Broiler costs are calculated in cooperation with Embrapa Suínos e Aves (Pigs and Poultry). Paraná State costs are calculated in cooperation the Department of Rural Economy (DERAL) of the State Secretary of Agriculture and Food Supply (SERAL). These data permit farmers to compare their costs with the averages and to obtain knowledge of the cost structure of the whole chain.

The movement in the poultry industry towards the Centre-West Region will be paralleled in the pork sector, because the majority of the main meat companies in Brazil produce and process both poultry and pork. This march towards the Centre-West along with the increase in meat exports has probably been one of the most remarkable developments in Brazil's livestock sector during the last decade and will continue to have an impact over the coming decade.

Appendix 2 presents data on Brazil's geographic regions, and their respective areas and populations. To these data are added information on income, expressed in euros, distribution of the active population by economic activity and herd size by species. A graphic shows the share of the region's total chicken for meat flock accounted for by each of its federal states.

The distribution of Brazil's chicken for meat flock

The distribution of the chicken for meat flock across the states of the Brazilian Federation for the years 1995 and 2005 is presented in Table 26.

TABLE 26
Brazil's chicken for meat flock by state, 1995 and 2005

Herd Sizes (Heads) - Herd = Cocks, hens, broilers & 1-day chicks							
	Year = 1995		%		Year = 2005		%
1	Rio Grande do Sul	110 746 770	20.5%	1	Paraná	151 814 509	18.7%
2	Paraná	89 020 286	16.4%	2	Santa Catarina	142 411 820	17.5%
3	São Paulo	78 765 024	14.6%	3	São Paulo	133 671 738	16.5%
4	Santa Catarina	73 718 164	13.6%	4	Rio Grande do Sul	108 730 854	13.4%
5	Minas Gerais	44 235 371	8.2%	5	Minas Gerais	67 618 845	8.3%
6	Bahia	19 874 937	3.7%	6	Goiás	31 801 276	3.9%
7	Rio de Janeiro	15 230 545	2.8%	7	Bahia	21 971 409	2.7%
8	Pernambuco	13 714 285	2.5%	8	Mato Grosso do Sul	21 585 870	2.7%
9	Ceará	11 543 264	2.1%	9	Mato Grosso	15 959 146	2.0%
10	Pará	10 971 675	2.0%	10	Pernambuco	15 882 854	2.0%
11	Maranhão	9 986 025	1.8%	11	Ceará	15 367 090	1.9%
12	Goiás	9 637 610	1.8%	12	Distrito Federal	13 505 480	1.7%
13	Mato Grosso	8 245 753	1.5%	13	Rio de Janeiro	12 737 252	1.6%
14	Espírito Santo	7 314 354	1.4%	14	Pará	9 918 115	1.2%
15	Mato Grosso do Sul	6 851 789	1.3%	15	Espírito Santo	9 593 088	1.2%
16	Piauí	6 074 203	1.1%	16	Maranhão	8 368 394	1.0%
17	Rondônia	5 626 581	1.0%	17	Piauí	7 599 507	0.9%
18	Paraíba	4 028 487	0.7%	18	Paraíba	6 146 814	0.8%
19	Distrito Federal	3 782 236	0.7%	19	Sergipe	3 536 628	0.4%
20	Tocantins	2 475 136	0.5%	20	Alagoas	3 038 943	0.4%
21	Alagoas	2 189 239	0.4%	21	Rondônia	2 954 770	0.4%
22	Sergipe	2 188 508	0.4%	22	Rio Grande do Norte	2 906 662	0.4%
23	Amazonas	1 740 261	0.3%	23	Tocantins	2 402 603	0.3%
24	Rio Grande do Norte	1 529 545	0.3%	24	Amazonas	1 527 537	0.2%
25	Acre	849 471	0.2%	25	Acre	722 181	0.1%
26	Roraima	528 455	0.1%	26	Roraima	648 000	0.1%
27	Amapá	295 968	0.1%	27	Amapá	46 515	0.0%

Source: IBGE's SIDRA – PPM 2005.

TABLE 27

Chicken flock growth by state, 1995 to 2005 (head)

Brazil 271.303.598					
Santa Catarina	68 693 656	Espírito Santo	2 278 734	Tocantins	-72 533
Paraná	62 794 223	Pernambuco	2 168 569	Acre	-127 290
São Paulo	54 906 714	Paraíba	2 118 327	Amazonas	-212 724
Minas Gerais	23 383 474	Bahia	2 096 472	Amapá	-249 453
Goiás	22 163 666	Piauí	1 525 304	Pará	-1 053 560
Mato Grosso do Sul	14 734 081	Rio Grande do Norte	1 377 117	Maranhão	-1 617 631
Distrito Federal	9 723 244	Sergipe	1 348 120	Rio Grande do Sul	-2 015 916
Mato Grosso	7 713 393	Alagoas	849 704	Rio de Janeiro	-2 493 293
Ceará	3 823 826	Roraima	119 545	Rondônia	-2 671 811

Source: IBGE's SIDRA – PPM 2005

TABLE 28

Chicken flock growth by state, 1995 to 2005 (in percentage terms)

Federal State	Chicken Herd Δ% 1995-2005	State Rank in 1995	State Rank in 2005	Federal State	Chicken Herd Δ% 1995-2005	State Rank in 1995	State Rank in 2005
Distrito Federal	257.1%	19	12	Espírito Santo	31.2%	14	15
Goiás	230.0%	12	6	Piauí	25.1%	16	17
Mato Grosso do Sul	215.0%	15	8	Roraima	22.6%	26	26
Mato Grosso	93.5%	13	9	Pernambuco	15.8%	8	10
Santa Catarina	93.2%	4	2	Bahia	10.5%	6	7
Rio Grande do Norte	90.0%	24	22	Rio Grande do Sul	-1.8%	1	4
Paraná	70.5%	2	1	Tocantins	-2.9%	20	23
São Paulo	69.7%	3	3	Pará	-9.6%	10	14
Sergipe	61.6%	22	19	Amazonas	-12.2%	23	24
Minas Gerais	52.9%	5	5	Acre	-15.0%	25	25
Paraíba	52.6%	18	18	Maranhão	-16.2%	11	16
Alagoas	38.8%	21	20	Rio de Janeiro	-16.4%	7	13
Ceará	33.1%	9	11	Rondônia	-47.5%	17	21
				Amapá	-84.3%	27	27

Sources: IBGE's SIDRA – PPM 2005.

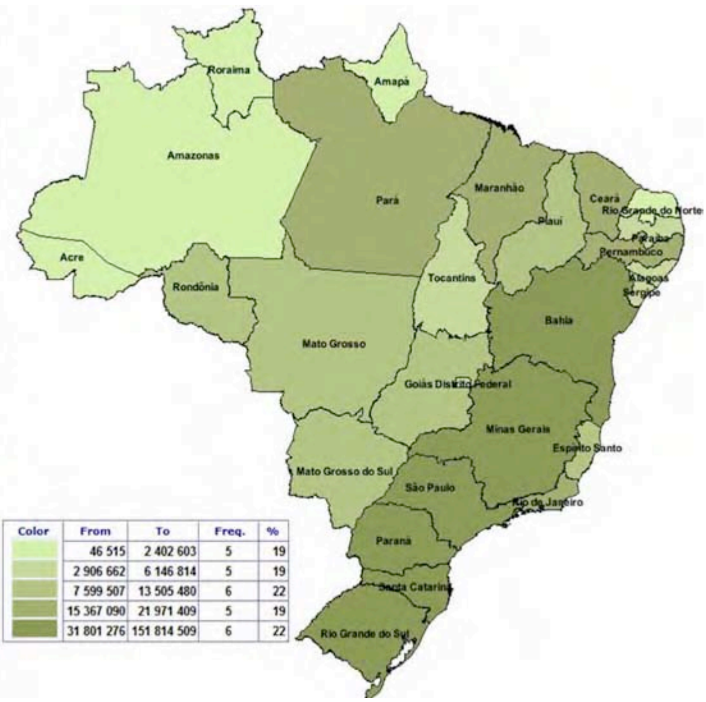
Tables 26 to 28 show that:

- in both 1995 and 2005, the two leading states were from the South Region; and
- Rio Grande do Sul (RS) State is losing ground due to its lack of self-sufficiency in maize and its distance from the main consuming centres situated in the Southeast Region; Rio Grande do Sul maintains a strong position due to the tradition of poultry keeping and the presence of small farmers who favour the vertical integration system;[24].
- Paraná (PR) is the leading state in terms of herd size, but it was Santa Catarina (SC), home state of the three largest poultry companies, that has showed the highest growth in bird numbers (an increase of 68 693 656 head); and
- the states of the Centre-West Region – Goiás (GO), Mato Grosso do Sul (MS), Mato Grosso (MT) – and the Federal District (situated in the State of Goiás) had the highest percentage growth, confirming the progressive migration of grain-fed animals.

Figures 22 and 23 show the chicken for meat flock size in the years 1995 and 2005.

FIGURE 22
Brazil's chicken for meat flock size by state, 1995

Variable = Herd Numbers (Heads)		
Species = Cocks, chickens, broilers and chicks		
Year = 1995		
#	Brazil & Federation Unity	
1	Brazil	541 163 942
2	Rio Grande do Sul	110 746 770
3	Paraná	89 020 286
4	São Paulo	78 765 024
5	Santa Catarina	73 718 164
6	Minas Gerais	44 235 371
7	Bahia	19 874 937
8	Rio de Janeiro	15 230 545
9	Pernambuco	13 714 285
10	Ceará	11 543 264
11	Pará	10 971 675
12	Maranhão	9 986 025
13	Goiás	9 637 610
14	Mato Grosso	8 245 753
15	Espírito Santo	7 314 354
16	Mato Grosso do Sul	6 851 789
17	Piauí	6 074 203
18	Rondônia	5 626 581
19	Paraíba	4 028 487
20	Distrito Federal	3 782 236
21	Tocantins	2 475 136
22	Alagoas	2 189 239
23	Sergipe	2 188 508
24	Amazonas	1 740 261
25	Rio Grande do Norte	1 529 545
26	Acre	849 471
27	Roraima	528 455
28	Amapá	295 968

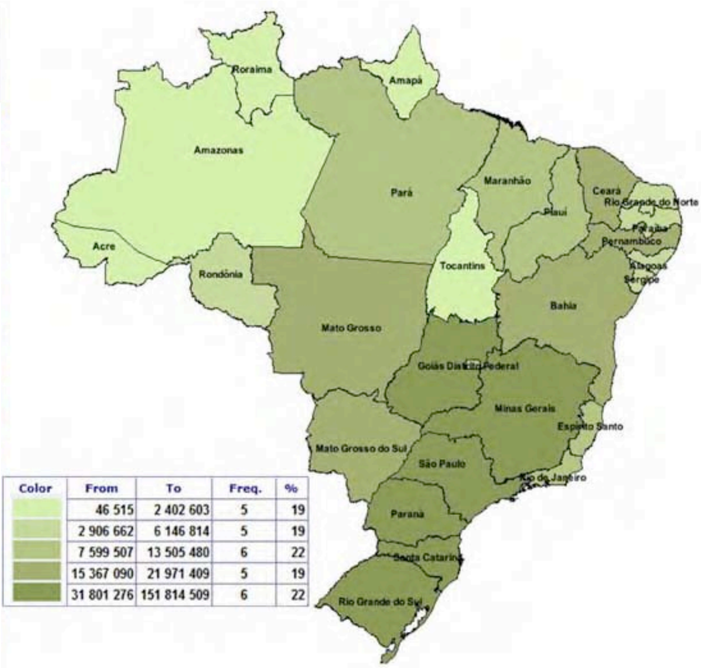


Color	From	To	Freq.	%
	46 515	2 402 603	5	19
	2 906 662	6 146 814	5	19
	7 599 507	13 505 480	6	22
	15 367 090	21 971 409	5	19
	31 801 276	151 814 509	6	22

[24] The Brazilian vertically integrated farmers or contract farmers are known as "integrados", which in Brazilian Portuguese means "he who is integrated".

FIGURE 23
Brazil's chicken for meat flock size by state, 2005

Variable = Herd Numbers (Heads)		
Species = Cocks, chickens, broilers and chicks		
Year = 2005		
#	Brazil & Federation Unity	
1	Brazil	812 467 900
2	Paraná	151 814 509
3	Santa Catarina	142 411 820
4	São Paulo	133 671 738
5	Rio Grande do Sul	108 730 854
6	Minas Gerais	67 618 845
7	Goiás	31 801 276
8	Bahia	21 971 409
9	Mato Grosso do Sul	21 585 870
10	Mato Grosso	15 959 146
11	Pernambuco	15 882 854
12	Ceará	15 367 090
13	Distrito Federal	13 505 480
14	Rio de Janeiro	12 737 252
15	Pará	9 918 115
16	Espírito Santo	9 593 088
17	Maranhão	8 368 394
18	Piauí	7 599 507
19	Paraíba	6 146 814
20	Sergipe	3 536 628
21	Alagoas	3 038 943
22	Rondônia	2 954 770
23	Rio Grande do Norte	2 906 662
24	Tocantins	2 403 603
25	Amazonas	1 527 537
26	Acre	722 181
27	Roraima	648 000
28	Amapá	46 515

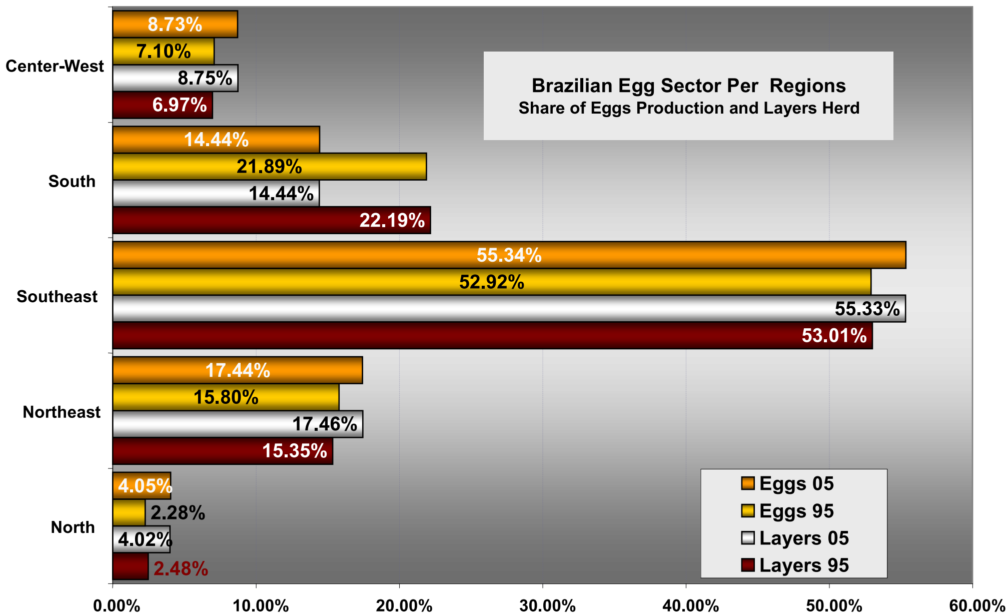


Color	From	To	Freq.	%
	46 515	2 402 603	5	19
	2 906 662	6 146 814	5	19
	7 599 507	13 505 480	6	22
	15 367 090	21 971 409	5	19
	31 801 276	151 814 509	6	22

The distribution of Brazil's poultry for eggs flock

The pioneer Southeast Region maintains its leadership in egg production and is responsible for over 55 percent of Brazil's production and of its layer flock. With the exception of the South Region, whose production grew by only 1.2 percent between 1995 and 2005, every region had substantial production gains during this period. In egg production, proximity to the centres of consumption is the most important determinant of the location of production facilities, even though feed is one of the most important costs.

FIGURE 24
Brazil's egg production and layer flock by region



Source: data from UBA and APA.

TABLE 29

Brazil's commercial layer flock by regions and federal state

Region	1995		2005		2006	
Brazil	**48 930 560**	**%**	**86 534 744**	**%**	**93 206 329**	**%**
North Region	**1 212 479**	**2.48%**	**3 501 314**	**4.05%**	**3 906 487**	**4.19%**
Acre	0	0.00%	105 300	0.12%	73 441	0.08%
Amazonas	535 707	1.09%	1 871 721	2.16%	1 882 292	2.02%
Pará	460 550	0.94%	481 146	0.56%	746 295	0.80%
Rondônia	59 286	0.12%	563 263	0.65%	456 425	0.49%
Roraima	74 200	0.15%	204 967	0.24%	253 705	0.27%
Amapá	30 772	0.06%	-	0.00%	19 248	0.02%
Tocantins	51 964	0.11%	274 917	0.32%	475 081	0.51%
Northeast Region	**7 511 555**	**15.35%**	**15 106 000**	**17.46%**	**15 473 943**	**16.60%**
Pernambuco	2 962 349	6.05%	5 556 434	6.42%	5 328 128	5.72%
Ceará	1 860 983	3.80%	3 111 277	3.60%	3 935 885	4.22%
Bahia	436 269	0.89%	2 093 377	2.42%	2 061 359	2.21%
Rio Grande do Norte	603 631	1.23%	1 432 136	1.65%	1 146 223	1.23%
Alagoas	92 466	0.19%	670 440	0.77%	802 733	0.86%
Sergipe	213 421	0.44%	602 551	0.70%	562 998	0.60%
Maranhão	439 350	0.90%	175 045	0.20%	138 257	0.15%
Piauí	295 294	0.60%	565 297	0.65%	536 478	0.58%
Paraíba	607 792	1.24%	899 443	1.04%	961 882	1.03%
Southeast Region	**25 939 959**	**53.01%**	**47 868 574**	**55.32%**	**51 947 539**	**55.73%**
São Paulo	19 777 025	40.42%	31 507 624	36.41%	34 665 335	37.19%
Minas Gerais	4 215 082	8.61%	11 907 058	13.76%	11 894 112	12.76%
Rio de Janeiro	756 890	1.55%	492 552	0.57%	563194	0.60%
Espírito Santo	1 190 962	2.43%	3 961 340	4.58%	4 824 898	5.18%
South Region	**10 857 324**	**22.19%**	**12 490 281**	**14.43%**	**14 639 085**	**15.71%**
Rio Grande do Sul	4 255 271	8.70%	5 379 039	6.22%	5 548 426	5.95%
Paraná	5 445 775	11.13%	5 584 710	6.45%	7 527 056	8.08%
Santa Catarina	1 156 278	2.36%	1 526 532	1.76%	1563603	1.68%
Center-West Region	**3 409 243**	**6.97%**	**7 568 575**	**8.75%**	**7 239 275**	**7.77%**
Goiás	1 920 386	3.92%	4 415 950	5.10%	4154762	4.46%
Mato Grosso	224 706	0.46%	1 521 273	1.76%	1 696 970	1.82%
Mato Grosso do Sul	583 837	1.19%	1 181 541	1.37%	1122072	1.20%
Distrito Federal	680 314	1.39%	449 811	0.52%	265 471	0.28%

Source: data from UBA and APA.

TABLE 30
Brazil's egg production by region and federal state (1 000 units)

Region	1995		2005		2006	
Brazil	**16.065.504**	**%**	**24.638.506**	**%**	**26.536.498**	**%**
North Region	**366.413**	**2,28%**	**996.935**	**4,05%**	**1.111.612**	**4,19%**
Acre	11.368	0,07%	29.958	0,12%	20.779	0,08%
Amazonas	141.657	0,88%	533.244	2,16%	536.144	2,02%
Pará	135.576	0,84%	136.782	0,56%	211.758	0,80%
Rondônia	22.617	0,14%	160.790	0,65%	129.735	0,49%
Roraima	24.304	0,15%	58.473	0,24%	72.451	0,27%
Amapá	8.135	0,05%	-	0,00%	5.486	0,02%
Tocantins	22.756	0,14%	77.689	0,32%	135.258	0,51%
Northeast Region	**2.538.943**	**15,80%**	**4.296.909**	**17,44%**	**4.406.058**	**16,60%**
Pernambuco	985.894	6,14%	1.581.205	6,42%	1.520.493	5,73%
Ceará	726.874	4,52%	888.477	3,61%	1.121.921	4,23%
Bahia	174.685	1,09%	592.650	2,41%	585.937	2,21%
Rio Grande do Norte	163.587	1,02%	406.023	1,65%	323.922	1,22%
Alagoas	23.635	0,15%	189.699	0,77%	229.292	0,86%
Sergipe	72.155	0,45%	171.903	0,70%	160.465	0,60%
Maranhão	106.281	0,66%	50.499	0,20%	39.373	0,15%
Piauí	72.858	0,45%	160.312	0,65%	151.988	0,57%
Paraíba	212.975	1,33%	256.140	1,04%	272.668	1,03%
Southeast Region	**8.502.422**	**52,92%**	**13.636.148**	**55,34%**	**14.795.344**	**55,75%**
São Paulo	6.456.032	40,19%	8.978.388	36,44%	9.878.469	37,23%
Minas Gerais	1.355.528	8,44%	3.390.420	13,76%	3.382.307	12,75%
Rio de Janeiro	238.608	1,49%	140.358	0,57%	160.815	0,61%
Espírito Santo	452.254	2,82%	1.126.982	4,57%	1.373.754	5,18%
South Region	**3.517.232**	**21,89%**	**3.558.243**	**14,44%**	**4.171.019**	**15,72%**
Rio Grande do Sul	1.333.813	8,30%	1.533.962	6,23%	1.582.233	5,96%
Paraná	1.821.937	11,34%	1.590.940	6,46%	2.143.744	8,08%
Santa Catarina	361.482	2,25%	433.341	1,76%	445.041	1,68%
Center-West Region	**1.140.495**	**7,10%**	**2.150.271**	**8,73%**	**2.052.465**	**7,73%**
Goiás	638.261	3,97%	1.256.377	5,10%	1.177.837	4,44%
Mato Grosso	80.688	0,50%	431.105	1,75%	481.273	1,81%
Mato Grosso do Sul	166.742	1,04%	336.233	1,36%	318.621	1,20%
Distrito Federal	254.804	1,59%	126.556	0,51%	74.734	0,28%

Source: data from UBA and APA.

Compared to the poultry-meat sector, the egg sector is less concentrated. The most important producers have at maximum 3.5 percent of the production output. It is interesting to note that many egg entrepreneurs in Brazil are of Japanese origin. The city of Bastos in the State of São Paulo is considered the "Egg Capital of Brazil"; it is predominantly colonized by Japanese immigrants.

TABLE 31

Largest egg producing companies by number of layers, 2005 and 2006

Rank	Company	State	Layers ('000) 2005	2006	% 2005
1	Granja Mantiqueira	MG	3 100	3 200	3.62%
2	Granja Yabuta	SP	3 000	3 000	3.51%
3	Somai Nordeste	MG	2 200	2 200	2.57%
4	Grupo Saito	SP	2 000		2.34%
5	Grupo Emape	CE	1 750	1 500	2.04%
6	Granja Shigueno	SP	1 200	1 200	1.40%
7	Granja Katayama	SP	1 200	1 200	1.40%
8	SOLAR	RS	1 000	1 000	1.17%
9	Gaasa Alimentos Ltda.	GO	1 000	1 000	1.17%
10	Aviário Santo Antônio	MG	1 000	1 000	1.17%
11	Granja Sumaré	SP	900	1 000	1.05%
12	Avicultura Josidith	GO	900	1 000	1.05%
13	Granja Sossêgo	BA	800	800	0.93%
14	Grupo Berger	ES	700		0.82%
15	Regina Alimentos	CE	700	700	0.82%
16	Granja Koga	SP	700	700	0.82%
17	Ademar Kerckoff	ES	600	800	0.70%
18	Oscar Hayashida	PR	600	600	0.70%
19	Granjas Tok	SP	600	600	0.70%
20	Granja Shinoda	SP	600	600	0.70%
21	Granja Kakimoto	SP	600	600	0.70%
22	Cooperativa Agropecuária Serrana	ES	600	600	0.70%
23	Agrop. Carnaúba	AL	600	600	0.70%
24	Yoshiharu Morishita	SP	600	500	0.70%
25	Produovos	SP	600	400	0.70%
26	Avipal Nordeste	BA	550		0.64%
27	Luiz Carlos Figueiredo e Outros	PR	520	520	0.61%
28	Luna Avícola	AL	500	700	0.58%
29	Straglioto	MT	500	500	0.58%
30	Roberto Kiotaka Tsuru e Outros	SP	500	500	0.58%
31	Kazuhiko Ino e Outros	SP	500	500	0.58%
32	Granja Yorozuya	SP	500	500	0.58%
33	Amauri Pinto Costa	MG	500	500	0.58%
34	Supergema	MG	450	450	0.53%
35	Agenor F Silva	PE	450	450	0.53%
36	Granja Áurea	SC	412	400	0.48%
37	Mauricéia Alimentos	PB	400	500	0.47%
38	Tsunehiro Nakanishi e Outros	SP	400	400	0.47%
39	Sumihiro Murakami	SP	400	400	0.47%
40	Ovomalta Ltda.	PE	400	400	0.47%
41	Kenichi Iwata	PE	400	400	0.47%
42	Granja Santa Marta	MG	400	400	0.47%
43	Agro-Avícola Moresco Ltda.	RS	400	400	0.47%
44	SS Avicultura	RN	400		0.47%
45	Inácio Shida	SP	350	400	0.41%
46	Massashi Yokochi	SP	350	350	0.41%
47	Granja Mizohata	SP	350	350	0.41%
48	Avícola Ledur Ltda.	RS	320	320	0.37%
49	Avine	CE	300	600	0.35%
50	Granja Alexaves	GO	300	400	0.35%
51	Granja Casagrande	PR	300		0.35%
52	Altino Loyola	MG	300		0.35%
53	Edilson A.Santos Jr.	PE	300		0.35%
54	Edgar Navais C.Araujo	PE	300		0.35%
55	Granja Antunes	SP		1 000	
56	Waldemiro Berger	ES		500	
57	Ernesto Guarese	RS		400	
58	Erasmo Berger	ES		400	
	Subtotal		**39 302**	**37 440**	
	Other		**46 281**	**55 766**	
	Total		**85 583**	**93 206**	

Source: UBA statistics and annual reports (www.uba.org.br).

1.6. Production systems

The Brazilian Poultry Union (UBA) keeps accurate records of parent stock and of day-old-chick lodgings, as these elements of the poultry sector are highly concentrated in Brazil. UBA reports that the number of hatcheries does not surpass 150 units, including both independent commercial operations and those belonging to medium- and large-scale integrated poultry companies.

From the day-old-chick lodgings, and by closely following the figures for mortality and for condemnation at slaughterhouse level, UBA is able to calculate a precise figure for the number of birds slaughtered. This estimated figure is checked against the available information on the number of chickens that are slaughtered under the Federal Inspection Service (SIF) of the Ministry of Agriculture, Livestock and Food Supply. In addition, the companies that are member of UBA supply their slaughtering figures and the weight produced, either directly or through the state associations. As UBA member companies cover 80 percent the chickens slaughtered under federal inspection, this allows a final check on the numbers.

The figures presented in Table 32 indicate the size of commercial or industrial chicken production operation in Brazil, versus what could be considered backyard production or even commercial production of flocks to be sold as live chickens.

TABLE 32
Chickens slaughtered (head)

	1995	2005	2006
Under Federal Inspection	1 670 255 415	3 866 793 706	3 778 773 132
W/out Federal Inspection	869 444 726	559 940 288	615 540 210
Total	**2 539 700 141**	**4 426 733 994**	**4 396 313 342**
Under Federal Inspection	65.8%	87.4%	86.0%
W/out Federal Inspection	34.2%	12.6%	14.0%
Estimated backyard	152 382 008	265 604 040	263 778 801

Source: UBA.

There are 172 SIF poultry slaughterhouses in Brazil, belonging to 134 different companies, which are responsible for more than 85 percent of the chicken production. The remaining birds are either sold live or slaughtered under state or municipal inspection.

The number of birds slaughtered under federal inspection increased, due to the growing concentration of poultry production described above. A company can not become large without the right to sell in the whole of Brazil, which is reserved to those that slaughter and process under federal inspection. The export boom in the Brazilian poultry industry also contributed to this evolution, given that only slaughterhouses under federal inspection may export.

Federal inspectors consider the demands imposed by the importing country. As a consequence, production standards increase for all the output of the slaughterhouse, including the products destined for the domestic market. Production that takes place without such inspection will be driven by productivity alone and consequently the quality of products and their safety will be jeopardized. The increasing proportion of poultry slaughtered or processed under SIF results in better-quality products, enhances food safety and helps to build consumers' confidence in poultry products. It is another example of the positive contribution of exports to the overall progress of the poultry sector and to the development of the domestic market in Brazil.

The market for live birds is declining. It is still present in parts of the North and Northeast Regions. In small cities and in even the peripheries of big cities, the "avícolas"[25] still survive, and in rural areas, the consumers themselves will slaughter the chickens. UBA estimates that a good percentage of the chickens slaughtered without federal inspection are sold to the "live market". There are also slaughterhouses that are under state or municipal inspection, although precise figures for the number of birds slaughtered under these types of inspection are not available.

Backyard production

Backyard production in Brazil is not as widespread as it is in some other parts of the world, but it does exist. It is present in the rural areas of states where chicken production is not one of the main activities. Of course, there are no statistics for backyard production. UBA estimated, based on field research conducted some five years ago by its executive director, Mr. Clovis Puperi, that backyard production could represent 6 percent of the total. The figures thus calculated are also given in Table 32.

In states and regions where poultry-keeping activity is strong and where industrial-scale integrated operations are present, "integrados" (contract farmers) account for almost all chicken production. To ensure that they do not keep lots for family consumption, the "integrados" are entitled to up to 20 birds from each lot. This does not preclude that other small farmers keep small numbers of chickens, one or two pigs and a milk cow for their own subsistence. This represents a constant biosecurity concern for the poultry industry.

Many regions of the world regularly face outbreaks of animal disease – highly pathogenic avian influenza (HPAI), porcine reproductive and respiratory syndrome (PRRS), etc. – because of the high sanitary risk associated with different species "living together". Backyard production will prevent these regions from enjoying sanitary peace during the coming decades. Individual backyard production is the worst enemy of biosecurity.

[25] "Avícolas" is the name given to shops where live chickens are sold. In some of them, there is a facility to slaughter and prepare the chicken (removal of feathers and inedible giblets) at the request of the client. They are normally small-scale operations and are not under permanent inspection by the sanitary authorities, but have to follow municipal rules applied to any establishment dealing with food.

Another concern is the "weekend farmer". Urban Brazilians of comfortable income have "weekend" farms for recreational purposes in rural areas not too far from their city of residence. Some of them like to breed ornamental birds or what they call "natural" or "raised the old way" chickens. Breeding "the old way" in the face of biosecurity concerns associated with diseases carried by migratory birds is a risk to the sustainability of modern poultry production.

A further sanitary risk is posed by a government policy of giving day-old chicks to landless farmers who receive land from the governmental land allocation programmes. This is highly criticized by UBA and other poultry organizations, which constantly convey the sanitary risks involved in such measures.

Independent chicken farmers

In some regions of Brazil there are still independent farmers who sell their poultry to slaughterhouses. They are becoming restricted to slaughterhouses that do not export or that do not have federal inspection.

