

BHC - Animal Health & INSEAD

Customer Driven Growth Strategies Programme, 2007

Global Trends / Mega Trends: 2007/2025

Relevant for Animal Health Business?!

Dr. M. Kern, Bayer CropScience AG, Monheim am Rhein, Germany

08. November, 2007
INSEAD
Fontainebleau/Paris, France

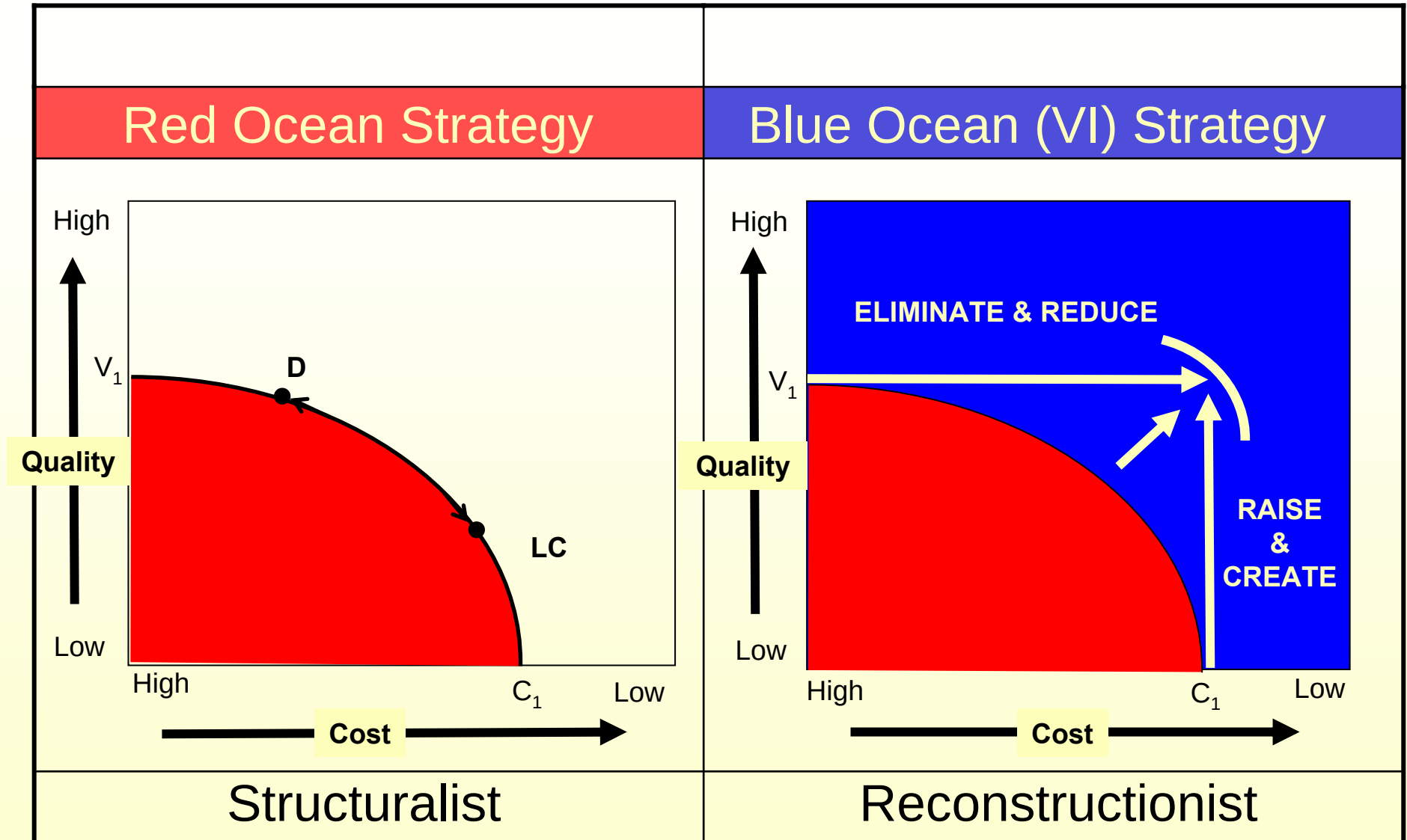
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The Wisdom of the Sands, Saint-Exupery, 1948

*"As for the future,
your task is not to foresee,
but to enable it."*

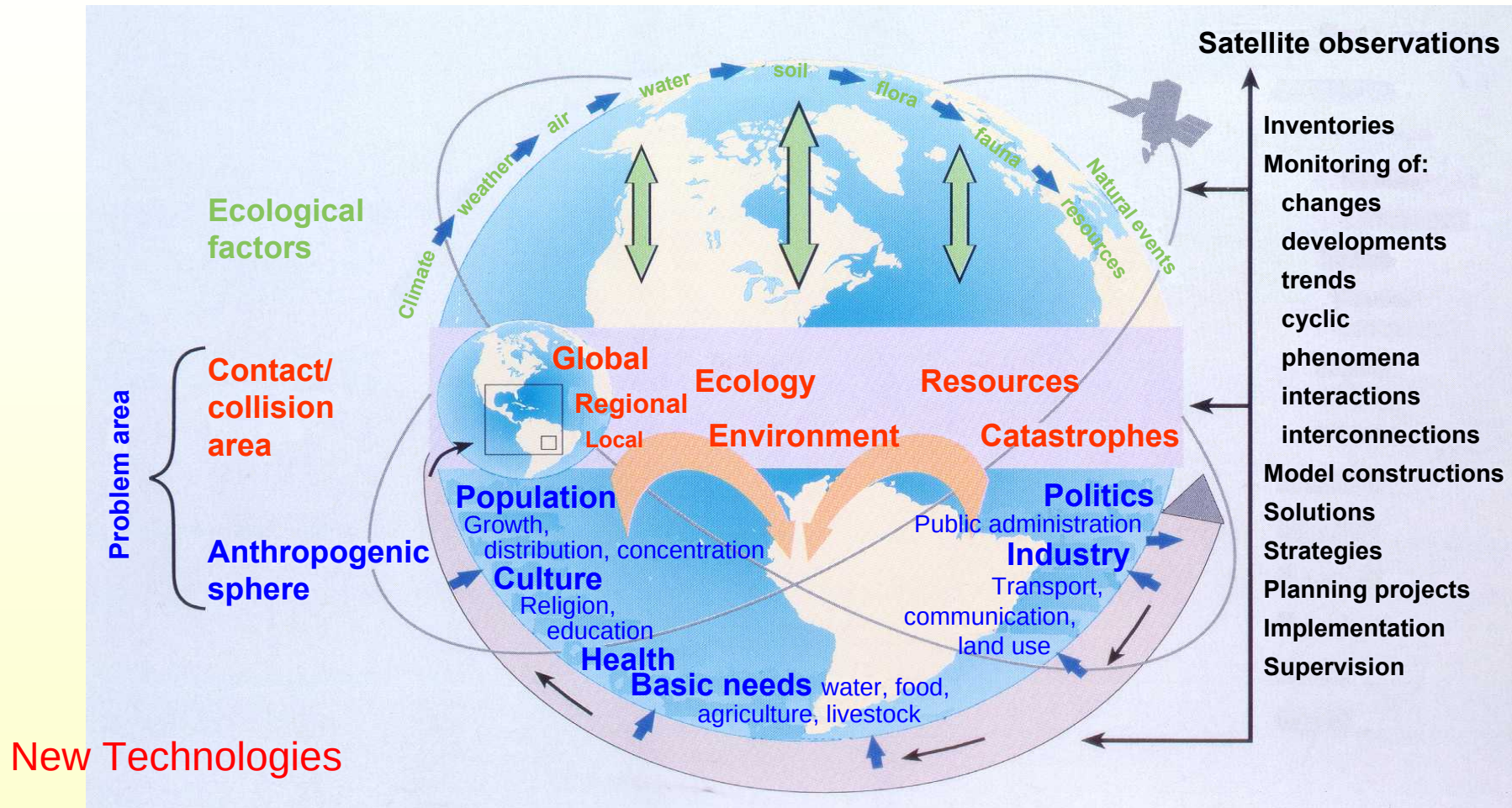
Saint-Exupery,
The Wisdom of the Sands, 1948

Generic Strategies vs. Value Innovation

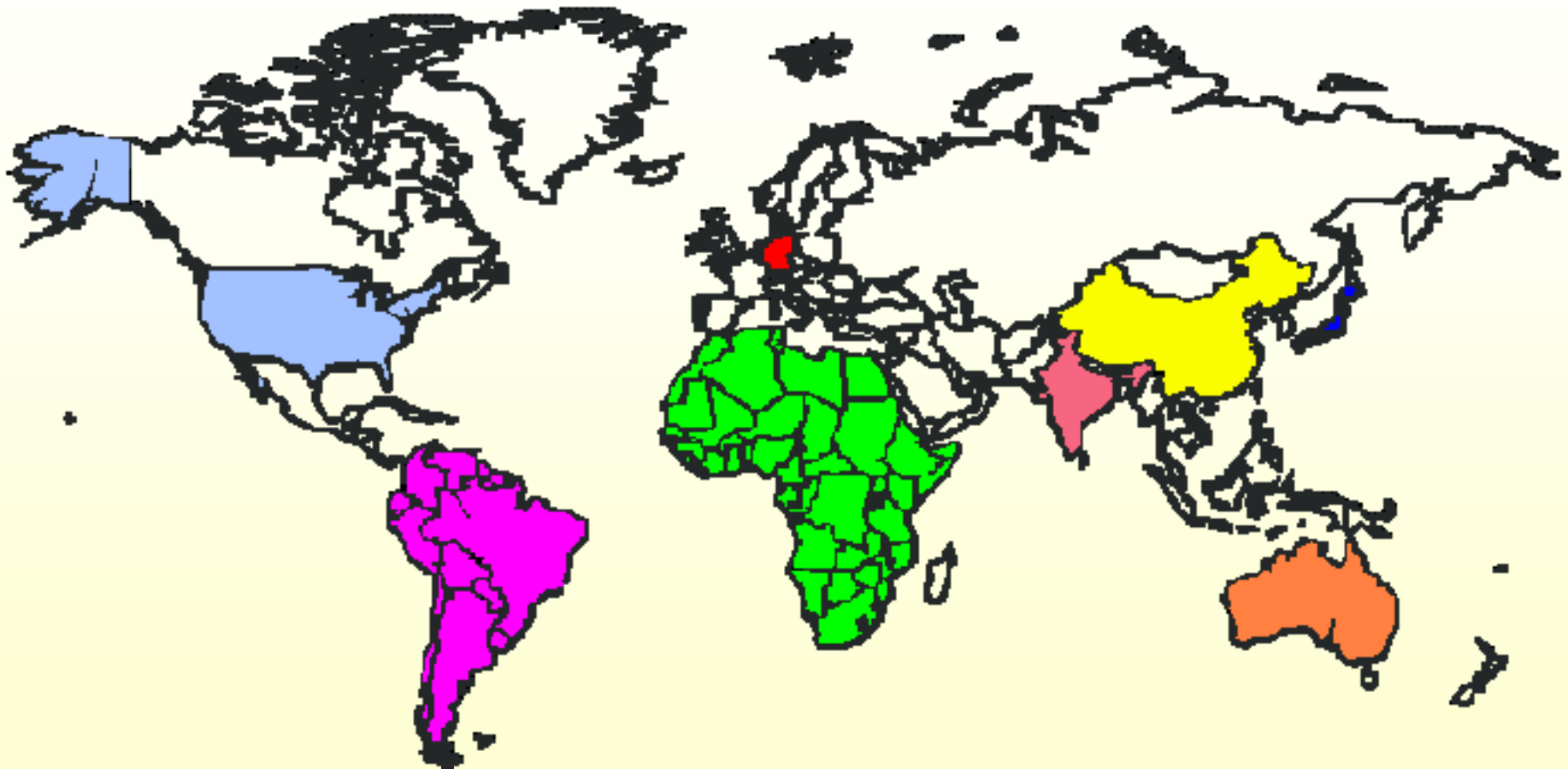


Source: Shipilov, A., INSEAD, 2006

A Global Perspective

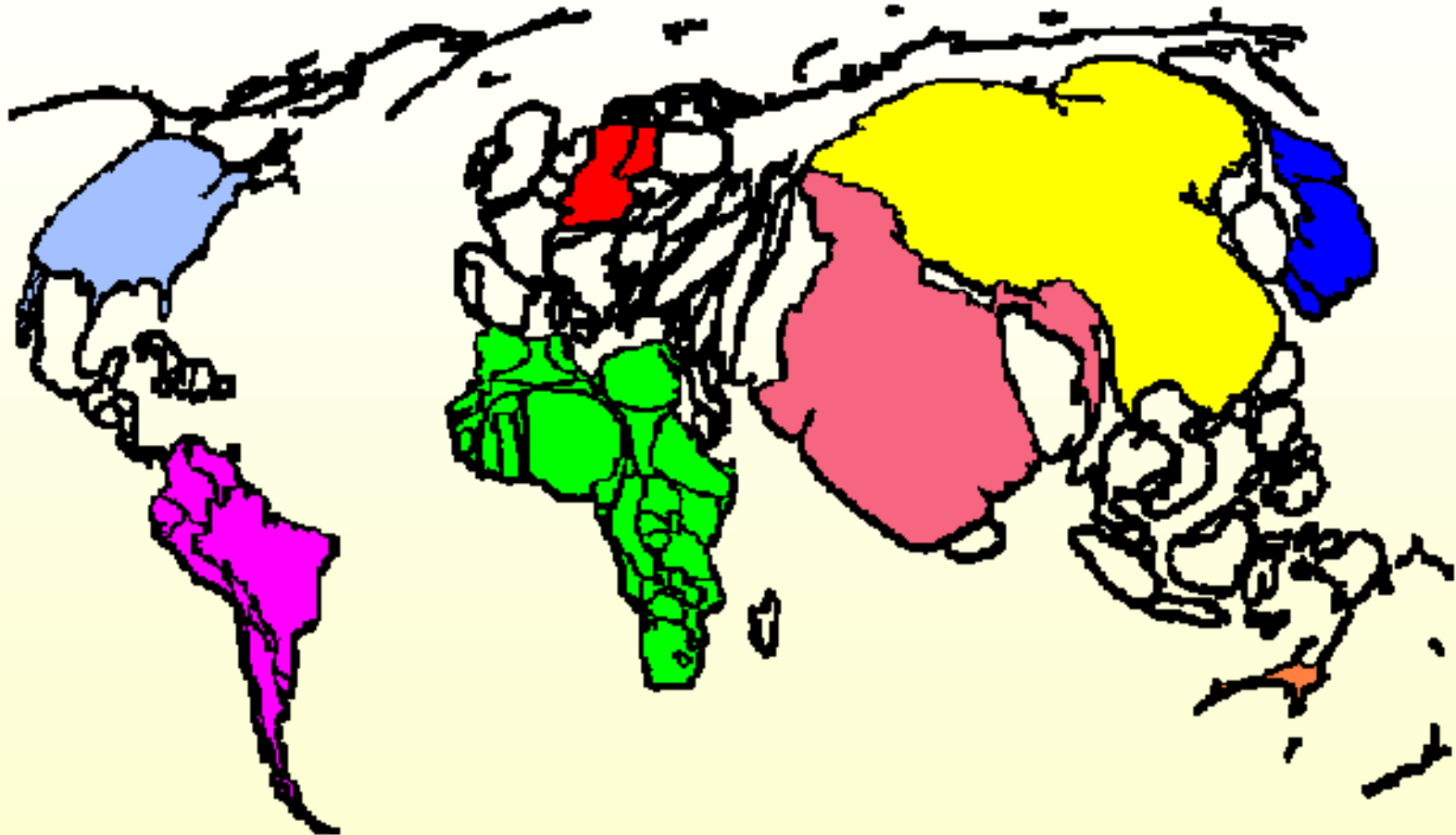


World Map



isnar₁₉₉₆

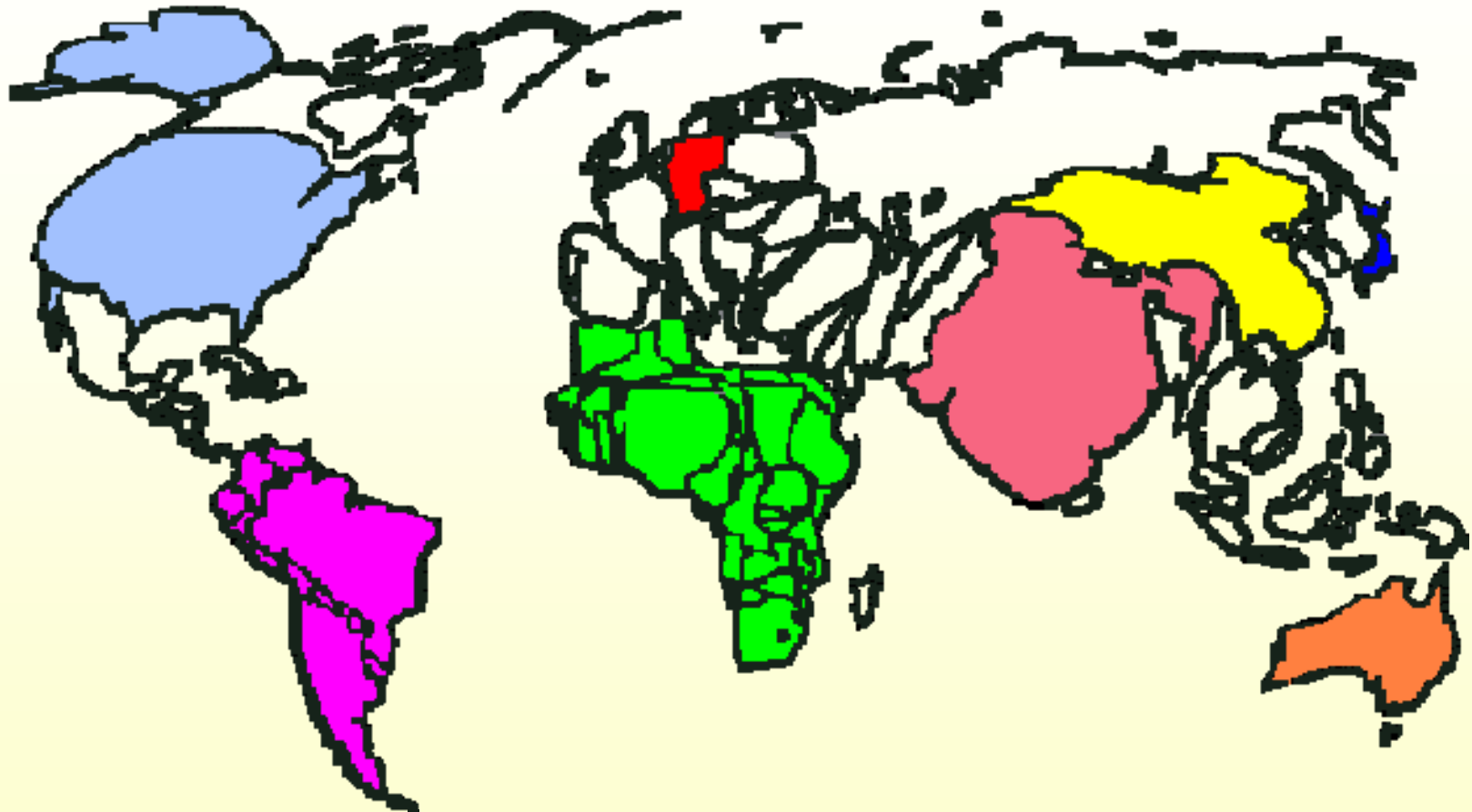
Anamorphosis of the World: Population Density



isnar₁₉₉₆

Source: Svein Tveitdhal, Grid, Arendal, Norway (UNEP Project)

Anamorphosis of the World: Total Cropland



isnar₁₉₉₆

Source: Svein Tveitdhal, Grid, Arendal, Norway (UNEP Project)

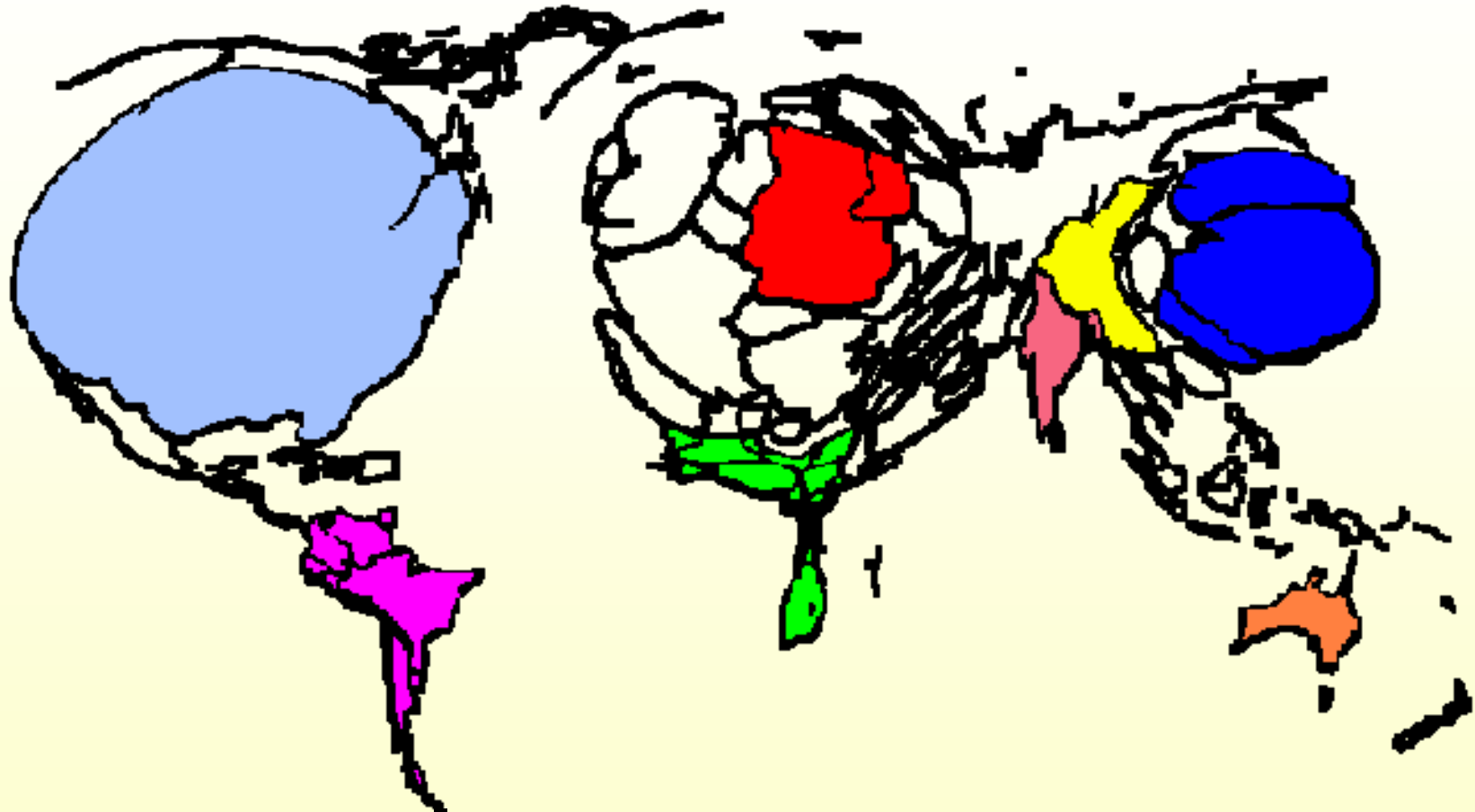
Anamorphosis of the World: Renewable Internal Water Resources



isnar₁₉₉₆

Source: Svein Tveitdhal, Grid, Arendal, Norway (UNEP Project)

