The ten biggest problems for the humanity in the next 50 years

AGRICULTURE

Energy
Water
Food
Environment
Poverty

Education
Democracy
Population
Disease
Terrorism & war

Source: Alan MacDiarmid, em São Carlos – SP
Changes in the demand:

- flavor
- quality
- traceability
- health
- environment
- organics products
Trends

Demographic trends:

<table>
<thead>
<tr>
<th></th>
<th>Increase.% 2000-2025</th>
<th>Part.% 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>13.2%</td>
<td>17.4%</td>
</tr>
<tr>
<td>India</td>
<td>36.6%</td>
<td>16.8%</td>
</tr>
<tr>
<td>Africa</td>
<td>68.9%</td>
<td>15.4%</td>
</tr>
<tr>
<td>World</td>
<td>33.9%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Bourlaug, N., Agroanalysis, Vol. 27, nº 03 (março/2007)
Elaboration: GV Agro

Food Demand (2000 – 2025)

+ 62.0%
Projection of the urban and rural population in the world

Source: ONU
Elaboration: GV Agro
World population per age group

Developed countries
- 0-4 years
- 5-14 years
- 15-59 years
- +60 years

Developing countries
- 0-4 years
- 5-14 years
- 15-59 years
- +60 years

Source: ONU, 2006. Elaboration: ICONE. Nota: Divisão dos países segue a classificação da ONU.
Trends

Evolution of GDP (2006-2013)

- World: 4.6% a.a
- Countries of G-7: 2.2% a.a
- Developing countries: 7.1% a.a

Participation in the world GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>Countries of G-7</th>
<th>Others developed</th>
<th>Developing countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>59.5%</td>
<td>15.8%</td>
<td>24.7%</td>
</tr>
<tr>
<td>2013</td>
<td>53.6%</td>
<td>15.6%</td>
<td>30.8%</td>
</tr>
</tbody>
</table>

Source: FMI
Nota: PIB a preços de 2005

19/09/2008
Growth of the *per capita* incomes

**Trends**

**Growth of the *per capita* incomes**

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**Nota:** América Latina inclui Caribe. Arabes compreendem Norte da África e Oriente Médio. Ex-comunistas correspondem ao Leste Europeu e países da CEI.
Evolution of the *per capita* consumption of food

Trends

![Graph showing trends in per capita consumption of food across different regions]


Per capita consumption of food in the world

Trend

Substitution of cereals and starches for meats, milk, fruits, processed food, etc.

Source: FAO, 2006. Note: do not include cereals used for the animal feeding.
World: offer and estimated demand for food

<table>
<thead>
<tr>
<th>Product</th>
<th>Production (2005)</th>
<th>Estimated Demand (2025)</th>
<th>Necessary Additional Production</th>
<th>Increase of the Production (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereal</td>
<td>2,219.40</td>
<td>3,140.40</td>
<td>921.00</td>
<td>41.5</td>
</tr>
<tr>
<td>Oil seeds</td>
<td>595.01</td>
<td>750.97</td>
<td>155.96</td>
<td>26.2</td>
</tr>
<tr>
<td>Perennials</td>
<td>242.81</td>
<td>321.99</td>
<td>79.18</td>
<td>32.6</td>
</tr>
<tr>
<td>Annual</td>
<td>352.20</td>
<td>437.98</td>
<td>85.78</td>
<td>24.4</td>
</tr>
<tr>
<td>Meat (^1)</td>
<td>264.70</td>
<td>376.49</td>
<td>111.79</td>
<td>42.2</td>
</tr>
<tr>
<td>Poultry</td>
<td>80.00</td>
<td>113.70</td>
<td>33.70</td>
<td>42.1</td>
</tr>
<tr>
<td>Pork</td>
<td>103.40</td>
<td>146.80</td>
<td>43.40</td>
<td>42.0</td>
</tr>
<tr>
<td>Bovine</td>
<td>63.50</td>
<td>90.40</td>
<td>26.90</td>
<td>42.4</td>
</tr>
<tr>
<td>Coffee</td>
<td>7.72</td>
<td>9.40</td>
<td>1.68</td>
<td>21.8</td>
</tr>
<tr>
<td>Fiber</td>
<td>28.50</td>
<td>36.37</td>
<td>7.87</td>
<td>27.6</td>
</tr>
<tr>
<td>Wood</td>
<td>3,401.90</td>
<td>4,148.40</td>
<td>746.50</td>
<td>21.9</td>
</tr>
</tbody>
</table>