Companies that export are increasingly required to be able to trace their produce back to the parent stock. Many important markets prohibit the use of certain medicines or growth promoters. In other markets, clients require inter alia genetically modified organism (GMO)-free feed, no use of non-vegetable feed components, and above all, total traceability not only with respect to feed, but also with respect to animal welfare, ethical and environmentally friendly procedures in breeding and slaughtering, and HACCP (hazard analysis and critical control point) procedures over the entire process. These demands, along with the need for medium- and long-term planning of production, the need to tailor products to precise market requirements, and above all the efficiency of the vertical integration model, have meant that the independent poultry breeder has become the exception and rather than the rule.

In the Southeast Region, independent poultry producers sell their products to slaughterhouses that offer refrigerated products to the big cities. Increasingly, they establish a supply arrangement with the slaughterhouse guaranteeing the supply of a certain number of head during a fixed period. They act almost as contract farmers, but in contrast to the "integrados" they provide the day-old chicks and feed for themselves, and their relation with the slaughterhouse is restricted to the supply of birds of a certain live-weight range.

In the recent past, there were independent chicken farmers who would speculate around once their birds had reached the commercial weight. During the 1995 to 2005 period, the poultry industry and market became too complex, and the space for this sort of maverick operation almost disappeared.

In the Northeast and North Region, where the live-chicken market is still present, the independent poultry producers will sell to "avícolas", traders of live chickens or in some cases directly to the consumer through their own "avícolas" (normally situated in front of the farm when this is near a town or city). As a general rule, these independent poultry producers will have a few broiler houses of 12 000 or 15 000 birds with breeding cycles of 42 days and will raise six to seven lots *per annum*.

Small-scale, medium-scale and large-scale chicken meat companies

There is no official size criterion by which to classify poultry companies in Brazil, but the poultry sector considers companies that slaughters up to 100 000 birds per day to be small scale and those that slaughter from 100 000 to 500 000 birds per day to be medium scale; above that level, companies are considered to be large scale. It may appear peculiar to consider a company that slaughters up to 100 000 birds per day, an impressive number in any country, to be small. Nonetheless, in Brazil a company that has this sort of output represents 0.5 percent of total production.

Table 19 lists the leading chicken-producing companies and the number of birds slaughtered *per annum* in 1995, 2000, 2005 and 2006. Many companies in the 1995 column did not reach 2005, either because they ceased operation or (in the majority of cases) because they changed ownership. In addition, many new companies appeared after 2000 – some of them with very substantial production figures.

For the above reasons, we classify Brazilian chicken-meat companies by size in accordance with the number of birds slaughtered in the years 2005 and 2006. To calculate the daily slaughter figures for each company we have considered the average of 252 working days in the year, although companies may surpass this limit when adjusting the size of their flocks or when there are unexpected peaks in demand. Table 33 shows the annual number of birds slaughtered within each size category. Tables 34 to 36 list the 50 largest Brazilian companies classified according to the three categories.

A certain number of companies report their production figures to UBA, but do not authorize their disclosure. These companies were responsible for 8.8 percent of the chickens slaughtered in 2005; in Table 33, these companies are categorized as "other under federal inspection".

TABLE 33
Slaughter of chickens (head per annum) by size-category of the companies, 2005

Large-Scale	1 850 546 297	41.8%
Medium-Scale	1 255 618 310	28.4%
Small-scale	370 557 800	8.4%
Other under Federal Inspection	390 071 299	8.8%
Total under Federal Inspection	***3 866 793 706***	***87.4%***
Other w/out Inspection	559 940 288	12.6%
Total 2005	**4 426 733 994**	

Source: elaborated with data from UBA – Brazilian Poultry Union – Annual Report 2006/2007, pages 44 and 45.

TABLE 34
Large-scale chicken-meat companies

	Chicken (heads per annum) 2005	2006
Sadia SC-PR-MG-MT-RS-DF	629 209 878	645 452 443
Perdigão SC-RS-PR-GO-MT	498 850 657	530 111 245
Seara SC-PR-SP-MS	277 320 934	257 490 544
Frangosul RS-MS	237 068 234	214 471 190
Avipal RS-MS-BA	208 096 594	174 229 179

Source: elaborated with data from UBA – Brazilian Poultry Union – Annual Report 2006/2007, pages 44 and 45.

TABLE 35
Medium-scale chicken-meat companies

	Chicken (heads slaughtered per annum) 2005	2006
Dagranja PR-MG	117 199 849	114 665 884
Aurora SC-RS	91 826 334	108 743 902
Diplomata PR-RS-SC	90 754 483	87 636 118
Penabranca SP	82 155 225	75 173 127
Copacol PR	72 080 048	70 089 917
Frango Forte SP	48 255 906	55 348 664
Rio Branco / Pif Paf MG-RJ	53 192 295	53 733 755
Rei Frango SP	45 777 144	51 151 583
Big Frango/Jandelle PR	48 193 500	49 152 408
C.Vale PR	42 408 783	48 231 895
Avícola Céu Azul SP	37 103 020	47 163 399
Kaefer Avicultura PR-RO	47 976 472	46 765 711
Coop. Agroindl. Lar PR	41 075 461	44 899 115
Penasul RS	42 325 268	44 206 550
Frango Sertanejo SP	48 255 906	40 431 245
Reginaves RJ	34 981 484	38 356 394
Ad'oro SP	37 361 755	38 293 177
São Salvador GO	32 411 121	37 980 277
Anhambi MT-PR	35 222 181	36 844 129
Coperguaçú SP	31 404 872	34 008 781
Mat. Avíc. Flamboiã SP	33 630 590	33 128 238
Nutriza GO	31 033 287	31 545 647
Coopavel PR	32 202 400	29 181 736
Agrovêneto SC	27 313 146	28 488 956
Abat. Aves Ideal SP	18 612 494	27 275 835
Avícola Paulista SP	32 865 286	25 405 227

Source: elaborated with data from UBA – Brazilian Poultry Union – Annual Report 2006/2007, pages 44 and 45.

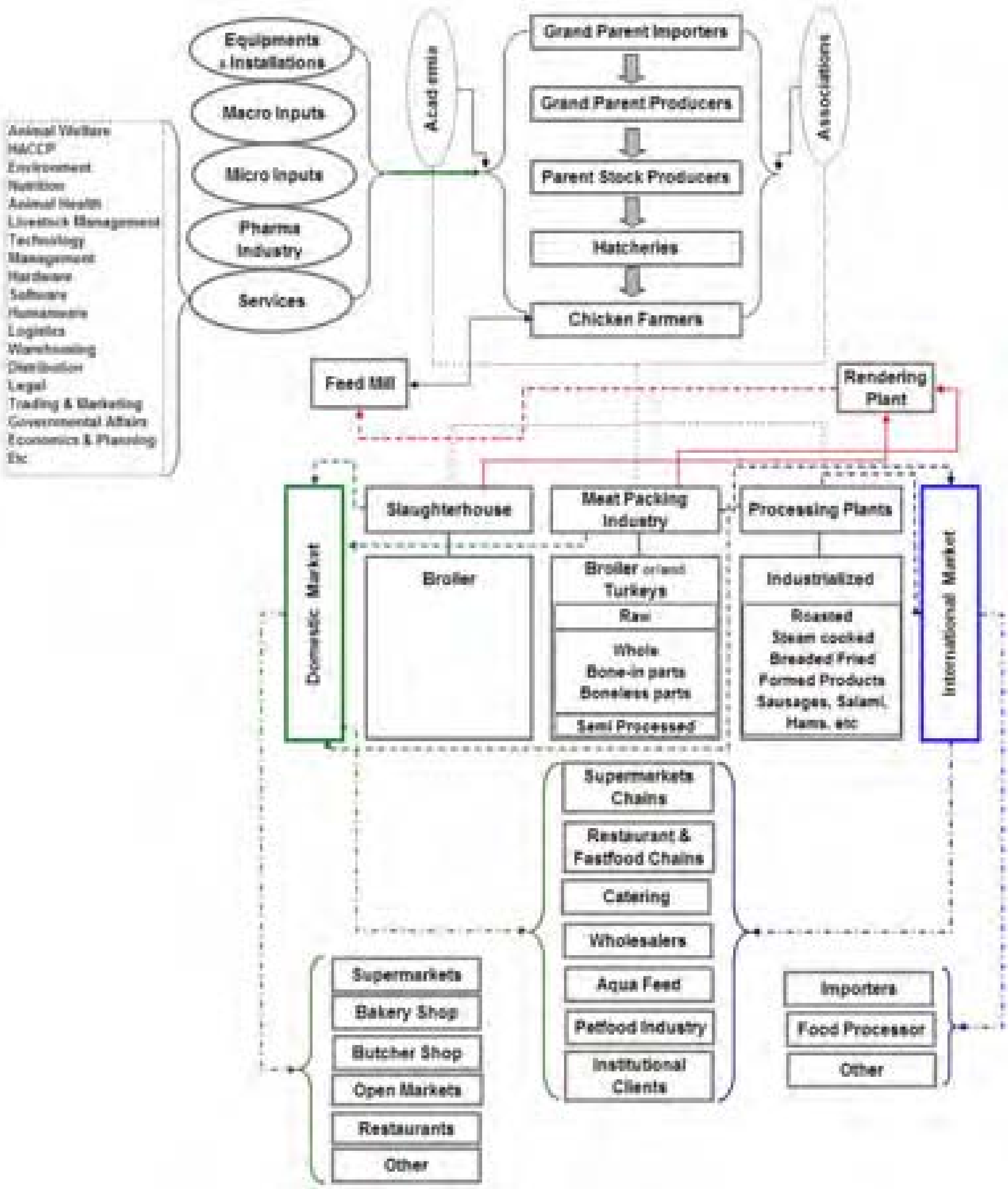
TABLE 36
Small-scale chicken-meat companies

	Chicken (heads slaughtered per annum) 2005	2006
Coop. Languirú RS	24 053 657	24 345 320
Comaves PR-MS	25 371 320	23 985 266
Gonçalves & Tortola PR	22 491 460	23 707 362
Avícola Felipe PR	25 948 112	23 353 578
Coroaves PR	21 872 592	22 618 712
Francap MG	21 115 438	22 171 485
Jaguafrangos PR	19 079 358	20 659 231
Asa Alimentos DF-GO-TO	21 636 506	20 612 932
Nogueira Rivelli MG	18 745 645	20 419 360
Frinal RS	18 172 072	19 612 660
Frangoeste SP	19 875 689	19 467 728
Coop. Holambra SP	19 847 930	19 301 571
Macedo Agroindustrial SC	25 732 727	18 730 507
Polifrigor SP	18 233 778	18 066 595
Palmali SP	13 603 752	16 507 381
Avivar Alimentos MG	11 240 612	15 984 120
Notaro Alimentos PE	14 156 698	14 958 081
Votuporanga SP	13 603 752	14 803 174
Agrofrango SC	15 776 702	14 546 717

Source: elaborated with data from UBA – Brazilian Poultry Union – Annual Report 2006/2007, pages 44 and 45.

Figure 25 illustrates the complete poultry chain, from import of genetic material to the commercialization of products in both domestic and international markets. The expression "meat packing plant" denotes an industrial operation that slaughters the birds, processes the meat and packs it for distribution. A further-processing operation may also be present on the site. Such a facility necessarily operates under SIF and is entitled to sell its products nationally and, when approved, also for export. We use the expression to differentiate such operations from "slaughterhouses", which slaughter birds and supply basic products (whole chickens and bone-in parts) and which may or not be under SIF inspection. If the "slaughterhouse" operates without SIF inspection, its products cannot be moved outside the municipality or state in which it is located (depending on whether it is submitted to municipal- or state-level inspection).

FIGURE 25
The poultry industry chain



Source: Source: CONAB – Companhia Nacional de Abastecimento (National Company for Food Supply) (http://www.conab.gov.br) (state company within the structure of the MAPA).

A processing plant for poultry meat may be an independent company that obtains its raw material from a meat-packing plant or, as is the case with the leading Brazilian poultry companies, be part of a larger operation.

The vertical integration system

UBA estimates that at least 85 percent of Brazilian chicken production is vertically integrated. All the main poultry producers use this system. We carried out a sample survey of producers, which revealed that there were only two exceptions among the fifteen companies interviewed. One small-scale company from Minas Gerais State reported that some of their slaughtered birds came from their own broiler farms and some from broiler farms belonging to shareholders, but even these operated under vertical integration. A medium-scale company situated in São Paulo State reported that vertical integration prevailed but that they bought 7 percent of their birds from independent chicken farmers.

Many consider that the vertical integration system is one of the pillars of Brazil's strength and competitiveness in poultry-meat production. A poultry entrepreneur who had operations both in European countries and in Brazil once said that, more than the abundance of grains, the main factor explaining the boom in the Brazilian poultry industry was the vertical integration system based largely on properties belonging to and worked by individual families. He remarked

"the difference is that the last thing the 'integrado' does before going to bed is the same as the first thing he does when he wakes up – to look at the flock and see how the birds are".

The entrepreneur in question has actually extended the vertical integration system in his Brazilian operation to include parent-stock breeding, which is not a normal practice.

The vertical integration system is being used by other agribusiness sectors – fruits, vegetables, silk, seeds, genetic material, alcohol and sugarcane, and tobacco, as a result of its proven success in the poultry and pork sectors.

The system of "integrated" agricultural and livestock production was introduced for chicken production in the State of Santa Catarina in the 1960s. The core idea is integration between agricultural production and industrial processing. Excerpts from the paper "Integration – a partnership that proved right" published by the Brazilian Poultry Union in 2001 can be found in Appendix 3. It provides a very accurate and useful appraisal of the integration system in the Brazilian poultry sector.

As mentioned above, the vertical integration system boomed from the end of the 1970s or early 1980s when roads permitted producers from the South Region to have access to the major centres of consumption situated in the Southeast Region – mainly Rio de Janeiro, São Paulo and Belo Horizonte.

The vertical integration system was not so popular or widespread in the poultry industry of the Southeast Region before the 1980s. The region was the leading poultry producer until the mid-1980s and was characterized by a mixed system of breeding, in which slaughterhouses and meat-packing industries would buy live birds from independent producers or complement their own breeding activity with live birds bought in the market.

In the South Region, the integration system is fundamental to the economic feasibility of one-family rural properties of 10–20 hectares, while the industry provides job opportunities for the children when they become adults. It is not uncommon that an "integrado" has several family members working directly or indirectly for the industry.

The industry in Brazil is increasingly replacing activities they used to perform themselves by "contract services" that are inspired by the positive experience of vertical integration. All transport operations – carrying day-old chicks and feed to the farms, birds to the slaughterhouses, and products to warehouses, ports and markets – used to be carried out by the various companies using their own trucks. Today, a visitor to the poultry-producting areas of Brazil will see hundreds of trucks bearing the colours and logos of the poultry companies (Brazil continues to depend on road transport). All these trucks belong to individuals or small entrepreneurs. They enter into contracts with the industry, which establish standards for equipment and operations, provide training and ensure a constant demand for transport services.

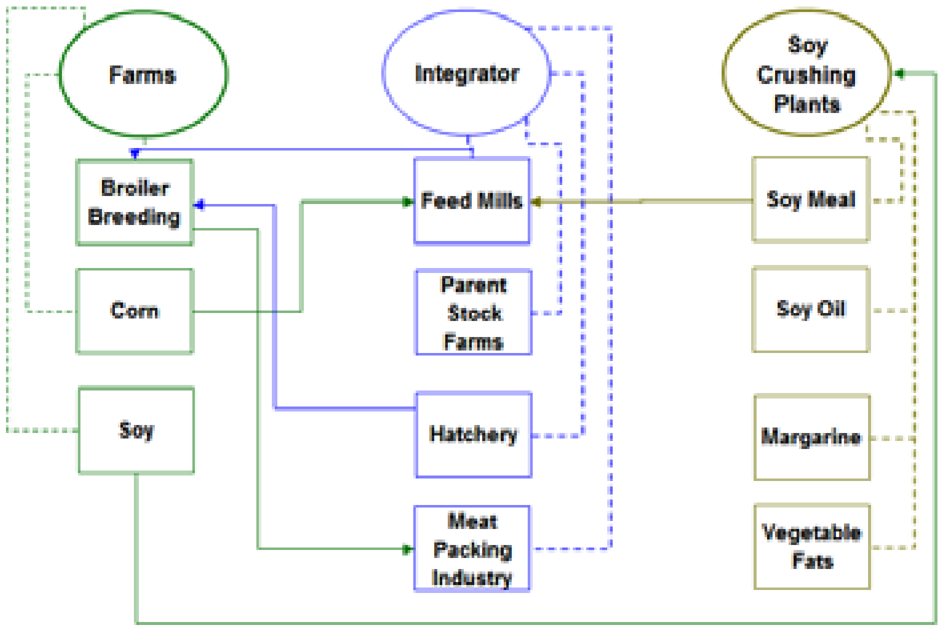
The same sort of procedure is adopted in cafeteria services, security services, cleaning services, laundering, healthcare, etc. The Portuguese word for it is "terceirização" which means outsourcing. "Terceirização" became extreme popular with managers in Brazil during the 1980s and early 1990s who understood that companies should dedicate themselves to their core business and hand over support or parallel activities to third parties.

Many of the Centre-West Region's farmers came from the South Region and had knowledge or first-hand experience of integrated production. In this new area of abundant land and big properties, the model continued to be followed. In addition to the remunerative benefits of the operation in itself, the extension services provided by the industry to its integrated farmers and the opportunity to use chicken litter as a source of fertilizer has favoured the continuation of the system. Above all from the farmers' perspective, the industry's feed mills provide a market for the maize and soy they grow. This interdependency is an aspect of the success of the vertically integrated system.

As the main poultry and pork companies are making considerable investments in the Centre-West Region, even big farmers are joining the integration system. In contrast to the South Region "integrado" – where the average is to have one or at most two broiler houses per property – in the Centre-West, three to five broiler houses per property is very common.

Figure 26 shows a flowchart of the vertically integrated system in poultry production. The soy crushing plant may belong to the integrator – this is the case in many of the largest companies.

FIGURE 26
The vertically integrated poultry chain



Source: Source: CONAB – Companhia Nacional de Abastecimento (National Company for Food Supply) (http://www.conab.gov.br) (state company within the structure of the MAPA).

The vertically integrated poultry chain

Normally, companies do not divulge how many integrated farmers they have – unless as part of information packs supplied to the financial community. UBA does not record these numbers and very few state poultry association divulge them. The exception is ASGAV – Associação Gaúcha de Avicultura (Rio Grande do Sul State Poultry Association) – which in a 2006 leaflet reported that 9 000 integrated farm families were involved in producing 675 million head of chicken and 5.2 million head of turkey. In that state, the integration system includes the production of fertile eggs. Several leading figures in the poultry industry estimate the number of integrated farmers in Brazil, for poultry alone, to be around 60 000. This figure represents an opinion rather than a researched figure.

The preliminary results of IBGE's Agricultural and Livestock Census 2006 reveal that 2 712 438 rural properties kept chickens – a total of 1 244 260 918 birds – but as in the previous census, integrated farmers are not distinguished.

1.7. The role of poultry associations

Poultry Associations in Brazil are organized both geographically and by segment. The master association is the UBA, which is the institutional entity that represents the national poultry sector before the Brazilian Federal Government and Judiciary Power. It focuses on the sanitary, quality and legal issues that affect the development of the sector.

UBA brings together ABEF, APINCO (Association of One-Day Chicks Producers), FACTA (Apinco Foundation for Poultry Science and Technology) and ACAV (Associação de Criadores de Avestruzes –Ostrich Breeders Association). UBA also includes all state poultry associations, breeding companies, chicken-meat and egg producing companies, poultry-meat packing companies, turkey producers, poultry input suppliers and providers of related services.

UBA representatives also have seats on various governmental bodies that deal with animal health and food safety, among which is the Consulting Council of the PNSA – Plano Nacional de Sanidade Avícola (National Plan of Poultry Animal Health), and the poultry-sector associations that interact with several other ministries and governmental authorities.

Participation in associations is not compulsory and each association has its bylaws regulating membership, fees, voting systems, mission, administration, etc. Poultry associations do not receive any public money and depend entirely on their members' contributions. Approaches to fee collection vary greatly – fixed monthly sums are the general rule, but in some associations the contribution is linked to production level. Even in the latter organizations, decisions are taken on the basis of one member, one vote. Brazilian poultry companies cooperate with their respective associations, with UBA having a central role with respect to issues that cross regional or segmental boundaries.

UBA organizes a monthly meeting at which the activity of the poultry industry during the previous month is assessed and a short-term forecast is made. These meeting involve representatives from the various regional and segment associations, as well as representatives from the commercial companies.

UBA collects and publishes data on the poultry sector. It is interesting to note that industry associations organize, process and keep most of the data. UBA consolidates regional data and segment data. ABEF takes care of all data related to exports. APINCO handles information on day-old chicks. This is an ongoing process that dates backs to 1996.

The view that "secrecy is the key to success" prevailed in Brazil until the mid-1990s. Subsequently, the very good initiatives undertaken within UBA by associations such as ABEF, APINCO and APA[26] promoted the concept that "information is the key to success". Although suspicion and reluctance to provide data still exist today, it would be fair to state that the majority has recognized the value of information for the development of the whole poultry chain. The reliability of some of the data collected by the associations has meant that they are used and disseminated by many official departments. The quality of data gathering is improving with time. The format and availability of data collected since the beginning of the twenty-first century have made them an important resource for planning purposes. Unfortunately, the quality and availability of "historical data" are less good.

Many of the main poultry companies are also pork producers and are involved in further processing of all meats. As the Brazilian market expanded, competition among these companies – which in some cases dated back to the 1940s – became intense. The same

[26] APA's magazine "Birds and Eggs" (no longer available) published data on egg and meat production.

companies were among the export pioneers and they also became competitors for international market share. The associations have been important for the Brazilian poultry sector as they provided a forum in which fierce competitors could share common cause. It was through the associations that the poultry companies adopted common positions on issues that affected directly or indirectly the whole poultry sector.

UBA and other national associations such as ABEF also allowed a national perspective for the poultry sector to emerge. The fact that their meetings involved representatives from all over Brazil prevented the main producing states, regions or companies from imposing their individual perspectives. Regions with less production and smaller producers were represented and their views were thus reflected in the common positions adopted by the poultry sector. The fact that these associations reflected a common national position, and not that of a specific group or region, contributed to their credibility with the government authorities.

In addition to the monthly meetings that review the state of the poultry sector, UBA and the other associations also have a most important role whenever a crisis affects the sector. They serve as a rallying point – meetings held at these dark hours have an enormous attendance. The discussions are neutral; specialists are called in to present their analysis of the situation, and recommendations are issued. More than once these "crisis meetings" have helped the poultry sector through difficult times. When the crisis is over, attendances fall dramatically.

The last example of this kind of crisis was in early 2006 when importers from countries affected by HPAI cancelled or postponed shipment of their orders, generating a surplus of goods in the Brazilian domestic market. Several poultry associations, companies and specialists remained mobilized by UBA from January to March. This joint action allowed the poultry sector to weather the crisis – despite considerable losses. By the second half of July 2006 attendances at the crisis meetings had fallen, as the collective actions had borne fruit and the sector had resumed its growth.

An absolute golden rule of the Brazilian poultry associations is their neutrality. Most associations have professional executive directors to manage their affairs, and company representatives participate on their boards of directors or councils of administration. To ensure absolute and fundamental neutrality, associations never become involved in commercial matters and restrict their actions to institutional affairs. They will support an individual company when dealing with governmental authorities, but they never get involved in the commercial activities of any company. Neither do they involve themselves in recommending suppliers or products to their member companies.

Foreign companies looking for suppliers frequently contact meat exporters' associations such as ABEF, ABIEC (Brazilian Association of Beef Meat Industry Exporters) and ABIPECS. Their response is normally to indicate all their member companies, details of which can be found on the Web sites of the respective associations. When the associations have their stands at international fairs their aim is to promote Brazil as a source of poultry meat and any specific request from a potential buyer is conveyed to all member companies.

ABEF, the poultry exporters association, has been a decisive factor in making Brazil one of the leading countries in the poultry trade. The country does not have a very strong position in international negotiations and has few ways to retaliate against protectionism and sanitary barriers. It was only as a result of very efficient work conducted under the auspices of ABEF that it was possible for Brazil to open markets for its exports.

We consider the action of ABEF to be the most perfect example of the "hunt in a pack" concept, particularly given the fierce competition that exists among the main Brazilian poultry companies in both domestic and international markets.

Historically, ABEF had a board of directors on which the main exporting companies would have a seat; an executive secretary would conduct the day-to-day work. Today, the association has an entirely professional staff and the representatives of the main exporting companies constitute a directive council. This professional management prevents the normal market disputes among companies from hindering the common objectives – opening new markets for Brazilian exports and keeping the existing markets open against protectionism in its various forms.

ABEF was founded in 1976 by nine companies interested in promoting chicken-meat exports. Today, the member companies are responsible for 75 percent of Brazilian chicken production and 92 percent of the production designated for foreign trade. The main objectives are monitoring the process of accessing new markets for chicken meat and the tax and non-tax barriers imposed by buyer countries, cooperating with member companies and linking them to the public authorities.[27]

Associations are financed via the contributions made by the member companies and receive no funds from any level of government or from official organizations. Normally, their board approves an annual budget for the association, and the participation of each company is directly linked to its size, level of production or exports.

As noted above, one of the major structural changes in the poultry sector has been the shift that has taken place in relations between the official organizations and authorities and the private companies. The evolution from a state of trench warfare to one of synergy, common strategy and joint action would not have occurred without the work of the associations.

Professionally managed, neutral and dedicated exclusively to institutional tasks, poultry associations were vital to the progress of the sector. They incarnated the quintessence of the "hunt in a pack" concept, but above all they operated a much-needed "pack defence" in which the stronger members of the pack constituted the first and outer lines. Brazilian companies, even those considered by many to be benchmarks in the world poultry industry, would not have achieved the position they hold today in the international market had they chosen to act outside the pack.

Poultry associations in Brazil have become strong and credible thanks to their representation of the poultry sector as a whole rather than parts of the sector or individual companies. Member companies may disagree entirely with an association decision or even feel that a decision jeopardizes their corporate interests. Some may even leave an association for a period – this has happened more than once. Nevertheless, none of the dissidents have ever tried to form an alternative association, nor has a company or group of companies dominated any of the associations. Above all, the merit of the associations has lain in their provision of a neutral forum where fierce competitors can focus on their common interests rather than their differences.

[27] ABEF Web site (www.abef.com.br).

2 DRIVERS THAT HAVE CAUSED STRUCTURAL CHANGE OVER THE PAST DECADE (1995 TO 2005) – GOVERNMENT POLICIES

2.1 Trade policies and the general role of the state

The military governments that ruled Brazil from 1964 to 1985 strongly believed in the role of the state in the promotion of economic development. State monopolies were abundant, state-owned companies dominated the economic scene, and the state used fiscal and financial incentives to direct private-sector investment. Exports were encouraged, internalization of economic development towards the Centre-West and North Regions was promoted, investments were made in infrastructure, and the country experienced an economic boom. Conditions started to deteriorate with the second oil-price shock in the second half of the 1970s.

The civilian governments that succeeded the military tried to cope with inflation through heterodox economic juggling and had to grapple with a suffocating external debt. These governments retained some of the agencies used by the military to "orientate" the private sector through price controls and other forms of state intervention in day-to-day economic life. They eliminated fiscal and financial incentives to exports and kept a strict control on foreign currency, essential to secure oil imports and the rolling of the external debt.

The policies implemented at this time represented the worst of scenarios. Government stopped granting fiscal or financial subsidies, imposed restrictions on imports and kept strict control on exports due to foreign currency shortages; it interfered, via various government agencies, in commercialization and prices.

1994 saw the launch of an economic plan which did not include price controls or other heterodox economic measures. State companies were privatized, state monopolies were eliminated, and the degree of intervention in the economy diminished. To keep inflation in check, credit and monetary expansion were strictly controlled.

Since 1994, the principles of the market economy have been observed and livestock and feed products have benefited. There is no longer a state organization or agency setting the prices of particular products or dictating whether they can be sold abroad or internally. It is no longer necessary to obtain an export permit which might or might not be granted by a bureaucrat who never left his desk or seen a slaughtering operation in his life. Neither is it necessary to beg for an import license for equipment or for an essential input. If a company is duly registered and authorized, if the object of the transaction is legal and is not subject to restrictions, any company can sell any livestock or feed products locally or internationally.

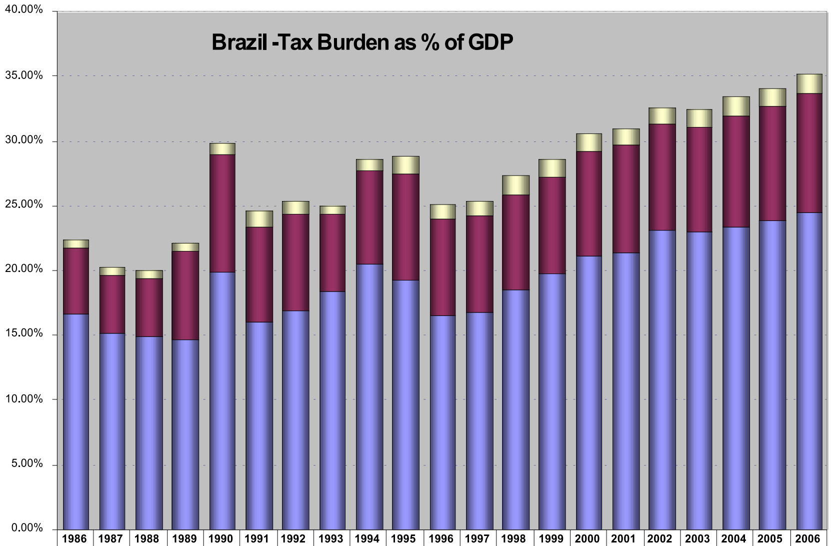
Of course, there was another side to the coin. The total tax burden continued to increase. In 1986 the tax burden represented 22.39 percent of Brazil's GDP; it increased to 28.92 percent in 1995, and reached 34.12 percent in 2005. In both 2006 and 2007 it continued to increase. This represents a fiscal charge higher than most developed countries, but the quality of public services is very much that of a developing country.

The fiscal voracity of the Brazilian state was not translated into corresponding investments and improvements in infrastructure, which continues to lag behind the country's growth. Privatized sectors such as telecommunications have boomed, but sectors that have been in the hands of the government – roads, ports and electrical energy, to name a few –

have shown neither the expansion nor the efficiency required by the country's agricultural growth. Tax is not paid on exported poultry products, but the state does not reimburse the tax burden associated with feed inputs, packing materials, labour force, transport, energy, etc.

FIGURE 27
Fiscal burden as a proportion of GDP in Brazil

Total Taxes as % of GDP	
1986	22.39%
1987	20.38%
1988	20.01%
1989	22.16%
1990	29.90%
1991	24.62%
1992	25.38%
1993	25.09%
1994	28.61%
1995	28.92%
1996	25.19%
1997	25.46%
1998	27.38%
1999	28.63%
2000	30.67%
2001	31.01%
2002	32.65%
2003	32.53%
2004	33.49%
2005	34.12%
2006	35.21%



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Municipal Taxes	0.62%	0.58%	0.60%	0.60%	0.92%	1.18%	0.98%	0.69%	0.88%	1.40%	1.20%	1.20%	1.45%	1.42%	1.36%	1.30%	1.27%	1.35%	1.53%	1.42%	1.52%
State Taxes	5.08%	4.44%	4.48%	6.91%	9.08%	7.32%	7.40%	5.91%	7.18%	8.22%	7.46%	7.38%	7.36%	7.43%	8.09%	8.31%	8.27%	8.18%	8.56%	8.75%	9.12%
Federal Taxes	16.69	15.26	14.93	14.65	19.90	16.12	17.00	18.49	20.55	19.30	16.53	16.88	18.57	19.78	21.22	21.40	23.11	23.00	23.40	23.95	24.57

Source: based on data from IBPT (2007).