Anamorphosis of the World: Gross National Product

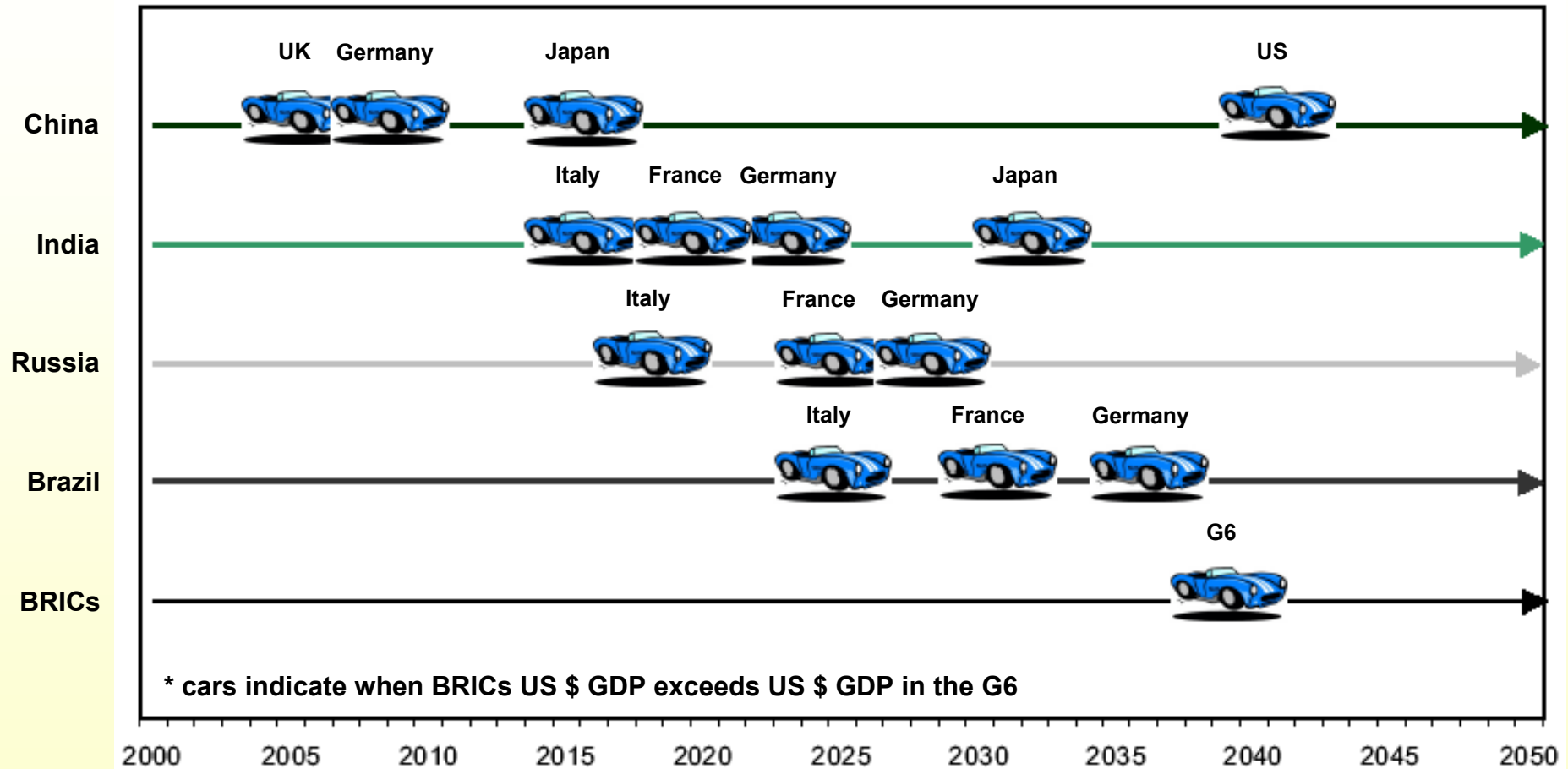


isnar₁₉₉₆

Source: Svein Tveitdhal, Grid, Arendal, Norway (UNEP Project)

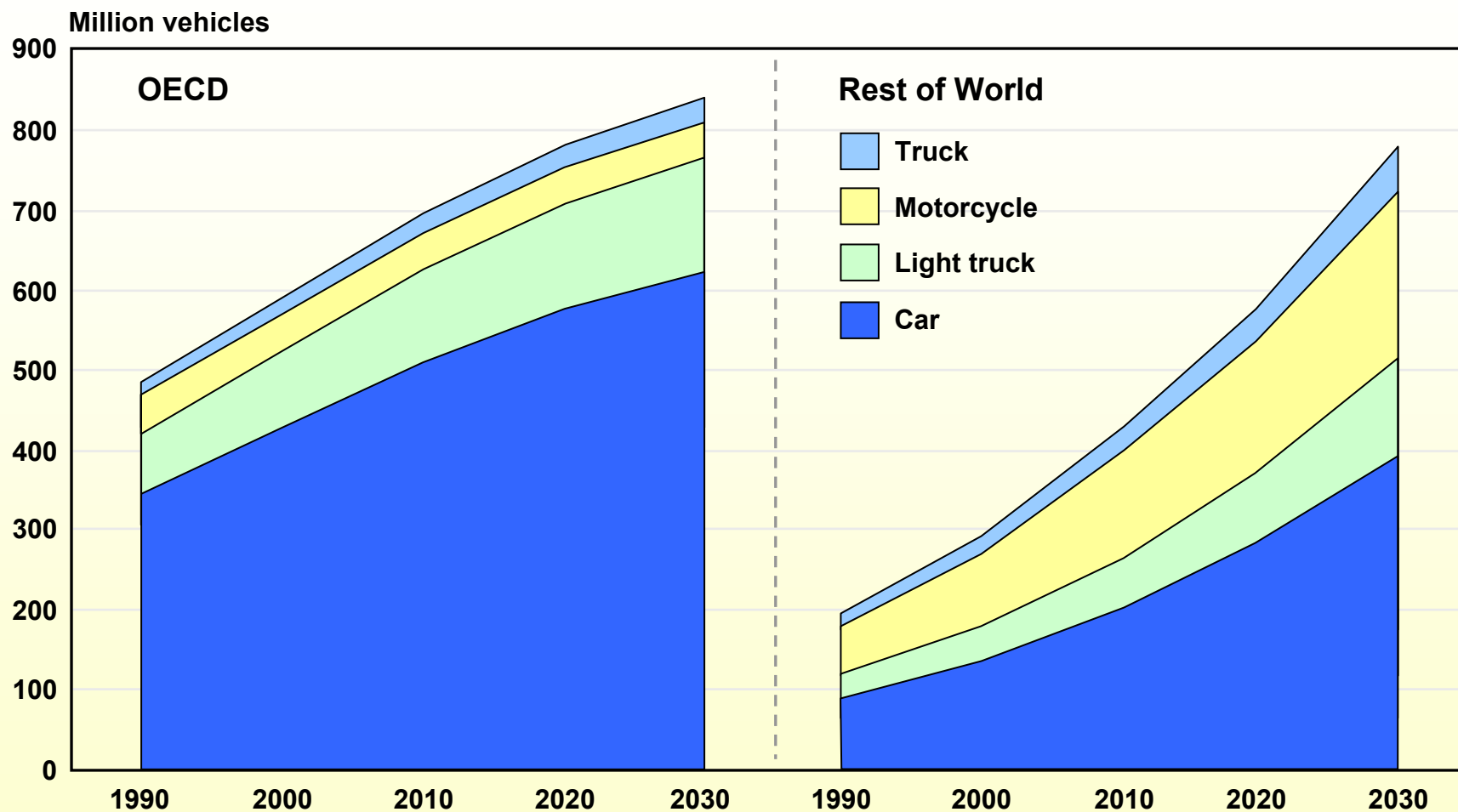
Overtaking the G6:

When BRICs US \$ GDP Would Exceed G6 GDP *



Source: Goldman Sachs, 2003

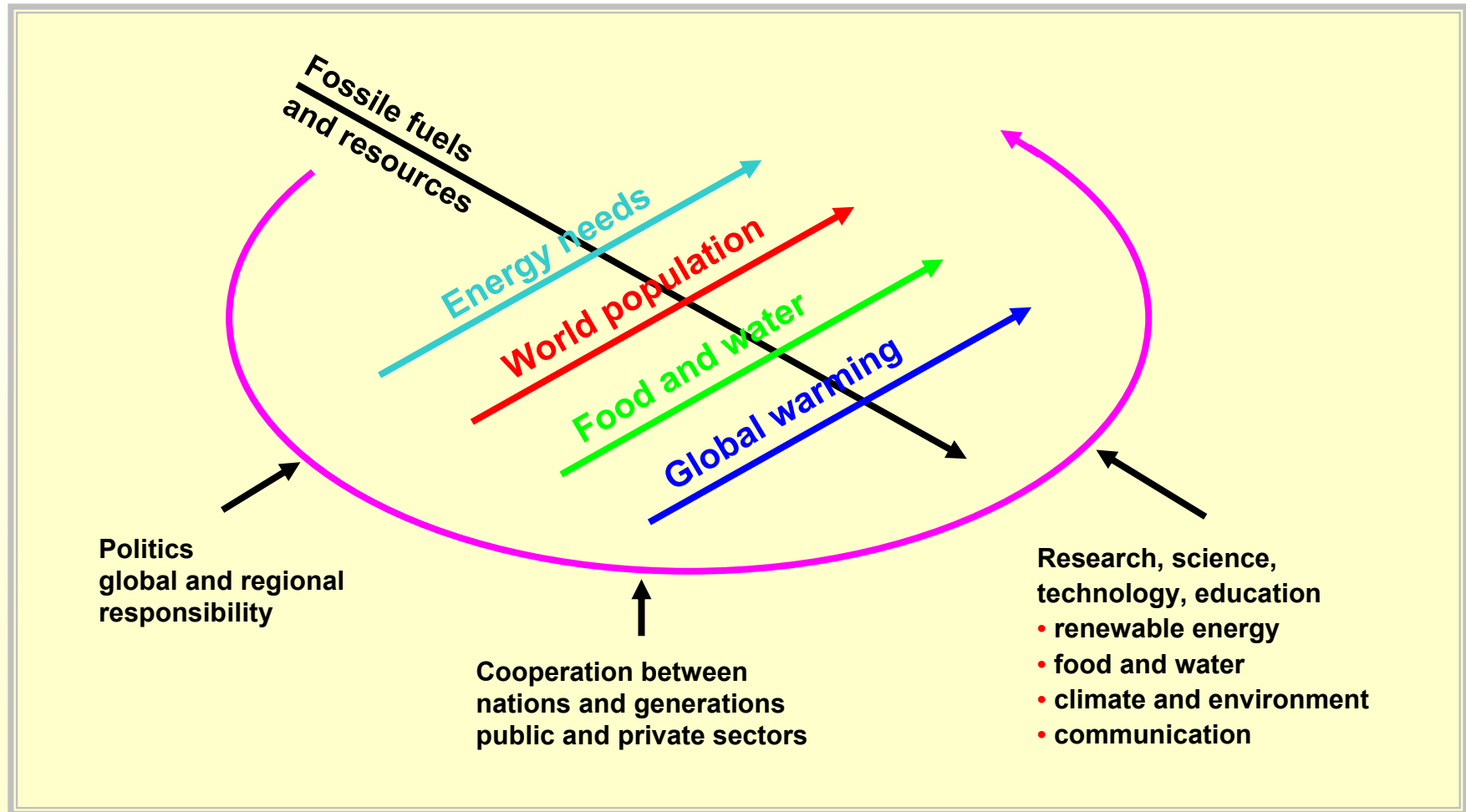
Vehicle Fleets Worldwide, 1990 - 2030



Source: FUIORE, R&D Technology Roadmap, 2003

Sustainability in the Global Context

Needs, Risks and Steering Elements



Source: El Bassam, N., Lamnet, Brazil, 2002

Central Questions Today, 2006

How can we feed the future world population in a sustainable way and in keeping with human dignity?

(Kern, M., 2000)

Who will be fed in the 21st century?

(Wiebe, K. et al., IFPRI, 2001)

What do we eat in the 21st century?

(Kern, M., 2001)

What can or must be done by whom to react to changes in time?

(Kern, M., 2002)

Source: Kern, M., 2002, 2006

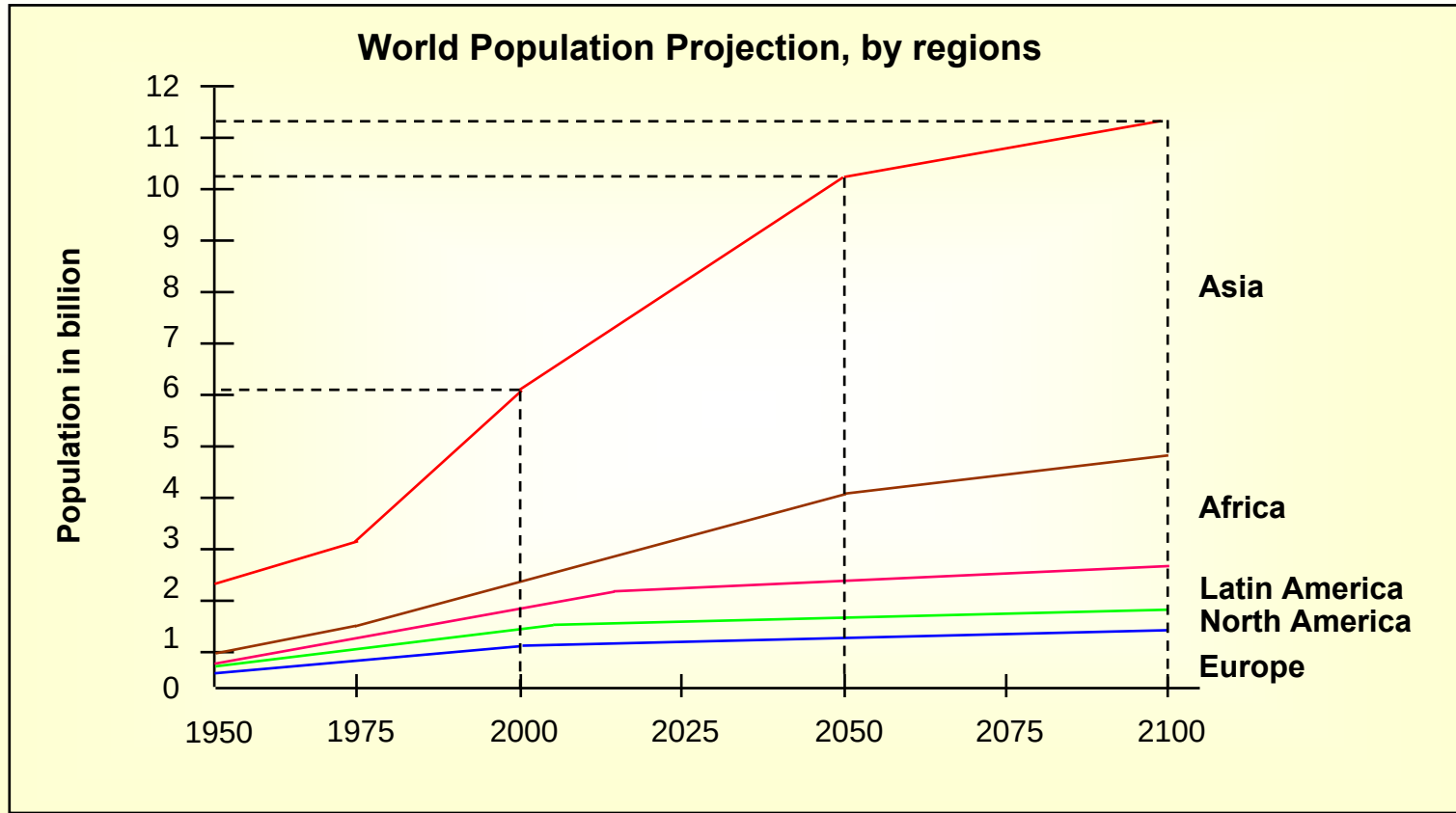
World Food Security in the 21st Century - to the Uttermost Limit of Necessity: Vision 2025/2050

The forecasts are based on over 9,000 industries, governmental agencies and academic sources (FAO, UN, IFPRI, IRRI, ECPA, GTZ, Hutson Institute, Worldwatch, Browditch, GREAN, CGIAR, World Bank, WHO, NATO, OECD, UNESCO, CARD, USDA, IPTS, EC, ISNAR, ...). 90% of the original source are less than 3 year old.

Source: Kern, M., 2003

World Population Growth, 1950 - 2100

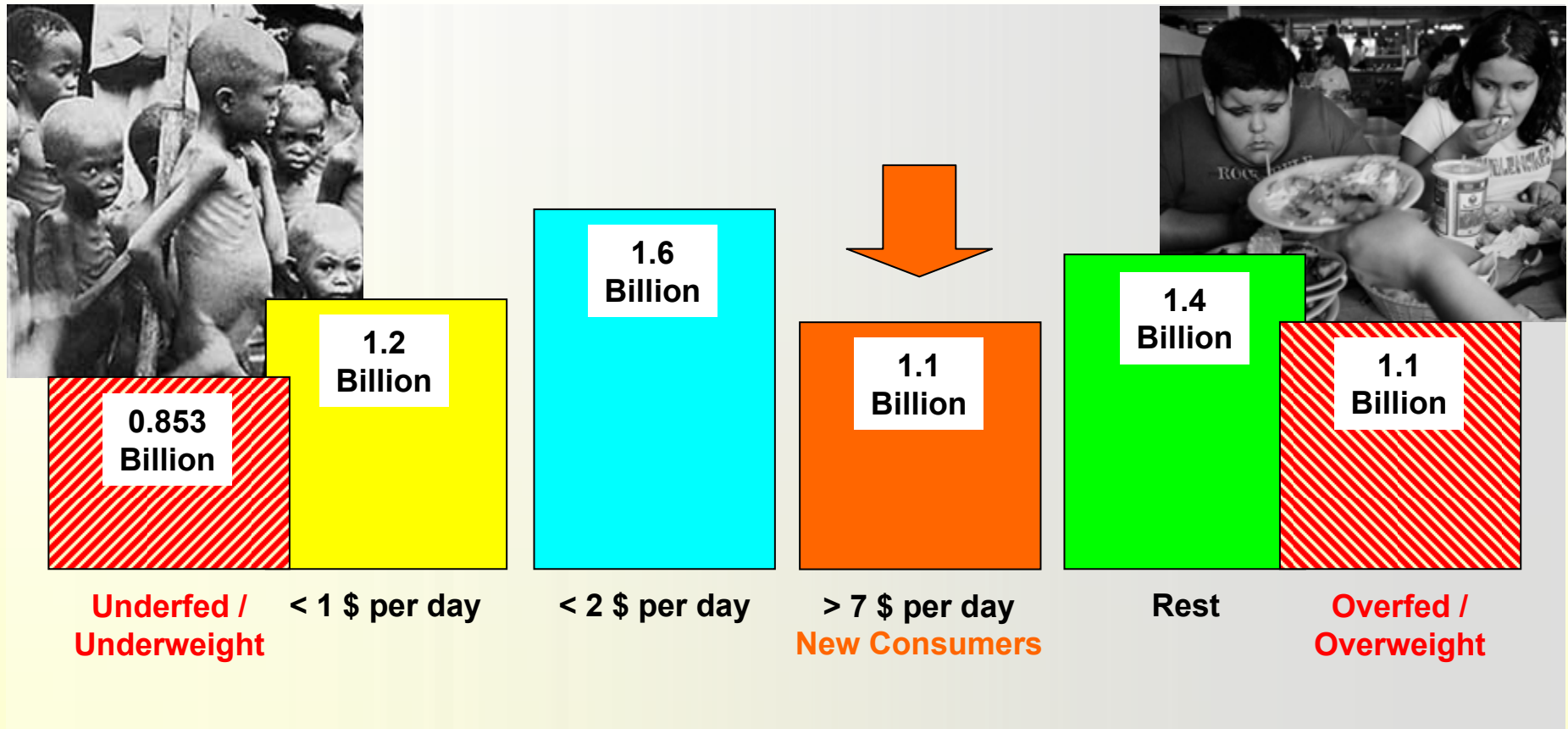
Population size estimates (1950-1990) and projection (1990-2025), by regions show a drastic increase in Asia and Africa.