Elaboration: AGE – MAPA  
\(^1\) all of consumed meats
Grains: production and world consumption

consumption of the stocks

replacement of the stocks

Source: USDA

Note: corn, soybean, wheat and rice

Elaboration: GV Agro
**Global stockpiles**

<table>
<thead>
<tr>
<th>Safra</th>
<th>Coffee (3)</th>
<th>Meats</th>
<th>Corn</th>
<th><strong>Soybean</strong></th>
<th>Rice</th>
<th>Sugar</th>
<th>Wheat</th>
<th>Cotton</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Meal</td>
<td>Oil</td>
<td>Grain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001-02</td>
<td>22.6</td>
<td>2.5</td>
<td>151.2</td>
<td>5.9</td>
<td>3.1</td>
<td>35.5</td>
<td>133.0</td>
<td>40.0</td>
</tr>
<tr>
<td>2002-03</td>
<td>19.7</td>
<td>2.4</td>
<td>126.6</td>
<td>5.9</td>
<td>2.8</td>
<td>42.9</td>
<td>103.3</td>
<td>36.7</td>
</tr>
<tr>
<td>2003-04</td>
<td>26.5</td>
<td>2.1</td>
<td>105.2</td>
<td>5.5</td>
<td>2.4</td>
<td>37.8</td>
<td>81.1</td>
<td>37.6</td>
</tr>
<tr>
<td>2004-05</td>
<td>19.5</td>
<td>2.0</td>
<td>132.1</td>
<td>6.5</td>
<td>3.1</td>
<td>47.5</td>
<td>73.2</td>
<td>38.3</td>
</tr>
<tr>
<td>2005-06</td>
<td>22.0</td>
<td>2.0</td>
<td>125.1</td>
<td>5.9</td>
<td>3.3</td>
<td>53.4</td>
<td>75.7</td>
<td>33.0</td>
</tr>
<tr>
<td>2006-07</td>
<td>18.0</td>
<td>2.0</td>
<td>109.9</td>
<td>6.1</td>
<td>3.1</td>
<td>62.5</td>
<td>75.7</td>
<td>30.9</td>
</tr>
<tr>
<td>2007-08(1)</td>
<td>19.2</td>
<td>2.0</td>
<td>124.6</td>
<td>5.9</td>
<td>2.7</td>
<td>48.8</td>
<td>78.5</td>
<td>39.9</td>
</tr>
<tr>
<td>2008-09(2)</td>
<td>12.4</td>
<td>1.8</td>
<td>105.3</td>
<td>5.5</td>
<td>2.6</td>
<td>48.9</td>
<td>82.0</td>
<td>44.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2008-09 / 2001-02</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-45.2%</td>
<td>-26.0%</td>
<td>-30.4%</td>
<td>-6.0%</td>
<td>-15.9%</td>
<td>37.6%</td>
<td>-38.4%</td>
</tr>
<tr>
<td></td>
<td>12.2%</td>
<td>-34.6%</td>
<td>-2.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2008-09 / 2007-08</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-35.4%</td>
<td>-10.4%</td>
<td>-15.5%</td>
<td>-6.0%</td>
<td>-4.0%</td>
<td>0.1%</td>
<td>4.4%</td>
</tr>
<tr>
<td></td>
<td>12.4%</td>
<td>14.7%</td>
<td>-13.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 - Estimate  2 - Forecast  3 - in million bags (60kg)
Source: USDA (July/08)  Elaboration: GV Agro
## Global stocks of grains

**Production x Consumption**: total in the period (2000/01-2007/08)

**Brazil produces surpluses to supply the world stocks**

<table>
<thead>
<tr>
<th>World</th>
<th>Production</th>
<th>Consumption</th>
<th>Result - consumption of the stocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12,832,206</td>
<td>12,951,785</td>
<td>-119,579</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>China</th>
<th>Production</th>
<th>Consumption</th>
<th>Result - consumption of the stocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1,958,175</td>
<td>2,239,351</td>
<td>-281,176</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brasil</th>
<th>Production</th>
<th>Consumption</th>
<th>Result - supplying the stocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>798,141</td>
<td>634,810</td>
<td>+163,331</td>
</tr>
</tbody>
</table>

* Source: USDA  
  Note: * Soybean, Corn, Wheat and Barley.  
  In thousand tons  
  Elaboração: GV Agro
In comparison with Jan/2000, the prices of the foods increased 110%, while the oil increased 333%.
“AGROENERGY: the new paradigm of world agriculture”

“Agriculture is not only a matter of food safety. Today agriculture can also guarantee part of the energetic safety of the world.”
21st Century: the beginning of a New Era

Challenge: TO DIVERSIFY ENERGY SOURCES
Up to 2030, the world demand for energy should increase 58%.

Sources: Nakicenovic, Grubler and MaConald, 1998 and Energy Information Administration - EIA/USA

19/09/2008
Why biofuels?