Fiscal burden as a proportion of GDP in Brazil

Chicken meat "in natura" is subject to 18.67 percent tax, while the rate paid on industrialized poultry products is 35.50 percent, including 18 percent ICMS (state-level tax on circulation of goods and services). Eggs are exempt from ICMS but are subject to other taxes.

The Brazilian state is not simply expensive. It is also complicated. A study by IBPT (Brazilian Institute for Fiscal Planning) (Amaral et al., 2007) affirms that in 19 years, since the constitution was promulgated in 1988, the Brazilian governmental authorities (federal government, 27 states, one federal district and 5 564 municipalities) have issued 3.6 million legal instruments, which is an average of 766 new documents per working day. Of these, 235 900 were on fiscal matters – an average of two new fiscal legal instruments per hour.

According to World Bank and PricewaterhouseCoopers (2008), Brazil ranked last in terms of the number of hours per year required to comply with tax obligations – 2 600 hours. The study notes that:

"The issues range from the number of taxes charged, to the competence to each gov-

ernment authority (Federal, State and Municipal) to charge such taxes. … Each one of these governmental bodies has the power to legislate on the tax computation and collection."

The complexity of the state, its costs, and deficiencies in infrastructure that depends on the public sector are part of what many economists refer to as "cost Brazil". It adds to costs, it hinders progress and it makes life harder for entrepreneurs, but it does prevent naturally competitive economic sectors from prevailing. The following anecdote exemplifies this state of affairs and reveals much about the agricultural entrepreneur of the new agricultural frontier of Brazil in the Centre-West Region.

While visiting a medium-sized agricultural entrepreneur in the State of Mato Grosso, we asked what motivated him to invest so much in a region where roads were bad, logistics for transporting products to the market were deficient and expensive, and where there was a long list of other discouraging factors. His answer after some consideration was as follows: *"I am competitive today with all these problems you listed. Imagine when they are solved"*.

If life for the Brazilian poultry producer is not a bed of roses, neither is it only thorns. The Brazilian government and some of its agencies and organisms have made decisive contributions to agribusiness and the poultry industry. Embrapa's research efforts have made all the difference in enabling the Cerrado Biome to be utilized for agricultural production. Professors from public universities have been fundamental to the development of the Brazilian poultry industry – supplying know-how and technology adapted to local environmental conditions. The Ministry of Agriculture's agencies dealing with livestock defence, products of animal origin and international relations have made essential contributions to the results achieved by the sector.

Since 1995, there has been strong interaction between UBA and ABEF and MAPA (Ministério da Agricultura, Pecuária e Abastecimento – Ministry of Agriculture, Livestock and Food Supply) and MDIC (Ministério do Desenvolvimento, Indústria e Comércio Exterior – Brazilian Ministry of Economic Development, Industry and Foreign Trade) with regard to international sanitary agreements, promotion of bilateral agreements aimed at opening new markets, joint action to resolve conflicts, and other matters related to foreign trade in poultry products. ABEF has conducted joint projects with ApexBrasil[28] in trade promotion and business intelligence. Over the period, 1995 to 2005, relations between the poultry sector and the state have, for the most part, evolved towards cooperation and interaction.

The Brazilian state is not the lever that moves the poultry sector, nor does it provide the sector with incentives, special credit lines and subsidies, as it did in the 1970s and early 1980s when developing exports was vital for the country. Brazilian poultry exports boomed precisely from 1995 to 2005 when no incentives or subsidies existed. The freedom of market action that has prevailed from 1994 onwards has compensated for the incentives and subsidies of the past – without forgetting the economic stability the country has known since that time. Another major change is that the state now views the poultry sector as a modern and competitive industry with a global dimension.

[28] ApexBrasil (Brazilian Trade and Investment Promotion Agency) is within the structure of MDIC (http://www.apexbrasil.com.br/eng/).

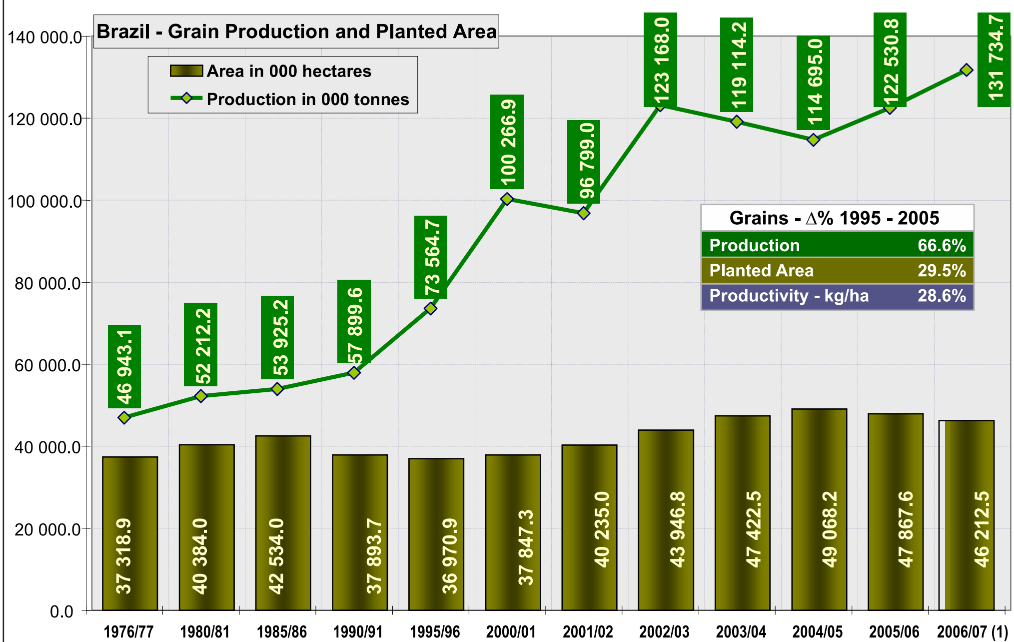
2.2 Feed products

As in the case of livestock, a market economy prevails for grains and microelements. The latter, however, require registration with the relevant authorities at federal level, prior to manufacturing, trade or import.

As far as grains are concerned, official policies impose restrictions on GMOs. The GMO debate in Brazil has been conducted on a very emotional basis and has been permeated by activism. At present, planting and trading of GMO soy and cotton is permitted, but this is not the case for maize. GMO soy is still subject to restrictions imposed by certain state governments, and the issue is constantly argued in courts. The ban on GMO maize creates difficulties for poultry producers in some regions of Brazil, mainly the Northeast Region, which brings in its maize mostly by truck from the Centre-West. It would be much more economical for the Northeast's producers to import maize by sea from Argentina, but the ban closes this alternative source of maize for the moment.

MAPA operates a minimal prices guarantee policy, several lines of rural credit and several programmes to stimulate agricultural production. Despite budgetary restrictions and insufficient credit lines, these actions are of fundamental importance to the rural producer. Brazil is expanding both its grain production and its planted area. But increases in grain production are more the result of rising productivity than of the expansion of the planted area.

FIGURE 28
Brazil's grain production and planted area



Source: CONAB – Brazilian crop grains assessment 4th 2007/2008January 2008.
[1] Preliminary

As described above, bovines and poultry are the most important species in Brazil for meat production, consumption and exports. Grazing predominates in cattle raising in Brazil and feedlot production is minimal. Milk cows are the major feed consumers among bovines, and poultry accounts for over 55 percent of feed consumption in Brazil.

TABLE 37
Feed consumption by livestock species in Brazil

		Poultry		Poultry %				
	Total	for Meat[1]	for Eggs[2]	/Total	Swine	Bovine[3]	Other	Total
1995	15 128	12 383	2 745	63.6%	6 801	1 050	794	23 773
1996	15 252	12 622	2 630	58.6%	8 493	1 239	1 029	26 013
1997	16 341	13 889	2 452	57.7%	8 950	1 425	1605	28 321
1998	17 138	14 637	2 502	56.9%	9 871	1 599	1 492	30 100
1999	19 237	16 140	3 097	59.2%	9 425	2 070	1775.2	32 507
2000	20 178	16 866	3 312	58.6%	10 085	2 469	1 727	34 458
2001	21 756	18 047	3 709	56.1%	12 050	2 982	2024	38 812
2002	23 145	19 195	3 950	55.6%	12 590	3 620	2 239	41 594
2003	24 190	20 250	3 940	55.4%	13 222	3 880	2395.5	43 687
2004	24 923	20 842	4 081	55.5%	12 554	5 165	2 291	44 932
2005	26 771	22 856	3 915	56.7%	12 393	5 375	2669.6	47 209
% Growth 1995-2005	77.0%	84.6%	42.6%		82.2%	411.9%	236.2%	98.6%

[1]Broilers & parent stock [2]Layers + parent stock [3]Mainly milk cows
Source: Sindirações – Sindicato Nacional da Indústria de Alimentação Animal (Animal Feed Industry National Syndicate) (http://www.sindiracoes.org.br/) and UBA Annual Reports 2001, 2002, 2004/2005, 2005/2006 and 2006/2007.

Poultry feed in Brazil is essentially maize and soybean meal. The evolution of soy and maize production and the share of each region is described above. Table 38 presents the evolution of demand for maize and soybean meal in the poultry sector.

TABLE 38

The Brazilian poultry sector's demand for maize and soy bean meal

Poultry - Maize Demand (in 000 tonnes)	**1996**	**1999**	**2000**	**2003**	**2004**	**2005**	**2006**
Poultry	9 361.7	12 528.5	13 109.1	16 093.2	17 372.7	18 910.4	19 220.0
Chicken for meat	7 812.0	10 666.5	11 305.9	13 403.9	14 516.4	15 889.7	16 048.5
Layers	1 549.7	1 862.0	1 803.2	2 116.9	2 193.1	2 263.3	2 421.7
Turkey				572.4	663.2	757.4	749.8
Poultry - Soybean Meal Demand (in 000 tonnes)	**1996**	**1999**	**2000**	**2003**	**2004**	**2005**	**2006**
Poultry	3 301.0	4 414.3	4 628.1	5 731.9	6 197.4	6 756.8	6 848.9
Chicken for meat	2 836.6	3 858.8	4 090.2	4 843.3	5 245.3	5 741.5	5 789.9
Layers	464.4	555.5	537.9	631.5	654.2	675.1	722.3
Turkey				257.1	297.9	340.2	336.7

Source: Sindirações - Sindicato Nacional da Indústria de Alimentação Animal (Animal Feed Industry National Syndicate) (http://www.sindiracoes.org.br/) and UBA Annual Reports 2001, 2002, 2004/2005, 2005/2006 and 2006/2007.

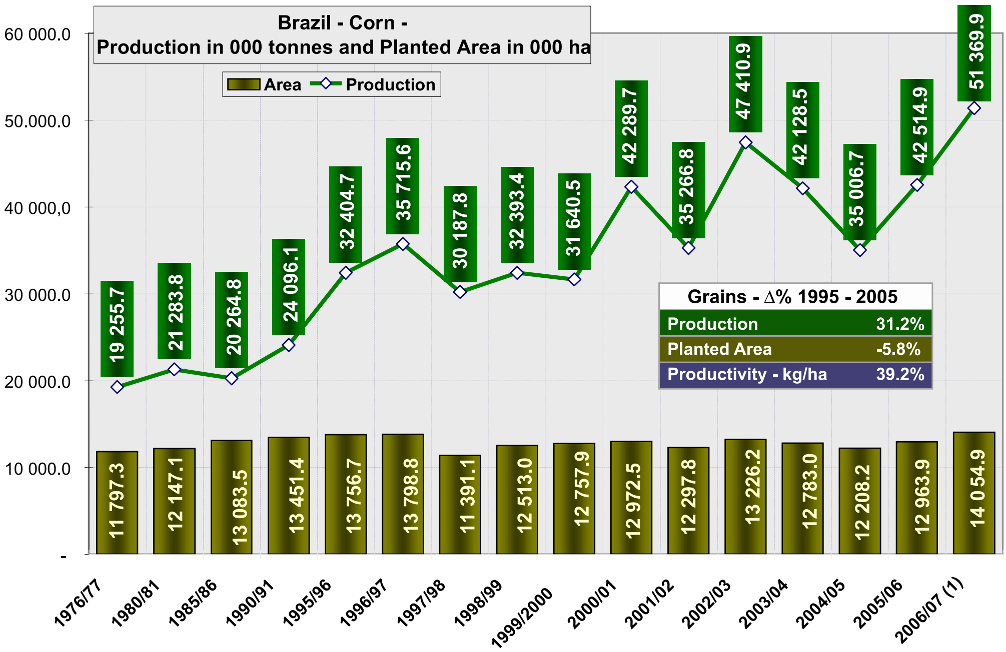
Brazil's domestic maize production is able to meet demand, but the country's exports are soaring because of rising demand for maize for ethanol production in the United States of America and for feed in Asia. Brazilian maize also receives premium prices from clients requiring GMO-free grains. Exports of maize in 2007 reached 10 million tonnes and domestic maize prices went up by 75 percent compared to the previous year. There is pressure from farmers for approval of GMO maize. Poultry and pork producers would welcome this, because it would permit imports of maize from Argentina.

Brazil is self-sufficient in macro-nutrients but entirely dependent on imports for feed additives, the prices of which have increased considerably in recent years. Feed-sector imports amounted to US$700 million in 2007. Among the major imports are DL-methionine, vitamins and minerals, coccidiostats and histomonostats.

The rising cost of feed is a concern for the livestock sector. In contrast to other countries, where the debate regarding grains for food or for ethanol centres on neo-Malthusian concerns, the debate in Brazil centres in how increased meat prices might affect local and international demand.

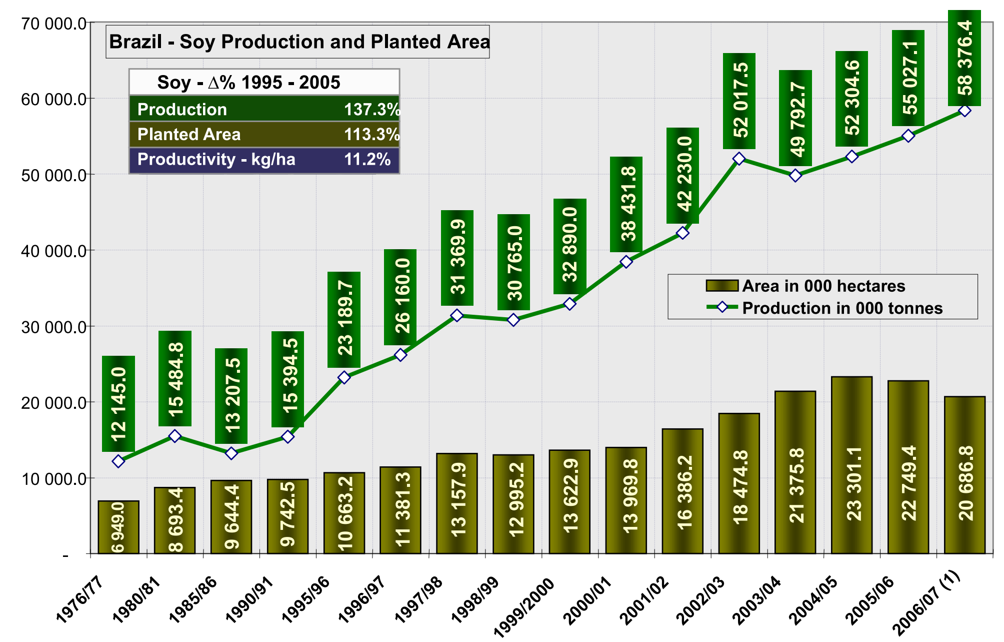
Figures 29 and 30 show the expansion of maize and soy production and planted area. Gains in productivity are shown in Figure 31.

FIGURE 29
Brazil's maize production and planted area



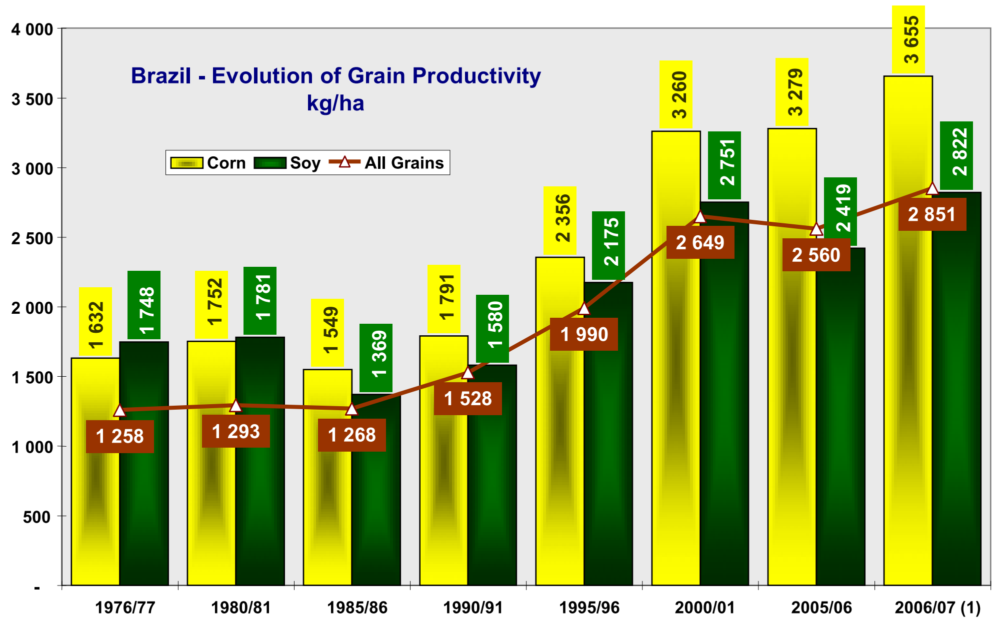
Source: CONAB – Brazilian crop grains assessment 4th 2007/2008 January 2008. [1] Preliminary

FIGURE 30
Brazil's soy production and planted area



Source: CONAB – Brazilian crop grains assessment 4th 2007/2008 January 2008. [1] Preliminary

FIGURE 31
Evolution of grain productivity in Brazil

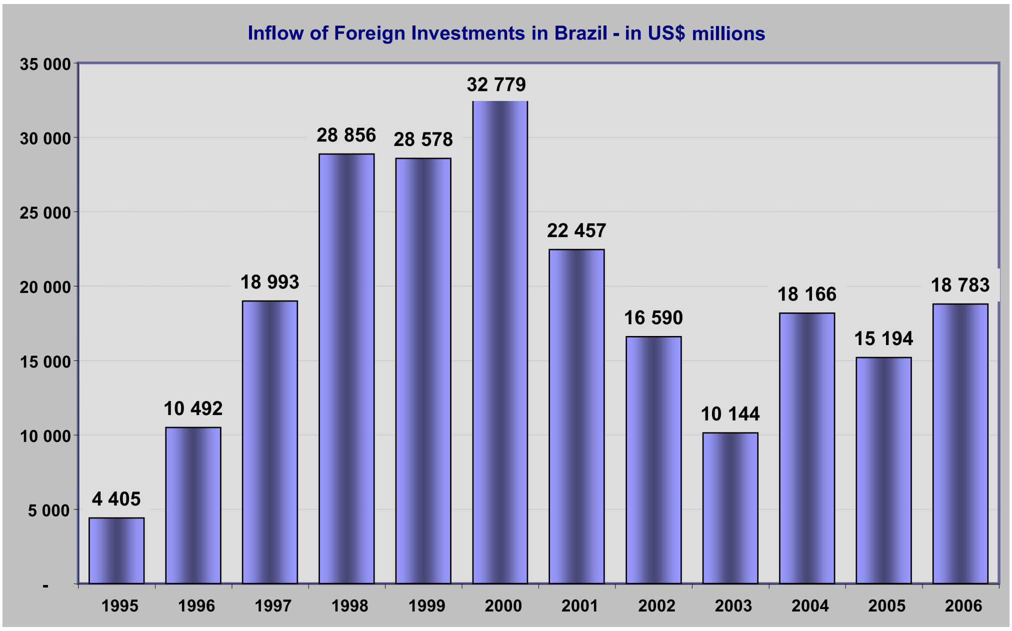


Source: CONAB – Brazilian crop grains assessment 4th 2007/2008 January 2008. [1] Preliminary

2.3 Foreign direct investments

The Brazilian constitution guarantees equal treatment to foreign capital. There are restrictions on foreign capital only in cabotage, domestic flights, and radio and television networks. Like most developing countries, Brazil seeks to attract foreign investments; several government agencies are involved in this task. The aim of these efforts is to increase the volume of foreign investment which has declined since its peak in 2000.

FIGURE 32
Foreign investments in Brazil



Source: elaborated by MDIC with data from BACEN (http://investimentos.desenvolvimento.gov.br/renai_en/arquivos/IEDfluxoSITERENAI.pdf).

All this effort by the Brazilian government to attract foreign investments indicates the openness of the country. The policy is very transparent, and there are critics saying that Brazil could do more to compete with other developing countries. The fiscal burden and its complexity, labour laws that date back to the 1950s and 1960s, bureaucracy, and deficiencies in the infrastructure are pointed to as areas where Brazil has to make changes. The "Doing Business Project"[29] of the World Bank allows comparisons between countries, and the ranking of Brazil seems to corroborate the need for such changes. The deficiencies affect both Brazilian and foreign investors.

Since 1995, the Brazilian poultry sector has been receiving foreign investments; two of the five largest Brazilian poultry producers are now foreign owned. The natural competitiveness of the country in poultry-meat production and its proven efficiency at the international level are attracting foreign investors to Brazil. Large international meat companies are seeking to buy existing poultry companies, but face competition from their Brazilian counterparts who are enlarging their operations through acquisitions. Foreign-investor interest in the Brazilian poultry sector is expected to continue during the coming decade. However, foreign direct investments did not stimulate structural changes in the past.

[29] http://www.doingbusiness.org/

2.4 Public and veterinary health policies and food-safety standards

Several episodes of animal disease marked the period between 1995 and 2005 (bovine spongiform encephalopathy; foot-and-mouth disease; HPAI), affecting demand, disrupting traditional trade flows and eroding the confidence of consumers in many countries. Bans on the use of meat meals in feed and prohibition of growth promoters were imposed; food safety, sustainability, animal welfare, total traceability, sanitation standard operating procedures (SSOP), HACCP, and auditing by clients and consumer organizations became minimal requirements. Quality was no longer enough for consumers, who demanded further assurances about their food. In this period, Brazil became the main poultry exporter to Europe, and after the outbreaks of HPAI from 2004 onwards, one of the few world poultry-meat suppliers not affected by the disease.

These developments led to changes in the Brazilian animal health system with the objective of preventing the entry of poultry diseases, particularly avian influenza, into the country. At the same time, the veterinary inspection services had to guarantee compliance with the new requirements of the importing countries.

Public and veterinary health policies are under the Secretariat of Agricultural and Livestock Defence (SDA) of MAPA. Within the structure of this secretariat there are three departments dealing with animals: Department of Livestock Inputs Control; Department of Inspection of Animal Origin Products (Departamento de Inspeção de Produtos de Origem Animal –DIPOA); and Department of Animal Health (Departamento de Defesa Animal – DDA).

Established in September 1994, the PNSA – Programa Nacional de Sanidade Avícola (National Programme of Poultry Health) – undertakes programmes of cooperation with both public and private institutions. PNSA sets standards for, *inter alia*, biosecurity and disinfection measures; sanitary monitoring of parent-stock producing farms; monitoring of migratory birds; control and inspection of borders, ports and airports; interstate transit of live birds; sample collection; and laboratory analysis for bird diseases.

PNSA has established procedures aimed at:

- controlling Newcastle disease;
- monitoring and controlling avian salmonellosis;
- establishing technical rules for the import and export of day-old chicks and fertile eggs for reproduction purposes;
- establishing technical rules for the control and certification of poultry establishments free from *Mycoplasma gallisepticum;*
- establishing technical rules for the control and certification of poultry establishments free from *Salmonella gallinarum* and *Salmonella pullorum* and free from, or controlled for, *Salmonella enteridis* and *Salmonella typhimurium*; and
- establishing technical rules for registration, inspection and sanitary control of establishments for incubation, breeding and lodging of ratites.

PNSA has developed several specific poultry-health programmes, among which are the National Plan for the Control and Prevention of Newcastle Disease and the Plan for the Prevention of Avian Influenza. UBA has cooperated in all these programmes through its Vice-Presidency for Technical and Scientific Matters.

PNSA, along with poultry producers' associations and state-level animal health authorities, is placing particular emphasis on implementing measures to prevent and control avian influenza. Information centres have been established, basic information is being disseminated among small producers and among those travelling to countries that have active outbreaks of the disease. It has also established procedures to be followed in the event of a suspected outbreak among wild birds or backyard flocks. A manual on the prevention and control of the disease in very small-scale poultry production has been produced.

In each state of the federation, there is a Ministry of Agriculture vet who is responsible for PNSA at state level along with a counterpart from the sanitary and animal health authorities of the state government. PNSA and UBA, along with state-level secretariats of agriculture and state-level associations, are implementing a plan aimed at the regionalization of the Brazilian poultry sector. The cooperation between the private sector through its associations, and DDA has been exemplary.

The main poultry producers have adopted additional biosecurity measures – severely restricting visits, reinforcing vigilance measures, promoting training and information dissemination among farmers, adopting individual disease-prevention plans and control plans to be implemented in the event of an outbreak.

DIPOA is in charge of the sanitary inspection of livestock products and observance at production level of the international sanitary agreements that Brazil has concluded with other countries. Each slaughterhouse producing meat for export has to be approved by the SIF. SIF veterinarians are allocated to each plant, their numbers depending on how many slaughtering lines the plant has, how many shifts it operates, the volume produced, etc. Only plants with SIF inspection can sell goods outside the federal state where they are located.

Various importing countries have bilateral sanitary agreements concerning requirements for export; consequently, a slaughtering plant under SIF may be authorized to sell to some countries but banned from others if it has not been approved by inspectors from the latter countries. Every product manufactured by the plant has to be registered with MAPA.

If an importing country bans the import of poultry meat that contains certain substances, SIF inspectors include these restrictions in their inspection of the production process or of the finished products. Goods can only leave the producing plant accompanied by the Certificate of Sanitary Inspection. For exports, these certificates will have a model approved in the bilateral sanitary agreement. Upon leaving the plant for the port, export goods are sealed in the container or truck by the plant SIF inspector, who issues a transit Certificate of Sanitary Inspection. Upon receiving it at the port, the veterinary inspector of the port warehouse will verify the integrity of the seal and may conduct additional random inspections. After that, a Certificate of Sanitary Inspection for export will be issued.

Good management practices (GMP), good production practices (GPP), HACCP and standard operating procedures (SOP) have become mandatory for poultry production for export. As Brazilian poultry producers started to supply major international supermarkets, fast-food and restaurants chains, food processors and other clients in food services, private inspections and audits by the clients or by auditors appointed by them became the norm. Such clients will not even consider visiting the plant of a prospective supplier before receiving documentation of an audit on total traceability up to the parent-stock level, HACCP, SOP, etc. To have an audit approving a plant for the production of one line of products does not mean automatic approval for all products from the plant. To have a product approved does not assure that the product can be supplied to the same client in another country, which might require its own auditing. All these requirements and the need to meet ever-higher standards have enhanced the operation and control of poultry facilities, with positive repercussions for the domestic consumer and for the competitiveness of the poultry operations.

SIF's animal product inspection is complemented at consumer and distribution levels by state and municipal sanitary surveillance authorities to ensure proper handling and storage.

Disease outbreaks (particularly HPAI)

There have been no outbreaks of HPAI in Brazil, and its prevention is one of the top priorities of PNSA – with the full support of all elements of the poultry chain. Besides prevention of avian influenza, another priority is the prevention and control of Newcastle disease, of which there were outbreaks in Brazil in 1996, 1999, 2000, 2001 and 2006.[30] The outbreaks of 2006 occurred in backyard production in Rio Grande do Sul and Mato Grosso.

Within the framework of active surveillance implemented under PNSA's National Plan for the Control and Prevention of Newcastle Disease and the Plan for the Prevention of Avian Influenza samples were taken from several premises keeping poultry for on-farm consumption located within a 10 km radius of sites used by migratory birds. One of the samples form a farm near the urban area of Manaus tested positive in 2006, before the birds presented any clinical signs of the disease. This outbreak, as well as the one in Mato Grosso, occurred in an area where no commercial production was present. All birds were destroyed and the premises disinfected. The Rio Grande do Sul outbreak occurred in an area near to commercial production units, and so additional measures were taken – a surveillance zone was established, virological tests performed and sentinel birds introduced. In March 2007, Brazil communicated its final report on the three outbreaks to OIE, thus bringing the episodes to a close.

2.5 General economy and household income development

Several points regarding the Brazilian economy have been raised in this paper. The following points are to be highlighted for the period from 1995 to 2005:

- the importance of agribusiness for the country's economy and foreign trade;
- the contribution of meat exports, particularly poultry meat, to the country's trade surplus and foreign currency situation;
- economic stability and the decline of inflation;
- the reduction of state intervention in the economy and the prevalence of the market economy; and
- growing cost of the Brazilian state without corresponding improvements in the quality of public services and the country's infrastructure.

[30] Source: OIE, HANDISTATUS II Multiannual animal disease status for data up to 2004. Data from 2005 to 2008 is from WAHID Interface – OIE World Animal Health Information Database.