Source: Deichner, 1995

Underfed and Overfed, World, 2005 - New Consumers

Billion People



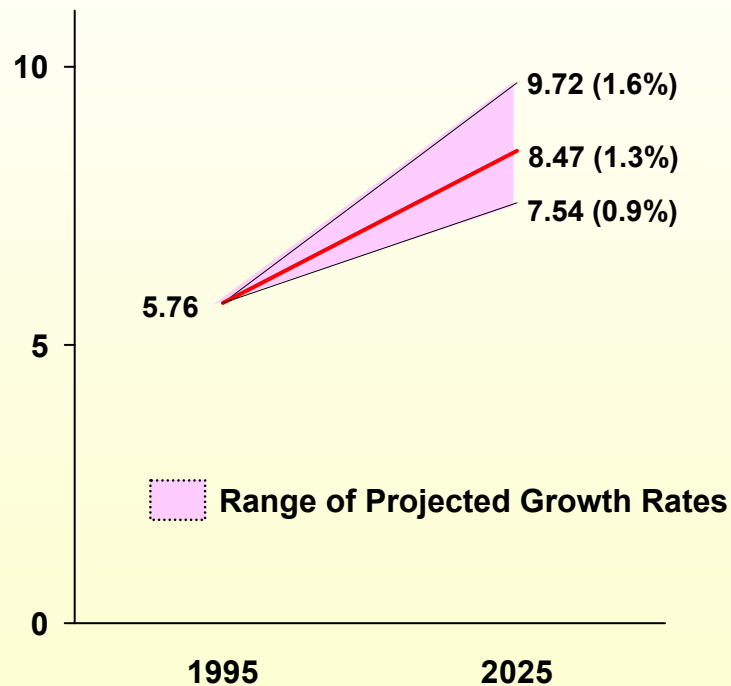
Source: Myers, N. and Kent, J., The New Consumers, 2004

The Question

To Discuss "Can We Feed the World Population?"
We Focus on Demand and Supply Factors Through Year 2025

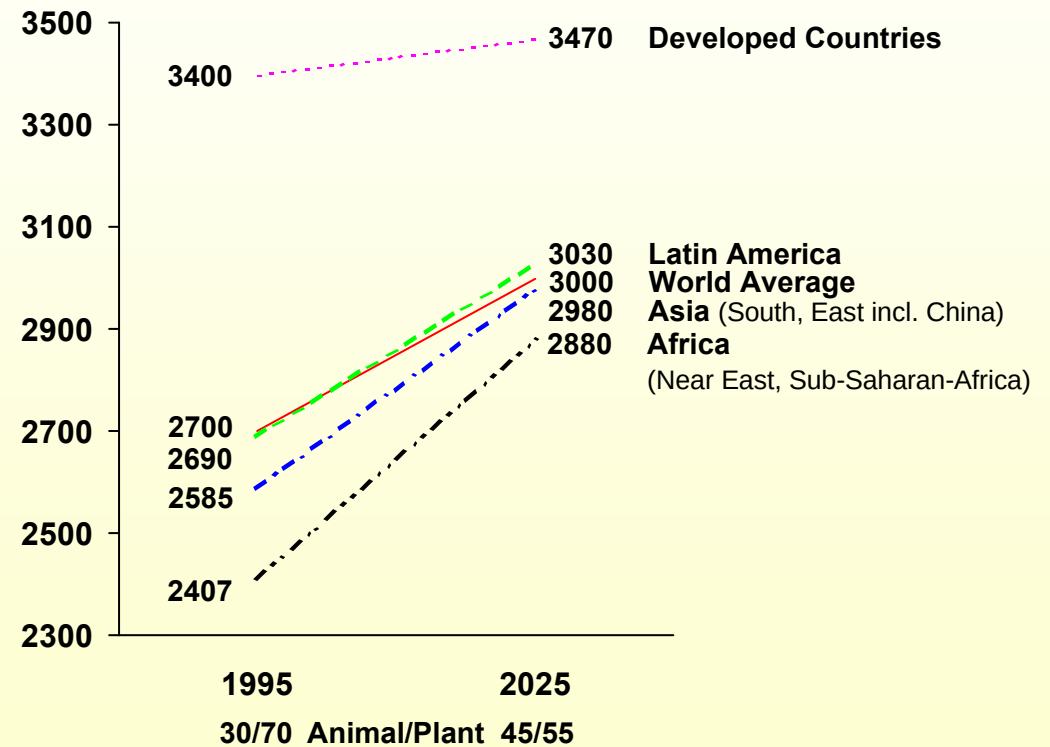
Population Growth (14 Studies)

Billion People



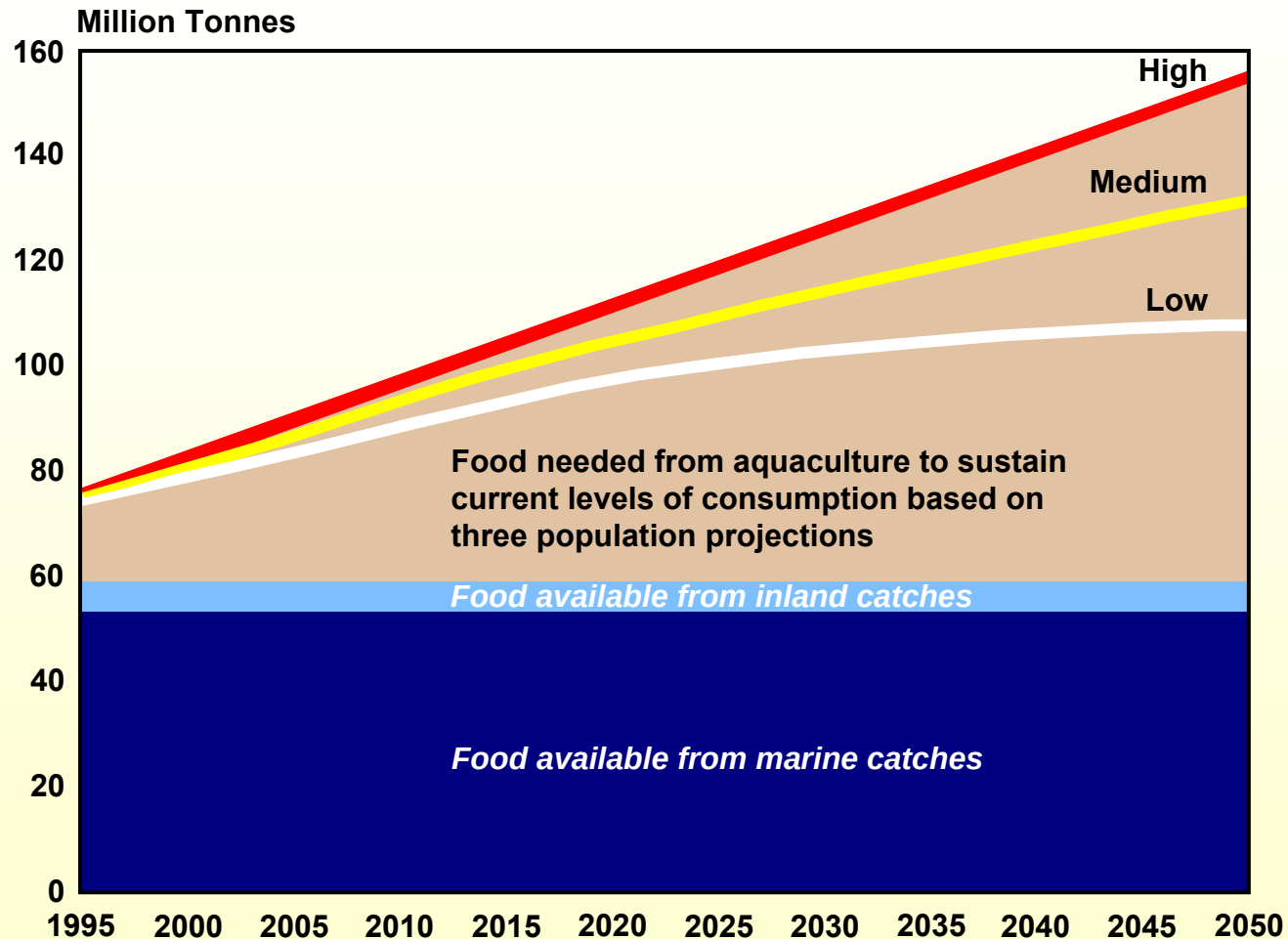
Calorie Consumption Growth

Calories/Capita/day



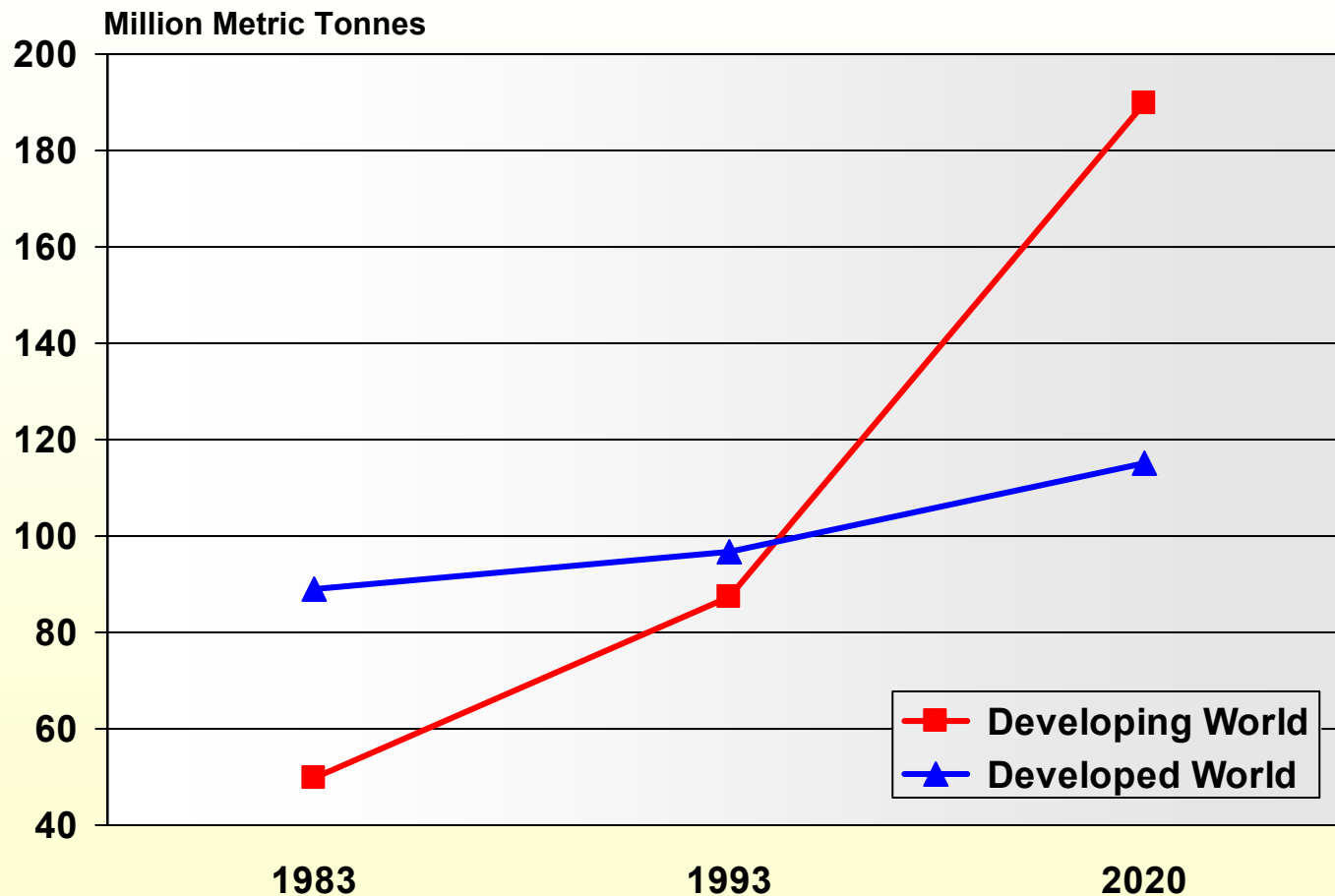
Source: Avery, FAO, 1995

World Production of Fish for Food, 1995 - 2050



Source: Hamilton, J., Treasure Valley Renewable Resources, 2006

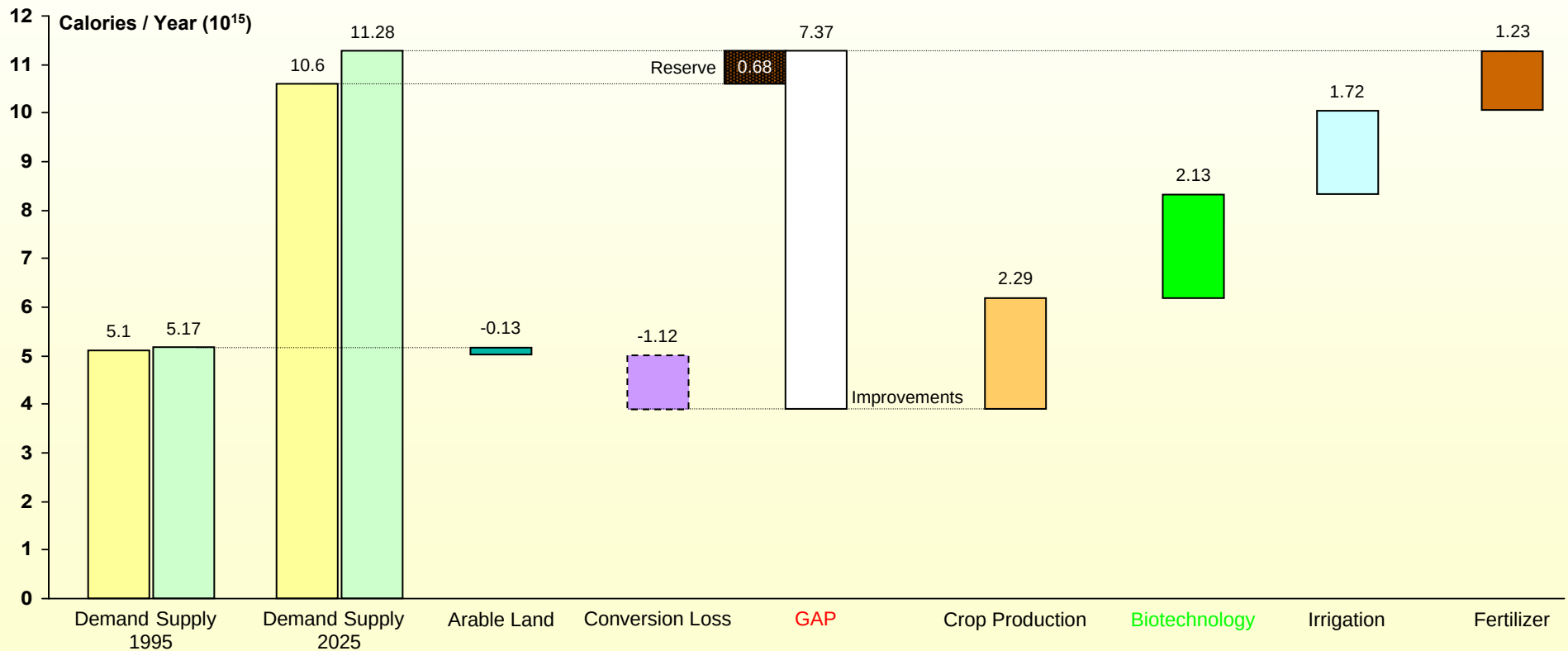
World Meat Consumption, 1983 - 2020



Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004

Global Food-Forecast, 1995 - 2025

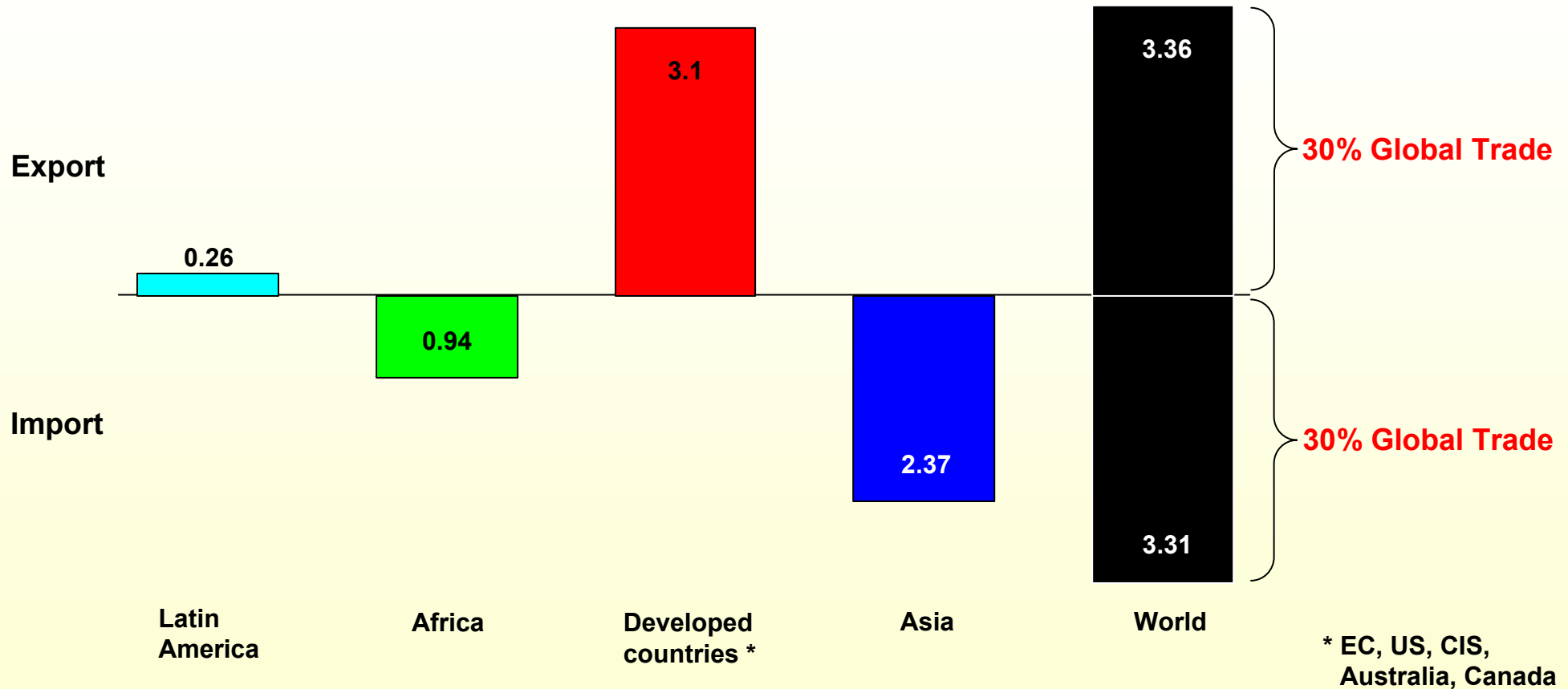
In 2025, the world will be able to feed 8.5 billion people. Extra production forecast will provide a small reserve for additional meat consumption in Asia and increased demand for renewable non-food resources in developed countries. Biotechnology will play a deciding role in preserving global self-sufficiency and the environment.



Source: Kern, M., 1996, 2005

Global and Regional Agricultural Export / Import: 2025

Trillion Kilocalories per Year



In **2000** agricultural trade represents only about **10 percent** of global production.

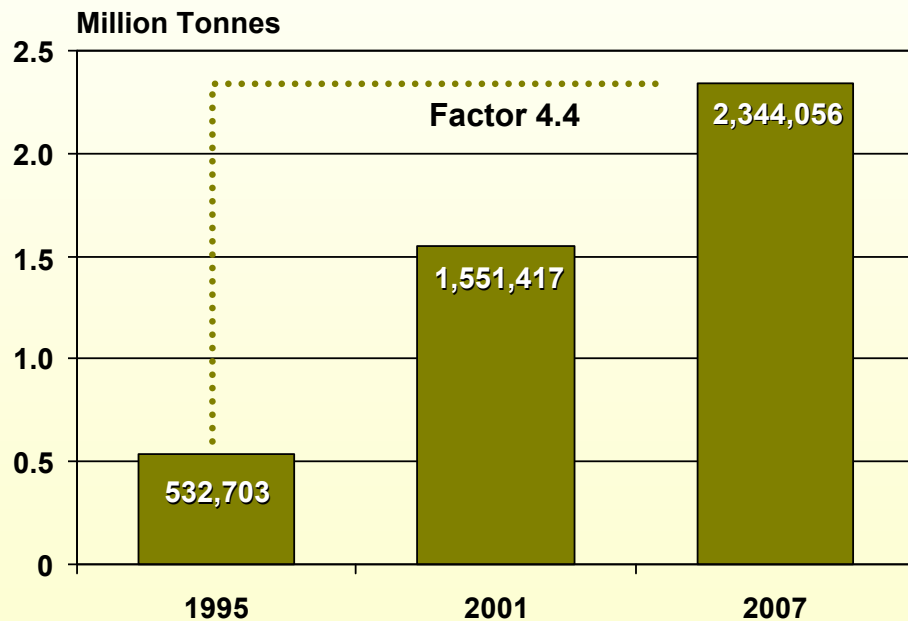
In **2025** agricultural trade will be about **30 percent** of global production.