Environmental profits
- carbon sequestration
- lower level of emission in the consumption
- global warming

Renewability
- short cycle of production
- man-controlled process

Economic aspects
- new component of demand
- impacts in the trade balance

Social aspects
- jobs creation
- income deconcentration

Political aspects
- democracy
Organization of the market

- More countries producing
- Compulsory mix
- Eliminating all myths
- Global strategy
More countries producing

Energetic matrix – Brazil and World

**World**

<table>
<thead>
<tr>
<th>Renewable sources</th>
<th>Brazil</th>
<th>World</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation in the total consumption</td>
<td>2.1%</td>
<td>48.5%</td>
</tr>
</tbody>
</table>

World total: 11,434 Mtep


In 2007, sugarcane became the second main source of energy in Brazil.
More countries producing


100 countries could supply biofuels to 200 nations, while currently 20 oil producers provide fossil fuels to the rest of the World.

Source: BP Statistical Review of World Energy

Elaboration: GV Agro
Worldwide water and land availability

More countries producing

Russia has land area and water sources, but doesn’t have adequate climate

Asia has enough water sources, but doesn’t have additional land areas

Tropical Region: favorable production of sugar-cane

Market potential for ethanol

World Consumption of Gasoline (in billion liters/year)

- **North America**: 594.3 billion liters, -49.9%
- **Latin America**: 56.9 billion liters, +11.6%
- **E.U-27**: 147.9 billion liters, +57.5%
- **Africa**: 38.9 billion liters, -9.9%
- **Asia**: 73.1 billion liters, -5.8%

**World**
- **Production**: 1,210.6 billion liters
- **Consumption**: 1,202.5 billion liters

Source: IEA (International Energy Agency). Note: data from 2005
Elaboration: GV Agro
Market potential for ethanol

Substitution of part of the gasoline 3 CENARIOS: E-5, E-10 and E-20

World: potential demand for ethanol (billion liters / year)

Worldwide demand for ethanol in the 3 cenarios (billion liters / year): 60.1, 120.2 and 240.5

Sources: IEA, CONAB e IBGE

Notes: para o cálculo da área, considerou-se um rendimento de 7.000 litros/ha.

Elaboration: GV Agro
### Compulsory mix

**USA: ethanol imports**

**(in billion liters / year)**

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2012</th>
<th>2017</th>
<th>2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline demand</td>
<td>530.0</td>
<td>560.2</td>
<td>598.1</td>
<td>647.3</td>
</tr>
<tr>
<td>Ethanol demand</td>
<td>20.4</td>
<td>73.4</td>
<td>85.2</td>
<td>113.9</td>
</tr>
<tr>
<td>Ethanol capacity</td>
<td>20.8</td>
<td>60.6</td>
<td>65.9</td>
<td>73.8</td>
</tr>
</tbody>
</table>
Emission of GHG through the replacement of gasoline by ethanol

- Ethanol from corn (USA)
- Ethanol from beet (E.U)
- Ethanol from sugarcane (Brazil)

Compared to diesel, biodiesel reduces in about 50% of the CO₂ emissions.

The replacement of 1,000 buses (diesel) by buses that use ethanol would avoid the emission of 96 tons of CO₂ per year, equivalent to emissions of 20,000 cars with gasoline.

Since 1970, it is estimated that the use of ethanol in Brazil has avoided emissions of 644 million tons of CO₂ and 25.8 million tons last year.
Eliminating all myths

Cycle of Ethanol: balance of emissions

1. Planting and Harvesting*
   Emission: 2,961kg of CO₂

   * Admitindo 50% de colheita mecanizada.

2. Development of the cane
   Absorption: 7,650kg of CO₂

3. Processing
   Emission: 3,604kg of CO₂
   Avoided Emissions: 7,875kg of CO₂

   Balance
   Generated Emissions: 8,135kg of CO₂
   Result: 260kg of CO₂

   89%

   Emissions if Gasoline was used: 2,280kg of CO₂

4. Bioelectricity
   Avoided Emissions: 225kg of CO₂

5. Transport
   Emission: 50kg of CO₂

6. Motors of vehicles
   Emission: 1,520kg of CO₂

Source: UNICA

Nota: Dados relativos à emissão de CO₂ para cada 1,000 litros de etanol produzido e consumido.
Cane: a machine of absorbing Carbon

Eliminating all myths

from 22 to 36 tons of C / ha

from 3 to 5 tons of C / ha

5 - 7 years

Source: UNICA - Pólo de Biocombustíveis (Weber Amaral)
Pasture vs. Cane: carbon absorbed

Eliminating all myths

The sugarcane absorbs 5x more C than the pastures.

3 - 8 tons of C / ha / year

22 - 36 tons of C / ha / year

Source: UNICA - Pólo de Biocombustíveis (Weber Amaral)
### Where to produce sugarcane?