General Data

The following data are drawn from the BrazilTradeNet section "Investing in Brazil".[31]

- Territory: 8 514 215 km²
- Population: 189 334 953 inhabitants (07/2007)
- Gross Domestic Product (GDP): US$ 1 067 325 millions (2006)
- International Reserves: US$85.8 billion (Annual Report 2006 – BACEN)
- Human Development Index (HDI): 0.792 (2005)
- Currency: real (R$)

Language: Portuguese

TABLE 39

Macroeconomic indicators for Brazil 2001–2007

	2001	2002	2003	2004	2005	2006f	2007f
GDP Brazil (US$ billion)	509.6	459.6	508.6	603.9	797.4	940.7	1 011.2
GDP Brazil (R$ billion)	1198.7	1346.0	1556.2	1766.6	1937.6	2 029.7	2 199.5
Real GDP Growth Rate (% - market price)	1.3	1.9	0.5	4.9	2.3	3.0	3.5
- Agriculture and livestock (% - value added)	5.8	5.5	4.5	5.3	0.8	3.0	3.5
- Industry (% - value added)	-0.5	2.6	0.1	6.2	2.5	4.0	4.1
- Services (% - value added)	1.8	1.6	0.6	3.7	2.0	2.5	3.3
Population Brazil (million)	173.8	176.4	179.0	181.6	184.2	186.8	189.3
Per capita GDP (US$)	2 932	2 606	2 841	3 326	4 329	5 036	5 341
Unemployment Rate (% of working force, IBGE week - avg)	6.2	11.7	12.4	11.5	9.8	9.7	9.0
Inflation - IPC-Fipe (end of period, %)	7.1	9.9	8.2	6.6	4.5	1.9	4.0
Inflation - IPCA (end of period, %)	7.7	12.5	9.3	7.6	5.7	3.1	4.5
Inflation - IGP-M (end of period, %)	10.4	25.3	8.7	12.4	1.2	3.6	4.5
Nominal Interest Rate Over- Selic (end of period, % pa)	19.0	25.0	16.5	17.8	18.0	13.8	12.5
Nominal Interest Rate Over - Selic (average, % pa)	17.3	19.1	23.2	16.2	19.0	15.1	13.1
Real Interest Rate (average, IPCA, % pa)	8.9	5.9	12.8	8.0	12.6	11.6	8.2
Nominal Devaluation (end of period, %)	29.0	43.8	-18.9	-10.0	-11.8	-8.1	2.3
Public Sector - Primary Result (% GDP)	3.6	3.9	4.3	4.6	4.8	4.3	4.3
- Federal Government and Central Bank (% GDP)	1.8	2.4	2.5	3.0	-2.9	na	na
- State and Local Government (% GDP)	0.9	0.8	0.9	1.0	-1.1	na	na
- State Enterprises (% GDP)	0.9	0.7	0.9	0.6	-0.9	na	na
Harmonized Result (% GDP)	-3.6	-4.6	-5.1	-2.7	-3.3	-3.0	-2.3
Nominal Result (% GDP)	-5.2	-10.3	-3.6	-2.5	-3.0	-3.0	-2.3
Net Public Sector Debt (% GDP)	52.6	55.5	57.2	51.7	51.6	50.1	49.2
Trade Balance (US$ billion)	2.7	13.1	24.8	33.6	44.8	42.5	35.1
- Exports (US$ billion)	58.2	60.4	73.1	96.5	118.3	132.0	135.8
- Imports (US$ billion)	55.6	47.2	48.3	62.8	73.6	89.5	100.7
Services and Income (US$ billion)	-27.5	-23.1	-23.7	-25.2	-34.1	-37.7	-34.4
- Interest Payments (US$ billion)	-14.9	-13.1	-13.0	-13.4	-13.5	-12.3	-8.6
- Profits and Dividends (US$ billion)	-5.0	-5.2	-5.6	-7.3	-12.7	-16.8	-15.5
- International Travel (US$ billion)	-1.5	-0.4	0.2	0.4	-0.9	-1.2	-1.5
- Other (US$ billion)	-6.2	-4.5	-5.0	-4.8	-7.1	-7.4	-8.8
Unrequited Transfers (US$ billion)	1.6	2.4	2.9	3.3	3.6	3.5	3.5
Current Account (US$ billion)	-23.2	-7.6	4.0	11.7	14.2	8.3	6.0
Current Account (% GDP)	-4.6	-1.7	0.8	1.9	1.8	0.9	0.6
Capital and Financial Account (US$ billion)	27.1	8.9	5.5	-7.3	-8.8	-4.9	-3.1
Capital Account (US$ billion)	0.0	0.4	0.5	0.3	0.7	0.5	0.5
Financial Account (US$ billion)	27.1	7.6	4.6	-8.0	-9.5	-5.4	-3.6
- Foreign Direct Investment (US$ billion)	22.5	16.6	10.1	18.2	15.2	15.0	15.0
- Foreign Portfolio Investment (US$ billion)	0.1	-5.1	5.3	-4.8	4.9	3.0	3.0
- Others (US$ billion)	4.6	-3.9	-10.8	-21.4	-29.5	-23.4	-21.6
International Reserves (US$ billion, cash)	35.9	37.8	49.3	52.9	53.8	73.0	74.0
Total External Debt (US$ billion)	209.9	210.7	214.9	201.4	153.7	136.9	133.7

Source: IBGE, Central Bank and Citibank.

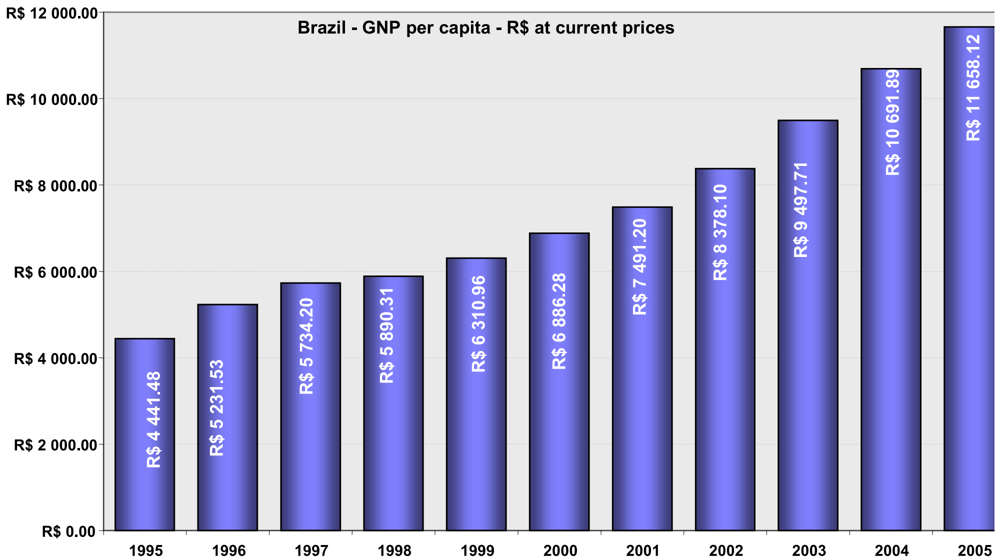
Figures as presented on the Braziltradenet site. Population data is not updated to the latest figures available at IBGE site and are overestimated for 2007.

[31] http://www.braziltradenet.gov.br/CDINVESTIMENTO/?Idioma=I

Income development

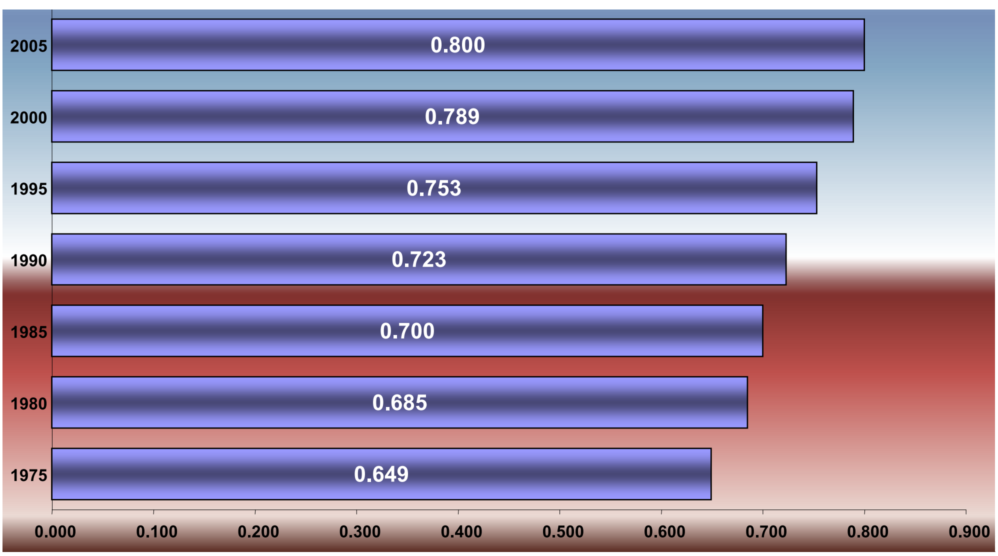
The Brazil of 2005 differs from that of 1995 in a positive way. Several parameters can be used to support this opinion (e.g. per capita income and HDI trends – Figures 33 and 34). However, the progress that has taken place during this period has not eliminated the severe income disparities among the different regions of the country (Table 40). There are also great income disparities within regions.

FIGURE 33
Brazil's GNP per capita, 1995 to 2005



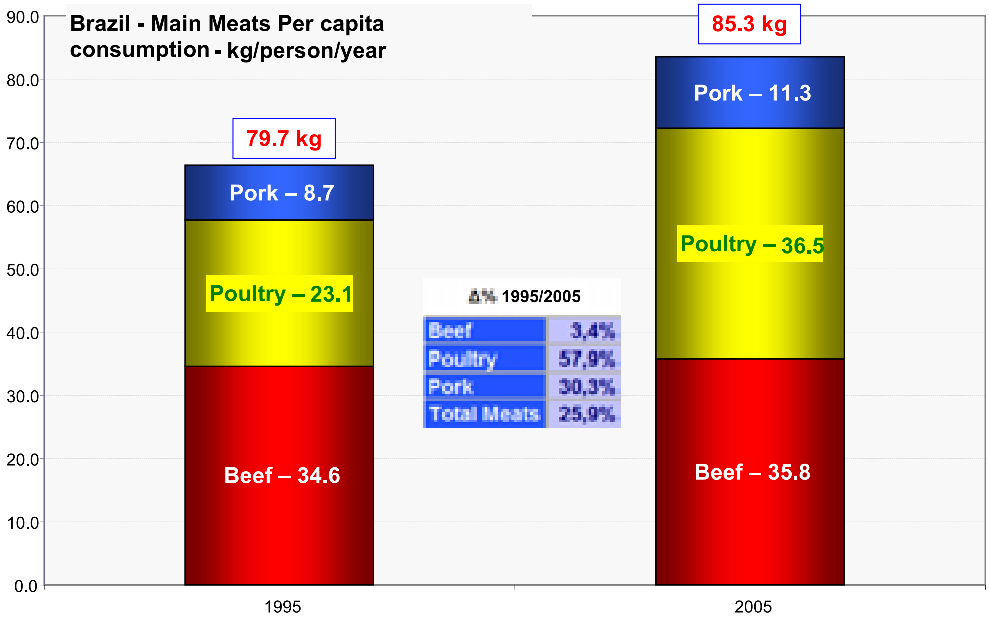
Source: IBGE, Diretoria de Pesquisas (Research Directory), Departamento de Contas Nacionais (Department of National Accounts). FTP directory /Contas_Nacionais/Sistema_de_Contas_Nacionais/Referencia_2000/2004_2005_novembro2007/Tabelas_Sinoticas/ at ftp.ibge.gov.br

FIGURE 34
Trends in Brazil's human development index



Source: UNDP (2007)

FIGURE 35
Brazil's per capita consumption of meats



Source: elaborated with data from ABEF, UBA, ABIEC and ABIPECS.

TABLE 40
Average incomes of working people by region

	Reais - R$	US$	Euro - €
Brazil	**R$ 800.80**	**$328.84**	**€266.64**
North Region	R$ 642.40	$263.80	€213.90
Northeast Region	R$ 490.40	$201.38	€163.29
Southeast Region	R$ 935.90	$384.32	€311.63
South Region	R$ 901.40	$370.16	€300.14
Center-West Region	R$ 931.70	$382.60	€310.23

Sources: IBGE – PNAD – 2005.
The yearly average exchange rate of the real to the US dollar and euro is estimated.

TABLE 41

Monthly Income for working people above 10 years of age, Brazil 2005 (classified by minimum salaries)

Average minimum salary in 2005 = R$ 286,67 = US$ 119,45	Brazil	North	Northeast	Southeast	South	Center-West
			Geographical Regions			
			2005			
			People 10 years old or more			
	152 740 402	**11 420 982**	**41 212 826**	**66 575 129**	**22 784 949**	**10 746 516**
1 to 2 minimum salaries	38 243 804	3 051 574	16 002 809	12 464 526	4 347 242	2 377 663
> 1 minimum salary	29 669 537	2 141 276	5 962 685	14 092 480	5 216 975	2 256 121
> 2 to 3 minimum salaries	11 165 917	674 663	1 464 863	6 062 423	2 183 440	780 528
> 3 to 5 minimum salaries	10 463 858	551 645	1 210 096	5 916 576	2 060 562	724 979
> 5 to 10 minimum salaries	6 828 965	303 111	812 717	3 802 090	1 359 333	551 714
> 3 to 5 minimum salaries	2 583 108	107 398	325 228	1 441 377	479 155	229 930
> 20 minimum salaries	1 023 622	35 369	113 409	606 304	162 375	106 165
No declaration or no income	51 573 651	4 524 976	15 139 754	21 367 632	6 854 647	3 686 642
			%			
	Brazil	**North**	**Northeast**	**Southeast**	**South**	**Center-West**
1 to 2 minimum salaries	25.0	26.7	38.8	18.7	19.1	22.1
> 1 minimum salary	19.4	18.7	14.5	21.2	22.9	21.0
> 2 to 3 minimum salaries	7.3	5.9	3.6	9.1	9.6	7.3
> 3 to 5 minimum salaries	6.9	4.8	2.9	8.9	9.0	6.7
> 5 to 10 minimum salaries	4.5	2.7	2.0	5.7	6.0	5.1
> 3 to 5 minimum salaries	1.7	0.9	0.8	2.2	2.1	2.1
> 20 minimum salaries	0.7	0.3	0.3	0.9	0.7	1.0
No declaration or no income	33.8	39.6	36.7	32.1	30.1	34.3

Source: IBGE – PNAD 2005–2006.

During the high inflation period in Brazil it became usual to represent values in minimum salaries. Minimum salaries were frequently corrected and used to fix salary levels and even to arrange rental contracts

TABLE 42

Households classified by monthly income expressed in minimum salaries – by geographic region, 2005

Household classified by income 2005	Minimum Salary average value in 2005			R$ 286,67	=	US$ 119,45
	Brazil	North	Northeast	Southeast	South	Center-West
Total Number of Households	**57 463**	**4 183**	**14 862**	**25 405**	**8 897**	**4 116**
Persons per household	**3.2**	**3.5**	**3.4**	**3.1**	**3.0**	**3.2**
Up to 1/4 of the minimum salary	4 894	491	2 863	989	335	216
> 1/4 to 1/2 minimum salary	9 475	991	3 812	3 012	998	663
> 1/2 to 1 minimum salary	15 335	1 210	4 063	6 588	2 258	1 217
> 1 to 2 minimum salaries	13 249	789	2 025	6 879	2 602	955
> 2 to 3 minimum salaries	4 782	225	543	2 647	1 027	340
> 3 to 5 minimum salaries	3 734	169	420	2 082	789	275
> 5 minimum salaries	3 470	116	387	2 024	640	304
W/out Income	**1 574**	**166**	**586**	**554**	**148**	**120**
W/out Declaration	**949**	**27**	**165**	**631**	**102**	**25**

Source: IBGE – PNAD 2005–2006.

During the high inflation period in Brazil it became usual to represent values in minimum salaries. Minimum salaries were frequently corrected and used to fix salary levels and even to arrange rental contracts

TABLE 43

Households classified by monthly income expressed in minimum salaries – by geographic region, 2006

Household classified by income 2006	Minimum Salary average value			R$ 337,50	=	US$ 155,55
	Brazil	North	Northeast	Southeast	South	Center-West
Total Number of Households	**59 094**	**4 294**	**15 238**	**26 196**	**9 117**	**4 248**
Persons per household	**3.2**	**3.5**	**3.4**	**3.0**	**3.0**	**3.1**
Up to 1/4 of the minimum salary	5 060	515	2 983	989	358	216
> 1/4 to 1/2 minimum salary	9 735	1 014	3 862	3 131	1 035	693
> 1/2 to 1 minimum salary	6 125	1 298	4 287	6 882	2 403	1 255
> 1 to 2 minimum salaries	13 760	781	2 114	7 106	2 719	1 040
> 2 to 3 minimum salaries	4 893	221	551	2 727	1 047	347
> 3 to 5 minimum salaries	3 518	143	400	1 999	722	255
> 5 minimum salaries	3 361	113	386	1 975	598	291
W/out Income	**1 465**	**174**	**483**	**562**	**145**	**101**
W/out Declaration	**1 175**	**37**	**173**	**825**	**90**	**50**

Source: IBGE – PNAD 2005–2006.

During the high inflation period in Brazil it became usual to represent values in minimum salaries. Minimum salaries were frequently corrected and used to fix salary levels and even to arrange rental contracts

The last detailed research on food acquisition and intake available is IBGE's POF (Family Budget Research) covering 2002–2003. The North and Northeast Regions are the poorest, and consequently food expenses represent more than 25 percent of household expenditure, against 20 percent for the other regions. Obviously, this disparity affects consumption patterns, choice and quantity. POF divided households by income category (but expressed in reals and not in minimum salaries). Minimum monthly salary was R$200.00 in 2002 and R$240.00 in 2003.

TABLE 44
Average income, total and food expenses, 2002–2003

	Brazil	North	Northeast	Southeast	South	Center-West
Average Income	1 789.66	1 259.91	1 085.82	2 204.71	1 946.30	1 781.45
Total Expenses	1 465.31	1 115.93	978.58	1 757.15	1 564.85	1 433.61
Food Expense	304.12	303.37	262.18	331.94	312.12	259.40
	20.75 %	27.19%	26.79%	18.89%	19.95%	18.09%

Source: IBGE – POF -2002–2003; PNAD for 2005 and 2006.

POF 2002–2003 data also confirmed that the North and Northeast Regions had the highest average number of people per household. Over 65 percent of households had monthly incomes below R$1 000.00 (approximately US$330.00).[32] Among these households, 51.3 percent had a monthly income below R$1 000.00; the figures for the Northeast and North Regions were 72.8 percent and 65.1 percent, respectively. This level of income normally translates into a food intake below the average of the country.

[32] The average approximate exchange rate to the US dollar for 2002 was R$ 2.921 and R$ 3.078 for 2003.

TABLE 45

Households and income by region, 2002–2003

	Brazil	North	Northeast	Southeast	South	Center-West
Total Number of Households	**48 534 638**	**3 143 142**	**12 235 500**	**21 897 577**	**7 768 891**	**3 489 528**
	%	**6.5%**	**25.2%**	**45.1%**	**16.0%**	**7.2%**
Persons per household	**3.62**	**4.34**	**4.01**	**3.42**	**3.33**	**3.50**
Monthly Income in R$	**Households per category of monthly income and %**					
Up to 400	7 949 351	702 405	3 999 064	1 979 146	700 786	567 950
	16.4%	22.3%	32.7%	9.0%	9.0%	16.3%
> 400 to 600	6 747 421	578 323	2 444 761	2 295 627	873 753	554 958
	13.9%	18.4%	20.0%	10.5%	11.2%	15.9%
> 600 to 1000	10 181 484	766 966	2 466 316	4 305 075	1 821 858	821 269
	21.0%	24.4%	20.2%	19.7%	23.5%	23.5%
> 1 000 to 1 200	3 528 908	213 898	656 923	1 799 612	611 078	247 398
	7.3%	6.8%	5.4%	8.2%	7.9%	7.1%
> 1 200 to 1 600	5 086 643	276 115	773 351	2 694 869	993 369	348 938
	10.5%	8.8%	6.3%	12.3%	12.8%	10.0%
> 1 600 to 2 000	3 349 073	161 241	492 570	1 810 308	674 564	210 390
	6.9%	5.1%	4.0%	8.3%	8.7%	6.0%
> 2 000 to 3 000	4 571 410	205 338	608 171	2 565 389	919 985	272 527
	9.4%	6.5%	5.0%	11.7%	11.8%	7.8%
> 3 000 to 4 000	2 416 195	88 703	281 389	1 490 844	412 375	142 883
	5.0%	2.8%	2.3%	6.8%	5.3%	4.1%
> 4 000 to 6 000	2 236 892	72 182	241 130	1 428 590	364 906	130 084
	4.6%	2.3%	2.0%	6.5%	4.7%	3.7%
> 6 000	2 467 262	77 971	271 825	1 528 117	396 217	193 131
	5.1%	2.5%	2.2%	7.0%	5.1%	5.5%

Source: IBGE – POF 2002–2003 (http://www.sidra.ibge.gov.br/bda/pesquisas/pof/default20022003.asp?z=p&o=8).

TABLE 46

Proportion of households with monthly income below R$1 000.00

Brazil	North	Northeast	Southeast	South	Center-West
51.3%	65.1%	72.8%	39.2%	43.7%	55.7%

Source: IBGE – POF – 2002–2003 (http://www.sidra.ibge.gov.br/bda/pesquisas/pof/default20022003.asp?z=p&o=8).

POF investigated the annual per capita food purchase in terms of kilograms. As in every consumption study, the results reflect the observations made during the visit of the researcher and the subjective views of the questionnaire respondents. Therefore, the data presented in Table 47 reflects consumption patterns more than actual quantities – otherwise we would have to accept that the per capita consumption of all poultry meat in 2002–2003 was 13.86 kg and that of eggs 1.72 kg. Abundant data indicate that this is not the case.

TABLE 47

Annual per capita food purchases by household income category

Food Category	Household Food Purchase - Annual per capita (Kg) By category of household monthly monetary and non-monetary income (R$)						
	Brazil Annual Average	Up to 400(1)	>400 600	>600 1 000	>1 000 1 600	>1 600 3 000	> 3 000
Total in kg	*328.65*	*233.04*	*277.65*	*303.31*	*341.77*	*377.77*	*436.00*
Index - Brasil Average = 100	100.0	70.9	84.5	92.3	104.0	114.9	132.7
	% of each food category in total annual per capita food purchase						
Cereals and pulses	14.72%	22.21%	20.00%	17.18%	14.56%	11.25%	8.72%
Vegetables	8.82%	6.74%	8.07%	8.48%	9.13%	9.58%	9.69%
Fruits	7.45%	4.75%	5.06%	6.12%	7.16%	8.85%	10.52%
Flours. starches & pasta	6.93%	12.28%	10.26%	8.17%	6.14%	4.97%	3.56%
Bakery industry products	6.18%	5.32%	5.59%	6.06%	6.24%	6.57%	6.65%
Meats	7.68%	7.23%	7.26%	7.74%	8.01%	8.35%	7.12%
Offals	0.26%	0.35%	0.31%	0.29%	0.26%	0.22%	0.20%
Fish	1.40%	2.47%	2.20%	1.51%	1.17%	0.94%	0.89%
Poultry	4.22%	4.40%	4.52%	4.68%	4.50%	4.09%	3.34%
Eggs	0.52%	0.59%	0.54%	0.59%	0.57%	0.56%	0.32%
Dairy	15.18%	11.50%	12.64%	14.74%	15.90%	16.34%	17.26%
Sugar. sweets and confectionery	7.15%	9.37%	8.96%	7.89%	7.12%	6.06%	5.26%
Salts & Spices	1.82%	2.05%	2.08%	1.73%	1.82%	1.71%	1.72%
Oils & Fats	3.11%	3.59%	3.57%	3.15%	3.28%	2.98%	2.51%
Beverages and infusions	13.78%	6.82%	8.51%	11.18%	13.44%	16.57%	20.77%
Industrial Food Preparations and Mixes	0.78%	0.32%	0.43%	0.48%	0.67%	0.96%	1.45%
Other products	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Source: IBGE – POF 2002–2003 (http://www.sidra.ibge.gov.br/bda/pesquisas/pof/default20022003.asp?z=p&o=80).

Table 48 presents the food purchase disparity among the different income categories – 1.00 representing Brazil's average. Poultry meat and eggs are the animal products with the most universal access, as all households with an income level above R$600 (69.7 percent of the total) consumed more than the national average. The more expensive food items are restricted to the higher income groups and the difference in intake from one category to the other is large. These differences show that Brazilian internal consumption still has huge growth potential.

TABLE 48
Food purchase disparity by income category

Household Food Purchase - Disparity per income - Brazil average = 1,000 By category of household monthly monetary and non-monetary income (R$)						
	Up to 400	>400 600	>600 1 000	>1 000 1 600	>1 600 3 000	> 3 000
All Foods	0.709	0.845	0.923	1.040	1.149	1.32
Meats (Beef, pork, other)	0.668	0.799	0.930	1.085	1.251	1.229
Poultry Meats	0.740	0.905	1.024	1.110	1.114	1.051
Eggs	0.803	0.870	1.048	1.136	1.226	0.826
Roasted or Smoked Chicken	0.306	0.554	0.706	1.146	1.283	2.026
Breaded Chicken	0.089	0.282	0.492	0.923	1.409	2.927

Source: IBGE – POF 2002–2003 (http://www.sidra.ibge.gov.br/bda/pesquisas/pof/default20022003.asp?z=p&o=8).

Urbanization rate

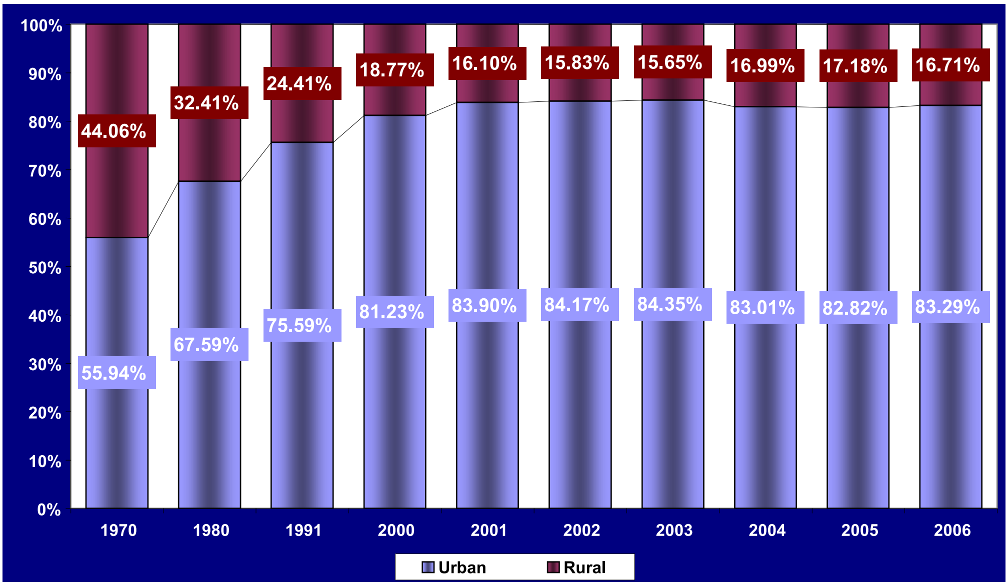
Demographic trends in Brazil follow those of most developed and higher developing countries: diminishing population growth, increasing life expectancy, rising average ages and a high rate of urbanization.

TABLE 49
Brazil's population – total, urban and rural

	Brazil - Population (000)					
	1970	1980	1991	2000	2005	2006
Total	93 135	119 011	146 825	169 591	184 601	187 228
Urban	52 097	80 437	110 991	137 756	152 892	155 934
Rural	41 038	38 574	35 834	31 835	31 709	31 294

Source: IBGE data for 1970 to 2000 are from Demographic Census (http://www.ibge.gov.br/home/estatistica/populacao/default_censo_2000.shtm); data for 2001 to 2006 are from IBGE's PNAD.

FIGURE 36
Brazil's urban and rural populations (percentage figures)



Source: IBGE – Data for 1970 to 2000 are from Demographic Census (http://www.ibge.gov.br/home/estatistica/populacao/default_censo_2000.shtm); data from 2001 to 2006 are from IBGE's PNAD.

Countries colonized by the Portuguese tend to have huge urban agglomerations. Portugal had a small population in the sixteenth and seventeenth centuries, and a colonial empire in three continents. For defensive purposes, the populations would cluster around cities on the coastline, from which goods could be shipped to the metropolis and to which military reinforcement could be sent in the event of attacks. Brazil is no exception to this pattern, and has 14 cities with populations of more than 1 million people.

TABLE 50
Brazilian cities with over 1 million inhabitants

	State	Municipality	Population 2006
1	SP	São Paulo	11 016 703
2	RJ	Rio de Janeiro	6 136 652
3	BA	Salvador	2 714 018
4	CE	Fortaleza	2 416 920
5	MG	Belo Horizonte	2 399 920
6	DF	Brasília	2 383 784
7	PR	Curitiba	1 788 559
8	AM	Manaus	1 688 524
9	PE	Recife	1 515 052
10	RS	Porto Alegre	1 440 939
11	PA	Belém	1 428 368
12	SP	Guarulhos	1 283 253
13	GO	Goiânia	1 220 412
14	SP	Campinas	1 059 420

Source: IBGE data for 1970 to 2000 are from Demographic Census (http://www.ibge.gov.br/home/estatistica/populacao/default_censo_2000.shtm); data for 2001 to 2006 are from IBGE's PNAD.

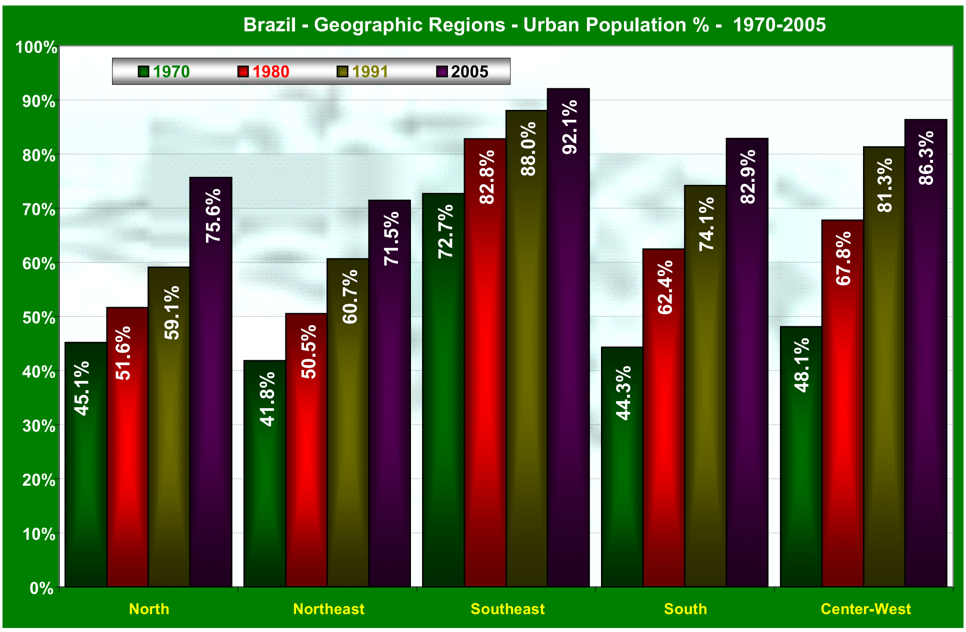
Each year, IBGE estimates the population of each Brazilian municipality for the purpose of tax distribution and resource allocation. Table 51 shows that in 2006 municipalities with over 100 000 inhabitants corresponded to 4.8 percent of the total, but accounted for 54.2 percent of the population. Figure 37 shows that the process of urbanization covers all regions of Brazil.

TABLE 51
Brazilian municipalities by population size

(000) inhabitants	#	Inhabitants	%
> 1000	14	38 492 524	20.6%
>500-<1000	22	15 511 967	8.3%
>400-<500	15	6 684 100	3.6%
>300-<400	28	9 680 717	5.2%
>200-<300	51	12 301 333	6.6%
>100-<200	137	18 562 320	9.9%
>50-<100	311	21 795 317	11.7%
<50	4 986	63 742 284	34.1%
Brazil Total	**5 564**	**186 770 562**	

Source: IBGE, Coordination of Population and Social Indicators.

FIGURE 37
Brazil's urban population by region



Source: IBGE Demographic Census and PNAD 2005.