Source: Kern, M., 1996, 2005

Special Cargo Capacities for Fresh and Cooled Goods, 1995 - 2007

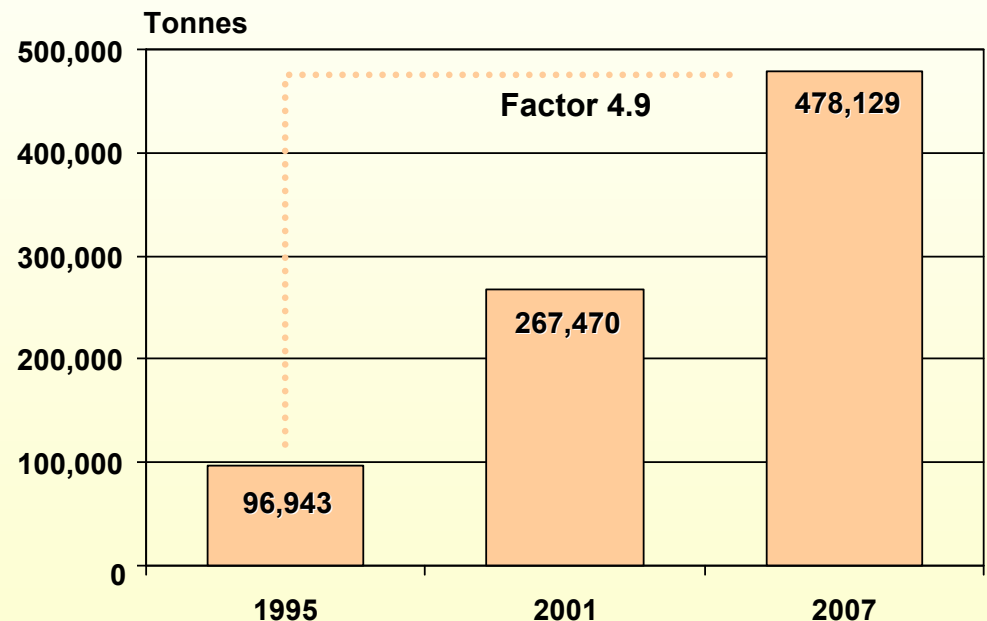
Fresh

The Service Package for perishable goods



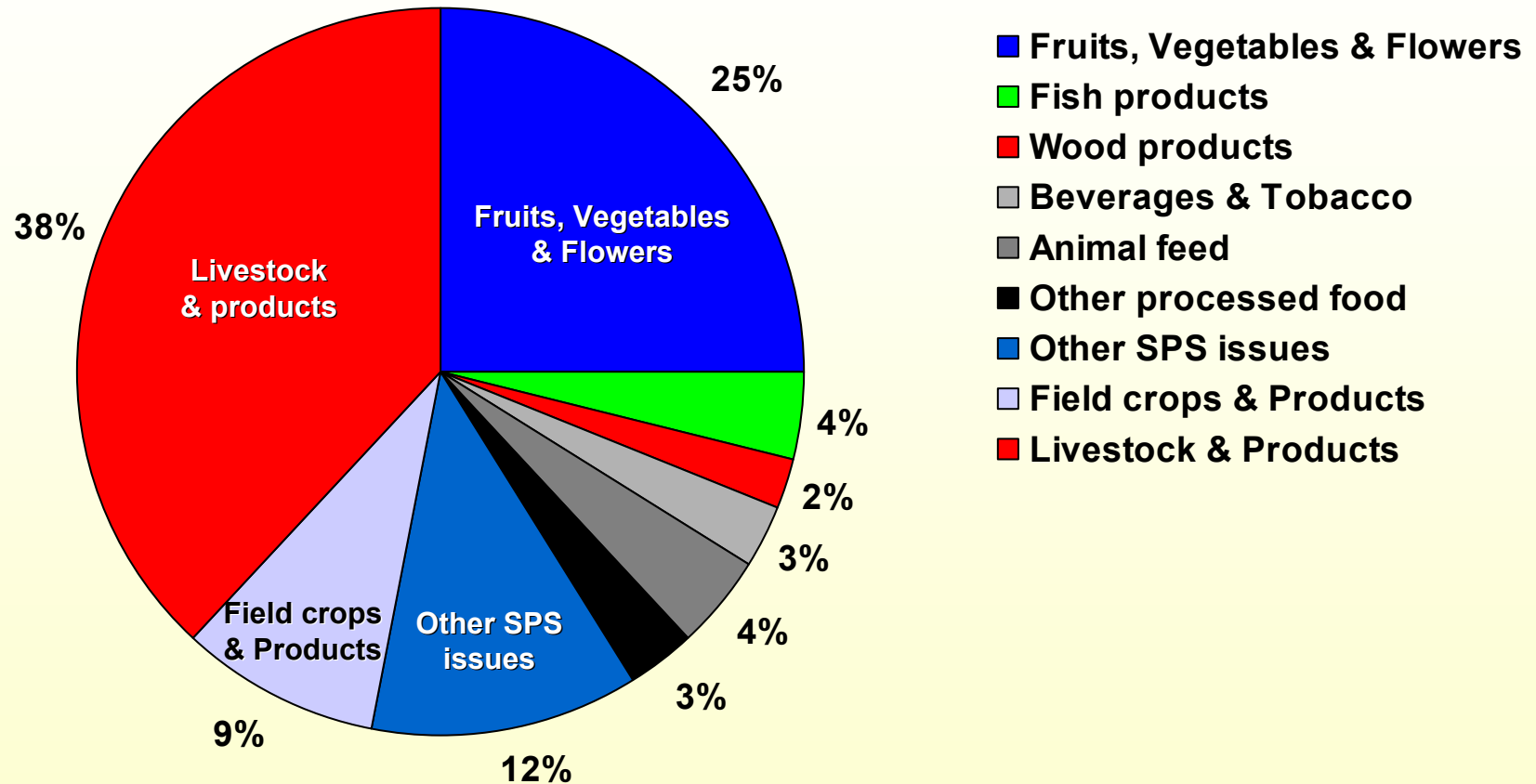
Cool

The Service Package for constant temperature management



Source: Lufthansa Cargo's, Planet 2002

Specific Trade Concerns by Product



Source: Seng, P., The European Union in the Global Meat Complex, 2005

Refrigerated Trades & Outlook to 2015

REFRIGERATED TRADES & OUTLOOK TO 2015

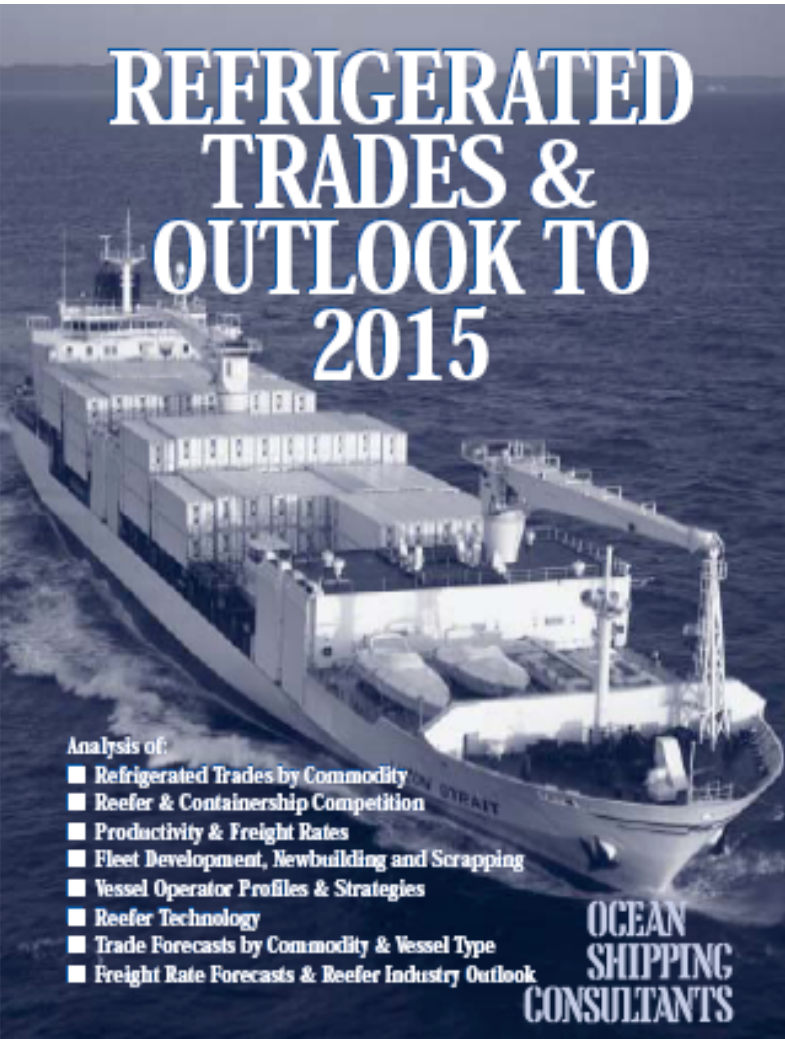
REFRIGERATED TRADES & OUTLOOK TO 2015

is one of a series of highly detailed studies published by Ocean Shipping Consultants Ltd about shipping, ports and associated markets. Other titles include:

- 'World Containerport Outlook to 2015'
- 'Containerisation in North Europe to 2015'
- 'The East Asian Containerport Market to 2015'
- 'The Middle East and Indian Subcontinent Containerport Market to 2010'
- 'Containerisation in the Americas to 2015'
- 'Shipping Profitability to 2015'

Further details of all publications and major consultancy projects undertaken by Ocean Shipping Consultants Ltd are available on request.

REFRIGERATED TRADES & OUTLOOK TO 2015



Analysis of:

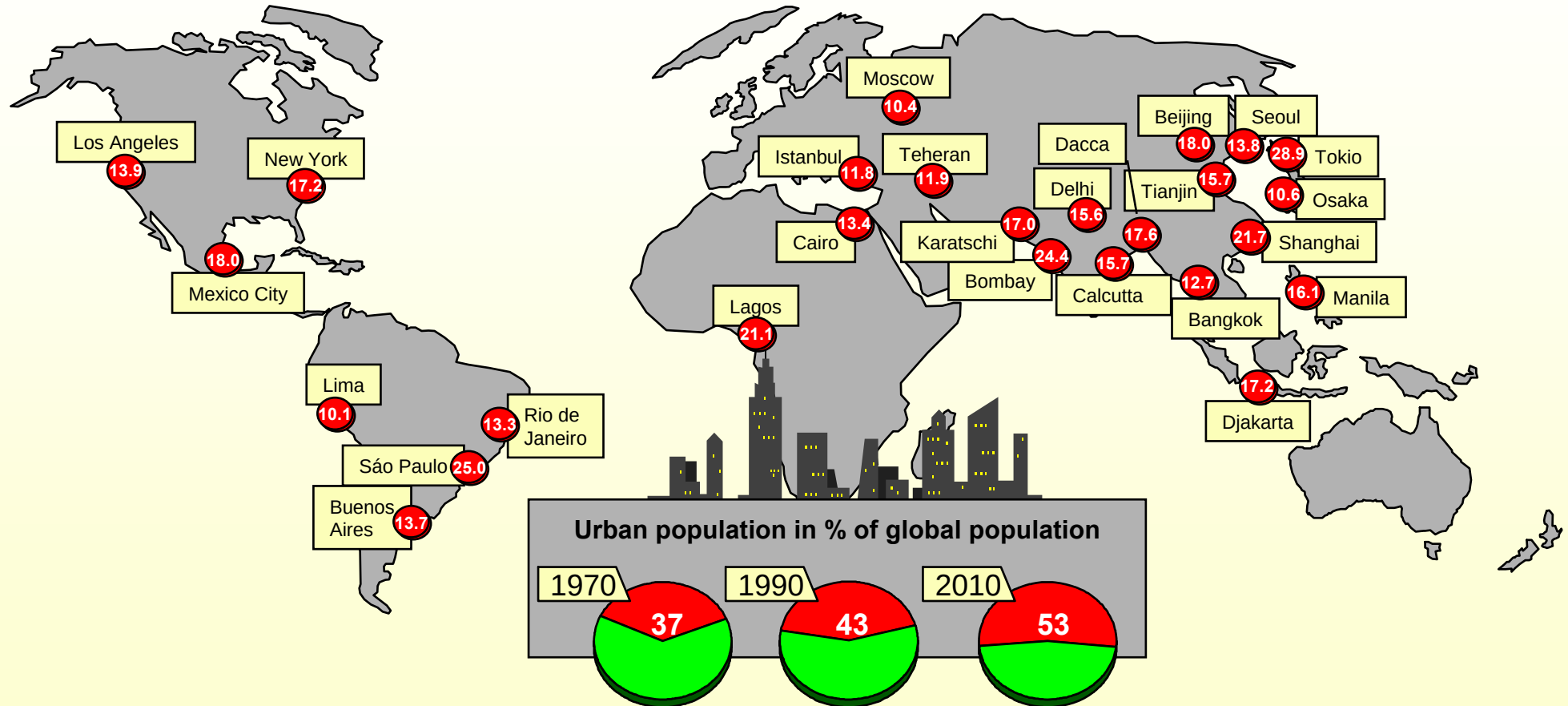
- Refrigerated Trades by Commodity
- Reefer & Containership Competition
- Productivity & Freight Rates
- Fleet Development, Newbuilding and Scrapping
- Vessel Operator Profiles & Strategies
- Reefer Technology
- Trade Forecasts by Commodity & Vessel Type
- Freight Rate Forecasts & Reefer Industry Outlook

OCEAN SHIPPING CONSULTANTS

The Largest Cities of the World

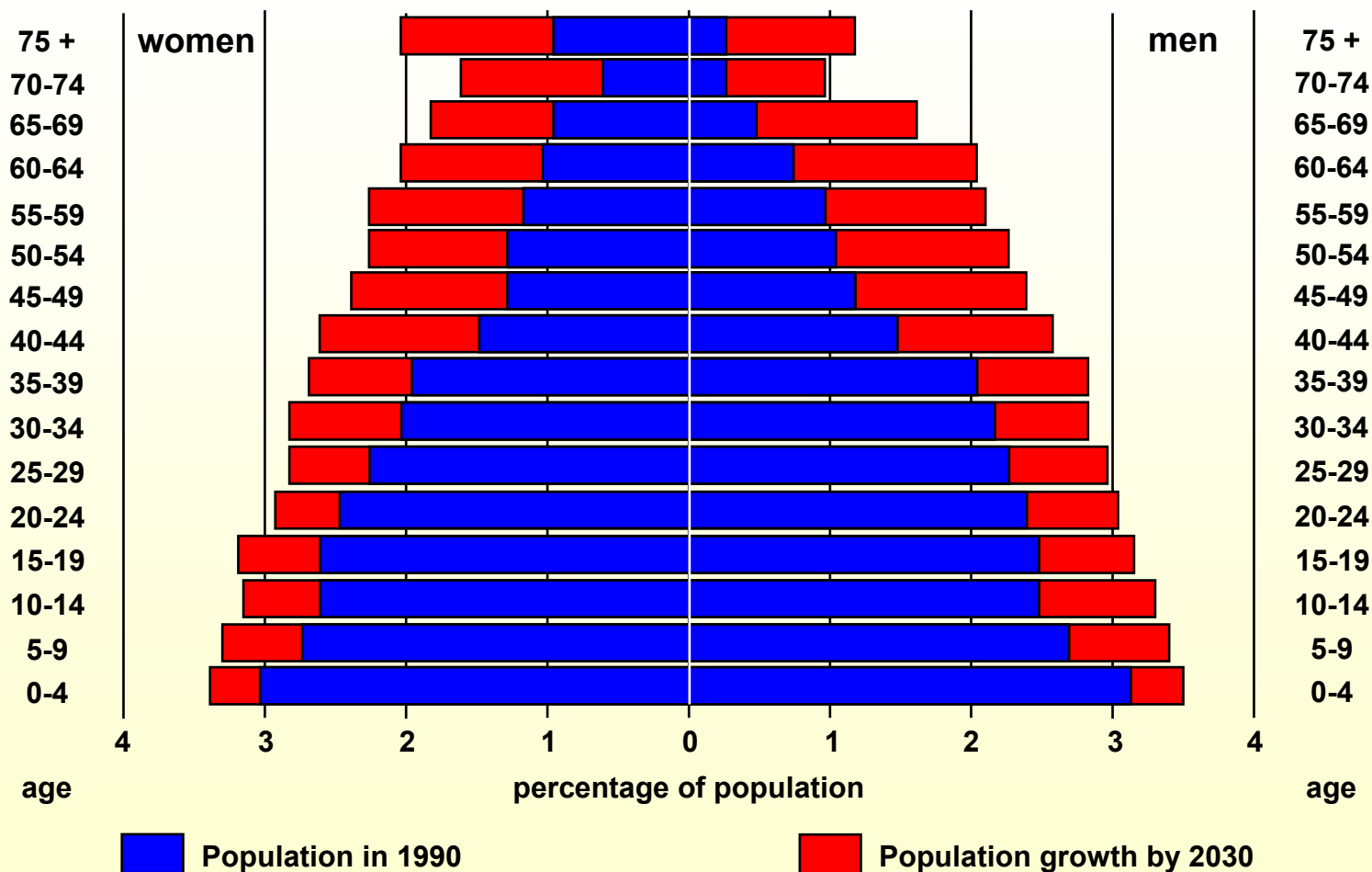
"Megacities" with more than 10 Million people

Assessed number of people in the year 2010 (in Mio.)



Source: UN, Andersen, U., 1996

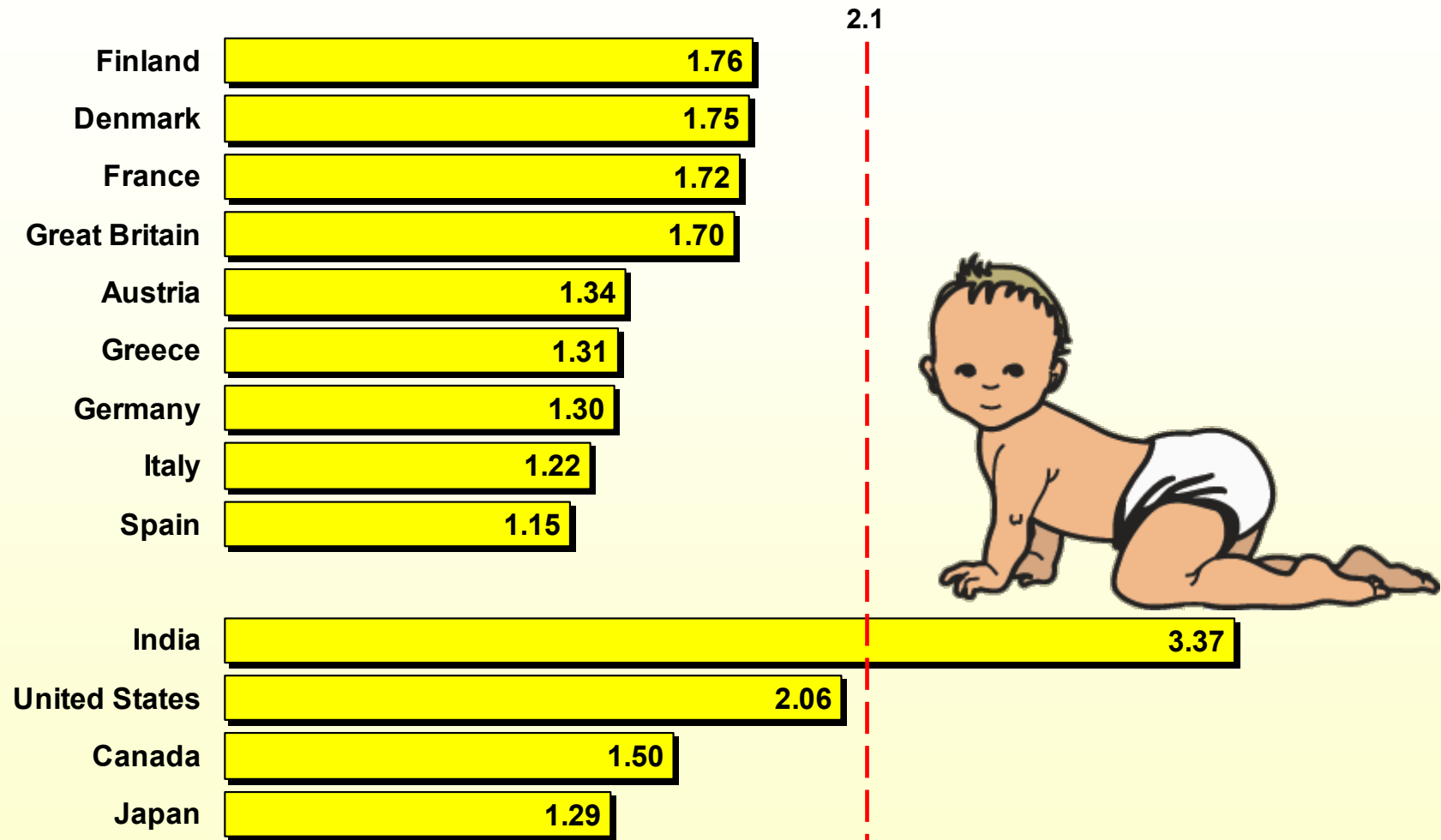
World Population by Age and Sex in 1990 and 2030



Source: World Bank, 1995

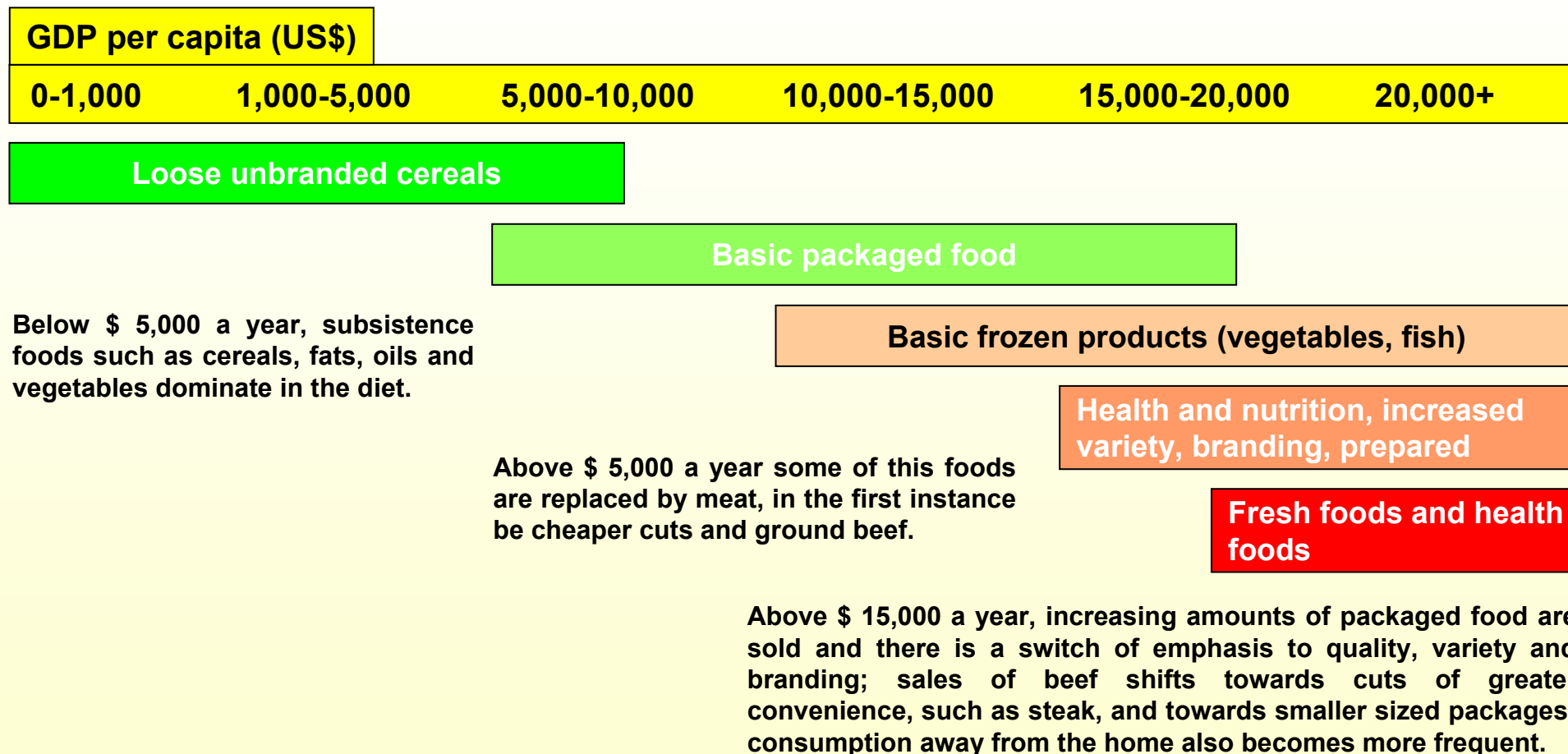
Kids, Kids ...

Number of babys per woman in ...