#### World: planted area with cane (in thousand ha)

<table>
<thead>
<tr>
<th>Country</th>
<th>2005</th>
<th>2006</th>
<th>Part%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>5,806</td>
<td>6,153</td>
<td>30.2%</td>
</tr>
<tr>
<td>India</td>
<td>3,862</td>
<td>4,200</td>
<td>20.8%</td>
</tr>
<tr>
<td>China</td>
<td>1,365</td>
<td>1,220</td>
<td>6.0%</td>
</tr>
<tr>
<td>Thailand</td>
<td>1,035</td>
<td>936</td>
<td>4.8%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>966</td>
<td>907</td>
<td>4.4%</td>
</tr>
<tr>
<td>Mexico</td>
<td>---</td>
<td>668</td>
<td>3.3%</td>
</tr>
<tr>
<td>Colombia</td>
<td>426</td>
<td>426</td>
<td>2.1%</td>
</tr>
<tr>
<td>South Africa</td>
<td>428</td>
<td>420</td>
<td>2.1%</td>
</tr>
<tr>
<td>Australia</td>
<td>434</td>
<td>415</td>
<td>2.0%</td>
</tr>
<tr>
<td>Cuba</td>
<td>517</td>
<td>397</td>
<td>1.9%</td>
</tr>
<tr>
<td>Philippines</td>
<td>369</td>
<td>382</td>
<td>1.8%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>360</td>
<td>370</td>
<td>1.8%</td>
</tr>
<tr>
<td>USA</td>
<td>373</td>
<td>363</td>
<td>1.8%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>266</td>
<td>285</td>
<td>1.4%</td>
</tr>
<tr>
<td>Argentina</td>
<td>285</td>
<td>285</td>
<td>1.4%</td>
</tr>
<tr>
<td>Guatemala</td>
<td>190</td>
<td>190</td>
<td>0.9%</td>
</tr>
<tr>
<td>Mozambique</td>
<td>---</td>
<td>185</td>
<td>0.9%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>157</td>
<td>157</td>
<td>0.8%</td>
</tr>
<tr>
<td>Cameroon</td>
<td>145</td>
<td>145</td>
<td>0.7%</td>
</tr>
<tr>
<td>Myanmar</td>
<td>129</td>
<td>140</td>
<td>0.7%</td>
</tr>
<tr>
<td>Egypt</td>
<td>135</td>
<td>135</td>
<td>0.7%</td>
</tr>
<tr>
<td>Others</td>
<td>2,821</td>
<td>2,008</td>
<td>9.8%</td>
</tr>
<tr>
<td><strong>World</strong></td>
<td><strong>19,869</strong></td>
<td><strong>20,399</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

According to FAO, there are 200 million of ha able to plant sugarcane in the World.

Source: FAO (july/2008)  Elaboration: GV Agro
In the world, the area used to produce biofuels represents 0.07% of the 1.3 billion ha destined to the agriculture.

Source: FAO - 2004
## Production with sustainability

### Territorial Distribution - million of ha

<table>
<thead>
<tr>
<th></th>
<th>Territorial Distribution - million of ha</th>
<th>% total land</th>
<th>% arable land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>851</td>
<td>100%</td>
<td>---</td>
</tr>
<tr>
<td>Arable land</td>
<td>340</td>
<td>40%</td>
<td>100%</td>
</tr>
<tr>
<td>Total crop land</td>
<td>72.0</td>
<td>8.5%</td>
<td>21.2%</td>
</tr>
<tr>
<td>Soybean</td>
<td>21.3</td>
<td>2.5%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Corn</td>
<td>14.6</td>
<td>1.7%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Sugarcane</td>
<td>7.6</td>
<td>0.9%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Sugarcane for ethanol</td>
<td>3.7</td>
<td>0.4%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Coffee</td>
<td>2.1</td>
<td>0.2%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Orange</td>
<td>0.9</td>
<td>0.1%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Pastures</td>
<td>172</td>
<td>20.2%</td>
<td>50.6%</td>
</tr>
<tr>
<td>Available Area</td>
<td>96</td>
<td>11.3%</td>
<td>28.2%</td>
</tr>
</tbody>
</table>

Source: IBGE and CONAB
Eliminating all myths
Sugarcane: evolution of the productivity

7.1 million of ha were preserved

Production (million tons)

Preserved Area **

Planted Area (million ha)

Elaboration: GV Agro

Note: * Estimate
**Area calculated by the productivity of 1970
Eliminating all myths
São Paulo: sugarcane vs. food

Sugarcane production (07/08)
4.9 million ha (+ 1.6%)
341 million tons (+ 2.9%)

Soybean production (07/08)
1.5 million tons
+ 2.3% than the harvest 06/07

Peanut production (07/08)
220.0 thousand tons
+ 27% than the harvest 06/07

Sources: CONAB and IEA/SP   Elaboration: GV Agro
Balance of energy

* Eliminating all myths

9.3

Energy contained in the fuel / Used fossil energy to produce fuel

- Fuel completely not renewable has value lower than 1.
- Values superior to 1 indicate how much renewable is the fuel.

Source: World Watch Institute
Eliminating all myths

Ethanol: average production yields

Brazilian consumption of fuels
Ethanol as an alternative fuel

In 2008, the ethanol already represents 50% of the consumption of fuels.