Market demand – volume and quality – for eggs and poultry meat

Volume of demand is discussed above, and the appendix 1 to this report details chicken-meat balance and wholesale prices from 2005 to 2007, on a monthly basis. It is also noted above:

- that reducing income-related disparities in consumption provides fertile ground for the growth of the Brazilian domestic market for poultry meat, which already represents the fourth largest world market after the United States of America, China and the EU-27;
- that per capita intake of eggs is not in line with the Brazilian tradition of heavy consumption of animal products;
- that for the Brazilian consumer poultry means chicken; and
- that the market for live chickens is declining and concentrated in rural areas and small cities in the interior, but that they are still popular in the North Region and some areas of the Northeast Region, with the exception of the main cities, which are served by supermarkets and modern retail outlets.

In contrast to live chickens, whole chicken is still a very popular product in Brazil, normally sold packed in plastic bags with all edible giblets, feet and head inside the carcass. Brazilians eat white-skinned chickens and their favourite retail weight for broilers is below 2 000 grams and above 1 700 grams. Grillers are available as well as dressed broilers and chicken parts. In the South Region, due to the influence of the Italian immigrants, small-sized grillers and spent hens are very much in demanded for some traditional and typical dishes. Brazilians consume chicken prepared in every way, but roasted whole chicken is highly popular. In the main cities, most supermarkets and retail outlets will offer roasted chicken prepared on their premises – competing in a segment of the market that until the 1990s was dominated by individual shops specialized in cooked foods to take away and by bakeries which on Sundays operate roasting machines. Some restaurant chains are known for their chicken dishes, but most of the fast-food chains that specialized in chicken-only dishes have failed – although chicken sandwiches and nuggets are successful in most hamburger fast-food chains. Chicken can be found on every restaurant menu, from the most sophisticated to the very popular and affordable "meals by the kilogram", where customers select their food from a buffet and pay by weight.

Familiar national and regional brands are preferred by the consumer; but in the case of whole chickens, price has a large influence on consumer choice. As chicken products become more sophisticated and expensive – parts, marinated raw meats, breaded chicken products, prepared chicken dishes, specialties, etc – brand reputation becomes paramount and the leading national brands prevail. These brands normally do not dispute the market for basic whole chickens, where competition includes state or municipally inspected products.[33]

Quality is normally connected to brand; among the unknown brands average consumers will judge the product when cooking – mostly based on carcass integrity and water content. The consumer involves the retailer in his/her view of "quality" and will say that "chicken" bought at shop "α" or "β" is bad or good. Brands with high visibility and publicity are identified as quality brands.

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[33] In contrast to SIF – federal inspection – in state and municipal slaughterhouses it is not mandatory to have an official resident veterinarian; requirements are much simpler, equipment and installations less sophisticated. Controls are effected through visits and audits. In federally inspected slaughterhouses, every slaughtered bird is checked by assistants to the official resident veterinarian(s).

Although averages are misleading, Table 52 reflects monthly average prices in the São Paulo market (price for live birds at the farm, wholesale price and retail price for the refrigerated broiler).

TABLE 52
Wholesale and retail prices for refrigerated broilers, São Paulo market (US$/kg)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Live chiken at farm in the interior of São Paulo State - Average monthly price - US$ per kg												
1995	USD 0.75	USD 0.66	USD 0.53	USD 0.51	USD 0.57	USD 0.62	USD 0.71	USD 0.70	USD 0.63	USD 0.49	USD 0.59	USD 0.68
2000	USD 0.49	USD 0.50	USD 0.40	USD 0.32	USD 0.36	USD 0.45	USD 0.55	USD 0.64	USD 0.61	USD 0.58	USD 0.57	USD 0.51
2005	USD 0.52	USD 0.53	USD 0.46	USD 0.47	USD 0.54	USD 0.58	USD 0.59	USD 0.63	USD 0.69	USD 0.64	USD 0.59	USD 0.50
2006	USD 0.46	USD 0.46	USD 0.38	USD 0.46	USD 0.53	USD 0.50	USD 0.42	USD 0.55	USD 0.71	USD 0.82	USD 0.59	USD 0.54
Wholesale price for refrigerated broiler with giblets, feet and head, packed in polybags, in São Paulo market - US$ per kg												
1995	USD 1.20	USD 1.14	USD 0.98	USD 0.93	USD 0.92	USD 0.94	USD 1.05	USD 1.08	USD 1.02	USD 0.98	USD 1.03	USD 1.08
2000	USD 0.67	USD 0.64	USD 0.58	USD 0.49	USD 0.50	USD 0.57	USD 0.68	USD 0.79	USD 0.76	USD 0.74	USD 0.75	USD 0.70
2005	USD 0.66	USD 0.67	USD 0.65	USD 0.66	USD 0.72	USD 0.72	USD 0.73	USD 0.79	USD 0.88	USD 0.86	USD 0.84	USD 0.76
2006	USD 0.62	USD 0.63	USD 0.55	USD 0.66	USD 0.69	USD 0.65	USD 0.58	USD 0.72	USD 0.85	USD 0.96	USD 0.86	USD 0.85
Retail price for refrigerated broiler with giblets, feet and head, packed in polybags, in São Paulo market - US$ per kg												
1995	USD 1.35	USD 1.24	USD 1.10	USD 1.03	USD 1.02	USD 1.02	USD 1.13	USD 1.15	USD 1.17	USD 1.08	USD 1.13	USD 1.17
2000	USD 0.74	USD 0.70	USD 0.65	USD 0.57	USD 0.57	USD 0.65	USD 0.74	USD 0.85	USD 0.83	USD 0.80	USD 0.80	USD 0.77
2005	USD 0.74	USD 0.75	USD 0.73	USD 0.73	USD 0.79	USD 0.79	USD 0.78	USD 0.85	USD 0.97	USD 0.95	USD 0.94	USD 0.85
2006	USD 0.74	USD 0.74	USD 0.66	USD 0.75	USD 0.80	USD 0.76	USD 0.73	USD 0.85	USD 0.98	USD 1.11	USD 1.02	USD 0.97

Source: Jox Assessoria Agropecuária (www.jox.com.br).

From wholesale to retail, the added margin averages around 10 percent. Normally the wholesale price corresponds to that of the slaughterhouse. Brazilian consumers declare their preference for refrigerated chicken, but will promptly accept frozen products for a few cents price difference. Free-range chicken is a relatively knew concept and is restricted to wealthier consumers.

In the egg market, the margins between wholesale and retail prices are much larger; between 1995 and 2005 they averaged 91.5 percent, while those between the producer and the wholesaler averaged 16.6 percent. The diversity of retail distribution channels and the absence of well-known or strong brands may partially explain the huge difference.

TABLE 53

Average annual egg prices

	R$ per carton with 30 dozens		
	Producer	**Wholesale**	**Consumer**
1995	R$ 11.35	R$ 20.05	R$ 27.38
1996	R$ 16.82	R$ 20.40	R$ 36.81
1997	R$ 16.99	R$ 20.08	R$ 39.40
1998	R$ 16.11	R$ 18.83	R$ 37.43
1999	R$ 16.91	R$ 19.91	R$ 35.80
2000	R$ 20.27	R$ 23.57	R$ 42.55
2001	R$ 21.15	R$ 24.00	R$ 48.25
2002	R$ 24.80	R$ 27.86	R$ 52.60
2003	R$ 35.85	R$ 39.49	R$ 77.10
2004	R$ 30.10	R$ 34.50	R$ 71.53
2005	R$ 31.66	R$ 33.50	R$ 71.70
2006	R$ 25.11	R$ 27.80	R$ 65.70

Sources: elaborated by José Carlos Teixeira Consultoria Ltda base on data from APA and IEA (Istituto di Econmia Agríclola – Agricultural Economy Institute) (http://www.iea.sp.gov.br/out/banco/menu.php).

A retailer cannot afford to ignore some of the leading poultry-meat brands, as the consumer perceives them as an indicator of quality and would consider their absence to represent a lack of quality on the part of the retailer. In the case of eggs, the consumer would have enormous difficulty spontaneously naming a few egg brands, thus permitting the retailer to replace suppliers with practically no consequences.

As mentioned above, Brazilian consumers claim preference for brown eggs, but white eggs are predominant. There are no expressed quality parameters for eggs; the consumer will check that there are no broken eggs and will check the production and expiry dates (normally 20 days). Eggs are classified and priced in accordance with their weight; types 2 and 3 are the most commonly found in supermarkets.

TABLE 54
Size categories for eggs

Type	Commercial name	g per piece
1	Jumbo	> 66g
2	Extra	60g - 65g
3	Big	55g - 60g
4	Medium	50g - 55g
5	Small	45g - 50g
6	Industrial	< 45g

Source: APA/IEA

The role of large retailers

In metropolitan areas, supermarkets are the main retail channel for consumer products such as food, and personal hygiene and house cleaning items. According to IBGE's Annual Trade Research, there were 10 632 supermarkets in 2005, which were responsible for 23.8 percent of all retails sales. Sources from the poultry industry estimate that 30.2 percent of food and 9.3 percent of perishable goods were sold in supermarkets in 2005. According to ABRAS (Brazilian Association of Supermarkets), in 2006 there were 73 695 supermarkets in the country, and supermarket sales amounted to R$124.1 billion.

As in most countries, the supermarket sector marches towards concentration. In 2006, the three leading chains respectively accounted for 13.0 percent, 10.4 percent and 10.4 percent of the sales volume, while the share of the fourth largest chain dropped to 1.4 percent. The four largest supermarket companies are all foreign owned.

During the years of high inflation, the Brazilian consumer used to make a monthly purchase at a hypermarket, thus avoiding the almost daily corrections in the prices of household items. Now the economy is more stable, this habit, although still very much present, is giving way to more frequent visits to retailers, both large retailers and local operations.

Although the three largest retailers have an impressive market share and a predominant role in food distribution in some of the major Brazilian cities, competition between these companies is very tough. They also face competition from regional chains. Even the largest retailer is not present in all the federal states. Nonetheless, they have very strong bargaining power with suppliers, and relations are often characterized by "nice speeches and tough realities". Many poultry companies opt to concentrate their sales in smaller chains, traditional retail organizations, food processors, restaurant chains and distributors.

The leading poultry companies in Brazil are usually also pork producers and are involved in the further processing of several food products. Their sales of whole chickens in the domestic market are minimal, but they are extremely strong in terms of differentiated chicken products and processed poultry-meat products. Consumers recognize and demand their brands, which enhances their negotiating power with the major supermarket chains.

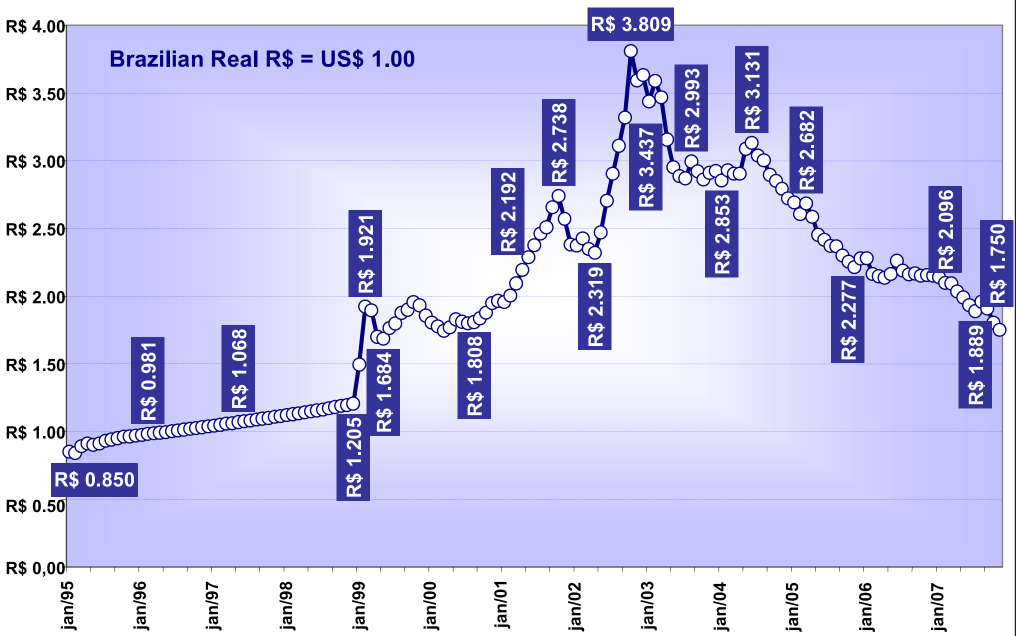
In addition, the major poultry producers have horizontal distribution networks that permit them to cover all parts of the food distribution chain. One of these companies has almost 100 000 active clients in the Brazilian domestic market and delivers almost 300 000 orders per month. In a country of continental dimensions such as Brazil, poorly served by railways and waterways, this distribution requires an enormous fleet of refrigerated trucks and vans covering over 2 million kilometres per month. This national horizontal presence reinforces awareness of the companies' brand among consumers.

Finally, yet importantly, chicken meat is an item that attracts consumers to supermarkets. Supermarkets in Brazil normally place meat sections at the back of the shop to ensure that before reaching it the consumer (87.5 kg/per capita/year of all meats in 2007) has plenty of opportunity for impulse buying. A chicken-meat price promotion is a sure booster of consumer flow in any shop.

Although none of the large retailers has a presence in all states of the federation, they are present in areas that account for no less than 70 percent of Brazilian demand. It is impossible to build a national brand if it is not stocked by these large retailers. Interdependence among major poultry producers and retailers does not necessarily mean harmonious relations, and as both segments move towards further concentration, this is unlikely to change.

Normally, in the streets of major Latin American cities it is possible to study 500 years of retail evolution. Brazil is no exception, and modern supermarkets with e-trade operation can be found alongside very traditional forms of retail.

FIGURE 38
R$–US dollar exchange rate



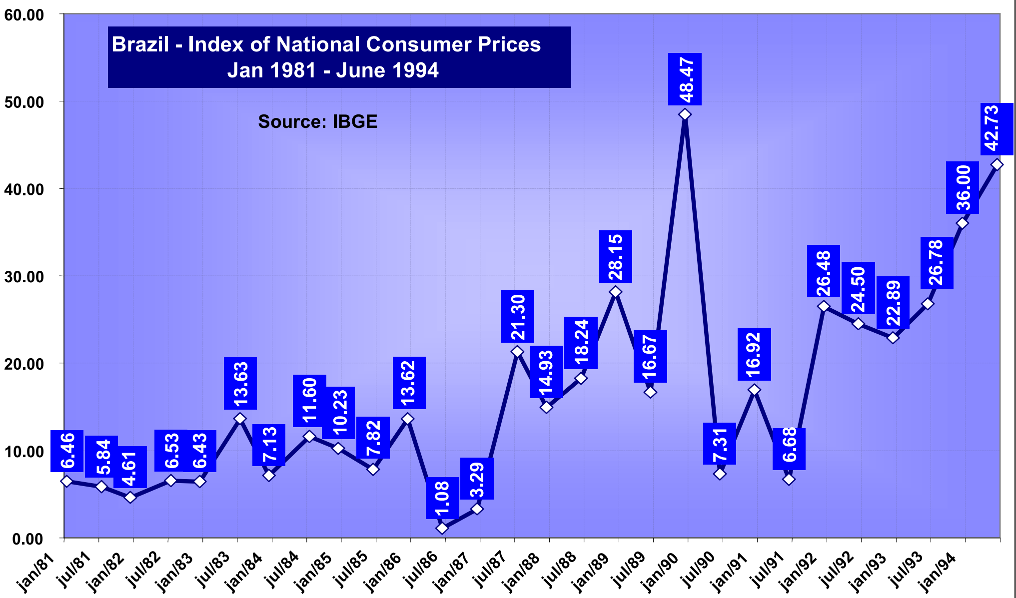
Source: BACEN (http://www5.bcb.gov.br/pec/taxas/port/PtaxRPesq.asp?idpai=TXCOTACAO).

Grain and soybean prices

The rollercoaster behaviour of the Brazilian currency in the period 1995 to 2007 makes any evaluation relating to value particularly difficult. For decades, Brazilians used US dollars as a parameter of monetary stability. Many companies in Brazil would do their budget in the national currency and in US dollars, as this was a measure of value that was accessible and understood by every one.

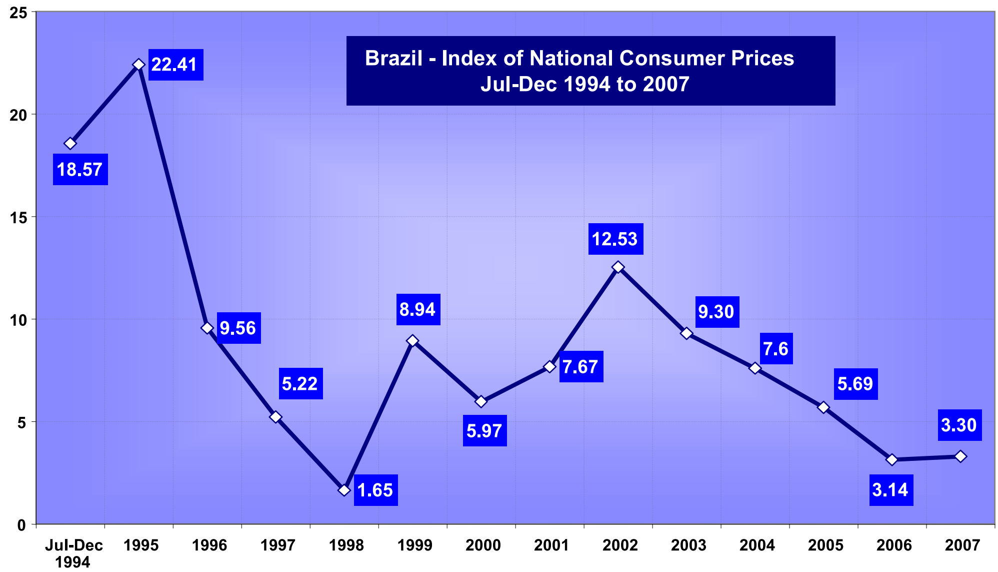
The Brazilian farmer had to live with high inflation rates (Figures 39 and 40) and various heterodox economic plans implemented to control it, which involved the name of the currency being changed six times and more than 18 zeros being cut from it.

FIGURE 39
Brazil's monthly inflation rates, 1991 to 1994



Source: IBGE (http://www.ibge.gov.br/home/estatistica/indicadores/precos/inpc_ipca/defaultinpc.shtm).
The index is known in Brazil as INPC.

FIGURE 40
Brazil's annual inflation rates, 1994 to 2007



Source: IBGE (http://www.ibge.gov.br/home/estatistica/indicadores/precos/inpc_ipca/real_200710.shtm).

In order to survive this jungle of economic concepts, indexes and theories, the poultry farmers adopted what they knew best – they needed maize and soybean meal to produce chicken meat or eggs. These concrete things had nothing to do with concepts the farmers could neither understand nor influence. The basic question for the industry became: how many kilograms of live chicken had to be produced to buy a 60 kg bag of maize or 1 kg of soybean meal?

Appendix 4 contains tables that list, on a monthly basis from 2005 to 2007, the prices of maize, soybean meal and live chickens ready for slaughter. In order to permit comparison we have also included the prices of ready-for-slaughter cattle and pigs – expressed in "arrobas" due to market tradition. The "arroba" in Portugal and colonial Brazil was a measure equivalent to 14.689 kg, traditionally rounded up to 15 kg, used to trade cattle and pigs. Although not recognized as an official measurement, it is still used today – mostly for cattle; pigs are increasingly traded in kilograms. The values presented in the tables in Appendix 4 are not averages, but those recorded on the last working day of each month. Tables 55, 56 and 57 show the same data on an annual basis – representing, respectively, average, maximum and minimum annual prices.

TABLE 55

Prices of maize, soy meal and live chickens, 1995 to 2007 (average annual prices)

YEAR	US$/R$ EXCHANGE RATE	CORN US$/60 KG BAG	SOYBEAN MEAL US$/Kg	LIVE CHICKEN[1] US$/Kg	LIVE BOVINE[1] US$/@[2]	LIVE SWINE[1] US$/@[2]	Kgs of Live Chicken per kg of Corn	Kgs of Chicken per Kg soymeal	Kgs Live Chicken/ kg live bovine	Kgs Live Chicken/ kg live swine
1995	R$ 0.950	$8.230	$0.190	$0.624	$24.96	$17.47	0.227	0.314	2.76	1.82
1996	R$ 1.007	$8.853	$0.256	$0.682	$23.06	$16.72	0.218	0.377	2.27	1.65
1997	R$ 1.080	$7.876	$0.277	$0.616	$24.80	$20.57	0.216	0.458	2.73	2.46
1998	R$ 1.164	$8.194	$0.163	$0.661	$23.90	$16.61	0.209	0.247	2.45	1.98
1999	R$ 1.879	$6.399	$0.147	$0.428	$18.61	$12.72	0.249	0.346	2.93	3.73
2000	R$ 1.834	$7.843	$0.187	$0.492	$22.20	$13.73	0.282	0.402	3.17	3.53
2001	R$ 2.370	$4.777	$0.186	$0.405	$18.58	$12.08	0.200	0.470	3.11	4.77
2002	R$ 2.998	$6.247	$0.180	$0.387	$16.73	$9.09	0.272	0.474	2.90	4.66
2003	R$ 3.059	$6.502	$0.210	$0.473	$19.11	$12.06	0.233	0.445	2.70	5.14
2004	R$ 2.916	$6.289	$0.222	$0.511	$21.04	$17.10	0.210	0.451	2.79	6.49
2005	R$ 2.412	$7.393	$0.217	$0.559	$23.01	$18.46	0.223	0.394	2.78	5.39
2006	R$ 2.167	$8.140	$0.212	$0.531	$24.83	$14.60	0.260	0.414	3.21	4.06
2007	R$ 1.930	$12.389	$0.286	$0.813	$32.63	$20.95	0.254	0.351	2.68	3.02

Source: Source: elaborated with data collection from Jox Assessoria Agropecuário Ltda (www.jox.com.br).

[1]Animals ready for slaughtering; [2]@ = 15 kg.

TABLE 56

Prices of maize soy meal and live chickens, 1995 to 2007 (annual maximum prices)

YEAR	US$/R$ EXCHANGE RATE	CORN US$/60 KG BAG	SOYBEAN MEAL US$/Kg	LIVE CHICKEN[1] US$/Kg	LIVE BOVINE[1] US$/@[2]	LIVE SWINE[1] US$/@[2]	Kgs of Live Chicken per kg of Corn	Kgs of Chicken per Kg soymeal	Kgs Live Chicken/ kg live bovine	Kgs Live Chicken/ kg live swine
1995	R$ 0.972	$8.954	$0.234	$0.696	$27.84	$19.81	0.348	0.493	4.42	2.60
1996	R$ 1.039	$9.653	$0.298	$0.784	$24.49	$21.55	0.264	0.483	2.75	2.00
1997	R$ 1.116	$9.367	$0.299	$0.739	$25.51	$24.80	0.268	0.606	3.53	3.47
1998	R$ 1.208	$9.128	$0.221	$0.801	$24.48	$18.42	0.263	0.278	2.97	2.49
1999	R$ 2.064	$9.115	$0.173	$0.531	$22.93	$15.94	0.290	0.441	3.65	4.13
2000	R$ 1.959	$9.492	$0.216	$0.604	$24.24	$15.64	0.531	0.727	5.63	5.42
2001	R$ 2.706	$5.340	$0.200	$0.499	$20.81	$13.42	0.239	0.594	3.64	6.72
2002	R$ 3.894	$8.733	$0.200	$0.476	$19.81	$11.79	0.365	0.605	3.17	6.23
2003	R$ 3.562	$8.085	$0.277	$0.616	$21.71	$15.58	0.328	0.564	2.95	6.05
2004	R$ 3.128	$6.964	$0.282	$0.696	$23.93	$22.53	0.281	0.683	3.28	7.48
2005	R$ 2.665	$8.086	$0.237	$0.677	$24.93	$21.83	0.267	0.505	3.27	7.18
2006	R$ 2.300	$11.311	$0.240	$0.805	$28.99	$18.04	0.355	0.520	4.17	5.48
2007	R$ 2.134	$18.790	$0.391	$0.986	$44.31	$32.48	0.338	0.431	3.39	4.11

Source: Source: elaborated with data collection from Jox Assessoria Agropecuário Ltda (www.jox.com.br).

[1]Animals ready for slaughtering; [2]@ = 15 kg.

TABLE 57

Prices of maize soy meal and live chickens, 1995 to 2007 (annual minimum prices)

YEAR	US$/R$ EXCHANGE RATE	CORN US$/60 KG BAG	SOYBEAN MEAL US$/Kg	LIVE CHICKEN[1] US$/Kg	LIVE BOVINE[1] US$/@[2]	LIVE SWINE[1] US$/@[2]	Kgs of Live Chicken per kg of Corn	Kgs of Chicken per Kg soymeal	Kgs Live Chicken/ kg live bovine	Kgs Live Chicken/ kg live swine
1995	R$ 0.920	$7.534	$0.150	$0.416	$22.13	$16.03	0.183	0.230	2.21	1.51
1996	R$ 0.978	$7.751	$0.205	$0.590	$21.55	$12.60	0.182	0.332	1.98	1.18
1997	R$ 1.045	$7.288	$0.251	$0.470	$23.44	$18.94	0.168	0.360	2.27	1.89
1998	R$ 1.123	$7.396	$0.147	$0.548	$22.83	$15.51	0.175	0.213	2.00	1.58
1999	R$ 1.660	$4.724	$0.111	$0.348	$15.50	$10.72	0.176	0.270	2.18	3.30
2000	R$ 1.747	$5.730	$0.172	$0.249	$20.27	$11.21	0.196	0.290	2.55	2.85
2001	R$ 1.970	$4.196	$0.155	$0.333	$16.86	$9.74	0.151	0.338	2.41	3.81
2002	R$ 2.323	$4.930	$0.165	$0.292	$13.35	$6.56	0.194	0.371	2.46	3.78
2003	R$ 2.855	$5.279	$0.176	$0.411	$16.28	$9.22	0.163	0.356	2.22	4.51
2004	R$ 2.654	$5.898	$0.179	$0.413	$19.63	$13.10	0.141	0.261	2.25	5.68
2005	R$ 2.206	$6.479	$0.198	$0.469	$21.58	$14.42	0.188	0.328	2.13	4.33
2006	R$ 2.088	$5.963	$0.184	$0.368	$21.74	$10.82	0.186	0.269	2.40	2.86
2007	R$ 1.743	$9.099	$0.204	$0.541	$25.31	$13.91	0.173	0.266	2.05	2.54

Source: Source: elaborated with data collection from Jox Assessoria Agropecuário Ltda (www.jox.com.br).

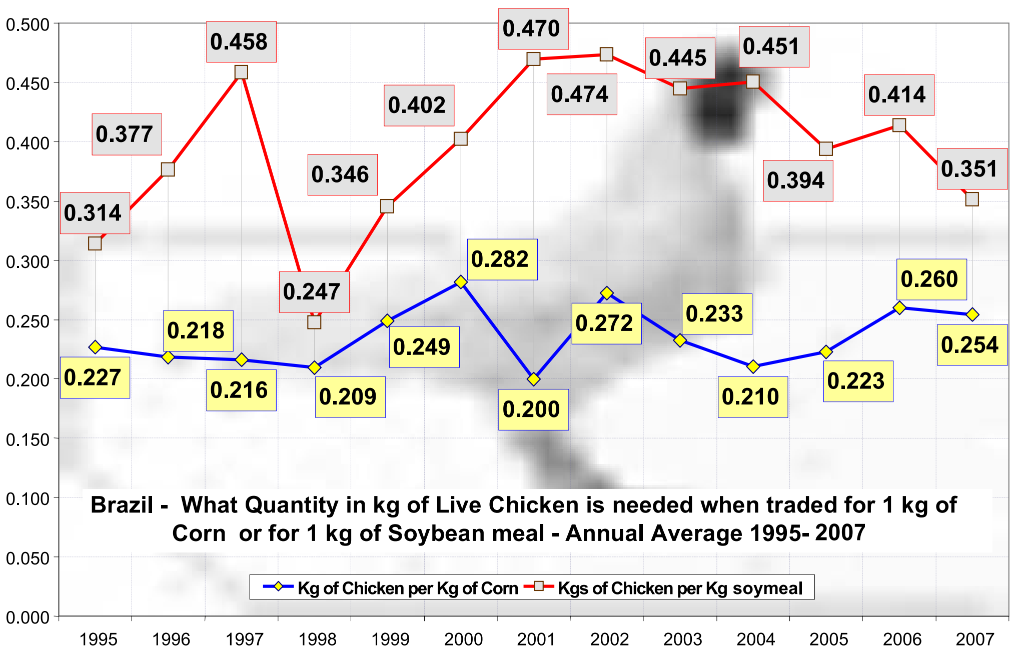
[1]Animals ready for slaughtering; [2]@ = 15 kg.

In terms of annual averages, the trade off between soybean meal and chicken ranges between the lowest and atypical value of 0.247 kg in 1998 and the highest value of 0.474 kg for 2002. The equivalent figures for maize are 0.209 kg for 1998 and 0.260 kg for 2006 (Figure 41). In terms of monthly prices for the same period, there were several peaks in which soybean meal prices surpassed 0.500 kg of chicken, with the record registered in April 2000 when it reached 0.727 kg of chicken. The record trade off for maize was in the same month, at 0.531 kg, but the figures for maize were less volatile than those for soy meal (Figure 42). Although the prices of both maize and soy meal increased during the months preceding the preparation of this paper, by the trade-off criteria they remain far from the peaks of the last decade.

This very simple instrument of comparison used and closely watched by the Brazilian poultry producers for decades proved to be extremely useful during Brazil's periods of high inflation rates and currency-exchange oscillations.

FIGURE 41

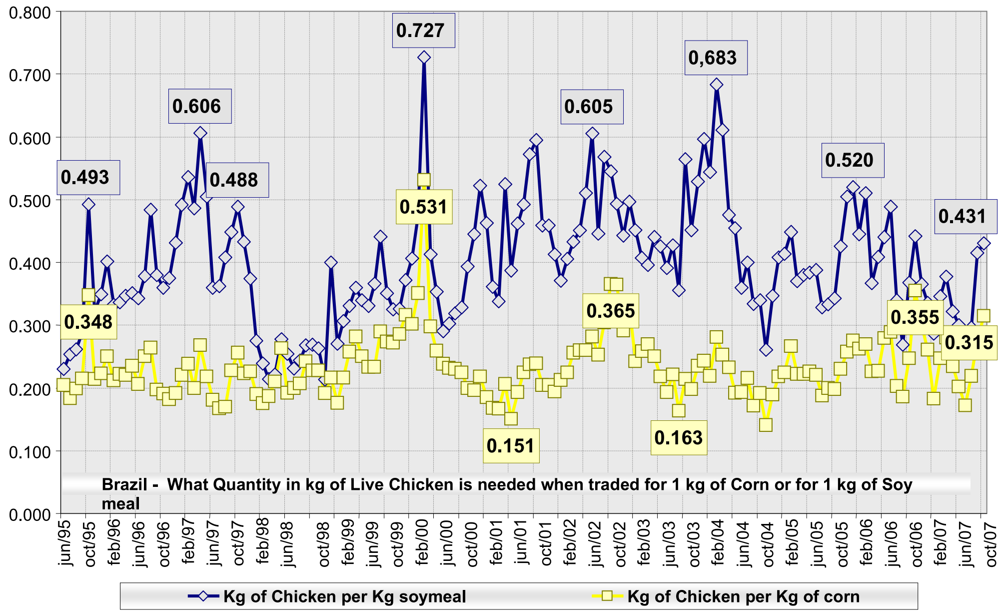
Price of live chicken relative to maize and soy meal (annual averages, 1995 to 2007)



Source: elaborated with data from JOX (www.jox.com.br).