Source: US Bureau of Census, Eurostat (teilweise geschätzt), in: Focus 42, 1997, Demografisches Jahrbuch Österreichs, 1997, LifeSiteNews.com, 4/2004, The Gazette, 6/2004

Trigger Levels of GDP Per Capita for Different Types of Foods



Source: Steenkamp, 1997 in: The World Beef Industry, 1998

Trigger Levels of GDP per Capita for Different Types of Dog and Cat Foods

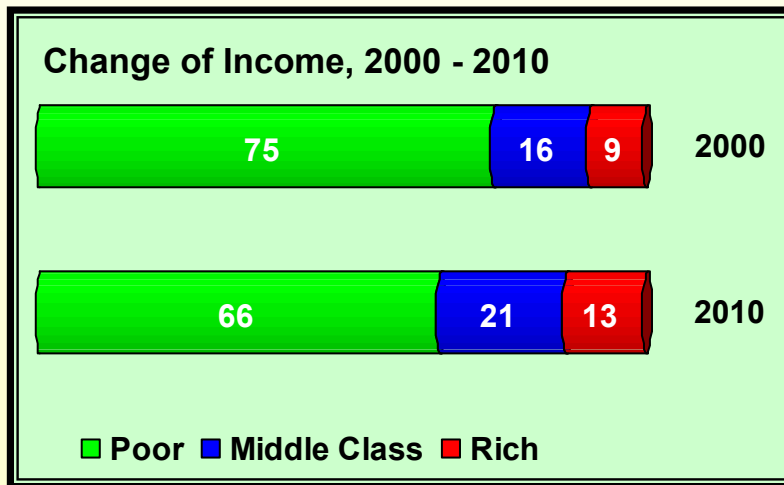
GDP per capita (US\$)					
0-1.000	1.000-5.000	5.000-10.000	10.000-15.000	15.000-20.000	20.000+

Food from Table Left Overs

> 8000 US\$

Canned Food

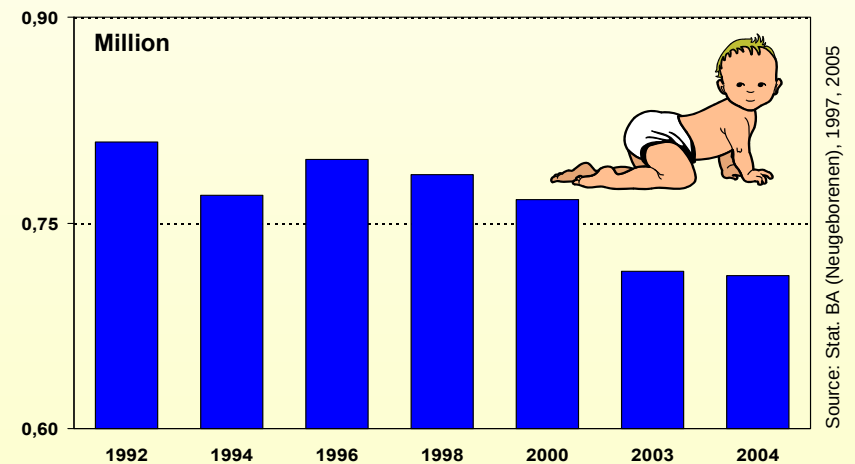
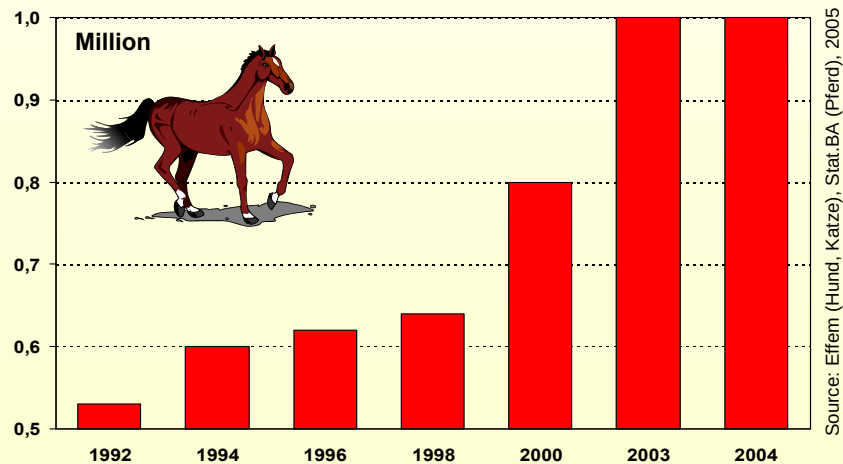
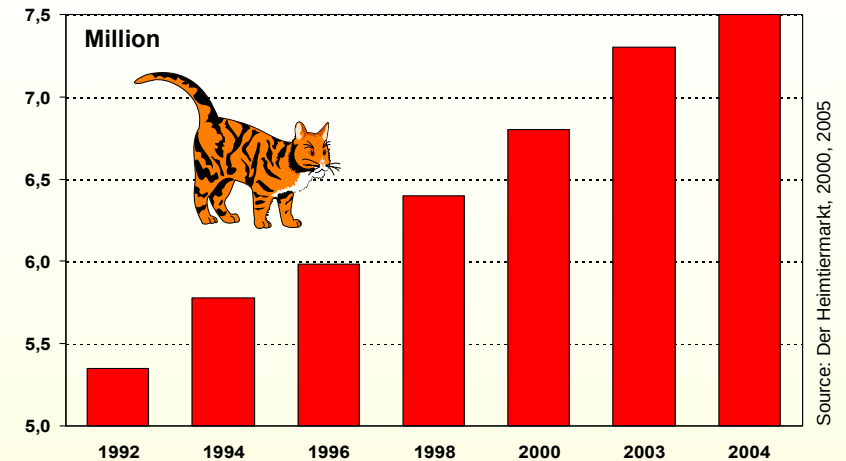
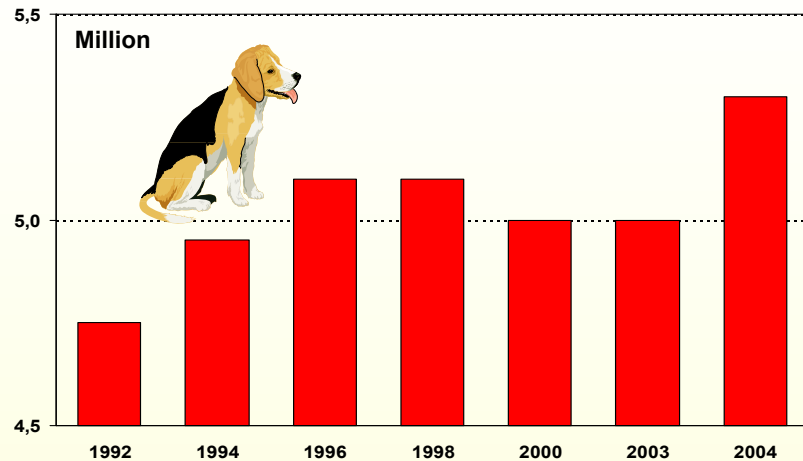
> 25000 US\$
Premium Food



Source: promar international, 2000

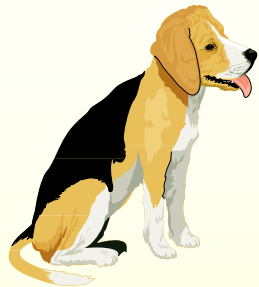
Companion Animals in Germany, 1992 - 2004

Number of New Born Children in Germany, 1992 - 2004

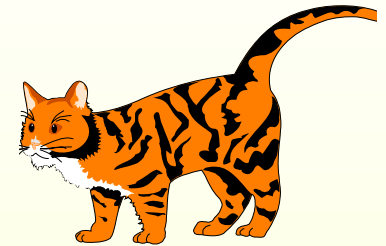


Global Number of Dogs and Cats, 1998 ... 2008?

235,000,000 dogs



245,000,000 cats



First domesticated canine appeared about 12,000 years ago, before advent of agriculture

Source: Euromonitor (Petfood industry, 2000)

2007: **Up to 35%** of Household Dogs and Cats Are **Obese** ...

... **and the rate of obesity in these animals is growing at similar rates to humans.**

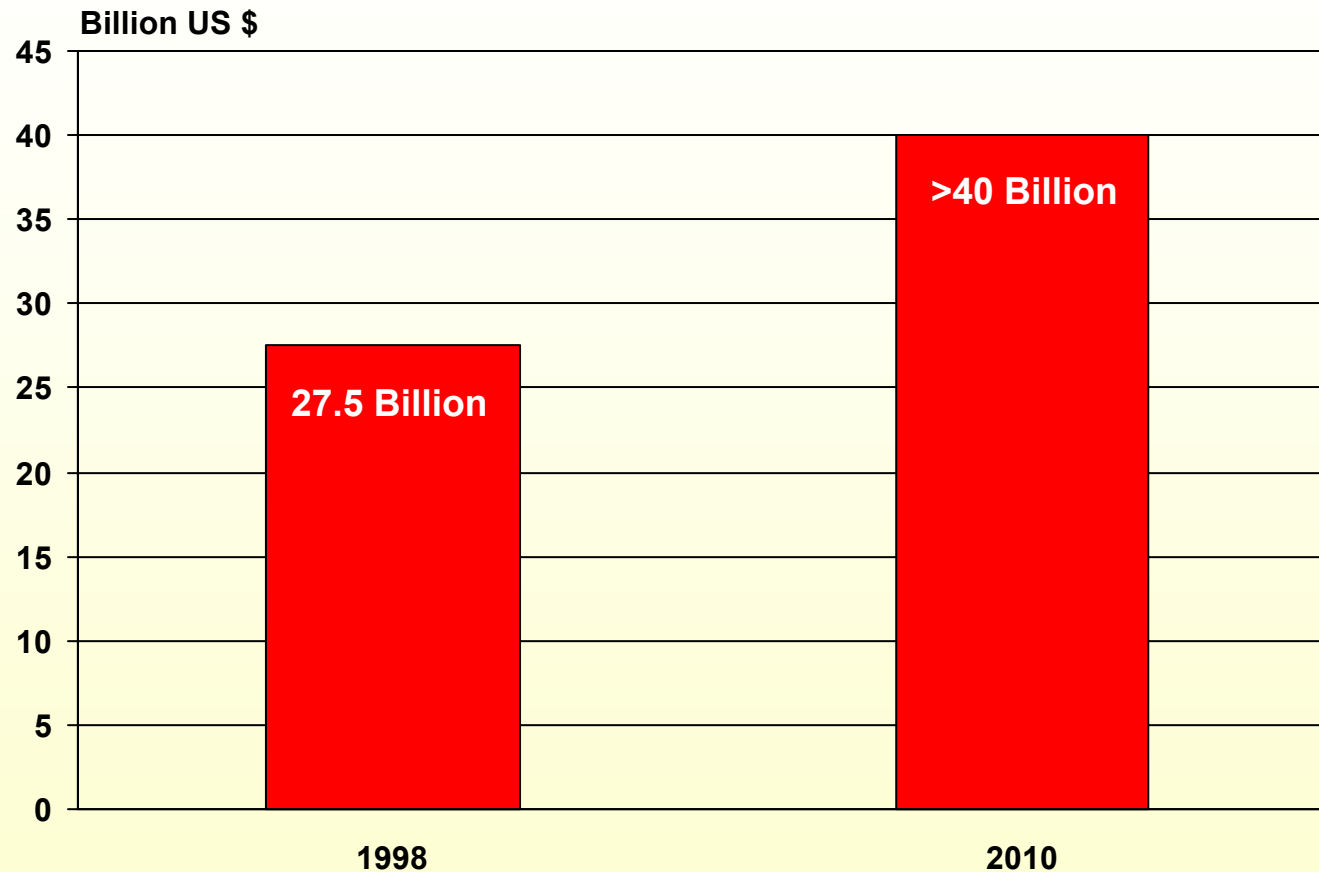
R-salbutamol – a beta 2 receptor agonists for metabolic modification.

- **Energy is destined for fat production is reprogrammed to muscle production in animals in order **to promote growth in livestock** and to **treat obesity in companion animals.****
- **In cattle, sheep, chicken and pigs it increases their growth, produces a carcass with less fat and more lean meat.**
- **In obese rats, it reduces weight gain by 79%.**
- **In horses, it helps to overcome heaves or recurrent airways obstruction (RAO).**

“If we see that R-salbutamol is a success in the companion animal market we will definitely explore its potential use in humans.”

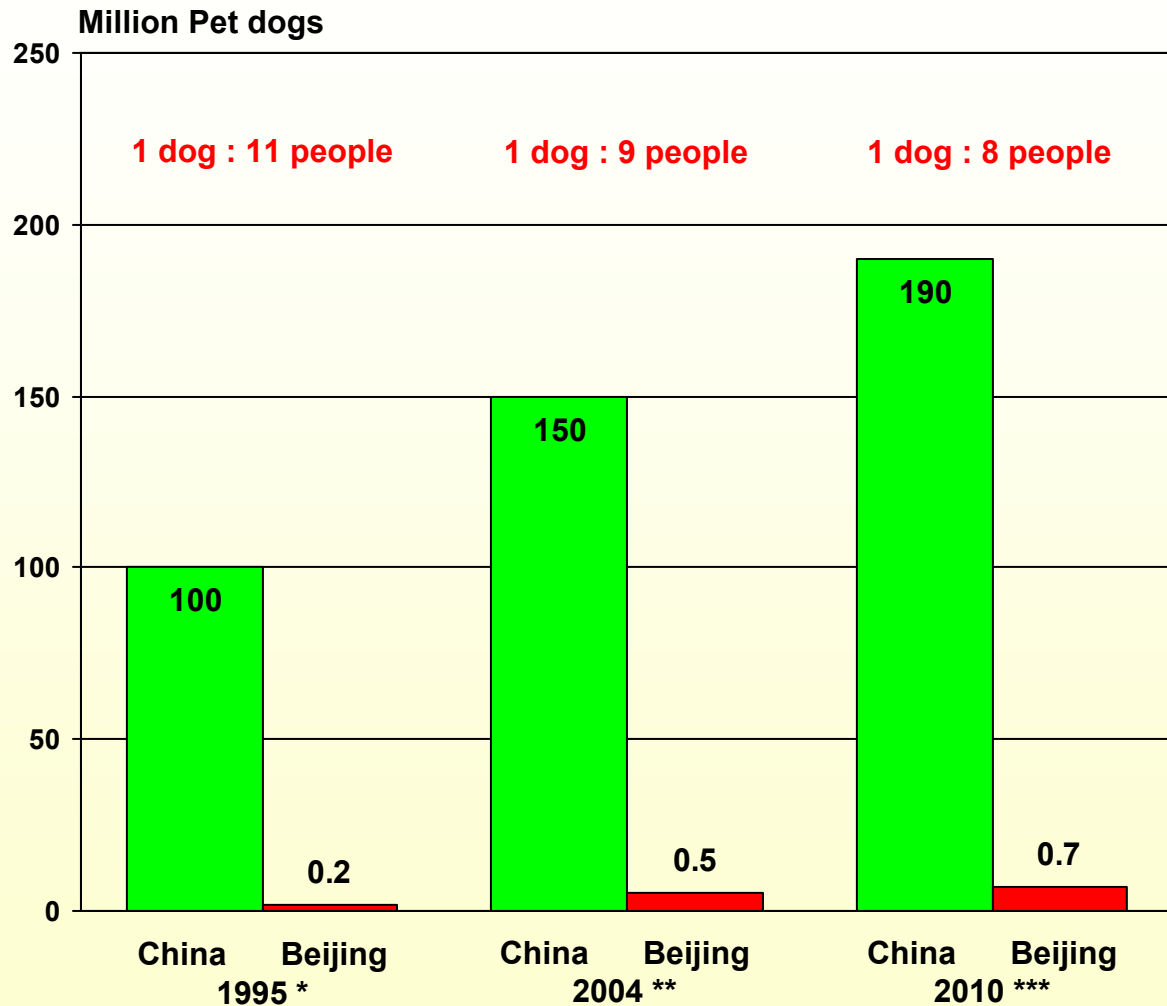
Source: McDonald, K. LifeScientist, 27 October 2007

Global Petfood Sales, 1998 – 2010 ... *(has to be updated)*



Source: promar international, 2000

Pet Dogs in China - 'Prohibition Law 1995', 2005 / 2010



* UN Report 1995:

- major environmental burden
- dogs eat up 15 tons of food per year, enough to feed 40 million Chinese people
- ~ 7% of the country's grain production goes "to the dogs"
- prohibition does allow any dog measuring under 36 cm as well as Pekinese
- must shell out US \$ 460 a year

** China Embassy NZ 2005:

- China pet food market > 7.2 billion US \$ (2008)

Source:

* United Nations Population Information Network 95-12,1995

** www.chinaembassy.org.nz/eng/xw/t183390.htm, 2005

*** estimations

Pet Food and Pet Care Products Will Grow by 9% per Year in Thailand, 2006

Two primary reasons:

- 1. Dogs and cats continue to be the preferred pet types among Thais**
- 2. More dog and cat owners are switching from feeding their pets with non-prepared food to prepared food.**

With less time on their hands as the pace of life picks up and a greater understanding of the health benefits of feeding their pets prepared food, pet owners will go for such type of pet food.

Dog and cat owners, particularly young women, are extremely interested in such luxurious products.

Source: Euromonitor International's Pet food and pet care products in Thailand Market Report, 2006

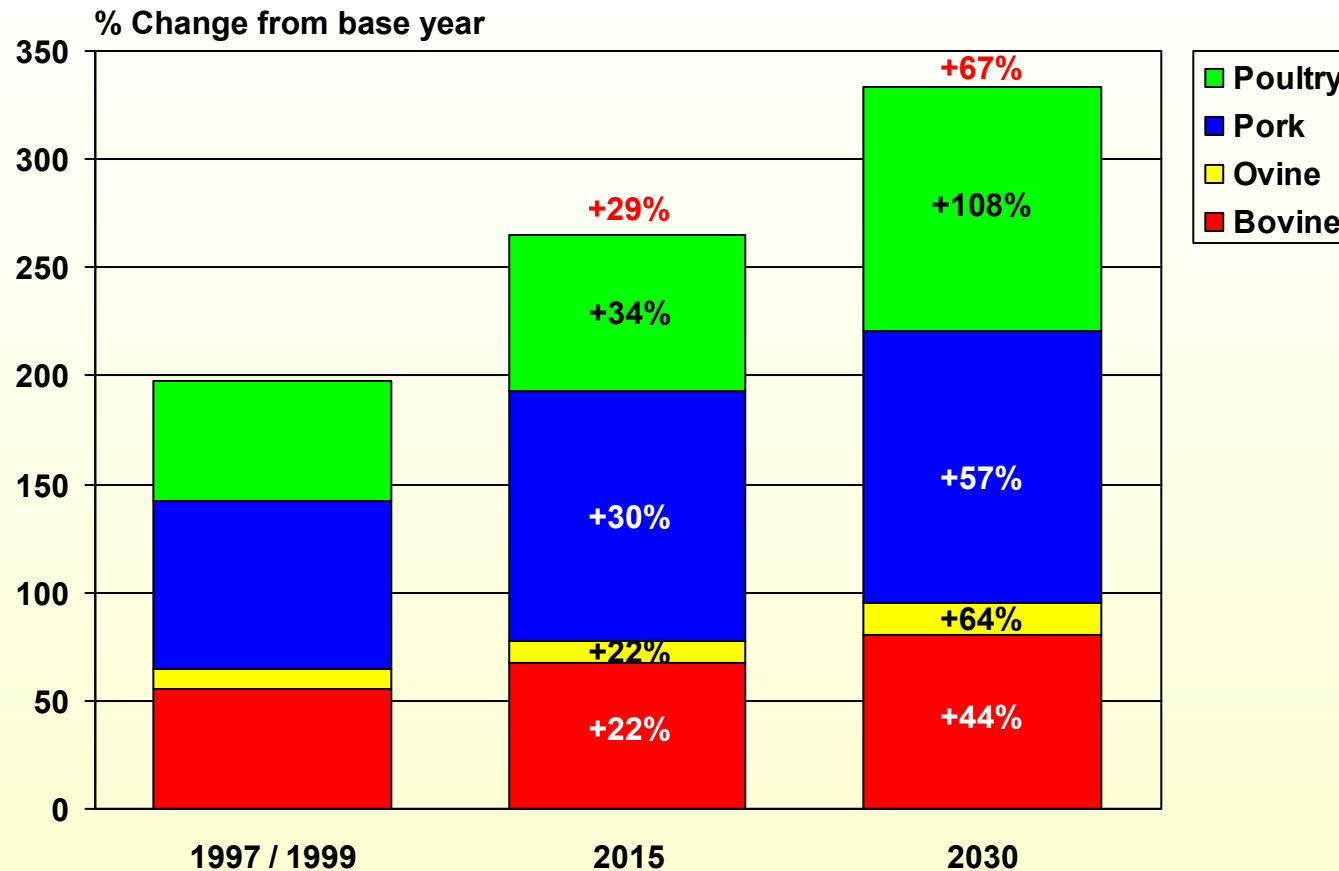
The Animals We Love, the Animals We Eat -

Pets are Family, but Chickens are Food Products?



Source: Morstad, J. in: Ladry, D.T., Report on Business, November 2006

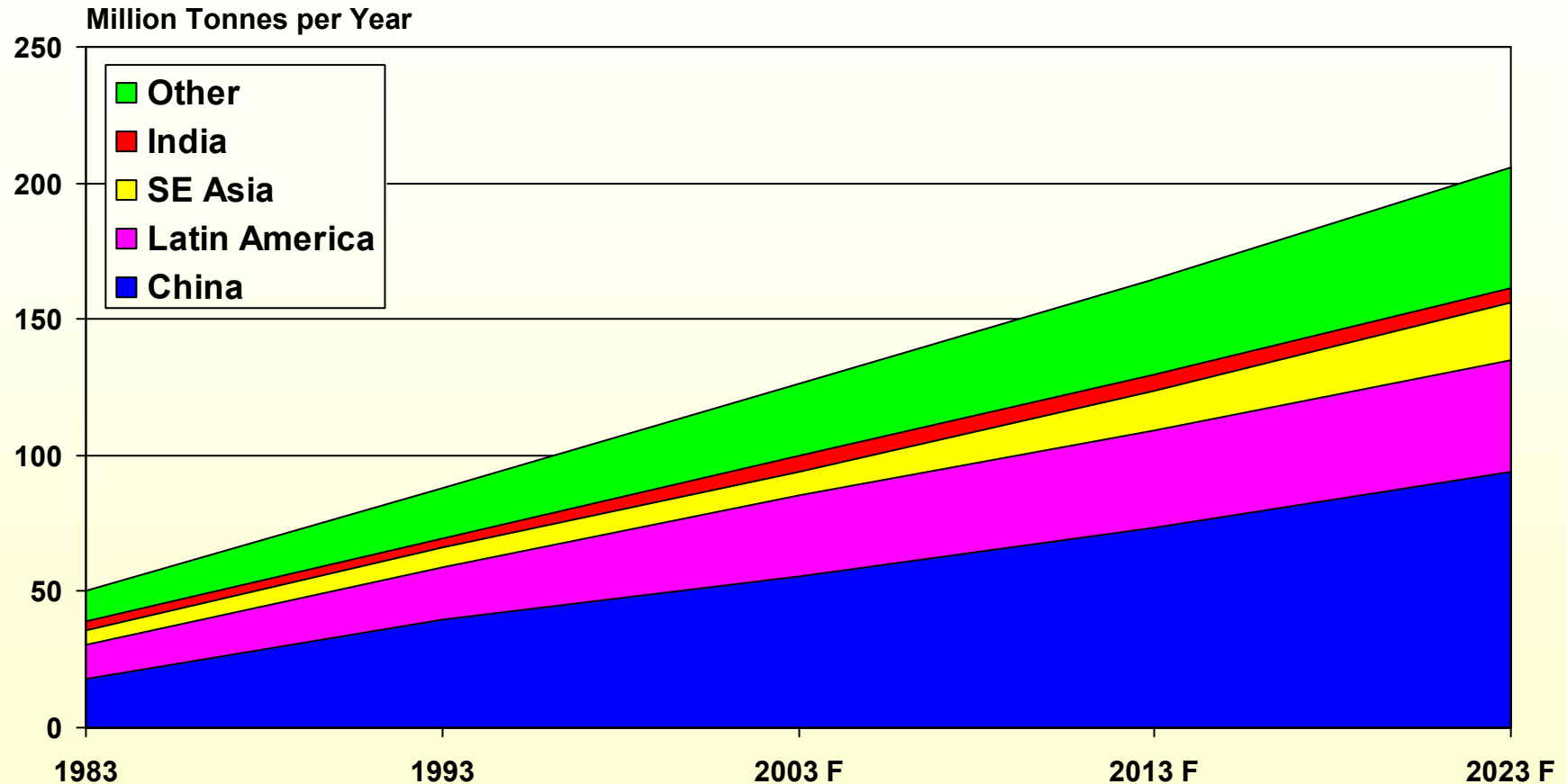
FAO Meat Consumption Estimates, 1997/99, 2015, 2030