90% of new cars sold are flex-fuel, representing about 25% of fleet.

Sources: ANP and ANFAVEA
Elaboration: GV Agro
Note: it was considered 25% of ethanol added to the gasoline in the period.
Soil and climate adapted to the sugarcane production without irrigation

Eliminating all myths

Source: UNICAMP

Excluded the Amazon Region, Pantanal and declivity superior to 12%

19/09/2008
Eliminating all myths

Brazil: herd of cattle x pasture

More efficient livestock ➡ liberation of land for the agriculture

<table>
<thead>
<tr>
<th>Herd of cattle in Brazil (2006)</th>
<th>Average SP* (head/ha)</th>
<th>Need of pasture area</th>
</tr>
</thead>
<tbody>
<tr>
<td>169.90</td>
<td>1.40</td>
<td>121.36 (a)</td>
</tr>
</tbody>
</table>

**Pasture (2006)**: 172.30 (b)

**Liberated Area (b-a)**: 50.94

Source: IBGE (Censo Agropecuário) e IEA/SP
Elaboration: GV Agro
*Iotação média de São Paulo (2006)

19/09/2008
Energy content of the sugarcane

Energy contained in 1,000 tons of sugarcane (tons in equivalent petroleum)

- Sucrose: 51.11 tons
- Bagasse: 56.43 tons
- Tips and Straws: 55.05 tons

Source: Nastari, Lisbon, 2000
Estimates of the potential of bioelectricity in Brazil

Global strategy

The bagasse resulting from the processing of the cane represents 30% of the total volume. Raw material for the bioelectricity production.

Source: Cogen and Unica
Support estimate of the producer - PSE (average 2003-2005)

- US tax
- The matters of the agricultural protectionism

Source: OCDE      Elaboration: GV Agro
Challenges to the sector

• Commercial limitations?
  - protected markets
  - protected contestant
  - self-sufficiency (target of the countries)
  - low/ righ cycles

• Constant Expansion of the Offer
  - balance of the offer and demand
  - investments
Challenges to the sector

• Sectorial Regulation

• Research and Development

• Planning

• Administration
The great issues

• Where we want to arrive?
  - domestic market
  - external market

• Long period contracts
• Production model
• The Zoning and the Financing
• Infrastructure and logistics
• Estorage
The great issues

- Technology: subproducts
- Human Resources
- Tax Politics
- Verification, traceability and certification
- Commoditization
- Definition of the future of the hydrated alcohol
- Alcohol chemistry
The great issues

- Rural integration: mechanical cut
- Training of the rural labor
- Creation of a global market: partnerships
- Communication and information
- Industry of equipments
- Protectionism: tariffs and subsidies
- Coordination: An Special Secretariat
Brazilian agribusiness

GDP (2006) (US$ 1,071 billions)

Agribusiness GDP (US$ 246.3 billions)

Agriculture
US$ 176.9 billions (71.8%)

Livestock
US$ 69.5 billions (28.2%)

Distribution of GDP in the Agro-Industrial System

“Before the farm” US$ 14.8 billions (6.0%)

“On the farm” US$ 68.2 billions (27.7%)

“After the farm” US$ 163.3 billions (66.3%)

Source: CEPEA-USP / CNA
Elaboration: GV Agro
Brazilian agribusiness

**Jobs (2005)**

- 37%

**Exports (2007)**

- US$ 160.65 billions

Others sectors

- US$ 102.2 billions

Agribusiness

- US$ 58.4 billions

Sources: MAPA and IPEA

Elaboration: GV Agro
Brazilian production of grain

The use of high technology resulted on an increase of 99% in productivity at the period from 1990/1991 to 2007/08.

Source: CONAB    Elaboration: GV Agro    * Estimated (august/2008)
Brazil: sugar and ethanol production

<table>
<thead>
<tr>
<th>Year</th>
<th>Sugar (million tons)</th>
<th>Ethanol (billion liters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/09*</td>
<td>34.5</td>
<td>26.9</td>
</tr>
</tbody>
</table>