FIGURE 42

Price of live chicken relative to maize and soy meal (monthly averages, 1995 to 2007)



Source: elaborated with data from JOX (www.jox.com.br).

2.5.7.Land prices

It is extremely difficult to give an indication of land prices, as figures vary according to land use, the characteristics of the soils, whether the land is prepared for planting, precipitation averages in the locality, proximity to urban centres, distance to major consumer markets and ports, and countless other criteria. Nonetheless, Table 58 presents the price range for agricultural land in Brazil based on data provided by a specialized institute. The average exchange rate to the US dollar was R$2.693 in January 2005 and R$ 2.5978 in February 2005.

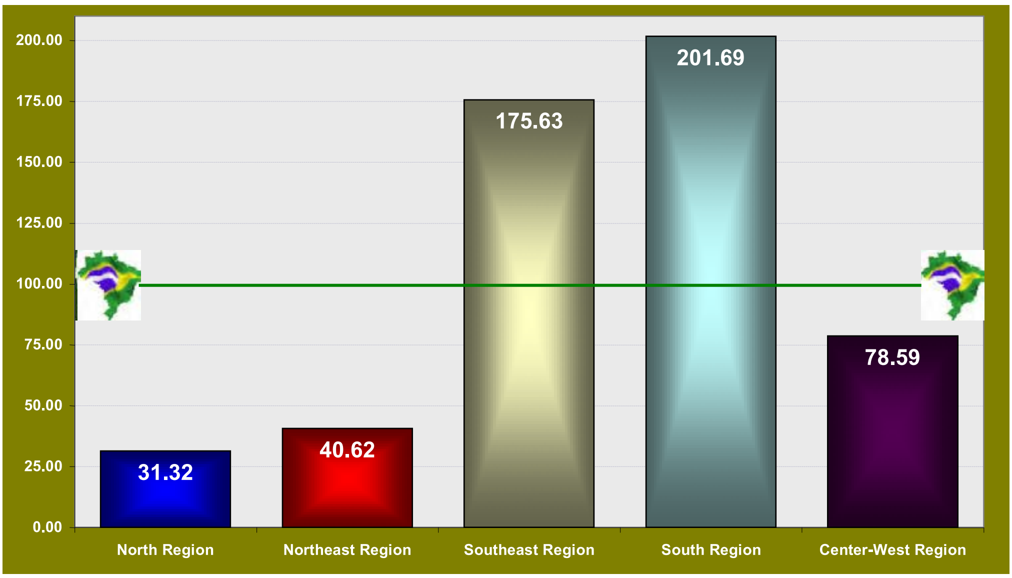
TABLE 53
Price of land in Brazil (R$/ha)

	Average	Maximum	Minimum
Brazil	**R$ 3 139.00**	**R$ 28 000.00**	**R$ 16.00**
North Region	**R$ 983.00**	**R$ 6 485.00**	**R$ 16.00**
Rondônia	R$ 2 372.00	R$ 6 485.00	R$ 186.00
Acre	R$ 433.00	R$ 1 337.00	R$ 30.00
Amazonas	R$ 220.00	R$ 918.00	R$ 34.00
Roraima	R$ 598.00	R$ 1 178.00	R$ 77.00
Pará	R$ 680.00	R$ 3 100.00	R$ 40.00
Amapá	R$ 129.00	R$ 373.00	R$ 16.00
Tocantins	R$ 1 308.00	R$ 3 500.00	R$ 145.00
Northeast Region	**R$ 1 275.00**	**R$ 12 977.00**	**R$ 30.00**
Maranhão	R$ 644.00	R$ 2 815.00	R$ 66.00
Piauí	R$ 493.00	R$ 2 111.00	R$ 45.00
Ceará	R$ 951.00	R$ 10 338.00	R$ 34.00
Rio Grande do Norte	R$ 932.00	R$ 5 439.00	R$ 44.00
Paraíba	R$ 915.00	R$ 3 625.00	R$ 124.00
Pernambuco	R$ 2 491.00	R$ 12 977.00	R$ 30.00
Alagoas	R$ 1 344.00	R$ 3 769.00	R$ 241.00
Sergipe	R$ 2 407.00	R$ 9 863.00	R$ 245.00
Bahia	R$ 1 730.00	R$ 8 575.00	R$ 69.00
Southeast Region	**R$ 5 513.00**	**R$ 21 694.00**	**R$ 72.00**
Minas Gerais	R$ 3 329.00	R$ 12 463.00	R$ 72.00
Espírito Santo	R$ 3 279.00	R$ 10 305.00	R$ 657.00
Rio de Janeiro	R$ 2 401.00	R$ 5 113.00	R$ 500.00
São Paulo	R$ 9 364.00	R$ 21 694.00	R$ 1 240.00
South Region	**R$ 6 331.00**	**R$ 28 000.00**	**R$ 369.00**
Paraná	R$ 6 709.00	R$ 16 116.00	R$ 369.00
Santa Catarina	R$ 6 373.00	R$ 28 000.00	R$ 1 428.00
Rio Grande do Sul	R$ 5 610.00	R$ 14 560.00	R$ 2 295.00
Center-West Region	**R$ 2 467.00**	**R$ 9 229.00**	**R$ 89.00**
Mato Grosso do Sul	R$ 1 967.00	R$ 7 205.00	R$ 158.00
Mato Grosso	R$ 2 864.00	R$ 9 229.00	R$ 89.00
Goiás e Distrito Federal	R$ 2 806.00	R$ 6 723.00	R$ 580.00

Sources: Instituto FNP (http://www.fnp.com.br/prodserv/relatorios/pdf/29.pdf).

Transforming the average prices in Table 58 into an index in which the national average represents 100, we can understand the migration of grain production towards the Centre-West Region. The lowest land prices are found in parts of the North Region, as a large part of it is covered by the Amazon Forest. The Northeast Region comes next in terms of low land prices, but it has a vast area with a semi-arid climate, shallow and stony soil, and erratic rainfall, which severely limit agriculture.

FIGURE 43
Land price index – geographical regions and states



Source: Instituto FNP (http://www.fnp.com.br/prodserv/relatorios/pdf/29.pdf).

The South Region has a strong agriculture, and this is reflected in land prices, although São Paulo State in the Southeast Region has the highest land prices in Brazil because of the strong presence of sugarcane, coffee and citrus-fruit plantations.

It is mostly from the South Region that farmers migrated to the Centre-West Region. The motor was not only the difference in land prices, but also the fact that yields were comparable to those obtained in the South. Tables 59 and 60 show the productivity levels of maize and soybeans in the different Brazilian regions.

TABLE 59

Regional comparison of maize production

	AREA (in thousand ha)		PRODUCTIVITY (in kg/ha)		PRODUCTION (in thousand t)	
	CROP 06/07 (a)	CROP 07/08 (b)	CROP 06/07 (c)	CROP 07/08 (d)	CROP 06/07 (e)	CROP 07/08 (f)
NORTH	564.5	575.5	2 202.0	2136.0	1 243.0	1 229.4
NORTHEAST	2 961.60	3 005.00	1 049.00	1 263.00	3 106.20	3 795.60
CENTRE-WEST	3 259.70	3 373.20	3 986.00	4 057.00	12 994.10	13 685.80
SOUTHEAST	2 404.60	2 332.70	4 306.00	4 431.00	10 353.20	10 336.60
SOUTH	4 864.50	4 983.30	4 867.00	4 670.00	23 673.40	23 272.60
NORTH/NORTHEAST	3 526.10	3 580.50	1 233.00	1 403.00	4 349.20	5 025.00
CENTRE-SOUTH	10 528.80	10 689.20	4 466.00	4 425.00	47 020.70	47 295.00
BRAZIL	14 054.90	14 269.70	3 655.00	3 667.00	51 369.90	52 320.00

Source: Conab.

TABLE 60

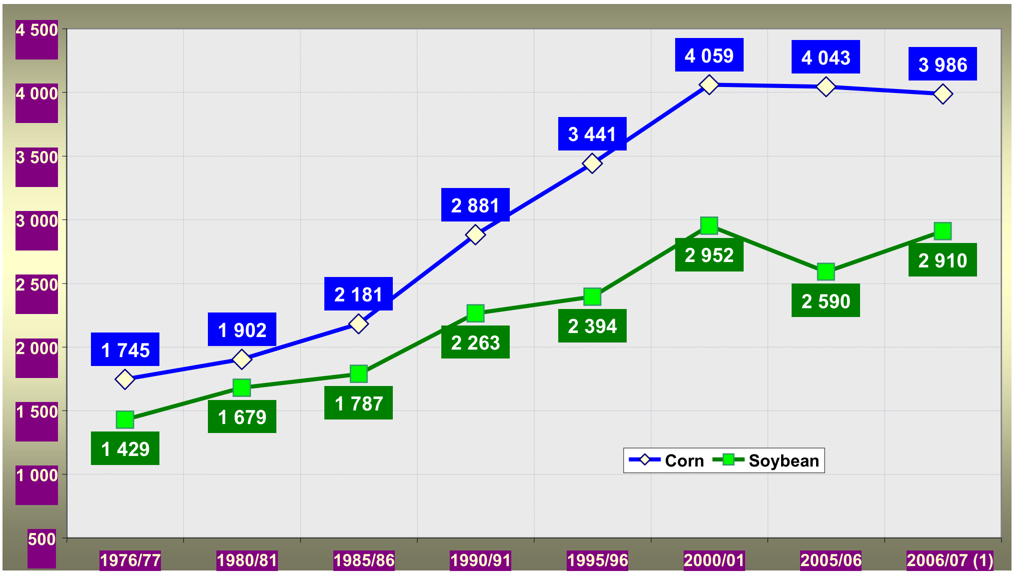
Regional comparison of soybean production

	AREA (in thousand ha)			PRODUCTIVITY (in kg/ha)			PRODUCTION (in thousand t)		
	CROP 06/07 (a)	CROP 07/08 (b)	VAR. % (b/a)	CROP 06/07 (c)	CROP 07/08 (d)	VAR. % (d/e)	CROP 06/07 (e)	CROP 07/08 (f)	VAR. % (f/e)
NORTH	410.6	430.2	4.77%	2 630.0	2637.0	0.27%	1 079.9	1 134.6	5.07%
NORTHEAST	1 454.90	1 553.10	6.75%	2 658.00	2 740.00	3.09%	3 867.20	4 256.00	10.05%
CENTRE-WEST	9 105.10	9 368.00	2.89%	2 910.00	2 954.00	1.51%	26 494.80	27 673.10	4.45%
SOUTHEAST	1 468.80	1 495.70	1.83%	2 727.00	2 727.00	0.00%	4 005.40	4 078.00	1.81%
SOUTH	8 247.40	8 111.60	-1.65%	2 782.00	2 585.00	-7.08%	22 944.50	20 968.90	-8.61%
NORTH/N.EAST	1 865.50	1 983.30	6.31%	2 652.00	2 150.00	-18.93%	4 947.10	5 390.60	8.96%
CENTRE-SOUTH	18 821.30	18 975.30	0.82%	2 840.00	2 778.00	-2.18%	53 444.70	52 720.00	-1.36%
BRAZIL	20 686.80	20 958.60	1.31%	2 823.00	2 773.00	-1.77%	58 391.80	58 110.60	-0.48%

Source: Conab.

The Centre-West Region has rising rates of productivity in maize and soybeans, as the "direct planting" or "zero-tillage" system, which enhances productivity as organic matter accumulates in the soil, is widely used. As the Centre-West accounts for most of Brazil's reserves of agricultural land, the movement of agricultural production towards the centre should continue in the coming decades.

FIGURE 44
Maize and soybean productivity in the Centre-West Region



Source: Conab.

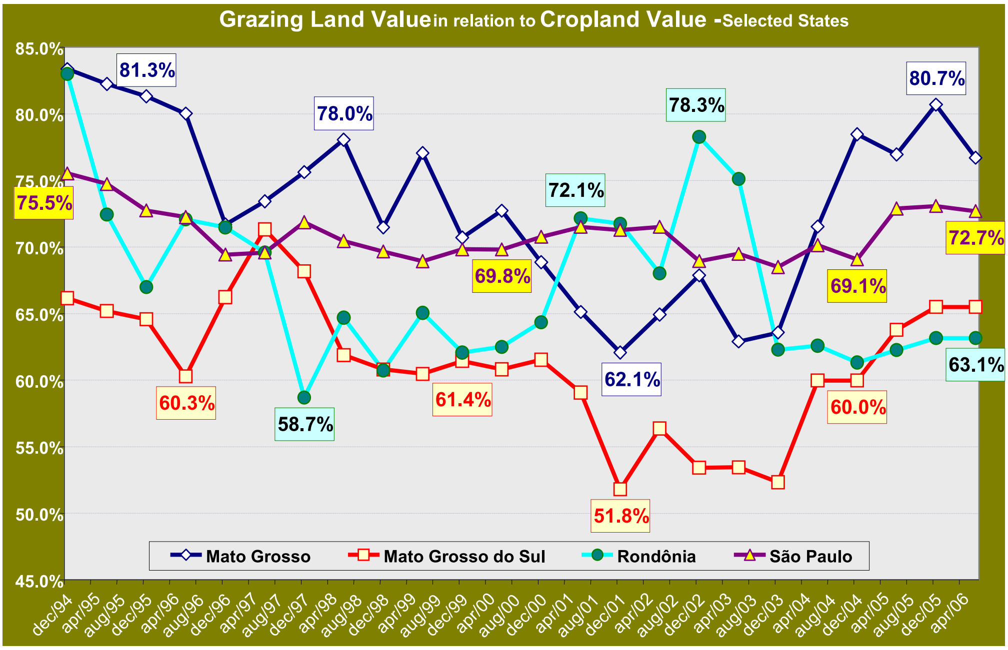
Table 61 presents the average prices of cropland in Brazil and in selected states from June 1995 to December 2005. Figure 45 presents a comparison of the price of cropland to that of grazing land in the same states during the period January 1994 to December 2006; it can be seen that grazing land is worth 50 percent to 80 percent of the value of cropland.

TABLE 61
Value of cropland – selected states

	Brasil R$/HA	Mato Grosso R$/HA	Mato Grosso do Sul R$/HA	Pará R$/HA	Rondônia R$/HA	São Paulo R$/HA	Average Monthly Rate R$/US$
Jun-95	1 742.00	698.00	1 628.00	369.00	562.00	3 935.00	R$ 0.913
Dec-95	1 477.00	610.00	1 281.00	298.00	648.00	3 440.00	R$ 0.968
Jun-96	1 345.08	574.48	1 228.58	364.51	456.69	2 799.82	R$ 1.00
Dec-97	1 289.37	582.90	1 053.26	268.14	405.93	2 625.96	R$ 1.113
Jun-00	1 575.09	680.99	1 322.71	364.05	589.17	2 983.81	R$ 1.808
Dec-00	1 667.46	796.12	1 407.32	366.89	645.72	3 268.30	R$ 1.963
Jun-01	1 893.29	1 050.82	1 848.73	350.70	741.54	3 710.87	R$ 2.376
Dec-02	2 774.86	1 523.45	2 964.05	402.84	810.29	5 397.04	R$ 3.626
Jun-03	3 354.86	1 925.98	3 633.65	428.75	873.48	6 520.32	R$ 2.883
Dec-03	3 886.59	2 183.71	4 504.86	406.85	1 058.29	7 446.98	R$ 2.925
Jun-05	4 604.53	2 517.31	4 456.34	554.25	1 413.00	8 998.46	R$ 2.414
Dec-05	4 687.84	2 563.93	4 456.34	557.21	1 393.00	9 332.50	R$ 2.286

Source: FGV.

FIGURE 45
Value of grazing land vs. cropland



Source: FGV.

Employment and wages in the poultry sector

Available statistics on labour and agriculture do not allow extent of the transfer of wages and labour to other sectors to be established. IBGE keeps several statistics on employment, such as: PPE (Monthly Research on Employment)[34] which monitors urban employment in the main metropolitan regions of the country; and Pesquisa Industrial Mensal de Emprego e Salário (Industry Monthly Research on Employment and Salaries)[35] which provides data on employment in the category "food and beverages", but does not separate meat or meat processing.

Data on agriculture and livestock employment are available from the Agricultural and Livestock Census[36] and in IBGE's annual research "Sistema de Contas Nacionais – Brasil 2000–2005" (System of National Accounts)[37]. Both provide information on the numbers employed in agriculture and livestock production; the latter also includes average incomes, but the occupation categories are not detailed.

TABLE 62

Employment and incomes in agriculture and the food industry)

Categories and activities	**Total Number of People Occupied**					
	2000	**2001**	**2002**	**2003**	**2004**	**2005**
Total	**78 972 347**	**79 544 414**	**82 629 067**	**84 034 981**	**88 252 473**	**90 905 673**
Agriculture and Livestock	***17 610 940***	***16 902 498***	***17 353 605***	***17 660 548***	***18 873 744***	***18 980 620***
- Agriculture, silviculture, forestry	12 160 942	11 680 935	11 997 589	12 251 005	13 040 725	13 094 054
- Livestock & Fishing	5 449 998	5 221 563	5 356 016	5 409 543	5 833 019	5 886 566
Industry	***15 401 694***	***15 302 635***	***15 850 088***	***16 002 247***	***17 067 388***	***18 194 779***
- Food & Beverages	1 639 696	1 675 455	1 695 397	1 836 412	2 031 041	2 203 042
Categories and activities	**Average Income (R$) (Salaries + other remunerations or income/occupation)**					
	2000	**2001**	**2002**	**2003**	**2004**	**2005**
Total	**R$ 6 489**	**R$ 7 014**	**R$ 7 478**	**R$ 8 428**	**R$ 8 914**	**R$ 9 702**
Agriculture and Livestock	***R$ 2 502***	***R$ 2 942***	***R$ 3 422***	***R$ 4 296***	***R$ 4 452***	***R$ 4 436***
- Agriculture, silviculture, forestry	R$ 2 182	R$ 2 600	R$ 3 202	R$ 4 066	R$ 4 219	R$ 3 957
- Livestock & Fishing	R$ 3 215	R$ 3 708	R$ 3 913	R$ 4 817	R$ 4 974	R$ 5 503
Industry	***R$ 7 450***	***R$ 7 978***	***R$ 8 506***	***R$ 9 555***	***R$ 10 336***	***R$ 11 109***
- Food & Beverages	R$ 6 530	R$ 6 782	R$ 7 322	R$ 8 217	R$ 8 867	R$ 9 382

Source: IBGE's annual research "Sistema de Contas Nacionais – Brasil 2000-2005" (System of National Accounts).

[34] Available at http://www.ibge.gov.br/home/estatistica/indicadores/trabalhoerendimento/pme_nova/default.shtm

[35] Available at http://www.ibge.gov.br/home/estatistica/indicadores/industria/pimes/default.shtm
(http://www.ipea.gov.br/default.jsp) IPEADATA, Sinopse macroeconômica (Macroeconomic synopsis).

[36] Preliminary results for the 2006 Census are available at http://www.ibge.gov.br/home/estatistica/economia/agropecuaria/censoagro/2006/default.shtm
Complete results for the 1995/1996 Census are available at http://www.ibge.gov.br/home/estatistica/economia/agropecuaria/censoagro/1995_1996/default.shtm

[37] http://www.ibge.gov.br/home/estatistica/economia/contasnacionais/referencia2000/2005/default.shtm

Another difficulty is that of all people working on farms, 75.9 percent in 1996 and 78.3 percent in 2006 had family bonds with the rural producer. In addition, agricultural censuses in Brazil only reveal the number of rural properties were poultry was present, without clarifying whether other agricultural activities or other livestock are also present, which is the majority of cases. It is thus not possible to establish how much poultry contributed to the income generated by the farm.

TABLE 63
Number of farms and farm population

Brazil		1996	2006
# of Agricultural and Livestock Establishments	(units)	4 859 864	5 204 130
People occupied at Agricultural and Livestock Establishments	(persons)	17 930 853	16 367 633
With family bonds with the rural producer	(persons)	13 607 876	12 810 591
	(%)	75.9%	78.3%
Without family bonds with the rural producer	(persons)	4 322 977	3 557 042
	(%)	24.1%	21.7%

Sources: Instituto FNP (http://www.fnp.com.br/prodserv/relatorios/pdf/29.pdf).

3 THE FUTURE

MAPA has just issued its forecast for Brazilian agriculture up to 2017/2018. It is based on projections by OECD-FAO and the Food and Agricultural Policy Research Institute (FAPRI) for the world economic outlook and the prospects for food and agriculture. As far as quantity is concerned, compared to FAPRI's figures, MAPA is more optimistic in its projections for maize, but extremely conservative for soy.

For the meat segment, MAPA figures surpass both OECD-FAO and FAPRI figures for bovine and broiler meats and are more moderate for pork. MAPA's projections[38] are shown in Tables 64 to 68.

TABLE 64
Brazil – maize projections to 2018

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Production	51.06	48.32	49.90	51.48	53.06	54.64	56.22	57.80	59.38	60.96	62.54	64.12
Exports	7.50	6.27	6.85	7.43	8.00	8.58	9.16	9.74	10.31	10.89	11.47	12.04
Domestic Consumption	39.50	40.38	40.88	41.96	42.71	43.57	44.43	45.25	46.11	46.95	47.79	48.64

TABLE 65
Brazil – soybean projections to 2018

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Production	57.55	59.17	60.79	62.40	64.02	65.64	67.26	68.88	70.49	72.11	73.73	75.35
Exports	25.20	26.11	27.03	27.94	28.85	29.77	30.68	31.59	32.51	33.42	34.33	35.25
Domestic Consumption	31.70	32.36	33.02	33.67	34.33	34.99	35.65	36.30	36.96	37.62	38.28	38.94

[38] MAPA – Projeções do Agronegócio Mundial e Brasil 2006/07 a 2017/06, Brasília, January 2008.

TABLE 66
Brazil – bovine meat projections to 2018

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Production	10.63	10.93	11.24	11.54	11.85	12.15	12.46	12.76	13.06	13.37	13.67	13.98
Exports	2.27	2.44	2.65	2.85	3.05	3.25	3.46	3.66	3.86	4.07	4.27	4.47
Domestic Consumption	8.39	8.61	8.84	9.06	9.28	9.50	9.73	9.95	10.17	10.40	10.62	10.84

TABLE 67
Brazil – pork projections to 2018

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Production	2.97	3.08	3.16	3.23	3.30	3.36	3.42	3.48	3.54	3.60	3.66	3.72
Exports	0.50	0.60	0.64	0.68	0.71	0.75	0.79	0.82	0.86	0.90	0.93	0.97
Domestic Consumption	2.48	2.49	2.56	2.62	2.68	2.75	2.81	2.88	2.94	3.01	3.07	3.14

TABLE 68
Brazil – broiler meat projections to 2018

Year	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Production	9.82	10.47	10.86	11.25	11.69	12.11	12.51	12.90	13.29	13.67	14.05	14.41
Exports	2.98	3.15	3.31	3.46	3.60	3.73	3.87	3.99	4.11	4.23	4.35	4.47
Domestic Consumption	6.84	7.17	7.45	7.72	8.00	8.27	8.55	8.82	9.10	9.38	9.65	9.93

Projections are not meant to be precise to the gram or the cent, but are useful to identify tendencies. From this point of view, MAPA's projections coincide with our view that:

- Both agricultural and livestock production in Brazil will continue to grow in the coming decade. Brazil has the land, the water, the photosynthesis, the grains, the tradition of livestock production, and the know-how. It is an important international player; livestock products are one of the sources of wealth in this country.
- Feed grains will show particular dynamism even though sugarcane production will advance at the expense of grain in the Centre-West Region. Sugarcane is today the most profitable crop in Brazil, and consequently the price of land in the State of São Paulo, the major sugarcane producer, is skyrocketing. It is, thus, inevitable that sugarcane entrepreneurs expand the plantations into neighbouring states that have more affordable land, such as those in Centre-West Region. This is the natural direction of expansion for the São Paulo alcohol and sugar industry.
- Export will continue to be one of the main drivers of growth in meat production, but domestic demand will keep pace, thanks to the increasing purchasing power of the Brazilian population and the reduction of income disparity.
- Chicken will be the meat most consumed in the domestic market, but poultry will continue to depend on the international market to absorb 30 percent of production. As a consequence, the concerns of developed-country consumers – food safety, ethics, environmental and social impacts, and animal welfare – cannot be ignored. It is up to the industry to ensure that requirements emanating from Northern Hemisphere countries are adapted to local conditions.
- Animal health is the major challenge.
- The sustainability tripod – economic value, social value and environmental value – is the roadmap to the future. Otherwise, the road leads to extinction.
- Climate change is no longer a hypothesis. It is a fact today, and has huge potential to affect agriculture and human life all over the planet. A 3 °C average increase in the world temperature would be enough to change the geography the world's agricultural production.

Of course, there are reasons for prudence and concern about the future. Although in the short term, there is a preoccupation with the grain situation, we believe that animal diseases and climate change are greater challenges for the future.

Animal disease outbreaks affect poultry meat demand and the normal course of trade, as demonstrated during the HPAI episodes of 2004 and 2006. On the positive side, demand recovered rapidly in the following years.

Climate change is more worrying because it is actually occurring. However, its potential impact on agriculture and livestock has not yet been fully studied. Researchers are ringing alarm bells and warning that it may change the geography world of production, but as yet studies are do not permit global conclusions or the forecasting of quantified scenarios.

Under the conditions existing today, we would affirm that photosynthesis-, water- and land-rich countries should prevail as poultry-meat exporters in the future. Brazil is among them and there are not that many.

3.1 SWOT analysis

On the basis of the facts presented above, we offer an assessment of the future perspectives for the agribusiness sector, of which the poultry industry is an increasingly important segment. We have opted for a SWOT (strengths, weaknesses, opportunities, threats) analysis with the intention that the assessment be as neutral as possible.

Strengths

We expect the progress of Brazil's agricultural and livestock production sectors to continue. Agriculture is photosynthesis + water + arable land, and Brazil has them in abundance. Most of the countries that will be the centres of future demand do not have enough water, or arable land, to support a shift from economic vegetarianism to increased meat intake. Brazil is in position to continuously increase its exportable poultry-meat surplus. It develops science and technology adapted to local production conditions. The country has aggressive entrepreneurs and reinvestments are the rule.

Weaknesses

Inflation control and economic stability reduce the level of public investments and create problems, such as:

- lack of investment in infrastructure, above all in logistics (warehousing, transport and ports) and energy;
- insufficient investment in technology and tropical agricultural research to match the country's agribusiness growth and potential;
- insufficient investment in the plant and animal health services needed to constantly improve official veterinary inspection and ensure products and production systems that meet the safety demands of both domestic and international markets; and
- the low bargain power of the country at international level.

Opportunities

The country's natural conditions for livestock production will attract more and more foreign poultry companies, whose global competitiveness will require production platforms in Brazil and a presence in the fourth largest chicken-meat market in the world, which has the capacity to complement exports by absorbing all the parts of the chicken. Consequently, foreign investments are to be expected in the Brazilian poultry sector in the future, generating additional value for the industry and creating new potential for expansion.

Brazilian poultry companies will have to excel to survive, because in the coming decades the concentration of the poultry industry will be in the hands of global food companies and not merely poultry companies. Nothing, however, precludes Brazilian companies from challenging as global players.

Threats

Developing countries' exports bear the brunt of developed-country protectionism, which includes pseudo-sanitary barriers, rapid closing of borders in the event of disease episodes, intentional slowness in re-opening markets even when the World Organisation of Animal

Health (OIE) declares the episode closed, and other forms of protectionism based on sanitary claims.

Another major threat is animal disease and the spread of HPAI, resulting in closed borders if Brazil is directly affected or falls in demand due to health fears about poultry products among consumers in affected countries. If Brazil experiences an episode of HPAI, it will immediately lose 60 percent of its exports and production will undoubtedly be reduced. Protectionists will seek to postpone indefinitely the return of Brazilian exports to their territories. In such circumstances, world poultry supply would, however, be severely affected, perhaps meaning that the length of import bans would be based on science rather than protectionism.

Climate change may affect the geography of food production. A 4 °C increase in temperature would be mean that most of agricultural Brazil would no longer lie within the zone of agriculturally friendly temperatures that now predominate in the country. Changes in rainfall frequency would threaten Brazil's largely rainfed grain production and the country's wealth of renewable water resources.

A poultry industry that relies on the international market for 30 percent of its output would inevitably be affected by an international economic crisis affecting demand and growth in several of the world's new centres of demand.

3.2 Homework[39]

The Brazilian poultry industry has very good production coefficients. The figures shown in Table 69 represent the average for the country and not the benchmarks, some of which are already monitoring "age to slaughtering" in terms of days and hours.

TABLE 69
Evolution of chicken production coefficients in Brazil

Year	Live bird weight (g)	Feed Conversion	Age to slaughtering - weeks/days
1930	1 500	3.50	15 weeks
1940	1 550	3.00	14 weeks
1950	1 580	2.50	10 weeks
1960	1 600	2.25	8 weeks
1970	1 700	2.15	7 weeks
1980	1 800	2.05	7 weeks
1984	1 860	2.00	47 days
1988	1 940	2.00	47 days
1994	2 050	1.98	45 days
1998	2 150	1.95	45 days
2000	2 250	1.88	43 days
2001	2 300	1.85	42 days
2002	2 300	1.83	42 days
2003	2 350	1.88	43 days
2004	2 390	1.83	43 days
2005	2 300	1.82	42 days
2006	2 340	1.85	43 days
2007	2 450	1.85	44 days

Sources: MAPA – Projeções do Agronegócio Mundial e Brasil 2006/07 a 2017/06, Brasília, January 2008.

[38] Things, tasks, missions, points, etc, that require work, attention or priority from the Brazilian poultry sector or from the Brazilian authorities. "Homework" refers to the fact that it is up to the Brazilians to do it.

Progress will continue. In the coming 20 years or less, feed conversion rate should be around 1.40 for a bird that reaches 2 450 grams in less than 39 days. Nonetheless, even in the distant future, birds will not eat zero grams and be ready in 24 hours. To keep its benchmark competitiveness in the coming 20 years, the Brazilian poultry industry will have to monitor new coefficients, such as "water conversion", "kilometres travelled per kg of meat or dozen eggs", "energy self-sufficiency index", "percent of live weight commercially used, besides meat", "income from by-products and waste" and "ZERI (Zero Emissions Research and Initiatives) index". In an industry marked by progressive margin reduction, entrepreneurial Darwinism still prevails.

Ongoing support to neutral and professionally managed associations – ensuring the "hunt in a pack" and "defend in a pack" approach – will be essential. Otherwise, protectionism by developed countries, either in its crude form or in the guise of noble purposes, will take its toll. It will be the task of associations to scientifically debate the issue of animal welfare adapted to local conditions, as breeding a bird in a European environment and climate is totally different of doing it under tropical conditions. The associations have to ensure that public budget cuts do not jeopardize official or joint animal health and sanitary protection programmes. Strong and professional associations are able to promote cooperation between farmers, researchers, university lecturers and professors, private corporations, and public agents to ensure poultry science and technology adapted to the country's environment.

4 SMALLHOLDERS

According to the preliminary results of the 2006 Agricultural and Livestock Census, rural properties in Brazil numbered 5.2 million and occupied 354.9 million hectares – an average size of 68.2 ha per property.