Source: Seng, P., The European Union in the Global Meat Complex, 2005

Developing World Meat Consumption

1983 - 2023 (Forecasted)

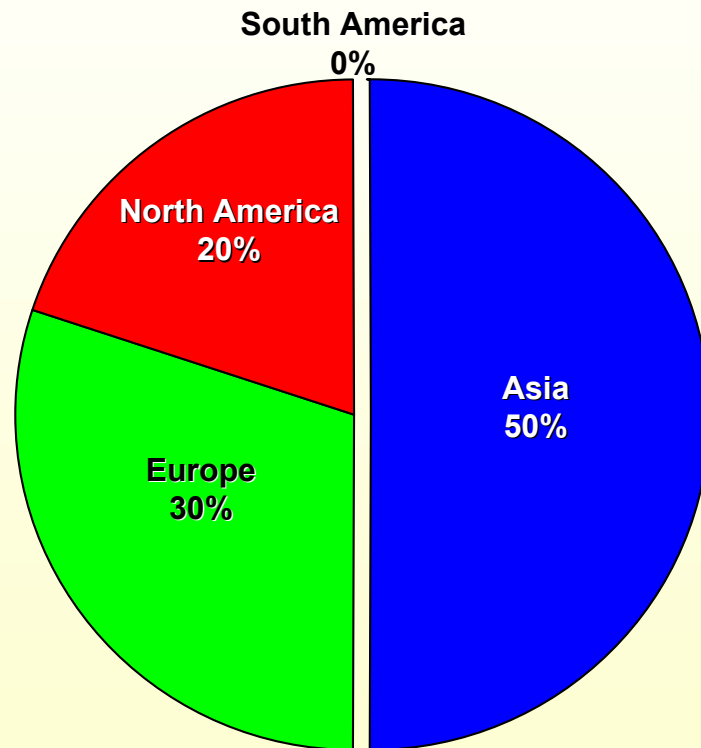


Source: Doyle, B., The Challenges Facing Food Production, 2002

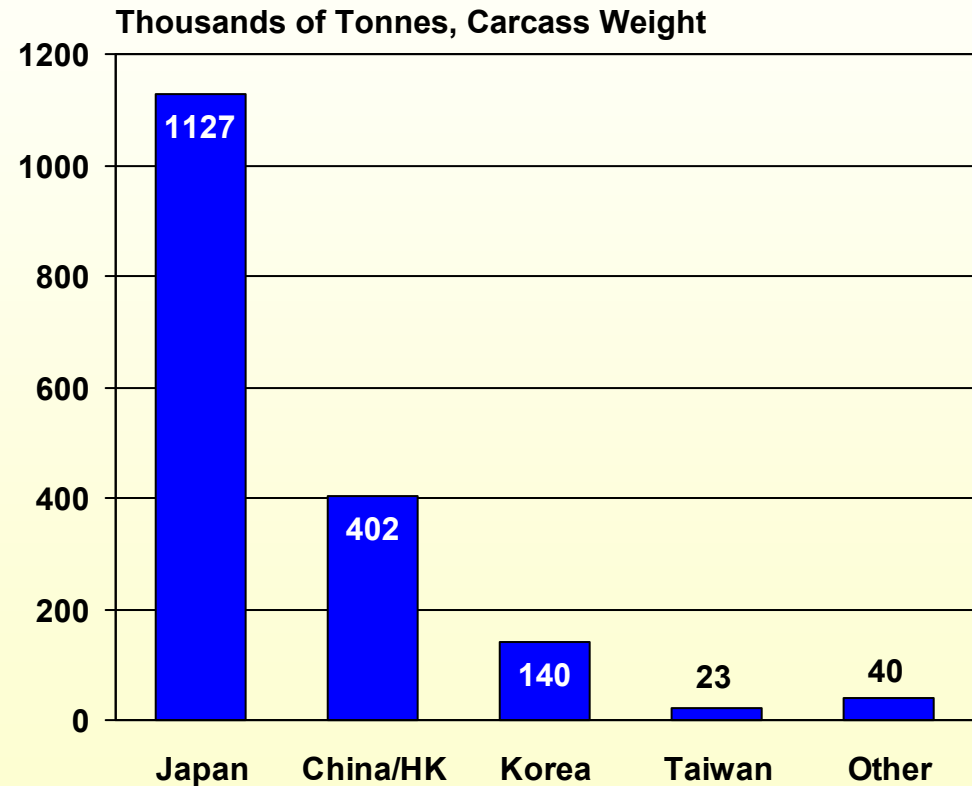
Focus on High Value / Growth Markets

Asian Pork Market

Break-down of Global Pork Imports (2001F)



Asian Pork Imports by Country (2004F)



Source: USDA in: Maple Leaf Foods International, 2003

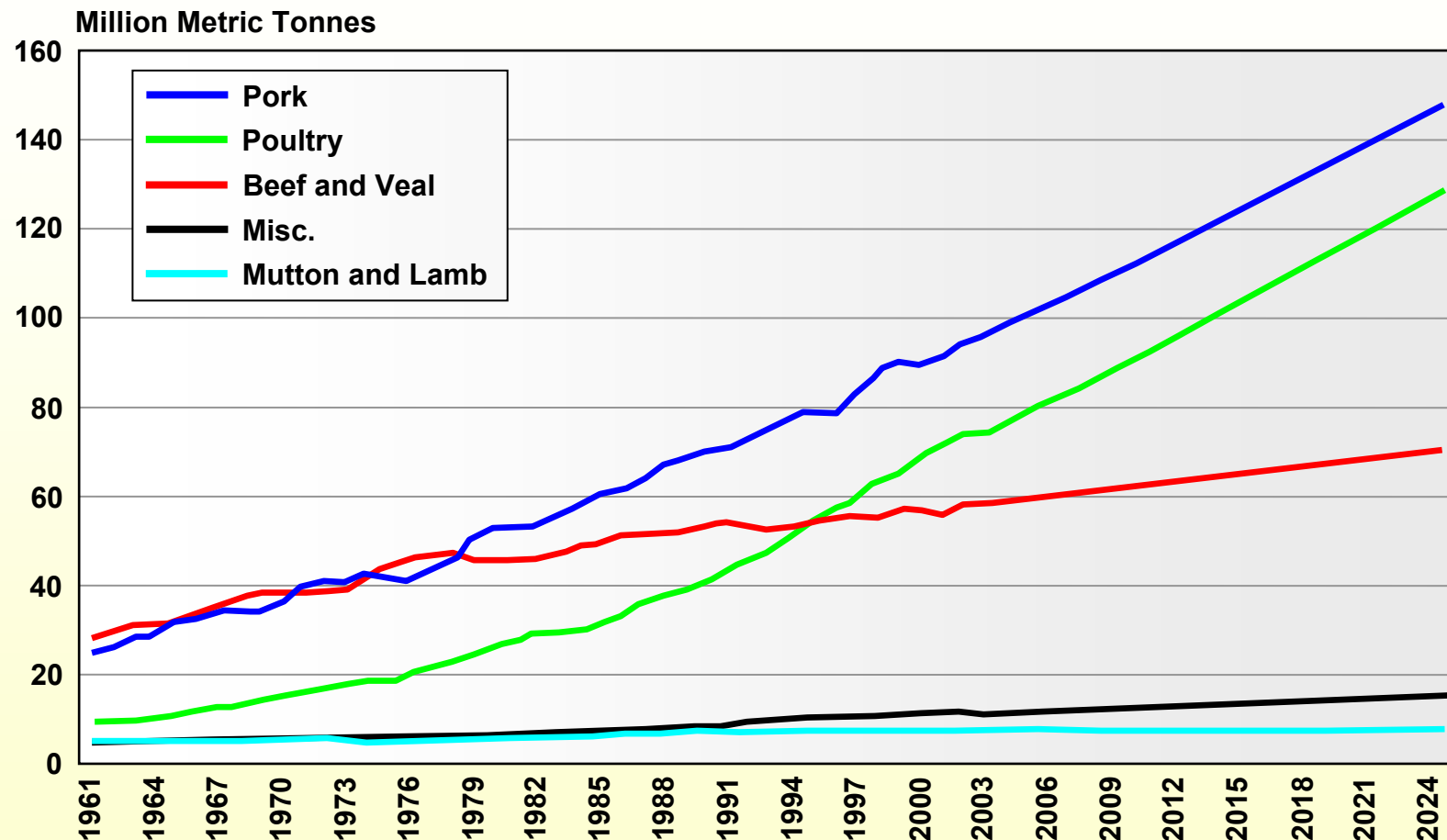
Global Pig Meat Production, 2005

Exports: Everyone wants more!

- **Exports allow the industry to grow**
- **Countries that can differentiate their products, will keep the profits for a long time**
- **Export countries must have excellent disease control**
- **The greater the percent exported, the greater the burden on the domestic market if exports shut down**
- **The market has no tolerance for serious disease outbreaks**

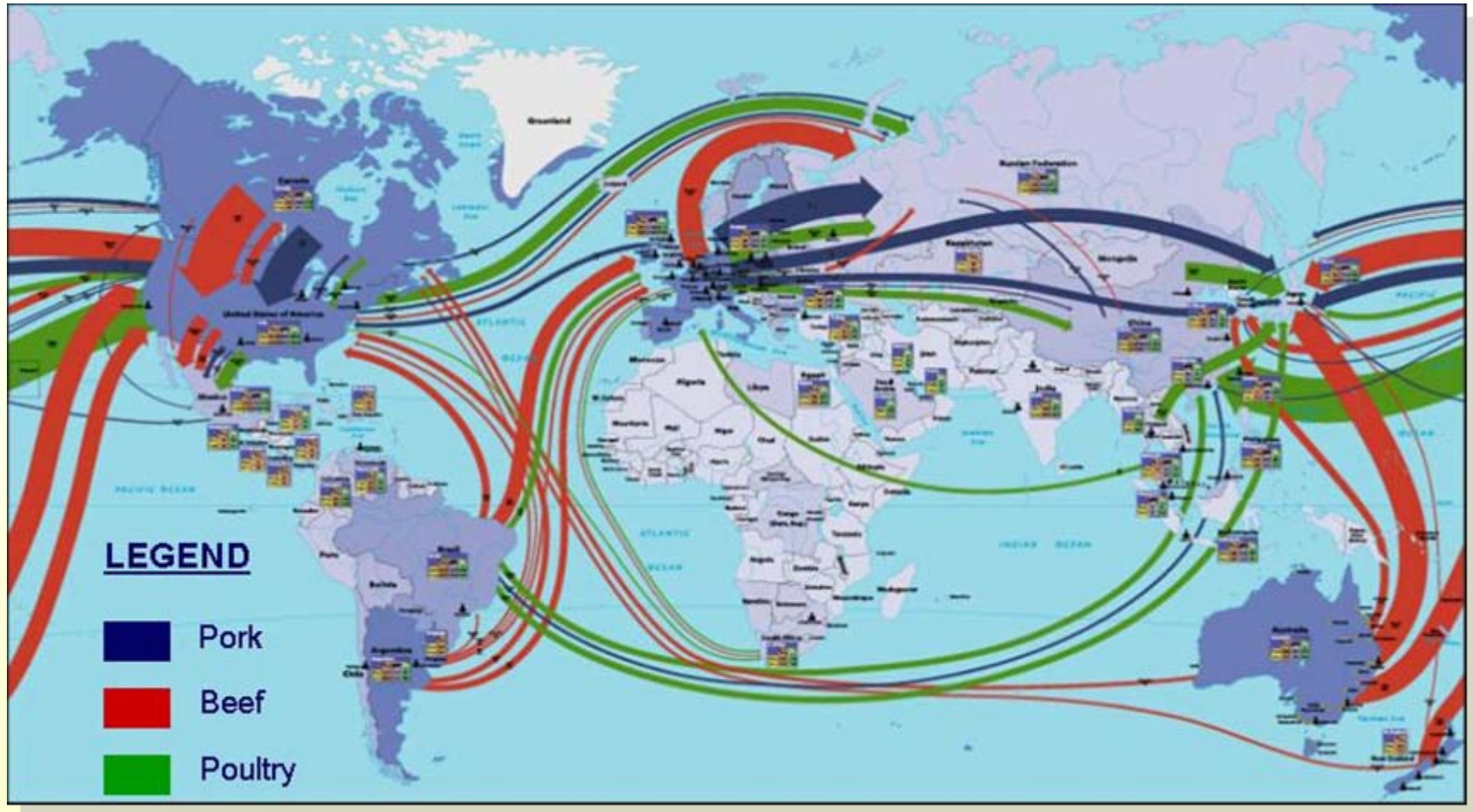
Source: Roppa, L., Nutron Alimentos, 2005

Projected Species Production, 1961 - 2025



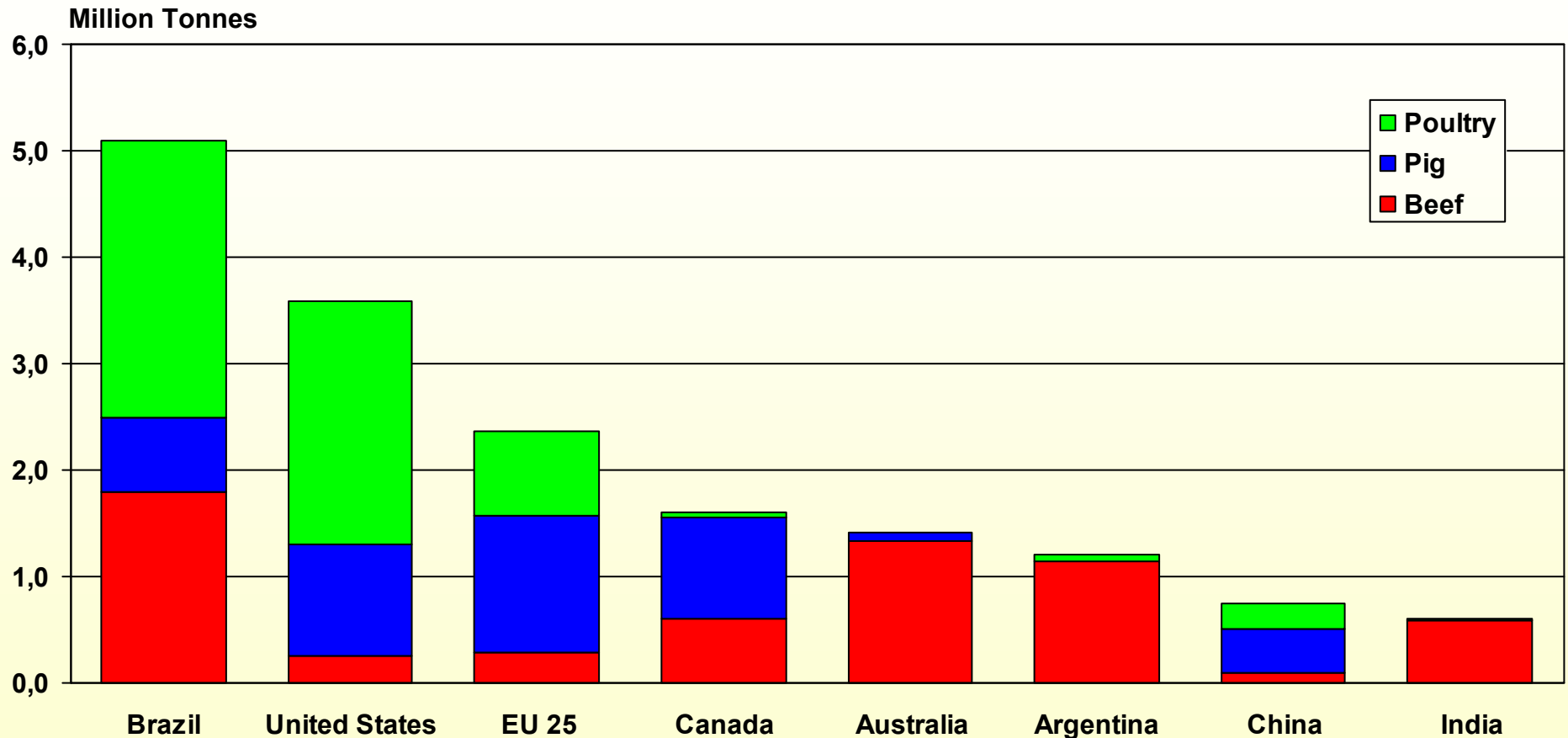
Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004

The Global Meat Trade is Highly Concentrated



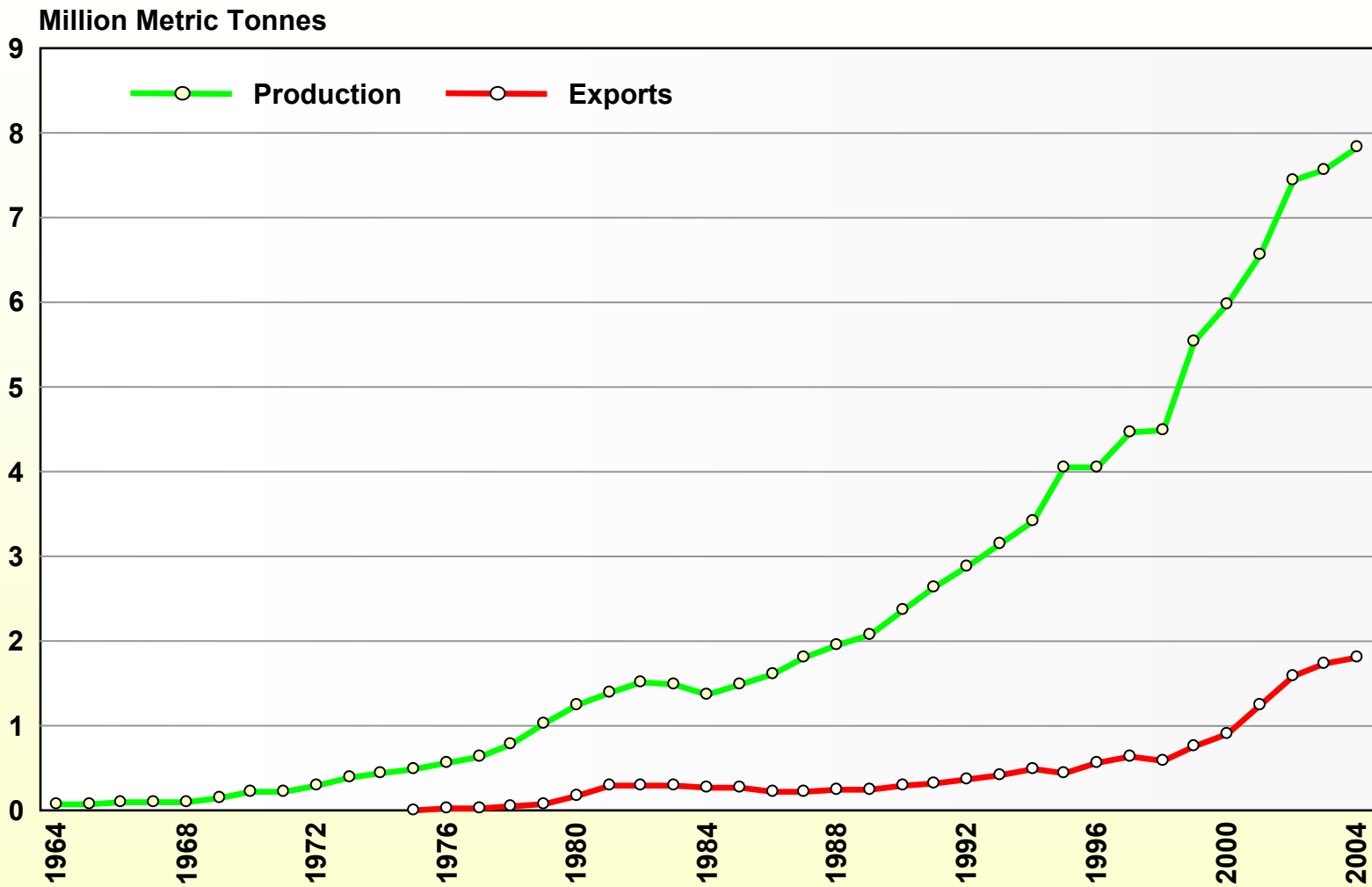
Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004

Key Meat Exporters, 2005



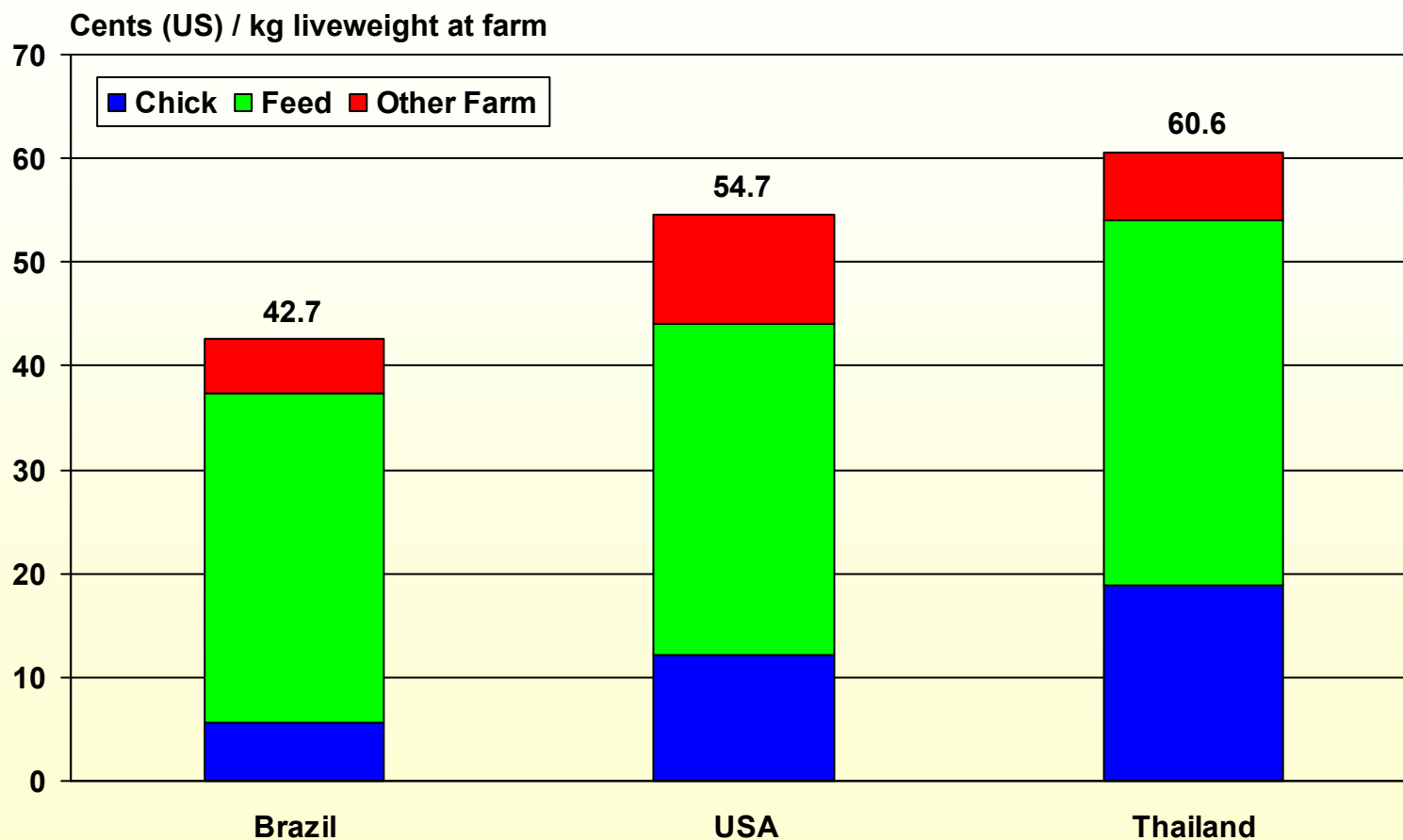
Source: Seng, P., The European Union in the Global Meat Complex, 2005

