Latin America

Population:
580m (8.4%)

Arable Land:
567m ha (37%)

Freshwater Supply:
18,392 km³ (33%)
Estadísticas e Indicadores Económicos Índices de producción de alimentos
Año base: promedio anual trienio 1999-2001 = 100
(SOFT) COMMODITY GIANTS
Brazilian Meat Exports
(last decade)

* Last 12 months (dec/06 to nov/07)
Source: Agribusiness Trade Balance/Ministry of Agriculture, Livestock and Food Supply (MAPA).
1 loaf of bread
MADE IN THE U.S.A.

- Wheat gluten from France, Poland, Russia, the Netherlands, or Australia
- Honey from China, Vietnam, Brazil, Uruguay, India, Canada, Mexico, or Argentina
- Calcium propionate from the Netherlands
- Guar gum from India
- Flour enrichments from China
- Beta-carotene from Switzerland
- Vitamin D3 from China

Source: R. Brackett; Managing Food Safety Practices (2009)
Food Supply Chain

- 200,000 food processing companies
- 900,000 restaurants (12m employees)
- 100m head of cattle
- Avg. distance farm-fork of 1lb of meat: 1,600km

Agricultural Supply Chain -> U$ 1 trillion p.a.

Source: P. Cheek (2006)
SIMPLIFIED FOOD SUPPLY CHAIN OF A DEVELOPED COUNTRY

PLANT ORIGIN

CROPS

OTHER

PRODUCE

CONSUMER

ANIMAL PROTEIN

Aquaculture

Storage & Trading

Feed & Flour Mills

PROCESSING & PACKAGING

FOOD INDUSTRY

Distribution & Retail

Restaurants
Major Concerns Facing you today

Q6. Looking at the screen which of the following are the major concerns facing you today? Please select your top three concerns.

- Crime levels: 43%
- Terrorism: 30%
- Provision of Health Services/NHS: 28%
- Drugs: 24%
- Healthy eating: 23%
- Pollution/environmental issues: 21%
- Pensions: 19%
- Household finances: 17%
- Standards in education: 16%
- House prices: 15%
- Traffic congestion: 13%
- The economy: 10%
- Food safety: 9%

Base: All respondents (3513)

Fuente: Consumer Attitudes to Food Standards_UK Report_2007_extract
## Consumer Perception and Public Health Concern in Germany

### Risk perceptions 2002 \(^{(n=449)}\)

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonella</td>
<td>1.63*</td>
</tr>
<tr>
<td>Mycotoxins(^{a})</td>
<td>1.74</td>
</tr>
<tr>
<td>Smoking</td>
<td>1.80</td>
</tr>
<tr>
<td>BSE / mad cow disease</td>
<td>1.85***</td>
</tr>
<tr>
<td>Pesticide residues</td>
<td>1.89***</td>
</tr>
<tr>
<td>Spoiled food</td>
<td>1.98</td>
</tr>
<tr>
<td>Hormones</td>
<td>2.03</td>
</tr>
<tr>
<td>Nuclear power plant</td>
<td>2.11***</td>
</tr>
<tr>
<td>Eating too much</td>
<td>2.17***</td>
</tr>
<tr>
<td>Road traffic</td>
<td>2.39*</td>
</tr>
<tr>
<td>Genetically modified food</td>
<td>2.47</td>
</tr>
<tr>
<td>Electromagnetic pollution</td>
<td>2.52</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>2.59</td>
</tr>
<tr>
<td>Preservatives</td>
<td>3.09***</td>
</tr>
</tbody>
</table>

* scale: 1 = very dangerous, 5 = (rather) not dangerous.

Source: Roehr et al (2005)
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>50000 BC</td>
<td>Early humans</td>
<td>Self preservation</td>
</tr>
<tr>
<td>4000 BC</td>
<td>Various</td>
<td>Early food fermentation</td>
</tr>
<tr>
<td>2000 BC</td>
<td>Leviticus</td>
<td>Religious beliefs</td>
</tr>
<tr>
<td>AD 1676</td>
<td>Antonie van Leeuwenhoek</td>
<td>Origins of Microbiology</td>
</tr>
<tr>
<td>AD 1810</td>
<td>Nicholas Appert</td>
<td>Basis of commercial heat processing</td>
</tr>
<tr>
<td>AD 1857</td>
<td>Pasteur</td>
<td>Early Food Microbiology</td>
</tr>
<tr>
<td>AD 1880</td>
<td>Gartner</td>
<td>First isolation of <em>Salmonella</em> from food</td>
</tr>
<tr>
<td></td>
<td></td>
<td>poisoning outbreak</td>
</tr>
<tr>
<td>1880 to date</td>
<td>Salmon, Russell, Frazier and many others</td>
<td>Start of Golden Age of Food Microbiology</td>
</tr>
</tbody>
</table>

Fuente: Griffith, C.J.; Food Safety: where from and where to?; British Food Journal, Vol. 108 No. 1; 2006; pp. 6-15
# Food Safety Contaminants

## Mycotoxins vs. Micro-biological

<table>
<thead>
<tr>
<th>Risk</th>
<th>Mycotoxins</th>
<th>Micro-biological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Acute Toxicity</td>
<td></td>
</tr>
</tbody>
</table>

## Main Cause

<table>
<thead>
<tr>
<th>Risk</th>
<th>Main Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Climate/Environ. Environment</td>
</tr>
</tbody>
</table>

## Predictability

<table>
<thead>
<tr>
<th>Risk</th>
<th>Predictability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Low</td>
</tr>
</tbody>
</table>