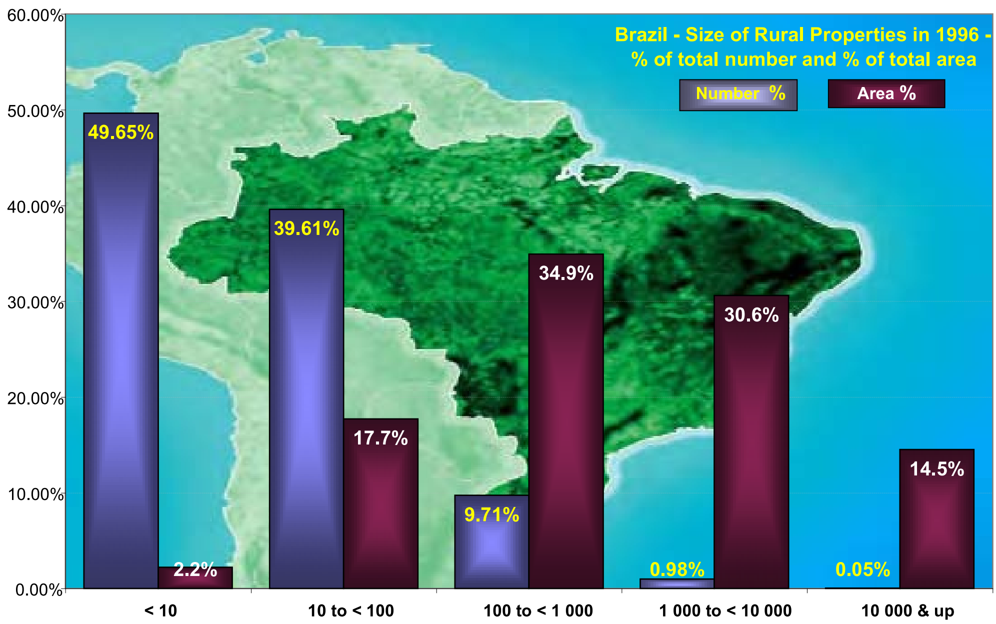
TABLE 70
Number and area of rural properties (1970 to 2006 censuses)

Structural Data	Agriculture and Livestock Census					
	1970	1975	1980	1985	1995	2006
Properties	4 924 019	4 993 252	5 159 851	5 801 809	4 859 865	5 204 130
Total area (ha)	294 145 466	323 896 082	364 854 421	37 4924 929	35 361 1246	354 865 534
Average area (ha)	59.74	64.87	70.71	64.62	72.76	68.19

Source: IBGE Agriculture and Livestock Censuses (http://www.ibge.gov.br/home/estatistica/economia/agropecuaria/censoagro/2006/default.shtm).

Data from the 1995/1996 census revealed that 49.6 percent of the rural properties in Brazil were below 10 ha. Although numerous, these properties occupied a mere 2.2 percent of the total agricultural area. Figure 46 details these percentages for each size category of rural property.

FIGURE 46
Number and area of rural properties (1996 census)



Source: IBGE Agriculture and Livestock Censuses (http://www.ibge.gov.br/home/estatistica/economia/agropecuaria/censoagro/2006/default.shtm)

Smallholders participate in the poultry sector as integrated farmers, who account for 85 percent of Brazilian chicken-meat production and 100 percent of turkey-meat production. In the South and Southeast Regions, smallholders with properties of less than 100 ha (in some areas less than 20 ha) made up the majority of integrated poultry farmers. In the Centre-West, bigger properties are involved in the vertical integration, many with several broiler houses, built with biosecurity measures that in the past were restricted to parent-stock farms. In commercial production of chickens for meat there is little space for independent smallholders. Table-egg production in Brazil is also carried out by companies or commercial operations.

Backyard production of both birds for meat and layers for eggs does exist, mainly in the interior and in regions where subsistence agriculture is strong, either because of their unsuitability for agriculture or remoteness. Brazil is promoting a policy of settling landless farmers, and not long ago one official agency distributed live birds so that the settlements could produce eggs and chicken meat for subsistence. Brazilian poultry associations alerted the authorities to the sanitary risk involved in such a policy of promoting backyard production. Concerns for the have-nots are not always the best allies of sanitary protection.

In countries where self-sufficiency or self-supply have not yet been achieved, smallholders play a fundamental role and will continue to do so. Ideally, they should organize themselves around cooperatives, associations, producers clubs or some other common structure, which would perform tasks that are difficult or unaffordable for the individual. Experience has shown that this is an extremely difficult task, as individualism is very hard to overcome and most farmers have had negative experiences with interactions outside their immediate circle of relations; they thus become suspicious and reserved with respect to collective organizations. Cases of mismanagement of cooperatives do not help to promote collective activities. Brazil has had its share of such stories, but many cooperatives from the South Region are, today, strong and efficient players in chicken meat production. Among the 30 largest chicken producers in Brazil, six are cooperatives, all of which operate under the vertical integration system. Apart from the cooperatives, there are a few successful "associations" for purchasing feed, but examples that go beyond this are the exception rather than the rule.

In the early days of Brazilian chicken-meat exports, five Brazilian companies formed a professionally managed "union" to handle exports, which lasted for a decade. More recently, small- and medium-scale chicken producers in the State of Paraná have organized a similar structure to handle their exports.

In countries where modern poultry industries prevail, the space left for smallholders to act independently is minimal and in those where exports are crucial, the possibility for the survival of the independent smallholder is almost negligible. Supplying sophisticated markets implies controls and procedures that any smallholder would find impossible to implement without the support of an integrator or a major company.

A current saying in the industry is that GMP nowadays means "give more paper". Auditors representing the clients or consumer organizations will not even inspect a production facility if the paper audit on procedures and controls is not satisfactory. How can an independent smallholder possibly provide full traceability on the grains and micro-elements used for feed or the full background of the parent stock that generated the day-old chicks that he or she is rearing? How can it realistically be expected that a smallholder would have the knowledge and the means to implement a HACCP programme? Or to keep up with the multitude of new regulations and impositions, which reproduce at a higher rate than the chickens?

Even medium-sized poultry companies sometimes quit exporting to particular markets because of the impossibility of coping with the rules, legal requirements and assurances demanded. Other companies, however, welcome such requirements because they reduce competition.

Official rules and market requirements will continue to multiply. During the 1960s and the 1970s, the poultry industry regarded the animal husbandry people as the masters of the trade, for it was they who could guarantee the hatching and survival of the birds. During the 1980s, nutrition and slaughterhouse professionals were to the fore. In the 1990s, the industry would look to marketing to reinvent the chicken on a daily basis, and to processing experts to transform dreams in products. By the late 1990s and early 2000s, it was quality assurance and regulatory affairs that were guiding the industry. Livestock managers will do what the rules and demands permit them to do; nutrition experts will formulate in accordance with the latest prohibition or market requirements; production will simply obey and marketing will no be longer chasing the consumer, but trying to anticipate the next demand the consumer will make.

Smallholders spend their lives monitoring the weather, their debts with the banks, the high prices of inputs and low prices of output, the latest production technique that extension personnel brought to their attention, or the modern equipment they have seen in a trade show and cannot afford. They will adapt their production procedures to what the integrator informs them is the new rule or market requirement. They have done this in the past and they will do so in the future, provided they are provided with the relevant information.

Farmers love to farm and to produce, and that this is what they do best. They have to be paid not to do so, as many examples from North Hemisphere have taught us. Integrated into a poultry chain, most of them will be able to continue farming rather than having to migrate to the city. In good years, they will dream about buying the property of a neighbour or a larger farmer in the new agricultural frontier. In bad years, they will accept that they have to hand back the financed tractor. However, unless someone explains to them, they will have a hard time understanding why clients are so worried about animal welfare. Are the farmers in the importing countries cruel to their animals? Do they not know that an ill-treated animal becomes stressed, does not eat properly and fails to gain weight?[40]

In countries favouring self-supply, smallholders will continue to play a part in poultry production. Nonetheless, poultry production is not only becoming “paper complex”, it is an activity that increasingly depends on science and technology for increasing its efficiency and its competitiveness. Human resources and knowledge are as essential to poultry production

[40] Free reproduction of a conversation with a number of integrated farmers during a conference on international markets in the south of Brazil.

as good feed and good genetic material. Add to that the teachings of Professor Vicente Falconi[41] that "international market includes the street where you live". In a global market, countries favouring self-supply are prone to have their markets disputed by international or global poultry companies. "Hunt in a pack" and "defend in a pack" for smallholders is not a philosophical option. It is a matter of survival.

[41] Professor Vicente Falconi Campos is the father of the total quality management revolution in Brazil in the late 1980s and early 1990s. Author of six books on management that have sold over one million copies, he is presently consultant to several of the largest Brazilian corporations. President Lula and five state governors belonging to four different political parties have drawn on his services. Called in by Minas Gerais State governor to manage the state finances in 2003, he took his native state from a budget deficit of 12 percent to a surplus of R$3 billion in 2006. He has a Ph.D. from the Colorado School of Mines (United States of America), and is professor emeritus of the Federal University of Minas Gerais, he was elected by the American Society for Quality as "One of the 21 voices for the 21st Century".

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ACRONYMS

ABEF – Associação Brasileira dos Produtores e Exportadores de Frango (Brazilian Chicken Producers and Exporters Association) – www.abef.com.br

ABIEC – Associação Brasileira das Indústrias Exportadoras de Carnes (Brazilian Association of Beef Meat Industry Exporters) – www.abiec.com.br

ABIPECS – Associação Brasileira da Indústria Produtora e Exportadora de Carne Suína (Brazilian Association of the Pork Meat Producer and Exporter Industry) – www.abipecs.org.br

ACAV – Associação de Criadores de Avestruzes (Ostrich Breeders Association)

AGE – Assessoria de Gestão Estratégica (Strategic Management Assessorship) – www.agricultura.gov.br

ALICE-WEB or simply ALICE – Análise das Informações de Comércio Exterior (Foreign Trade Information Analysis) – http://aliceweb.desenvolvimento.gov.br/default.asp

ANAB – Associação Nacional dos Abatedouros Avícolas (National Association of Poultry Slaughterhouses)

APA – Associação Paulista de Avicultura (São Paulo State Poultry Association) –www.apa.com.br

ApexBrasil – Brazilian Trade and Investment Promotion Agency – www.apexbrasil.com.br

APINCO – Associação Brasileira dos Produtores de Pinto de Corte (Association of One-Day Chicks Producers)

ASGAV – Associação Gaúcha de Avicultura (Rio Grande do Sul State Poultry Association)

BACEN – Banco Central do Brasil (Central Bank of Brazil) – www.bcb.gov.br

CGOE – Coordenação Geral de Organização para Exportação (General Coordination of Export Organization)

CNA – Confederação da Agricultura e Pecuária do Brasil (Brazilian Agricultural Confederation) – www.cna.org.br

CNPC – Conselho Nacional da Pecuária de Corte (National Beef Cattle Council) – www.cnpc.org.br

CONAB – Companhia Nacional de Abastecimento (National Company of Food Supply) – www.conab.gov.br

DDA – Departamento de Defesa Animal (Department of Animal Health)

DIPOA – Departamento de Inspeção de Produtos de Origem Animal (Department of Inspection of Products of Animal Origin)

DPI– Departamento de Promoção Internacional do Agronegocio (Agribusiness International Promotion Department)

EMBRAPA – Empresa Brasileira de Pesquisa Agropecuária (Brazilian Enterprise of Research on Agriculture and Livestock) – www.embrapa.br

EU – European Union

FAO – Food and Agriculture Organization of the United Nations

FAPRI – Food and Agricultural Policy Research Institute

FAS – Foreign Agriculture Service (of the USDA)

FGV – Fundação Getúlio Vargas (Getulio Vargas Foundation) – www.fgvdados.fgv.br

FOB – free on board

GMO – genetically modified organism

GMP – good management practices

GNP – gross national product

GPP – good production practices
HACCP – hazard analysis and critical control points
HDI – Human Development Index
HPAI – highly pathogenic avian influenza
IAA – Instituto do Açúcar e do Álcool (Sugar and Alcohol Institute)
IBGE - Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics) – www.ibge.gov.br
IBPT – Instituto Brasileira de Planejamento Tributário (Brazilian Institute for Fiscal Planning) – www.ibpt.com.br
IBRE – Instituto Brasileiro de Economia (Brazilian Institute of Economics) – www.ibre.fgv.br
ICMS – State-level tax on circulation of goods and services
IEA – Istituto di Econmia Agrícola (Agricultural Economy Institute) –http://www.iea.sp.gov.br/out/banco/menu.php
INPC – Índice Nacional De Preços Ao Consumidor (Consumer Price Index)
IPEA – Instituto de Pesquisa Econômica Aplicada (Research Institute of Applied Economics) – www.ipea.gov.br/default.jsp
MAPA – Ministério da Agricultura, Pecuária e Abastecimento (Ministry of Agriculture, Livestock and Food Supply) – www.agricultura.gov.br/
MDIC – Ministério do Desenvolvimento, Indústria e Comércio Exterior (Brazilian Ministry of Economic Development, Industry and Foreign Trade) – www.mdic.gov.br
PNAD – Pesquisa Nacional por Amostra de Domicílios (National Survey by Home Samples) – www.mpas.gov.br/docs/pdf/pnad.pdf
PNSA – Plano Nacional de Sanidade Avícola (National Plan of Poultry Animal Health)
POF – Pesquisa de Orçamentos Familiares (Family Budget Research) 2002–2003 conducted by IBGE
PPM – Pesquisa Pecuária Municipal (Municipal Livestock Research)
PSD – Production Supply and Distribution (database of USDA FAS)
OECD – Organisation for Economic Co-operation and Development
OIE – World Organisation for Animal Health
SDA – Secretaria de Defesa Agropecuária (Secretariat of Agricultural and Livestock Defense)
SECEX – Secretaria de Comércio Exterior (Secretary of Foreign Trade)
SIDRA – Sistema IBGE de Recuperação Automática (IBGE Automatic Data Recuperation System) – www.sidra.ibge.gov.br
SIF – Serviço de Inspeção Federal (Federal Inspection Service of the Ministry of Agriculture, Livestock and Food Supply)
SINDIRAÇÕES – Sindicato Nacional da Indústria de Alimentação Animal (Animal Feed Industry National Syndicate), www.sindiracoes.org.br
SISCOMEX – Sistema Integrado de Comércio Exterior (Foreign Trade Integrated System) – www.receita.fazenda.gov.br/legislacao/LegisAssunto/Siscomex
SOP – standard operating procedures
SRFMF – Secretaria da Receita Federal do Ministério da Fazenda (Secretary of Federal Income, Ministry of Finance) – www.fazenda.gov.br
SRI – Secretaria de Relações Internacionais do Agronegócio (Agribusiness International Relations Secretariat)

SWOT – strengths, weaknesses, opportunities, threats
UBA – União Brasileira de Avicultura (Brazilian Poultry Union) – www.uba.org.br
USDA – United States Department of Agriculture – www.usda.gov
ZERI – Zero Emissions Research and Initiatives

APPENDIX 1 - BRAZILIAN CHICKEN-MEAT BALANCE, ESTIMATED PER CAPITA CONSUMPTION AND WHOLESALE PRICES - 2005 TO 2007[1]

TABLE 1
Brazil's chicken/broiler-meat balance, 2005

Date	Brazilian Population persons	Per capita Consumption kg/inhabitant	Production (+) tonnes	Import (+) tonnes	Exports (+) tonnes	Domestic Availability tonnes	Average Domestic Monthly Price US$ p.kg Minimum	Average	Maximum	Estimated Total Value of Brazilian Domestic Market
Jan-05	182 722 318	3.05	745 388	154.0	187 916	557 626	$0.63	$0.66	$0.75	USD 367 931.52
Feb-05	182 936 346	2.92	749 577	22.0	215 646	533 953	$0.63	$0.67	$0.70	USD 357 733.77
Mar-05	183 150 455	2.69	724 312	47.0	231 871	492 488	$0.63	$0.65	$0.70	USD 320 086.65
Apr-05	183 364 645	2.73	733 864	37.0	232 916	500 985	$0.63	$0.66	$0.67	USD 330 625.68
May-05	183 578 916	2.81	755 295	26.0	239 144	516 177	$0.70	$0.72	$0.77	USD 371 628.72
Jun-05	183 793 267	2.91	778 370	18.0	244 421	533 967	$0.71	$0.72	$0.73	USD 384 443.28
Jul-05	184 007 699	2.84	784 176	46.0	261 558	522 664	$0.70	$0.73	$0.74	USD 381 511.14
Aug-05	184 222 212	2.89	797 926	24.0	265 442	532 508	$0.73	$0.79	$0.83	USD 420 662.36
Sep-05	184 436 805	3.05	817 582	48.0	255 028	562 602	$0.83	$0.88	$0.93	USD 495 047.52
Oct-05	184 651 478	3.04	821 715	47.0	259 764	561 998	$0.81	$0.86	$0.92	USD 483 277.86
Nov-05	184 866 232	3.37	830 220	24.0	206 589	623 655	$0.77	$0.84	$0.90	USD 523 850.04
Dec-05	185 081 066	3.23	842 705	57.0	245 650	597 112	$0.67	$0.76	$0.82	USD 453 761.80
Annual Total		35.53	9 381 130	550.0	2 845 945	6 535 735		Year Average		USD 4 890 560.34
Monthly Average		2.96	781 761	45.83	237 162	544 645		USD 0.75		USD 407 546.70
Growth % previous year		6.2%	10.4%	72.4%	17.4%	7.7%		19.20%		28.8%
		% over Production		0.006%	30.3%	69.7%				

[1] Production are data from UBA; export data from ABEF; import data from SECEX, ALICE, Ministry of Development, Industry and Foreign Trade (http://aliceweb.desenvolvimento.gov.br/); and price data from JOX Assessoria Agropecuária (http://www.jox.com.br).

TABLE 2
Brazil's chicken/broiler-meat balance, 2006

Date	Brazilian Population persons	Per capita Consumption kg/inhabitant	Production (+) tonnes	Import (+) tonnes	Exports (+) tonnes	Domestic Availability tonnes	Average Domestic Monthly Price US$ p.kg Minimum	Average	Maximum	Estimated Total Value of Brazilian Domestic Market
Jan-06	185 295 981	3.42	847 700	24.0	213 722	634 002	$0.59	$0.62	$0.66	USD 393 066.36
Feb-06	185 510 976	3.47	842 298	50.0	198 887	643 461	$0.61	$0.63	$0.64	USD 405 348.93
Mar-06	185 726 052	2.96	774 605	24.0	225 510	549 119	$0.46	$0.55	$0.64	USD 302 002.25
Apr-06	185 941 208	2.68	709 282	25.0	211 526	497 781	$0.53	$0.66	$0.74	USD 328 518.96
May-06	186 156 444	2.65	690 211	50.0	196 475	493 786	$0.57	$0.69	$0.80	USD 340 677.84
Jun-06	186 371 760	2.85	725 606	57.0	194 883	530 780	$0.59	$0.65	$0.71	USD 344 969.95
Jul-06	186 587 157	3.18	779 471	24.0	186 188	593 307	$0.54	$0.58	$0.62	USD 344 104.14
Aug-06	186 802 633	2.40	748 067	46.0	300 650	447 463	$0.59	$0.72	$0.78	USD 322 140.24
Sep-06	187 018 190	3.17	804 150	45.0	210 560	593 635	$0.77	$0.85	$0.89	USD 504 551.50
Oct-06	187 233 827	2.86	792 054	122.0	256 934	535 242	$0.87	$0.96	$1.08	USD 513 715.20
Nov-06	187 449 544	2.79	806 910	59.5	284 070	522 900	$0.78	$0.86	$0.92	USD 449 642.40
Dec-06	187 665 341	3.10	819 766	25.0	238 128	581 663	$0.78	$0.85	$0.94	USD 494 392.30
Annual Total		35.52	9 340 120	551.5	2 717 533	6 623 139		Year Average		USD 4 743 130.07
Monthly Average		2.96	778 343	46.0	226 461	551 928		USD 0.72		USD 395 260.84
Growth % previous year		-0.03%	-0.4%	0.3%	-4.5%	1.3%		-3.58%		-3.0%
		% over Production		0,006%	29,1%	70,9%				

TABLE 3
Brazil's chicken/broiler-meat balance, 2007

Date	Brazilian Population persons	Per capita Consumption kg/inhabitant	Production (+) tonnes	Import (+) tonnes	Exports (+) tonnes	Domestic Availability tonnes	Average Domestic Monthly Price US$ p.kg Minimum	Average	Maximum	Estimated Total Value of Brazilian Domestic Market
Jan-07	187 881 218	3.14	798 553	73.0	209 206	589 420	$0.75	$0.81	$0.94	USD 477 371.07
Feb-07	188 097 175	3.25	843 673	49.0	232 372	611 350	$0.89	$1.00	$1.03	USD 611 301.00
Mar-07	188 313 212	2.74	819 161	43.0	303 568	515 636	$0.77	$0.88	$0.99	USD 453 721.84
Apr-07	188 529 329	3.00	829 731	49.2	264 028	565 752	$0.88	$0.87	$0.98	USD 492 161.61
May-07	188 745 526	2.93	829 025	59.0	275 195	553 889	$0.81	$0.91	$1.04	USD 503 985.30
Jun-07	188 961 803	3.15	854 860	43.0	259 319	595 584	$0.89	$1.00	$1.06	USD 595 541.00
Jul-07	189 178 159	2.93	837 967	71.0	284 002	554 036	$1.00	$1.06	$1.14	USD 587 202.90
Aug-07	189 394 595	2.88	850 181	83.0	304 735	545 529	$0.99	$1.08	$1.15	USD 589 081.68
Sep-07	189 611 111	3.36	879 143	66.0	242 146	637 063	$1.06	$1.21	$1.23	USD 770 766.37
Oct-07	189 827 707	2.94	871 096	105.0	313 372	557 829	$1.12	$1.19	$1.26	USD 663 691.56
Nov-07	190 044 383	3.30	926 824	62.0	298 902	627 984	$1.23	$1.30	$1.38	USD 816 298.60
Dec-07	190 261 138	3.19	906 053	122.8	299 929	606 247	$1.25	$1.30	$1.39	USD 787 961.20
Annual Total		36.54	10 246 267	826.1	3 286 774	6 960 319		Year Average		USD 7 349 084.13
Monthly Average		3.05	853 856	69	273 898	580 027		USD 1.05		USD 612 423.68
Growth % previous year		2.9%	9.70%	49.78%	20.95%	5.09%		46.29%		54.9%
		% over Production		0,008%	32,1%	67,9%				

APPENDIX 2. BRAZILIAN REGIONS
North Region

FIGURE 1
North Region
Population: 14 750 385= 08.0% of Brazil (2005)
Total Area: 3 853 327 km²

State	Code	Area (Km2)	POPULATION
Rondônia	RO	152 581	1 538 831
Acre	AC	142 815	648 235
Amazonas	AM	1 570 746	3 269 876
Roraima	RR	1 247 690	393 253
Pará	PA	237 576	6 992 067
Amapá	AP	224 299	598 089
Tocantins	TO	277 621	1 310 034

Source: official area is from IBGE's Geosciences. Population from the Pesquisa Nacional por Amostra de Domicílios – PNAD (Domicile Sample National Research) 2005–2006.

TABLE 1

Monthly average income of working people aged above 10 years in North Region and its federal States, 2005

	Reais - R$	US$	Euro - €
Brazil	**R$ 800.80**	**$ 328.84**	**266.64**
North Region	R$ 642.40	$ 263.80	213.90
Rondônia	R$ 831.40	$ 341.41	276.83
Acre	R$ 680.70	$ 279.53	226.65
Amazonas	R$ 659.70	$ 270.90	219.66
Roraima	R$ 642.40	$ 263.80	213.90
Pará	R$ 581.80	$ 238.91	193.72
Belém Metropolitan Region	R$ 651.20	$ 267.41	216.83
Amapá	R$ 818.00	$ 335.91	272.37
Tocantins	R$ 601.00	$ 246.80	200.12

Sources: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 2

Active population and its distribution (percentage) by type of economic activity – North Region and its federal states, 2005

2005 – Active Population and Occupation per Group of Activity %	Total Active Population	Agriculture	Industry	Civil Construction	Trade	Services	Other
Brazil	**87 089 976**	**20.5**	**14.9**	**6.5**	**17.8**	**33.3**	**6.8**
North Region	6 585 422	23.4	14.9	6.7	18.1	32.4	3.8
Rondônia	768 226	37.9	11.7	4.8	14.2	28.4	2.9
Acre	277 562	31.3	8.2	5.0	15.0	37.5	3.1
Amazonas	1 367 312	20.4	14.2	6.4	19.3	34.9	4.7
Roraima	174 583	29.2	6.6	7.0	15.6	38.2	3.5
Pará	3 114 063	18.4	19.1	7.4	19.5	30.7	3.5
Amapá	230 994	9.2	8.4	9.0	21.3	45.7	6.1
Tocantins	652 682	36.4	6.9	6.5	14.6	31.8	3.8%

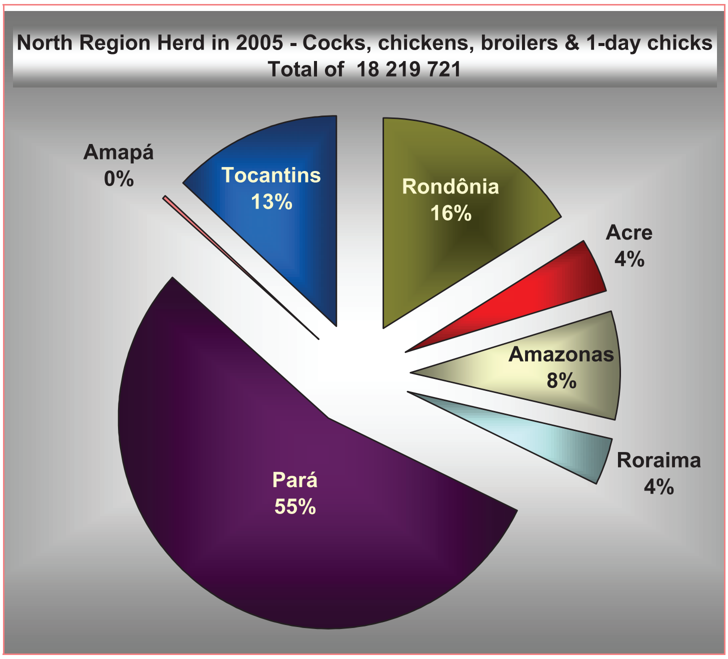
Source: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 3
Herd size – North Region and its federal states, 2005

Year 2005	Bovine	Swine	Layers Hens	Cocks, chickens, broilers & 1-day chicks	Buffaloes	Ovine & Caprine	Horses & Asses Mules	Other
Brazil	**207 156 696**	**34 063 934**	**186 573 334**	**812 467 900**	**1 173 629**	**25 894 763**	**8 367 447**	**7 141 407**
North Region	41 489 001	2 100 033	9 255 563	18 219 721	728 004	636 206	903 677	85 772
% of the Region/Brazil	20.0%	6.2%	5.0%	2.2%	62.0%	2.5%	10.8%	1.2%
Rondônia	11 349 452	308 406	1 442 062	2 954 770	6 457	115 706	177 852	0
Acre	2 313 185	151 073	427 903	722 181	2 421	53 932	40 675	8 846
Amazonas	1 197 171	290 410	2 406 616	1 527 537	49 891	81 937	13 188	17 097
Roraima	507 000	88 000	560 000	648 000	280	9 930	28 100	0
Pará	18 063 669	1 015 415	3 215 121	9 918 115	466 210	283 338	415 826	44 796
Amapá	96 599	22 248	3 222	46 515	193 485	2 938	6 083	0
Tocantins	7 961 926	224 481	1 200 639	2 402 603	9 260	88 425	221 953	15 033

Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

FIGURE 2
North region chicken flock in 2005 by state



Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

Northeast Region

FIGURE 3
Northeast Region
Population: 51 114 218= 27.7% of Brazil (2005)
Total Area: 1 554 257 km²

State	Code	Area (Km2)	POPULATION
Maranhão	MA	331 983	6 116 424
Piauí	PI	251 529	3 011 627
Ceará	CE	148 826	8 116 599
Rio Grande do Norte	RN	52 797	3 009 648
Paraíba	PB	56 440	3 600 290
Pernambuco	PE	98 312	8 427 944
Alagoas	AL	27 768	3 021 515
Sergipe	SE	21 910	1 973 103
Bahia	BA	564 693	13 837 068

Source: official area is from IBGE's Geosciences. Population from the Pesquisa Nacional por Amostra de Domicílios – PNAD (Domicile Sample National Research) 2005–2006.