Brazil Chicken Meat Production and Exports, 1964 - 2004



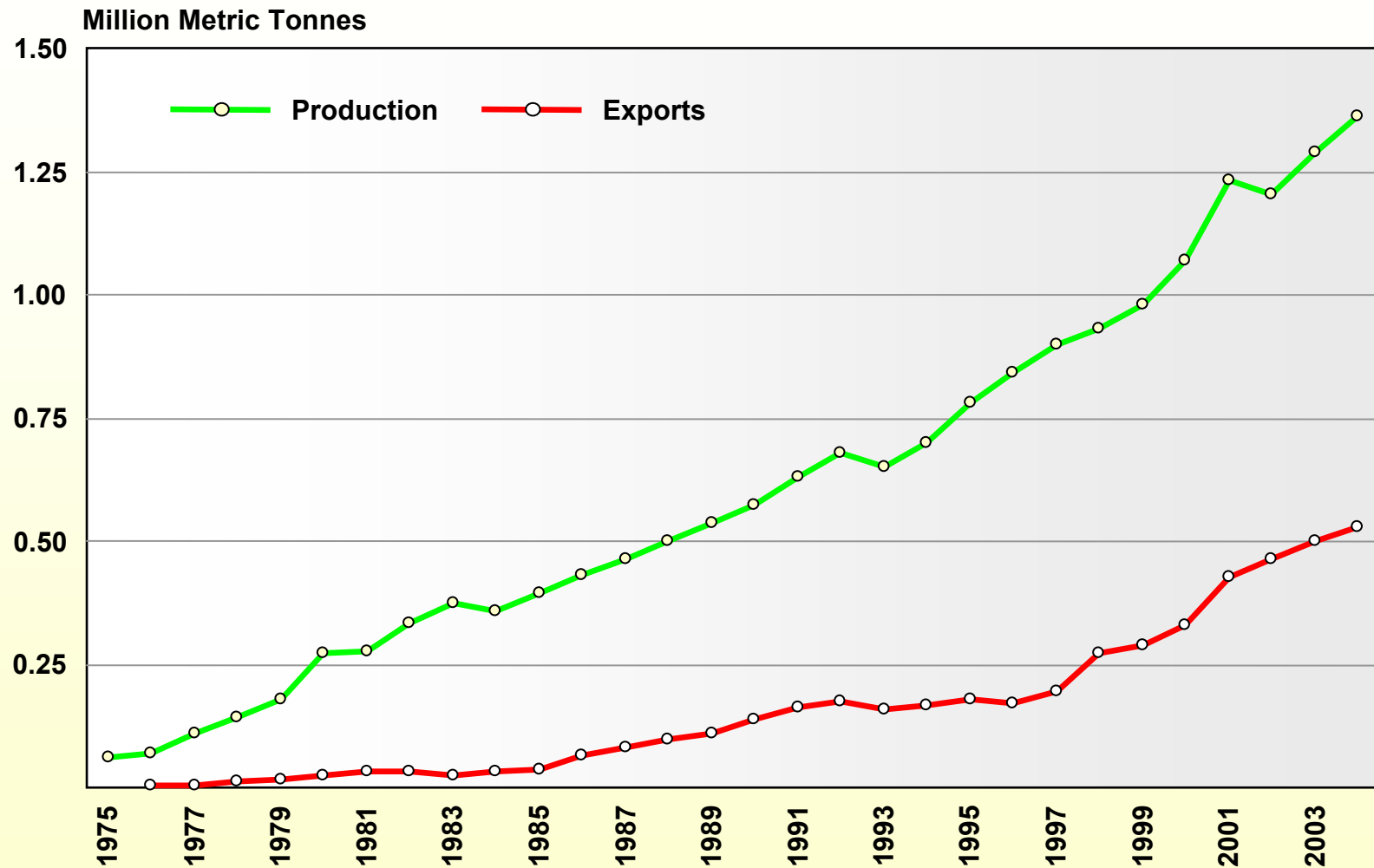
Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004

Poultry - Production Costs, 2002



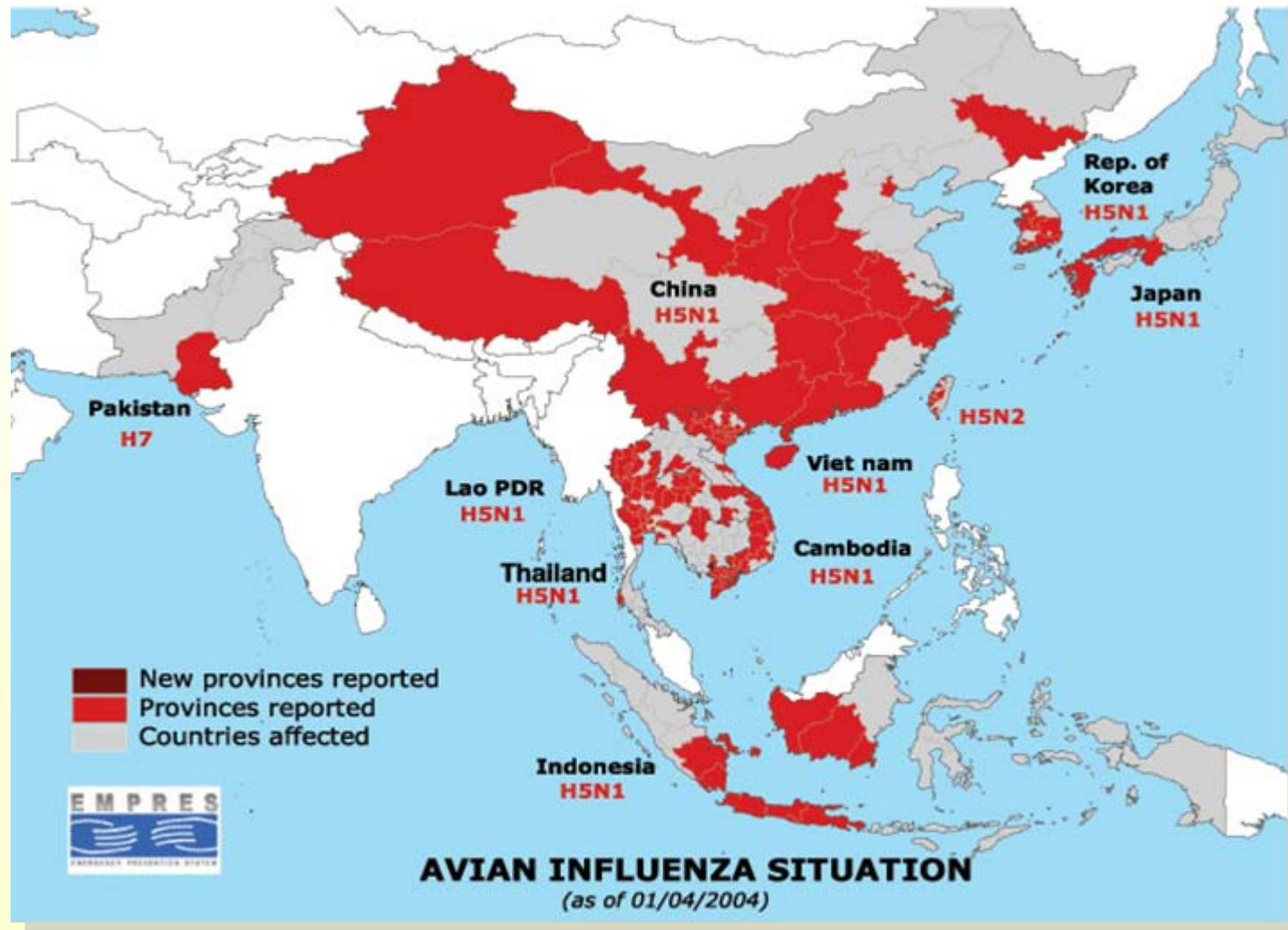
Source: De Sousa, E.L. et al., Brazilian Livestock Competitiveness, 2003

Thailand Chicken Meat Production and Exports, 1975 - 2004



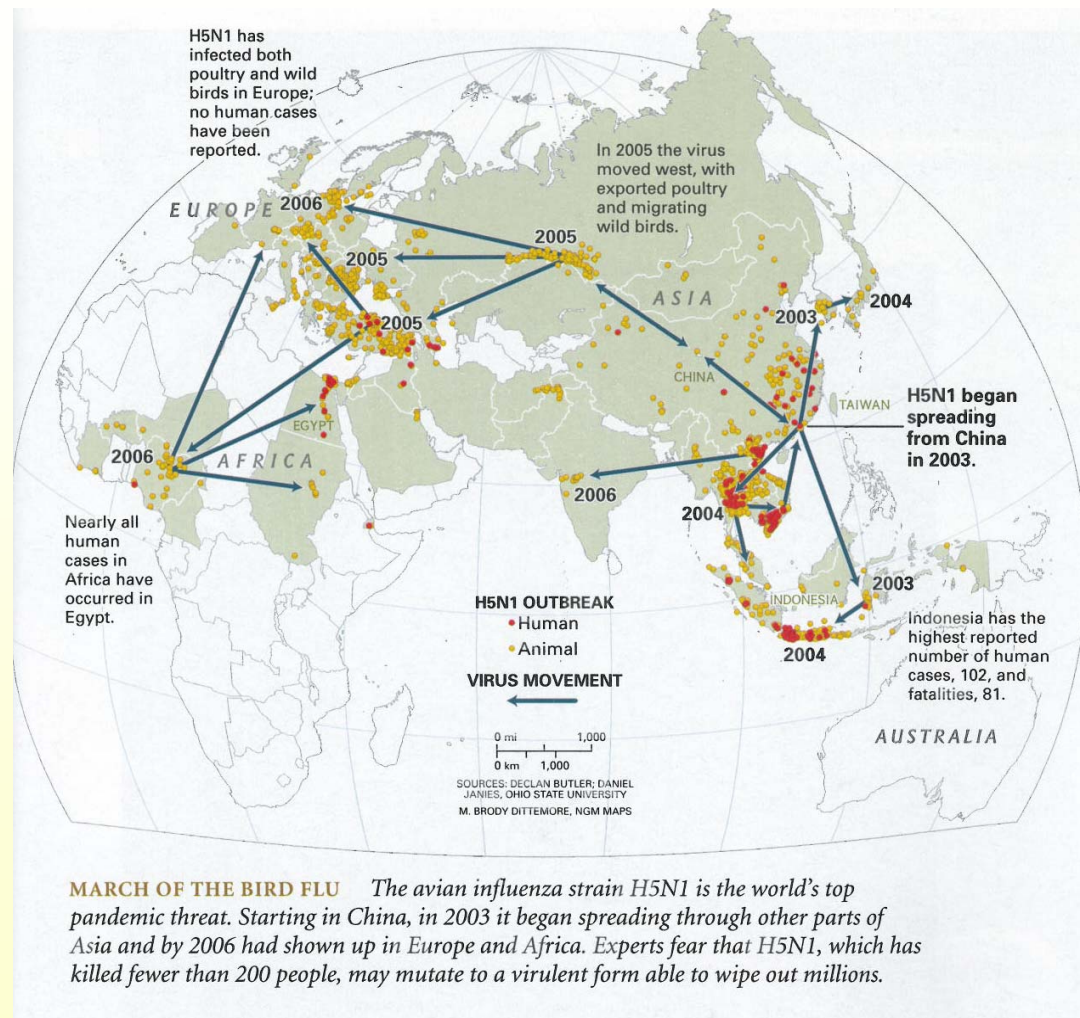
Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004

Avian Influenza Situation, 01.04.2004



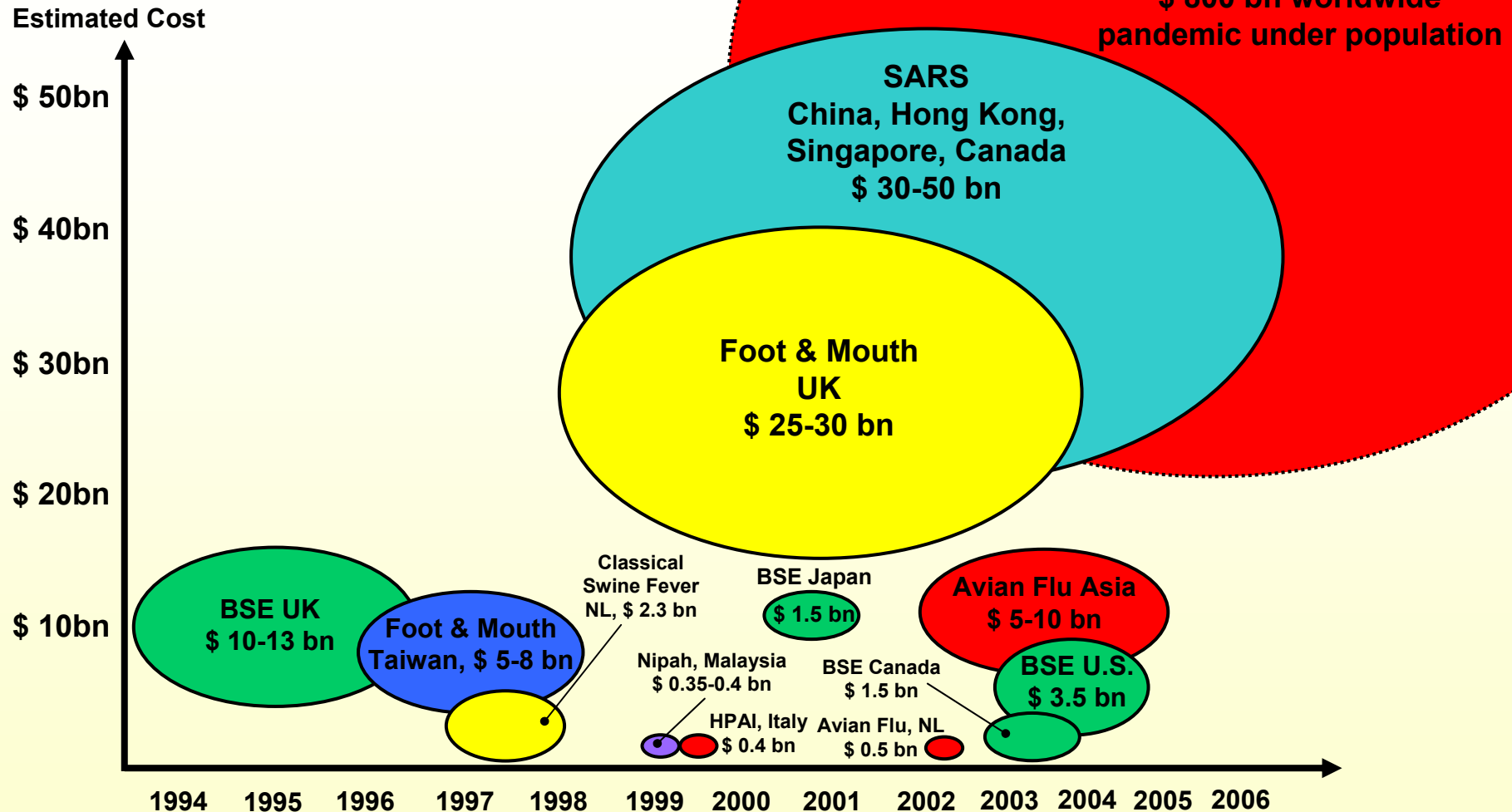
Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004

March of the Bird Flu, 2003 - 2006



Source: National Geographic, October 2007

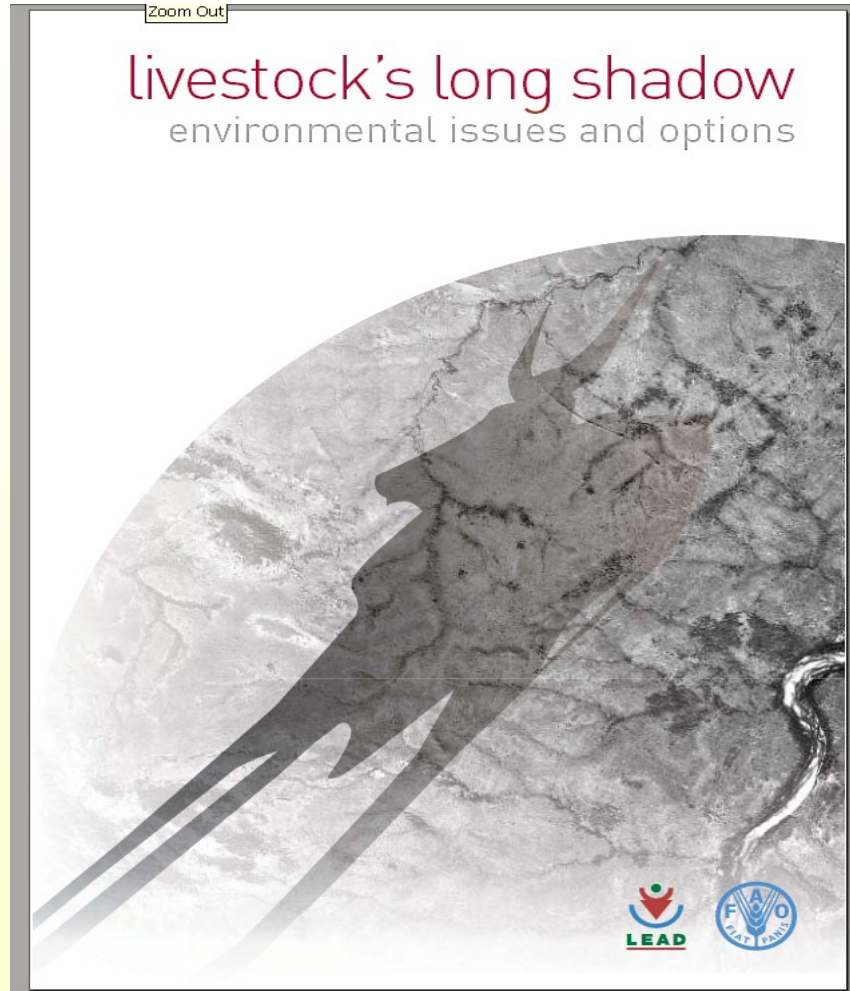
Economic Impact of Selected Infectious Diseases, 1994 - 2006



Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004, FAZ, 09.11.2005

Ecological Footprints, Global Warming, and Food Choices, 2007

United Nations Food and Agriculture Organization 2006



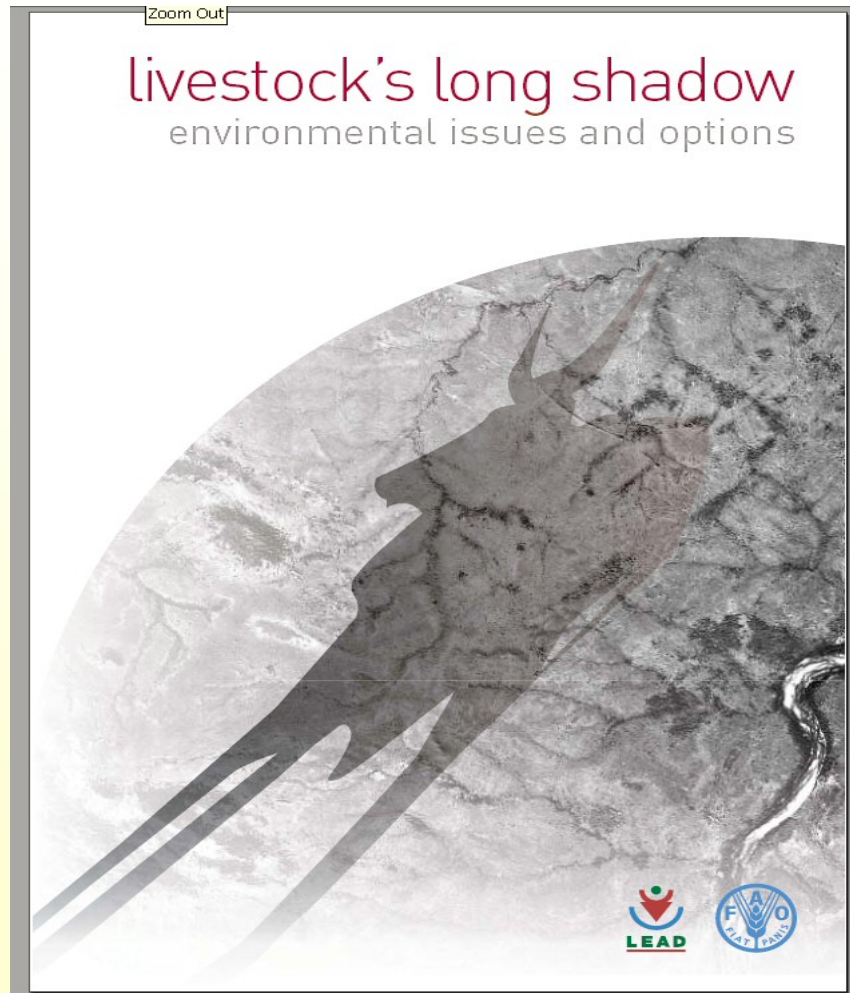
The livestock sector emerges as one of the top two or three most significant contributors to the most serious environmental problems, at every scale from local to global.

The findings of this report suggest that it should be a major policy focus when dealing with problems of land degradation, climate change and air pollution, water shortage and water pollution and loss of biodiversity.

Source: Spendelow, P., 2007

Ecological Footprints, Global Warming, and Food Choices, 2007

United Nations Food and Agriculture Organization 2006



The livestock sector is by far the single largest anthropogenic user of land.