## Frequency of occurrence

<table>
<thead>
<tr>
<th>Risk</th>
<th>Frequency of occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Medium/High</td>
</tr>
</tbody>
</table>

## In Supply Chain

<table>
<thead>
<tr>
<th>Risk</th>
<th>In Supply Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Mainly primary production/All over the supply chain</td>
</tr>
</tbody>
</table>

## Motive to Control

<table>
<thead>
<tr>
<th>Risk</th>
<th>Motive to Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Economic (Feed/Brand), Legislation/Economic (Brand, Recall), Legislation</td>
</tr>
</tbody>
</table>

## Preventive Action

<table>
<thead>
<tr>
<th>Risk</th>
<th>Preventive Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>hardly possible/partially possible/unaccepted (irradiation)</td>
</tr>
</tbody>
</table>

## Traceable/Liability

<table>
<thead>
<tr>
<th>Risk</th>
<th>Traceable/Liability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>no/partially</td>
</tr>
</tbody>
</table>

## Legislation

<table>
<thead>
<tr>
<th>Risk</th>
<th>Legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>partly/yes</td>
</tr>
</tbody>
</table>

## Allergens (claim!)

<table>
<thead>
<tr>
<th>Risk</th>
<th>Allergens (claim!)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Acute Toxicity</td>
</tr>
</tbody>
</table>

## Agrochemicals (Pest+Drugs)

<table>
<thead>
<tr>
<th>Risk</th>
<th>Agrochemicals (Pest+Drugs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>Toxic &amp; product attribute (organic)</td>
</tr>
</tbody>
</table>

## GMO

<table>
<thead>
<tr>
<th>Risk</th>
<th>GMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic Toxicity</td>
<td>unknown</td>
</tr>
</tbody>
</table>

## HUMAN INDUCED RISKS

### Environmentally induced risks

- **Risk**
- **Main Cause**
- **Predictability**
- **Frequency of occurrence**
- **In Supply Chain**
- **Motive to Control**
- **Preventive Action**
- **Traceable/Liability**
- **Legislation**

## Human induced risks

- **Risk**
- **Main Cause**
- **Predictability**
- **Frequency of occurrence**
- **In Supply Chain**
- **Motive to Control**
- **Preventive Action**
- **Traceable/Liability**
- **Legislation**
Latin American Food Safety Survey

- June 2010
- online
- n=209
- 14 countries

Respondents by Country:
- Brazil, 70
- Mexico, 45
- Colombia, 24
- Chile, 17
- Argentina, 17
- Uruguay, 8
- Peru, 4
- Panama, 1
- Nicaragua, 2
- Paraguay, 9
- Ecuador, 4
- Guatemala, 4
- Costa Rica, 3
- USA, 1
Respondents by Industry

- Food Complex
- Feed Complex
- Research and Public Organisations
- Services
- Distribution

- Certification & Auditing
- Brewery & Malting
- Dried Fruits, Nuts & Spicery
- Commodity Trader/Export
- Biotech & Food Safety
- Re-Seller/Distributor
- Petfood
- Flour Milling
- Consultancy
- Dairy
- Research
- Animal Husbandry
- Government
- Feed
- University
- Service Lab
- Food

Making the World's Food Safer
Respondents' Profiles

Repondents by Scope of Function
- Admin: 13
- Other: 14
- Vet/Nutrition: 16
- Management: 17
- QC: 44
- Researcher: 44
- Lab: 61

Respondents by Company Size
- Extra Large (>5000 FTE): 7
- Very Large (1000-5000 FTE): 12
- Large (250-1000 FTE): 38
- Medium (50-250 FTE): 48
- Small (10-50 FTE): 34
- Micro (1-10 FTE): 20
Diagnostic Technology Employed (chemical contaminants)

Technology Employed (n=209)

- ELISA: 48%
- Chromatography: 45%
- LFD: 13%
- Fluorometry: 8%

Technology in the Food Complex (n=62)

- ELISA: 55%
- Chromatography: 39%
- LFD: 18%
- Fluorometry: 8%

Technology in Feed Complex (n=48)

- ELISA: 48%
- Chromatography: 21%
- LFD: 8%
- Fluorometry: 8%
Contaminants and residues to play a major role in the future of food safety.

- Mycotoxins
- Pesticides
- Veterinary Drug Residues
- GMO
- Allergens
- Marine and Freshwater Biotoxins

- All (n=209)
- Food Complex (n=62)
- Feed Complex (n=48)
- Research Staff (n=44)
- QC & Lab Staff (n=105)
Status-Quo vs. Outlook
(chemical contaminants)
Interlaboratory Study

- Round CSS-26307-RLI-2
- Aflatoxins in Maize
- Oct/Nov 2010

Latin America
- 109 participants
- 10 countries
Final Considerations

• **Compliance with Export Food Safety Standards** helps Food Safety in the exporting country.

• **Ambivalent Realities**
  - Large Food Export Countries (e.g. Brazil, Argentina, Chile, Paraguay)
  - Countries depended on imports (e.g. cradle of maize depends on US corn)
A World Bank study has calculated that the European Union regulation on aflatoxins costs Africa $670 million each year in exports of cereals, dried fruit, and nuts. And what does it achieve? It may possibly save a life of one citizen of the European Union in every two years [...] Surely a more reasonable balance can be found.”

KOFI ANNAN
Final Considerations

**Number of undernourished people: Latin America and the Caribbean**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>5</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Central America</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>The Caribbean</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>South America</td>
<td>55</td>
<td>42</td>
<td>38</td>
</tr>
</tbody>
</table>

*Source: FAO*
Gerald Gutscher

Email: gerald@gutscher.com