TABLE 4

Monthly average income of working people aged above 10 years in Northeast Region and its federal states, 2005

	Reais - R$	US$	Euro - €
Brazil	**R$ 800.80**	**$ 328.84**	**266.64**
Northeast Region	R$ 490.40	$ 201.38	163.29
Maranhão	R$ 396.80	$ 162.94	132.12
Piauí	R$ 412.50	$ 169.39	137.35
Ceará	R$ 467.50	$ 191.98	155.66
Fortaleza Metropolitan Region	R$ 659.30	$ 270.74	219.53
Rio Grande Do Norte	R$ 607.00	$ 249.26	202.11
Paraíba	R$ 524.40	$ 215.34	174.61
Pernambuco	R$ 543.90	$ 223.35	181.10
Recife Metropolitan Region	R$ 751.60	$ 308.64	250.26
Alagoas	R$ 474.40	$ 194.81	157.96
Sergipe	R$ 541.10	$ 222.20	180.17
Bahia	R$ 492.30	$ 202.16	163.92
Salvador Metropolitan Region	R$ 728.30	$ 299.07	242.50

Sources: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 5

Active population and its distribution (percentage) by type of economic activity – Northeast Region and its federal states, 2005

2005 – Active Population and Occupation per Group of Activity %	Total Active Population	Agriculture	Industry	Civil Construction	Trade	Services	Other
Brazil	**87 089 976**	**20.5**	**14.9**	**6.5**	**17.8**	**33.3**	**6.8**
North Region	23 182 157	36.1	9.7	5.4	15.8	28.7	4.0
Maranhão	2 852 853	42.9	6.9	5.7	17.9	24.0	2.4
Piauí	1 543 303	50.0	7.2	3.8	12.2	24.9	1.8
Ceará	3 772 695	32.0	15.6	5.1	16.1	26.6	4.4
Rio Grande Do Norte	1 257 866	23.2	12.0	7.0	19.4	34.5	3.7
Paraíba	1 608 670	31.6	10.7	4.2	15.7	33.1	4.0
Pernambuco	3 622 900	31.3	9.7	5.2	17.1	30.6	5.4
Alagoas	1 211 169	43.0	6.4	5.1	14.6	28.1	2.7
Sergipe	898 801	26.2	10.4	5.0	19.9	33.1	5.3
Bahia	6 413 900	38.4	8.1	5.9	13.9	29.2	4.3

Source: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 6

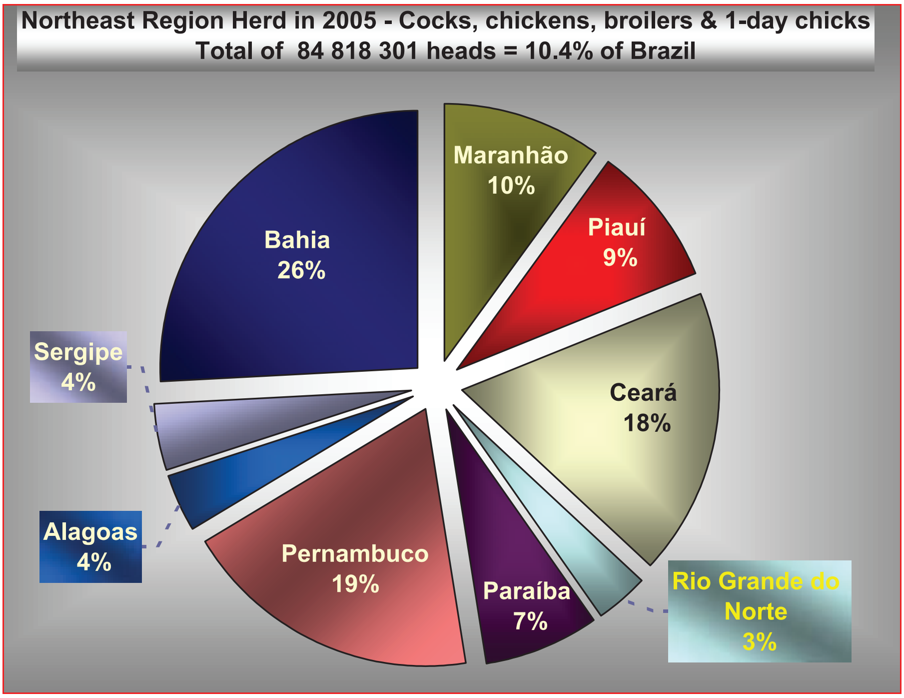
Herd size – Northeast Region and its federal states, 2005

Year 2005	Bovine	Swine	Layers Hens	Cocks, chickens, broilers & 1-day chicks	Buffaloes	Ovine & Caprine	Horses & Asses Mules	Other
Brazil	**207 156 696**	**34 063 934**	**186 573 334**	**812 467 900**	**1 173 629**	**25 894 763**	**8 367 447**	**7 141 407**
North Region	26 969 286	7 090 085	39 883 815	84 818 301	121 662	18 652 578	3 199 435	1 176 363
% of the Region/Brazil	13.0%	20.8%	21.4%	10.4%	10.4%	72.0%	38.2%	16.5%
Maranhão	6 448 948	1 666 063	3 096 996	8 368 394	79 915	621 496	408 110	25 689
Piauí	1 826 833	1 355 070	2 540 529	7 599 507	542	2 901 229	395 944	22 900
Ceará	2 299 233	1 089 530	6 751 617	15 367 090	1 186	2 840 816	422 173	66 904
RioGrande Do Norte	978 494	169 100	2 247 523	2 906 662	485	929 710	126 413	56 555
Paraíba	1 052 613	144 501	2 104 899	6 146 814	1 637	1 068 893	127 340	60 234
Pernambuco	1 909 468	436 857	7 681 443	15 882 854	17 353	2 668 625	280 501	462 938
Alagoas	985 422	127 781	1 650 123	3 038 943	1 818	271 183	88 113	117 972
Sergipe	1 005 177	107 722	1 460 918	3 536 628	387	170 345	97 766	19 225
Bahia	10 463 098	1 993 461	12 349 767	21 971 407	18 339	7 180 281	1 253 076	343 946

Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

FIGURE 4

Northeast Region chicken flock in 2005, by state



Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

Southeast Region

FIGURE 5
Southeast Region Population: 78 647 648= 42.6% of Brazil (2005)
Total Area: 924 511 km²

State	Code	Area (Km2)	POPULATION
Minas Gerais	MG	586 528	19 276 468
Espírito Santo	ES	46 078	3 417 382
Rio de Janeiro	RJ	43 696	15 412 167
São Paulo	SP	248 209	40 541 631

Source: official area is from IBGE's Geosciences. Population from the Pesquisa Nacional por Amostra de Domicílios – PNAD (Domicile Sample National Research) 2005–2006.

TABLE 7

Monthly average income of working people aged above 10 years in Southeast Region and its federal states, 2005

	Reais - R$	US$	Euro - €
Brazil	**R$ 800.80**	**$ 328.84**	**266.64**
Southeast Region	R$ 935.90	$ 384.32	311.63
Minas Gerais	R$ 693.50	$ 284.68	230.92
Belo Horizonte Metropolitan Region	R$ 902.80	$ 370.73	300.61
Espírito Santo	R$ 735.30	$ 301.95	244.83
Rio de Janeiro	R$ 940.00	$ 389.70	315.99
Rio de Janeiro Metropolitan Region	R$ 1 011.30	$ 415.29	336.74
São Paulo	R$ 1 060.00	$ 435.20	352.95
São Paulo Metropolitan Region	R$ 1 178.80	$ 484.07	392.51

Sources: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 8

Active population and its distribution (percentage) by type of economic activity – Southeast Region and its federal states, 2005

2005 – Active Population and Occupation per Group of Activity %	Total Active Population	Agriculture	Industry	Civil Construction	Trade	Services	Other
Brazil	**87 089 970**	**20.5**	**14.9**	**6.5**	**17.8**	**33.3**	**6.8**
Southeast Region	36 863 614	10.0	17.5	7.2	18.8	37.1	9.2
Minas Gerais	9 510 847	22.1	15.4	6.9	16.8	33.4	5.1
Espírito Santo	1 677 058	22.2	13.3	6.3	18.1	33.1	6.8
Rio de Janeiro	6 657 034	2.4	12.7	8.3	19.3	45.2	11.5
São Paulo	19 018 675	5.5	20.7	7.1	19.6	36.5	10.6

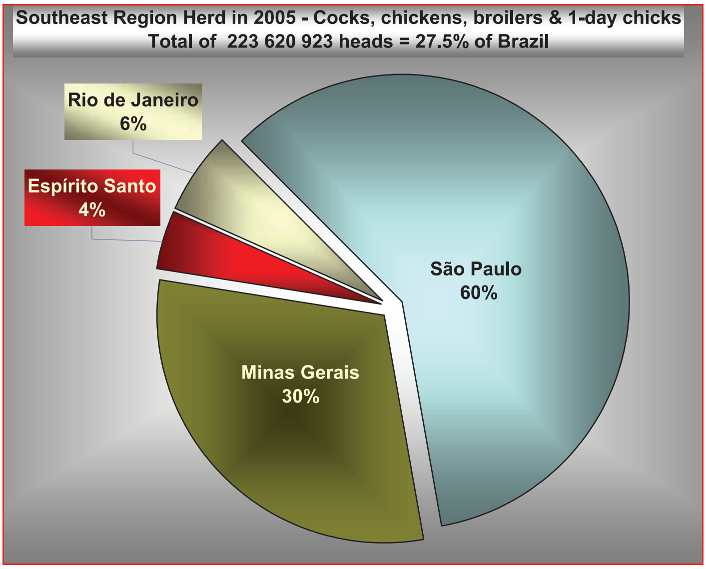
Source: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 9
Herd size – Southeast Region and its federal states, 2005

Year 2005	Bovine	Swine	Layers Hens	Cocks, chickens, broilers & 1-day chicks	Buffaloes	Ovine & Caprine	Horses & Asses Mules	Other
Brazil	**207 156 696**	**34 063 934**	**186 573 334**	**812 467 900**	**1 173 629**	**25 894 763**	**8 367 447**	**7 141 407**
Southeast Region	38 943 898	5 956 328	67 546 200	223 620 923	113 862	859 058	1 858 396	4 247 744
% of the Region/Brazil	18.8%	17.5%	36.2%	27.5%	9.7%	3.3%	22.2%	59.5%
Minas Gerais	21 403 680	3 792 958	21 599 818	67 618 845	36 158	315 529	1 064 852	629 017
Espírito Santo	2 026 690	292 405	5 868 492	9 593 088	669	49 324	89 710	690 750
Rio de Janeiro	2 092 748	164 103	898 776	12 737 252	5 299	73 961	126 907	348 454
São Paulo	13 420 780	1 706 862	39 178 664	133 671 738	71 736	420 244	576 927	2 579 523

Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

FIGURE 6
Southeast Region chicken flock in 2005, by state



Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

South Region

FIGURE 7
South Region Population: 27 027 601= 14.6% of Brazil (2005)
Total Area: 576 410 km²

State	Code	Area (Km2)	POPULATION
Paraná	PR	199 315	10 282 099
Santa Catarina	SC	95 346	5 881 352
Rio Grande do Sul	RS	281 749	10 864 150

Source: official area is from IBGE's Geosciences. Population from the Pesquisa Nacional por Amostra de Domicílios – PNAD (Domicile Sample National Research) 2005–2006.

TABLE 10

Monthly average income of working people aged above 10 years in South Region and its federal states, 2005

	Reais - R$	US$	Euro - €
Brazil	**R$ 800.80**	**$ 328.84**	**266.64**
South Region	R$ 901.40	$ 370.16	300.14
Paraná	R$ 898.80	$ 369.09	299.28
Curitiba Metropolitan Region	R$ 1 079.80	$ 443.41	359.54
Santa Catarina	R$ 961.50	$ 394.84	320.15
Rio Grande do Sul	R$ 870.30	$ 357.38	289.79
Porto Alegre Metropolitan Region	R$ 1 085.70	$ 445.84	361.51

Sources: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 11

Active population and its distribution (percentage) by type of economic activity – South Region and its federal states, 2005

2005 – Active Population and Occupation per Group of Activity %	Total Active Population	Agriculture	Industry	Civil Construction	Trade	Services	Other
Brazil	**87 089 976**	**20.5**	**14.9**	**6.5**	**17.8**	**33.3**	**6.8**
South Region	14 213 774	22.1	18.5	6.0	17.5	29.4	6.3
Paraná	5 246 954	20.5	15.9	6.5	19.0	31.8	6.3
Santa Catarina	3 168 780	20.8	22.8	5.5	17.9	26.6	6.5
Rio Grande do Sul	5 798 040	24.2	18.6	5.9	15.9	28.8	6.3

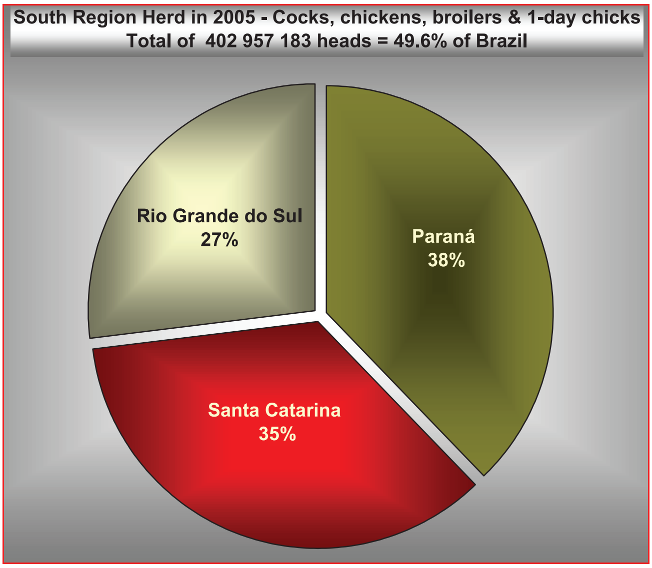
Source: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 12
Herd size – South Region and its federal states, 2005

Year 2005	Bovine	Swine	Layers Hens	Cocks, chickens, broilers & 1-day chicks	Buffaloes	Ovine & Caprine	Horses & Asses Mules	Other
Brazil	**207 156 696**	**34 063 934**	**186 573 334**	**812 467 900**	**1 173 629**	**25 894 763**	**8 367 447**	**7 141 404**
South Region	27 770 006	15 090 727	52 179 376	402 957 183	144 531	4 695 211	1 099 378	1 321 290
% of the Region/Brazil	13.4%	44.3%	28.0%	49.6%	12.3%	18.1%	13.1%	18.5%
Paraná	10 153 375	4 547 895	19 839 533	151 814 509	40 187	626 597	483 067	529 146
Santa Catarina	3 376 725	6 309 041	13 927 620	142 411 820	22 185	249 077	132 277	335 334
Rio Grande do Sul	14 239 906	4 233 791	18 412 223	108 730 854	82 159	3 819 537	484 034	456 810

Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

FIGURE 8
Southeast Region chicken flock in 2005, by state



Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

Center-West Region

FIGURE 9

Center-West Region Population: 13 060 882= 7.1 % of Brazil (2005)
Total Area: 1 606 372 km²

State	Code	Area (Km2)	POPULATION
Mato Grosso do Sul	MS	357 125	2 269 871
Mato Grosso	MT	903 358	2 811 942
Goiás	GO	340 087	5 637 792
Distrito Federal	DF	5 802	2 341 277

Source: official area is from IBGE's Geosciences. Population from the Pesquisa Nacional por Amostra de Domicílios – PNAD (Domicile Sample National Research) 2005–2006.

TABLE 13

Monthly average income of working people aged above 10 years in North Region and its federal States, 2005

	Reais - R$	US$	Euro - €
Brazil	**R$ 800.80**	**$ 328.84**	**266.64**
Center-West Region	R$ 931.70	$ 382.60	310.23
Mato Grosso do Sul	R$ 784.70	$ 322.23	261.28
Mato Grosso	R$ 816.80	$ 335.42	271.97
Goiás	R$ 802.10	$ 329.38	267.08
Distrito Federal	R$ 1 515.70	$ 622.42	504.69

Sources: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

TABLE 14

Active population and its distribution (percentage) by type of economic activity – Centre-West Region and its federal states, 2005

2005 – Active Population and Occupation per Group of Activity %	Total Active Population	Agriculture	Industry	Civil Construction	Trade	Services	Other
Brazil	**87 089 976**	**20.5**	**14.9**	**6.5**	**17.8**	**33.3**	**6.8**
Center-West Region	6 245 099	17.6	10.6	7.0	19.5	37.8	7.5
Mato Grosso do Sul	1 096 553	19.0	10.4	7.0	20.7	36.8	5.9
Mato Grosso	1 400 269	31.1	9.4	5.9	18.9	29.9	4.8
Goiás	2 674 504	16.5	13.1	7.9	19.8	37.1	5.6
Distrito Federal	1 073 683	1.6	6.0	6.1	18.4	50.6	17.3

Source: IBGE, Pesquisa Nacional por Amostra de Domicílios 2005 (Domicile Sample National Research, 2005).

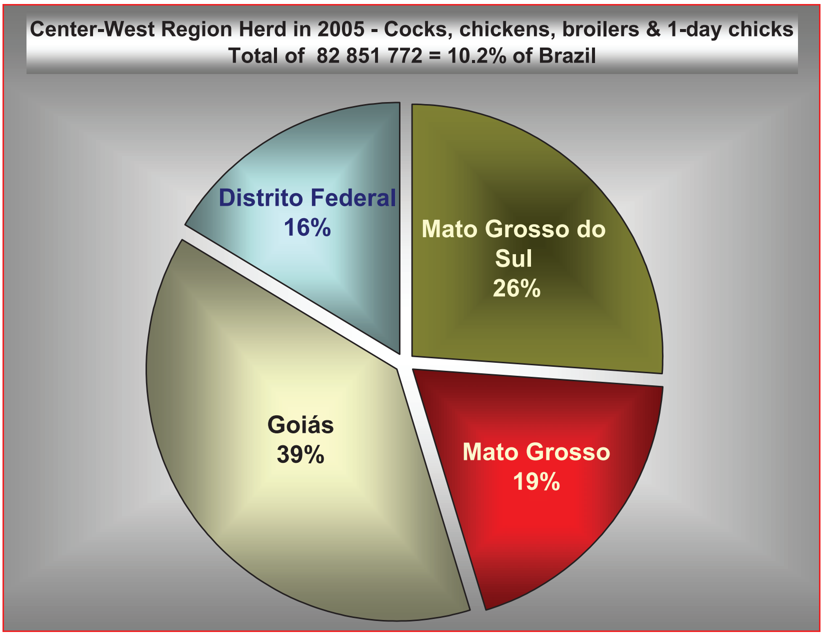
TABLE 12

Herd size – Centre-West Region and its federal states, 2005

Year 2005	Bovine	Swine	Layers Hens	Cocks, chickens, broilers & 1-day chicks	Buffaloes	Ovine & Caprine	Horses & Asses Mules	Other
Brazil	**207 156 696**	**34 063 934**	**186 573 334**	**812 467 900**	**1 173 629**	**25 894 763**	**8 367 447**	**7 141 407**
Center-West Region	71 984 504	3 826 761	17 708 380	82 851 772	65 570	1 051 710	1 306 560	310 238
% of the Region/Brazil	34.7%	11.2%	9.5%	10.2%	5.6%	4.1%	15.6%	4.3%
Mato Grosso do Sul	24 504 098	855 080	2 592 615	21 585 870	19 051	471 380	420 031	34 507
Mato Grosso	26 651 500	1 359 824	5 156 301	15 959 146	14 297	368 085	390 038	27 896
Goiás	20 726 586	1 499 138	8 029 921	31 801 276	31 268	193 685	490 545	111 295
Distrito Federal	102 320	112 719	1 929 543	13 505 480	954	18 560	5 946	136 540

Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

FIGURE 10
Southeast Region and Federal District chicken flock in 2005, by state



Source: IBGE (http://www.sidra.ibge.gov.br) Produção da pecuária municipal 2005 v.33 (Municipal Livestock Production 2005).

APPENDIX 3. INTEGRATION – A PARTNERSHIP THAT PROVED RIGHT[1]

In its early stages the system was based on informal agreements between the rural producer and the industry. As it enlarged and became more complex, several formal mechanisms were developed including contracts between the integrated farmers and the integrator company. The system is adopted by both private companies and cooperatives, which have a strong presence in poultry and pork production in Brazil.

The agricultural producer, regardless whether small, medium or large, is a rural entrepreneur who has a business to be managed for maximum productivity at the lowest possible cost. The integrator company supplies both resources (feed, seeds, day-old chicks, etc) and technical assistance, thus reducing the farmer's needs for working capital and enhancing his productivity. The integrated farmer contributes the installations, labour and costs such as electrical energy and water.

There is, in practice, just one model in "poultry partnership". The "industry"[2] has the capacity to produce day-old chicks, a complex structure that demands technical expertise and control, mainly of a sanitary nature. The day-old chicks are transferred at zero cost to the property of the "integrado", along with the feed required for the process of raising the birds until they are ready for slaughtering, at which point they are removed by the industry.

The remuneration of the integrated farmer is linked to productivity and efficiency, as he is responsible for managing the resources that have been allocated. It is always the objective that the "integrado" covers his basic costs, while the level of profitability depends on the efficiency of his production and management.

The industry bears the risk associated with the process and is not always able to pass the costs on via its sales price. The supply of feed involves huge financial resources on the part of the industry, as in Brazil there are rarely sufficient credit lines and financing for the rural producer.

The industry does not aim to obtain profits from the supply of resources. The goal is to facilitate and ensure the continuity of the production process and to guarantee the supply of raw-materials at the lowest possible cost in the production chain.

The integrated farmers have full liberty to act as independent poultry producers and run the risk of market prices. They are free to break their ties to an industry or cooperative at any time, and they are free to move from one integration to another, which does happen.

Integrated farmers complement their income by producing grains, milk, bovines for meat, fruits, tobacco, reforestation and other cultures. Many of their products (maize, soy, wood, etc) are bought by the industry a client.

The system has its imperfections, but when analysed without bias it proves to have prevailed over independent poultry production. It has been in place for over 45 years and has the preference of thousands of small and medium-sized rural producers, many of them situated in areas of difficult topography, that are partially inadequate for agriculture, where soils are stony and where holdings are of insufficient size to provide a good income.

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[1] Text extracted from UBA. 2001. *Integration – a partnership that proved right.* Brasilia, União Brasileira de Avicultura (Brazilian Poultry Union) (available at http://www.uba.org.br/integracao.html).

[2] As the vertically integrated farmers are known in the poultry segment as "integrados", the company that acts as the integrator is always known generically as "the industry". An integrated farmer will always introduce himself as "integrado of … *name of the company…*" and will refer to the industry by the name.

APPENDIX 4. PRICES OF MAIZE, SOY MEAL AND LIVE CHICKENS – KG. OF LIVE CHICKEN NEEDED TO PURCHASE 1 KG OF MAIZE AND SOY MEAL AND COMPARISON WITH LIVE BOVINES AND PIGS[1]

TABLE 1
Prices of maize, soy meal and live chickens – 2005

Mounth	US$/R$ Exchange Rate	Corn US$/60 Kg Bag	Soybean Meal US$/Kg	Live Chicken US$/Kg	Live Bovine US$/@	Live Swine US$/@	Kgs of live chicken per Kg of			
							Corn	Soymeal	live bovine	live swine
January	R$ 2.624	$6.479	$0.202	$0.495	$22.48	$19.63	0.218	0.408	3.03	6.93
February	R$ 2.594	$6.746	$0.207	$0.501	$23.13	$20.24	0.224	0.414	3.08	6.98
March	R$ 2.665	$7.504	$0.210	$0.469	$21.76	$18.95	0.267	0.448	3.09	7.18
April	R$ 2.531	$7.113	$0.198	$0.533	$22.13	$14.42	0.222	0.370	2.77	4.56
May	R$ 2.403	$7.491	$0.213	$0.562	$22.89	$15.19	0.222	0.380	2.72	4.33
June	R$ 2.350	$8.086	$0.229	$0.596	$22.98	$18.09	0.226	0.384	2.57	4.76
July	R$ 2.390	$7.742	$0.227	$0.586	$21.97	$18.20	0.220	0.388	2.50	4.95
August	R$ 2.363	$7.618	$0.222	$0.677	$21.58	$19.68	0.188	0.328	2.13	4.58
September	R$ 2.221	$8.080	$0.225	$0.675	$24.31	$21.83	0.199	0.333	2.40	4.79
October	R$ 2.254	$7.389	$0.213	$0.621	$24.85	$18.42	0.198	0.343	2.67	4.45
November	R$ 2.206	$7.207	$0.222	$0.521	$24.93	$19.94	0.230	0.426	3.19	5.63
December	R$ 2.340	$7.265	$0.237	$0.470	$23.08	$16.88	0.258	0.505	3.27	5.60
Year Average	R$ 2.412	$7.393	$0.217	$0.559	$23.01	$18.46	0.223	0.394	2.78	5.39
Year Maxim.	R$ 2.665	$8.086	$0.237	$0.677	$24.93	$21.83	0.267	0.505	3.27	7.18
Year Minim.	R$ 2.206	$6.479	$0.198	$0.469	$21.58	$14.42	0.188	0.328	2.13	4.33

[1] Animals ready for slaughtering; [2]@ = 15 kg.

[1] Elaborated with data collection from Jox Assessoria Agropecuário Ltda (www.jox.com.br) .

TABLE 2
Prices of maize, soy meal and live chickens – 2006

Mounth	US$/R$ Exchange Rate	Corn US$/60 Kg Bag	Soybean Meal US$/Kg	Live Chicken US$/Kg	Live Bovine US$/@	Live Swine US$/@	Kgs of live chicken per Kg of Corn	Soymeal	live bovine	live swine
January	R$ 2.215	$7.449	$0.235	$0.451	$22.57	$12.41	0.275	0.520	3.33	4.06
February	R$ 2.135	$7.378	$0.208	$0.468	$23.89	$18.04	0.263	0.445	3.40	5.48
March	R$ 2.172	$5.963	$0.188	$0.368	$23.02	$10.82	0.270	0.510	4.17	4.25
April	R$ 2.088	$6.823	$0.184	$0.503	$24.90	$13.65	0.226	0.367	3.30	3.78
May	R$ 2.300	$6.523	$0.196	$0.478	$21.74	$11.52	0.227	0.409	3.03	3.69
June	R$ 2.164	$7.742	$0.203	$0.462	$23.11	$12.25	0.279	0.440	3.33	3.82
July	R$ 2.175	$7.171	$0.202	$0.414	$25.28	$14.48	0.289	0.489	4.07	5.08
August	R$ 2.138	$7.671	$0.214	$0.631	$27.13	$15.20	0.202	0.339	2.86	3.43
September	R$ 2.173	$8.972	$0.216	$0.805	$28.99	$15.87	0.186	0.269	2.40	2.86
October	R$ 2.142	$9.686	$0.240	$0.654	$28.01	$16.57	0.247	0.368	2.86	3.62
November	R$ 2.166	$11.311	$0.235	$0.531	$24.47	$16.39	0.355	0.442	3.07	4.46
December	R$ 2.137	$10.996	$0.222	$0.608	$24.80	$18.01	0.301	0.365	2.72	4.22
Year Average	R$ 2.167	$8.140	$0.212	$0.531	$24.83	$14.60	0.260	0.414	3.21	4.06
Year Maxim.	R$ 2.300	$11.311	$0.240	$0.805	$28.99	$18.04	0.355	0.520	4.17	5.48
Year Minim.	R$ 2.088	$5.963	$0.184	$0.368	$21.74	$10.82	0.186	0.269	2.40	2.86

[1] *Animals ready for slaughtering;* [2]*@ = 15 kg.*

TABLE 3
Prices of maize, soy meal and live chickens – 2007

Mounth	US$/R$ Exchange Rate	Corn US$/60 Kg Bag	Soybean Meal US$/Kg	Live Chicken US$/Kg	Live Bovine US$/@	Live Swine US$/@	Kgs of live chicken per Kg of Corn	Soymeal	live bovine	live swine
January	R$ 2.134	$11.013	$0.236	$0.703	$25.31	$18.51	0.261	0.335	2.40	3.75
February	R$ 2.117	$9.564	$0.250	$0.874	$26.92	$16.29	0.182	0.286	2.05	2.63
March	R$ 2.050	$9.392	$0.220	$0.634	$27.81	$13.91	0.247	0.346	2.92	3.00
April	R$ 2.033	$9.099	$0.204	$0.541	$27.54	$15.49	0.280	0.377	3.39	3.88
May	R$ 1.928	$9.854	$0.226	$0.700	$29.04	$16.86	0.235	0.322	2.77	3.09
June	R$ 1.925	$9.427	$0.234	$0.779	$31.68	$17.40	0.202	0.300	2.71	2.87
July	R$ 1.877	$10.204	$0.263	$0.986	$34.10	$19.98	0.173	0.266	2.31	2.54
August	R$ 1.961	$12.059	$0.272	$0.918	$32.63	$20.14	0.219	0.296	2.37	2.87
September	R$ 1.838	$14.417	$0.362	$0.870	$33.73	$23.67	0.276	0.416	2.58	3.33
October	R$ 1.743	$16.779	$0.383	$0.889	$38.44	$27.25	0.315	0.431	2.88	3.56
November	R$ 1.783	$18.790	$0.387	$0.925	$44.31	$29.45	0.338	0.418	3.19	3.78
December	R$ 1.771	$18.074	$0.391	$0.932	$40.10	$32.48	0.323	0.420	2.87	4.11
Year Average	R$ 1.930	$12.389	$0.286	$0.813	$32.63	$20.95	0.254	0.351	2.68	3.02
Year Maxim.	R$ 2.134	$18.790	$0.391	$0.986	$44.31	$32.48	0.338	0.431	3.39	4.11
Year Minim.	R$ 1.743	$9.099	$0.204	$0.541	$25.31	$13.91	0.173	0.266	2.05	2.54

[1] Animals ready for slaughtering; [2]@ = 15 kg.

Agenda

MONDAY, 5 NOVEMBER 2007

08:00 – 09:30	Registration	
09:30 – 09:45	Welcome and opening	Chanchui He, Regional Representative / Assistant Director-General, FAO Regional Office for Asia and the Pacific
09:45 – 10:00	Setting the scene for the Conference	Anni McLeod

Session I: Sector Trends and Impacts (Chair: Samuel Jutzi)

10:00 – 10:30	Global poultry sector trends and external drivers for structural change	Clare Narrod
10:30 – 10:45	BREAK	
10:45 – 11:30	Country case studies:	
	China	Han Yijun
	Thailand	Viroj NaRanong
	India	Rajesh Mehta
	Egypt	Ali Ibrahim
11:30 – 12:00	Assessment of inter-country differences in structural changes and expected trends	Martin Upton
12:00 – 12:30	Future trends and developments in poultry nutrition	Stephen Chadd
12:30 – 13:00	Future trends for poultry genetic resources	Badi Besbes
13:00 – 14:30	LUNCH	
14:30 – 14:45	Perspectives of the global markets for poultry products	Dave Harlan
14:45 – 15:00	Challenges for global feed industries	Andreas Kocher

15:00 – 15:15	Feed production inducing structural change in the poultry sector	Jan Hinrichs
15:15 – 15:30	Social impacts of structural change	Anni McLeod
15:30 – 15:45	BREAK	
15:45 – 17:15	Podium discussion, Sector Trends and Impacts	Facilitator Simon Mack

TUESDAY, 6 NOVEMBER 2007

Session II: Risks and Challenges for Poultry Production (Chair: Jimmy Smith)

08:30 – 09:00	Risks associated with poultry production systems	Les Sims
09:00 – 09:30	Poultry production and the environment – a review	Carolyn Opio
09:30 – 10:00	Long-term impacts of HPAI on poultry production system	Jan Slingenbergh
10:00 – 10:15	BREAK	
10:15 – 10:30	OIE standards related to trade and poultry diseases	Christianne Bruschke
10:30 – 11:00	Animal welfare in poultry production systems: Impact of EU standards on world trade	Peter van Horne
11:00 – 11:15	Health and socioeconomic impacts of contract poultry growing for rural communities: a review of the US experience	Jessica Leibler
11:15 – 11:30	The importance of poultry products in human nutrition Response of the Thai poultry industry to HPAI	Anan Sirimongkolkasem
11:30 – 11:45	Cambodia HPAI video clip	
12:00 – 12:30	Poster sessions	
12:30 – 14:00	LUNCH	
14:00 – 14:20	The importance of poultry products in human nutrition	Simon Mack
14:20 – 14:40	Risks caused by bioaerosols of poultry houses	Jörg Hartung

14:40 – 15:00	Veterinary services for poultry production	Karin Schwabenbauer
15:15 – 15:45	BREAK	
15:45 – 17:15	Podium discussion, Risks and Challenges for Poultry Production	Facilitator Simon Mack
17:30 – 19:00	Round table discussions	
	Large poultry production	Facilitator Nancy Morgan
	Small poultry production	Facilitator Antonio Rota

WEDNESDAY, 7 NOVEMBER 2007

Session III: Poultry as a Development Tool (Chair: Robert Pym)

08:30 – 09:00	Poultry production for livelihoods and poverty alleviation	Frands Dolberg
09:00 – 09:30	Poultry production as a tool for general development initiatives	E. Babafunso Sonaiya
09:30 – 10:00	Opportunities of small commercial poultry producers in the future	Vinod Ahuja
10:00 – 10:15	BREAK	
10:15 – 10:30	Experiences in transferring and adapting the BRAC model for the development of small poultry producers to other countries	Dewan Zahid Hossain
10:30 – 10:45	Impact of chicken development projects for small scale producers in Thailand	Kreingkrai Choprakarn
10:45 – 11:00	Formal and informal contract farming in poultry in Bangladesh	Mohammad A. Jabbar
11:00 – 11:15	Getting the private poultry sector involved in the development for Africa	Flavio Oliveira
11:15 – 12:45	Podium discussions, Poultry as a Development Tool	Facilitator Simon Mack
12:45 – 13:00	Summary Statement	Samuel Jutzi, FAO