Source: SPAE / MAPA and Conab / MAPA

* Estimative (april/2008)
Brazil: meat production

Broiler +200%

Beef +77%

Pork +130%

Sources: ABIEC, ABEF e ABIPECS

Notes: *Estimative
## Worldwide production of food - 2006

<table>
<thead>
<tr>
<th>Product</th>
<th>Brazil (thousand tons)</th>
<th>Part.%</th>
<th>World (mil toneladas)</th>
<th>Part.%</th>
<th>Participation of Brazil in the World (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains</td>
<td>120,101</td>
<td>47.0%</td>
<td>2,964,579</td>
<td>52.2%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Vegetables</td>
<td>8,581</td>
<td>3.4%</td>
<td>903,405</td>
<td>15.9%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Tubers</td>
<td>30,602</td>
<td>12.0%</td>
<td>736,748</td>
<td>13.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Fruits</td>
<td>37,736</td>
<td>14.8%</td>
<td>526,496</td>
<td>9.3%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Sugar</td>
<td>29,500</td>
<td>11.5%</td>
<td>155,386</td>
<td>2.7%</td>
<td>19.0%</td>
</tr>
<tr>
<td>Vegetables oil</td>
<td>6,118</td>
<td>2.4%</td>
<td>127,141</td>
<td>2.2%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Fibers</td>
<td>1,464</td>
<td>0.6%</td>
<td>29,349</td>
<td>0.5%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Nuts</td>
<td>271</td>
<td>0.1%</td>
<td>11,106</td>
<td>0.2%</td>
<td>2.4%</td>
</tr>
<tr>
<td><strong>Total agriculture</strong></td>
<td><strong>234,391</strong></td>
<td><strong>91.7%</strong></td>
<td><strong>5,454,210</strong></td>
<td><strong>96.1%</strong></td>
<td><strong>4.3%</strong></td>
</tr>
<tr>
<td>Pork meat</td>
<td>2,830</td>
<td>1.1%</td>
<td>98,371</td>
<td>1.7%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Broiler</td>
<td>9,355</td>
<td>3.7%</td>
<td>63,797</td>
<td>1.1%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Beef</td>
<td>9,020</td>
<td>3.5%</td>
<td>59,420</td>
<td>1.0%</td>
<td>15.2%</td>
</tr>
<tr>
<td><strong>Total meat</strong></td>
<td><strong>21,205</strong></td>
<td><strong>8.3%</strong></td>
<td><strong>221,588</strong></td>
<td><strong>3.9%</strong></td>
<td><strong>9.6%</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>255,596</strong></td>
<td><strong>100%</strong></td>
<td><strong>5,675,798</strong></td>
<td><strong>100%</strong></td>
<td><strong>4.5%</strong></td>
</tr>
</tbody>
</table>

Source: FAO  
Elaboration: GV Agro  
19/09/2008
Evolution of the Brazilian trade balance

Source: AgroStat Brasil
Elaboration: GV Agro
*from july/2007 to june/2008
## Brazilian Agribusiness Exports (1997 – 2007)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>US$ million</td>
<td>thousand tons</td>
<td>US$ million</td>
</tr>
<tr>
<td><strong>SOY COMPLEX</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOYBEAN</td>
<td>2,286</td>
<td>7,788</td>
<td>6,703</td>
</tr>
<tr>
<td>MEAL</td>
<td>2,681</td>
<td>10,013</td>
<td>2,959</td>
</tr>
<tr>
<td>OIL</td>
<td>597</td>
<td>1,126</td>
<td>1,720</td>
</tr>
<tr>
<td><strong>MEAT</strong></td>
<td>1,598</td>
<td>938</td>
<td>11,295</td>
</tr>
<tr>
<td>BEEF</td>
<td>462</td>
<td>158</td>
<td>4,425</td>
</tr>
<tr>
<td>BROILER</td>
<td>884</td>
<td>651</td>
<td>4,620</td>
</tr>
<tr>
<td>PORK</td>
<td>166</td>
<td>74</td>
<td>1,230</td>
</tr>
<tr>
<td><strong>WOOD PRODUCTS</strong></td>
<td>3,501</td>
<td>7,249</td>
<td>8,820</td>
</tr>
<tr>
<td>WOOD</td>
<td>1,510</td>
<td>3,414</td>
<td>4,091</td>
</tr>
<tr>
<td>CELLULOSE</td>
<td>1,024</td>
<td>2,503</td>
<td>3,023</td>
</tr>
<tr>
<td>PAPER</td>
<td>967</td>
<td>1,332</td>
<td>1,703</td>
</tr>
<tr>
<td><strong>SUGAR AND ETHANOL</strong></td>
<td>1,827</td>
<td>6,493</td>
<td>6,578</td>
</tr>
<tr>
<td>SUGAR</td>
<td>1,772</td>
<td>6,376</td>
<td>5,100</td>
</tr>
<tr>
<td>ETHANOL</td>
<td>54</td>
<td>117</td>
<td>1,478</td>
</tr>
<tr>
<td><strong>COFFEE</strong></td>
<td>3,134</td>
<td>933</td>
<td>3,082</td>
</tr>
<tr>
<td>TOASTED AND GREEN COFFEE</td>
<td>2,749</td>
<td>869</td>
<td>3,405</td>
</tr>
<tr>
<td>SOLUBLE COFFEE</td>
<td>349</td>
<td>52</td>
<td>451</td>
</tr>
<tr>
<td><strong>LEATHER AND PRODUCTS</strong></td>
<td>2,159</td>
<td>299</td>
<td>3,555</td>
</tr>
<tr>
<td>FRUIT JUICES</td>
<td>1,858</td>
<td>1,224</td>
<td>2,374</td>
</tr>
<tr>
<td>ORANGE JUICE</td>
<td>1,007</td>
<td>1,186</td>
<td>2,252</td>
</tr>
<tr>
<td><strong>TOBACCO</strong></td>
<td>1,665</td>
<td>410</td>
<td>2,262</td>
</tr>
<tr>
<td>CORN</td>
<td>41</td>
<td>349</td>
<td>1,882</td>
</tr>
<tr>
<td>FIBERS AND PRODUCTS</td>
<td>873</td>
<td>212</td>
<td>1,058</td>
</tr>
<tr>
<td>COTTON AND PRODUCTS</td>
<td>640</td>
<td>86</td>
<td>1,392</td>
</tr>
<tr>
<td>FRUITS (EXCLUDE NUTS)</td>
<td>314</td>
<td>335</td>
<td>968</td>
</tr>
<tr>
<td>COCOA AND PRODUCTS</td>
<td>186</td>
<td>79</td>
<td>365</td>
</tr>
<tr>
<td>DAIRY PRODUCTS</td>
<td>11</td>
<td>4</td>
<td>300</td>
</tr>
<tr>
<td>LIVE ANIMALS</td>
<td>7</td>
<td>1</td>
<td>285</td>
</tr>
<tr>
<td><strong>TOTAL - AGRIBUSINESS</strong></td>
<td>23,367</td>
<td>-</td>
<td>58,420</td>
</tr>
<tr>
<td><strong>TOTAL - BRAZIL</strong></td>
<td>52,994</td>
<td>-</td>
<td>160,649</td>
</tr>
</tbody>
</table>

Sources: AgroStat Brasil / MAPA e MDIC
Elaboration: GV Agro
Brazilian agribusiness exports

Main products (by value) - 1965

- **Coffee**: 52.5%
- **Others**: 28.3%
- **Tobacco**: 2.0%
- **Corn**: 2.1%
- **Cocoa**: 3.1%
- **Sugar**: 4.2%
- **Cotton**: 7.9%

**Agribusiness Exports**: US$ 1.35 billion (84.4%)

**Total Brazilian Exports**: US$ 1.59 billion

Source: UN COMTRADE
Elaboration: GV Agro

19/09/2008
Brazilian agribusiness exports

Main products (by value)

2002

- PRODUTOS FLORESTAIS: 17.2%
- CARNES: 12.9%
- COUROS E SEUS PRODUTOS: 9.4%
- AÇÚCAR: 8.4%
- ALCOOL: 0.7%
- CAFÉ: 5.6%
- SUCOS DE FRUTA: 4.4%
- DEMAIŞ: 13.2%
- FUMO: 4.1%

2007

- PRODUTOS FLORESTAIS: 15.1%
- CARNES: 19.3%
- COUROS E SEUS PRODUTOS: 6.1%
- AÇÚCAR: 8.7%
- ALCOOL: 2.5%
- CAFÉ: 6.7%
- SUCOS DE FRUTA: 4.1%
- DEMAIŞ: 14.1%
- FUMO: 3.9%
- COMPLEXO SOJA: 19.5%

Source: AgroStat Brasil
Elaboration: GV Agro
Brazilian agribusiness exports

Main markets (by value)

2002
- EUA: 16.7%
- CHINA: 5.5%
- RUSSIA: 4.9%
- JAPAN: 4.0%
- EU-27*: 37.9%
- ARGENTINA: 1.5%
- DEMAIS: 27.8%

USA + E.U = 53.9%

2007
- EUA: 11.0%
- CHINA: 6.0%
- RUSSIA: 5.8%
- JAPAN: 3.0%
- EU-27*: 35.8%
- ARGENTINA: 2.1%
- DEMAIS: 31.7%

USA + E.U = 46.8%

Source: AgroStat Brasil
Elaboration: GV Agro
* EU-27 was also considered in 2002
Brazilian Agribusiness Exports

Developing Countries
from US$ 6.2 bi to US$ 29.1 bi

Developed Countries
from US$ 14.4 bi to US$ 34.8 bi
Variation (2000-2008*): +11.7% a.a.

Source: Aliceweb-MDIC. Nota: * from jun/07 to mai/08 Elaboration: GV Agro
- Available land
- Human resources
- Technology
Potential


Sources: Conab e IBGE

* Productivity in bags/ha


Elaboration: GV Agro
Planted area in “Plantio Direto” in Brazil

**safra verão / safrinha / inverno**

53% of total area of grains

3% of total area of grains

Source: FEBRAPDP – Federação Brasileira de Plantio Direto na Palha
Planted area in “Plantio Direto” in the World: harvest 04/05

**Potential**

**World Total:** 95,757 thousand ha

**Source:** FEBRAPDP – Federação Brasileira de Plantio Direto na Palha

**Elaboration:** GV Agro
Potencial

Benefits of GMO’s

To the World (1996 to 2006)

- **Economics** - US$ 34 billion in the period
- **Environmental** - 1.2 billion kg of CO₂ left of being emitted in the atmosphere in 2006.

To Brazil (until now to 2017)

- Will be saved:
  - 56.2 billion liters of water
  - 382 million liters of diesel
  - 77.1 thousand tons of agrochemicals

- In the case of the soybean (since 2003/04):
  - US$ 2.3 bi were saved, being US$ 1.3 bi by the decrease of the production cost and other US$1 bi by the productivity increase.
- Material and Financial Resources
The soils are poor

It is necessary to build the fertility of the soils

It is necessary to invest in fertilizers

Map of the fertility of the Brazilian soils

Source IBGE 2002, Elab. MBAgro
Brazilian consumption of nutrients (2007)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Production</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>2.8 M t</td>
<td>75%</td>
</tr>
<tr>
<td>P</td>
<td>3.7 M t</td>
<td>51%</td>
</tr>
<tr>
<td>K</td>
<td>4.2 M t</td>
<td>8%</td>
</tr>
</tbody>
</table>

Source: ANDA
Challenges

- Material and Financial Resources
- Infrastructure and logistics
Condition of the Brazilian highways - 2006

Challenges

- Paved 12%
- Not paved 88%
- Insufficient 39%
- Bad 24%
- Terrible 12%
- Good 11%
- Well 14%

Source: Centro de Estudos em Logística da UFRJ    Elaboration: GV Agro
- Material and Financial Resources
- Infrastructure and logistics
- Macroeconomics
### Inflation – variation since “Plano Real”

**IPCA (julho/1994 a julho/2008) = 232%**

<table>
<thead>
<tr>
<th>Category</th>
<th>IPCA</th>
<th>Category</th>
<th>IPCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comunicação</td>
<td>670,0</td>
<td>Cereais, Legum., Oleagín.</td>
<td>295,2</td>
</tr>
<tr>
<td>Combustíveis (Domésticos)</td>
<td>661,2</td>
<td>Carnes</td>
<td>252,2</td>
</tr>
<tr>
<td>Aluguel e Taxas</td>
<td>509,9</td>
<td>Farinha, Féculas e Massas</td>
<td>244,6</td>
</tr>
<tr>
<td>Transporte Público</td>
<td>465,5</td>
<td>Óleos e Gorduras</td>
<td>208,2</td>
</tr>
<tr>
<td>Energia Elétrica Resid.</td>
<td>380,0</td>
<td>Aves e Ovos</td>
<td>203,6</td>
</tr>
<tr>
<td>Plano de Saúde</td>
<td>348,5</td>
<td>Carnes e Peixes Indust.</td>
<td>186,5</td>
</tr>
<tr>
<td>Serviços Pessoais</td>
<td>348,1</td>
<td>Leite e Derivados</td>
<td>172,0</td>
</tr>
<tr>
<td>Combustíveis (Veículos)</td>
<td>337,9</td>
<td>Hortaliças e Verduras</td>
<td>168,7</td>
</tr>
<tr>
<td>Cursos</td>
<td>286,3</td>
<td>Açúcares e Derivados</td>
<td>126,4</td>
</tr>
<tr>
<td>Serviços Médicos e Dentários</td>
<td>264,5</td>
<td>Frutas</td>
<td>-27,6</td>
</tr>
</tbody>
</table>

“Alimentação no domicílio” participou com 15,3% no IPCA de julho/2008.

Fonte: IBGE  
Elaboração: GV Agro
Exchange valorization

<table>
<thead>
<tr>
<th>Month</th>
<th>Plantio</th>
<th>Colheita</th>
<th>Plantio</th>
<th>Colheita</th>
<th>Plantio</th>
<th>Colheita</th>
</tr>
</thead>
<tbody>
<tr>
<td>jul/02</td>
<td>5,56</td>
<td>1,59</td>
<td>jul/03</td>
<td>4,33</td>
<td>jul/04</td>
<td>3,92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>jan/03</td>
<td>3,81</td>
<td>jan/04</td>
<td>3,43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>jul/04</td>
<td>3,81</td>
<td>jul/05</td>
<td>3,01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>jan/05</td>
<td>2,67</td>
<td>jan/06</td>
<td>2,53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>jul/06</td>
<td>2,47</td>
<td>jul/07</td>
<td>2,28</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>jan/07</td>
<td>1,96</td>
<td>jan/08</td>
<td>1,71</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>jul/08</td>
<td>1,59</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Câmbio nominal deflacionado pelo IGP-DI. ** Médias: plantio (set-nov) e colheita (mar-mai)

Fontes: Bacen e FGV. Elaboração: GV Agro

19/09/2008
- Material and Financial Resources
- Infrastructure and logistics
- Macroeconomics
- International Negotiations: Doha Round
- Organization
Thank You!

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