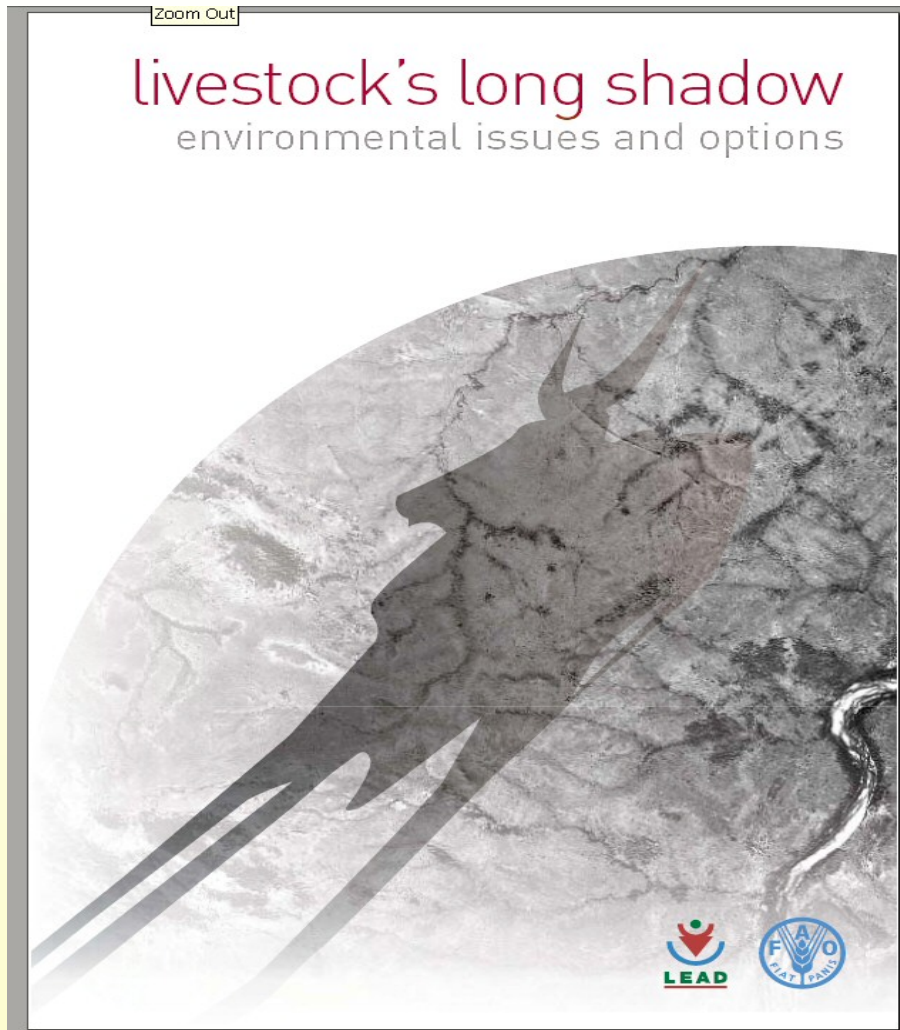
In all, livestock production accounts for:

70% of all agricultural land and 30% of the land surface of the planet.

Source: Spendelow, P., 2007

Ecological Footprints, Global Warming, and Food Choices, 2007

United Nations Food and Agriculture Organization 2006



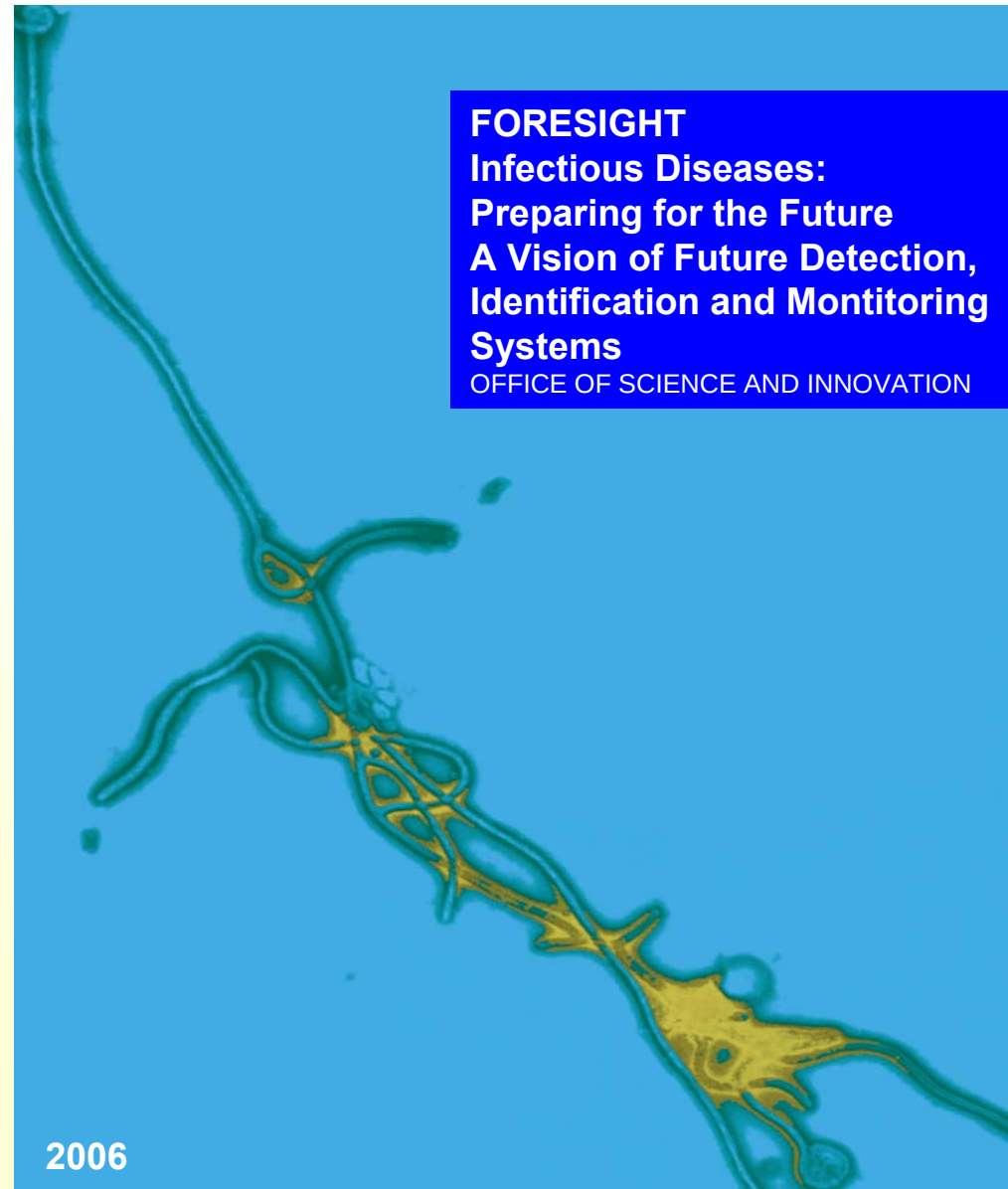
Greenhouse Gases:

The livestock sector is a major player, responsible for 18 percent of greenhouse gas emissions measured in CO₂ equivalent. This is a higher share than transport.

Source: Spendelow, P., 2007

FORESIGHT – 2025/2030

Infectious Diseases:

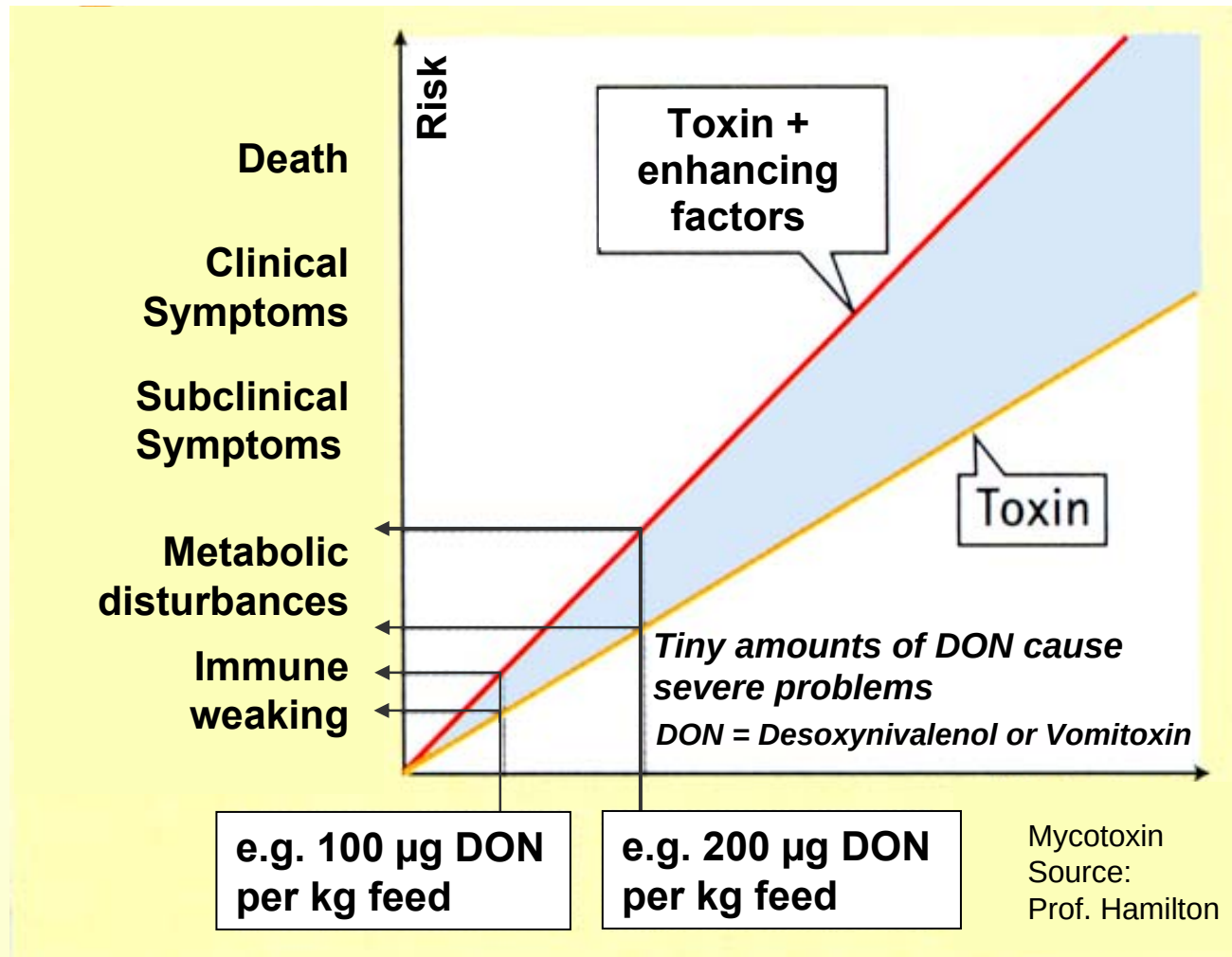


Source: Barker, I. et al., 2006

Dr. Manfred Kern / Jürgen Geiß
Business Relations

INSEAD-BHC-Animal Health, Fontainebleau - 53

Mycotoxins and Their Effects in Sows



Source: Lammers, J.-B. in: SUS Schweinezucht und Schweinemast, Nr. 5, 2004

Current targets in plant breeding:

- **increased protein content in corn**
- **enhanced protein quality through increased lysin / methion content in corn, oilseeds and grain legumes**
- **reduction of anti-nutritional factors**
- **reduction of grain moulds and mycotoxins**
- **low phytic acid in corn and rice**

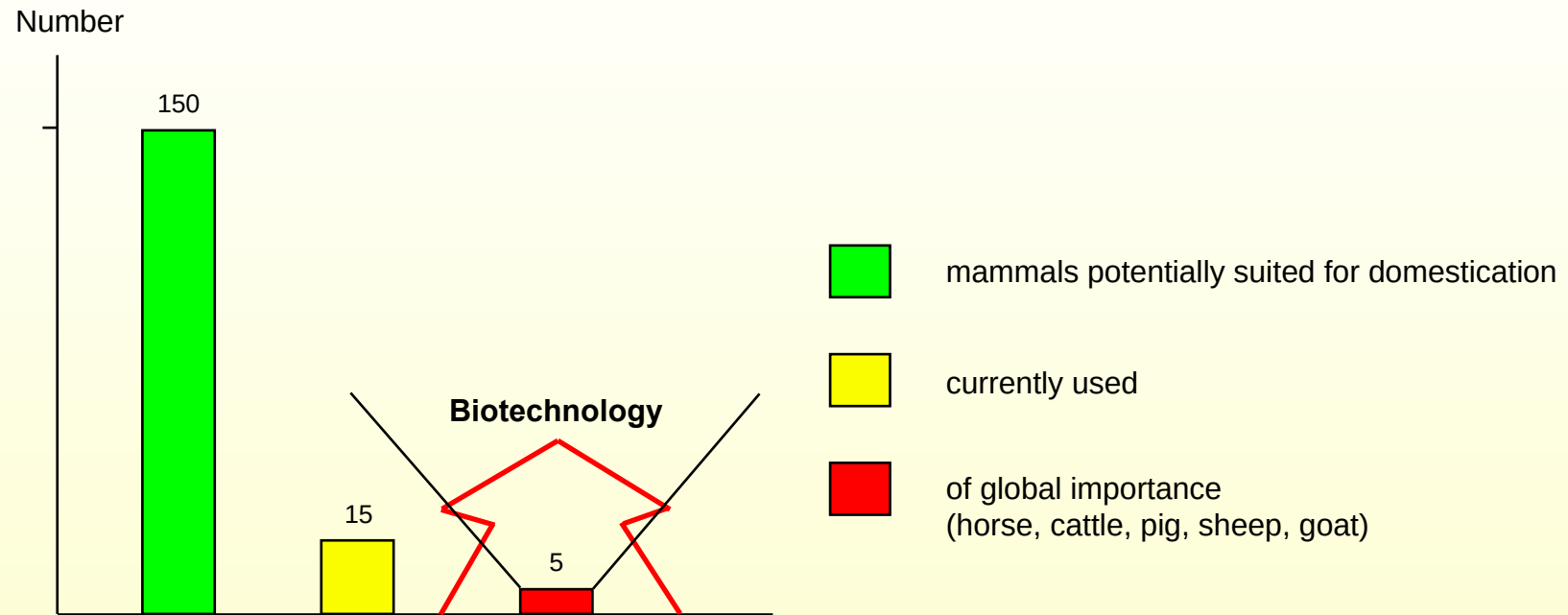
Source: Kern, M., 2002

- **to produce ingredients / probiotics which create favourable gastrointestinal bacteria**
- **more efficient feed conversion**
- **reduced protein requirements**
- **decreased environmental impact
(phosphor and nitrogen in manure)**

Source: Kern, M., 2002

Farm animals

4000 breeds of farm animals



Conservation of the genetic variety created by human breeding efforts is today the declared aim of the UN and is part of Germany's animal breeding legislation.

Source: Schug, W., Léon, J. und Gravert, H., 1996

Animal Breeding: 2025

- Opportunities for animal breeding and reproduction stem from the global need for a sustainable **increase in food quality, food quantity, and food production efficiency**.
- Worldwide, animal product consumption is expected **to grow by around 7%** nearly over the next decade, and to keep rising for the next 15-20 years. Much of this increase will be in developing countries.
- The 23% of people living in developed countries presently consume **3-4 times more meat and fish and 5-6 times more milk per capita** than people in developing countries.
- As the poorer people get richer, one of the first things they want to buy is more nutritious and satisfying food, and this generally **means more animal protein**.
- **It has been estimated that in the order of 17% of production is lost through animal disease in the developed world – and the figure is probably higher in the developing world.**

Source: FABRE Technology Platform, February 2006

Sustainable Long-Term Solutions May Require Innovative Science and Policy

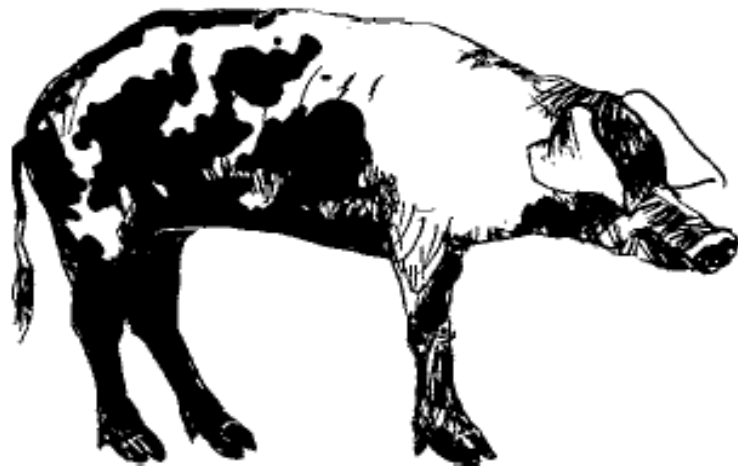
- **Breed livestock for disease resistance**
- **Produce animal vaccines in feed grains**
- **Implement advanced monitoring and detection systems for livestock**
- **Develop global wildlife health surveillance network**

Source: Newcomb, J., One World - One Health: An Economic Perspective, 2004

Agenda 21, Kapitel 16

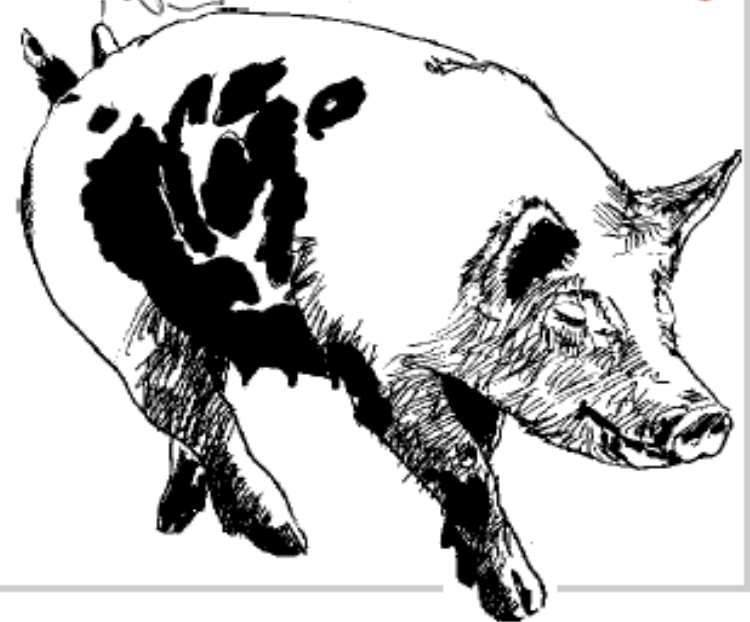
Biotechnologie $\approx$ Gentechnologie

Tiere



Influenza-
resistenz

Bessere
Futter-
verwertung



Genetically Modified Pigs, USA, 2003

Reduction of Phosphorus in Manure by up to 75%

Enviropig™ = Low Phosphorus Manure

These phytase enzyme-producing pigs will reduce phosphorus in manure by up to 75%.

Pig Feed

- Corn/barley
- Soybean meal
- Trace minerals/vitamins
- Supplemental phosphorus

Enviropig™ / Benefits

- First transgenic pig designed to solve a global environmental problem.
- Reduces phosphorus in manure by up to 75%.
- Helps maintain a sustainable environment.
- Contributes to the rural economy.
- Cereal and soybean meal provide all dietary phosphorus required.

UNIVERSITY of GUELPH

Sponsors:

- Ontario Pork
- Natural Sciences and Engineering Research Council of Canada
- Ontario Ministry of Agriculture, Food and Rural Affairs
- Food Systems Biotech Centre
- Agriculture and Agri-Food Canada



Source: www.uoguelph.ca/enviropig/poster.jpg, 2003

National Livestock Identification System

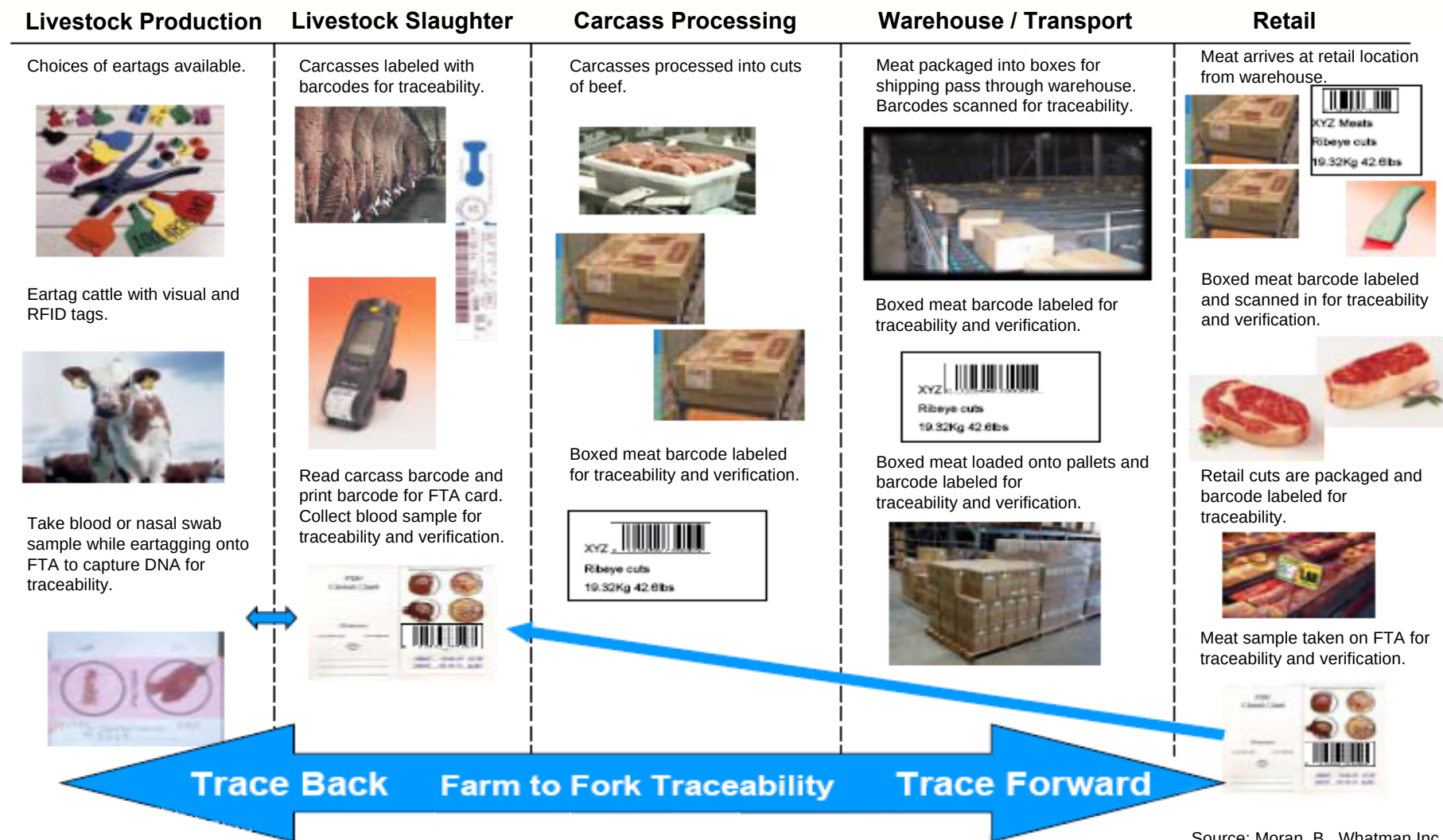


- The National Livestock Identification System (NLIS) is a complementary set of identification and provides traceability for the whole life of an animal.
- Uses NLIS approved electronic devices and transaction tags, as appropriate.
- The system has been expanded to include sheep.



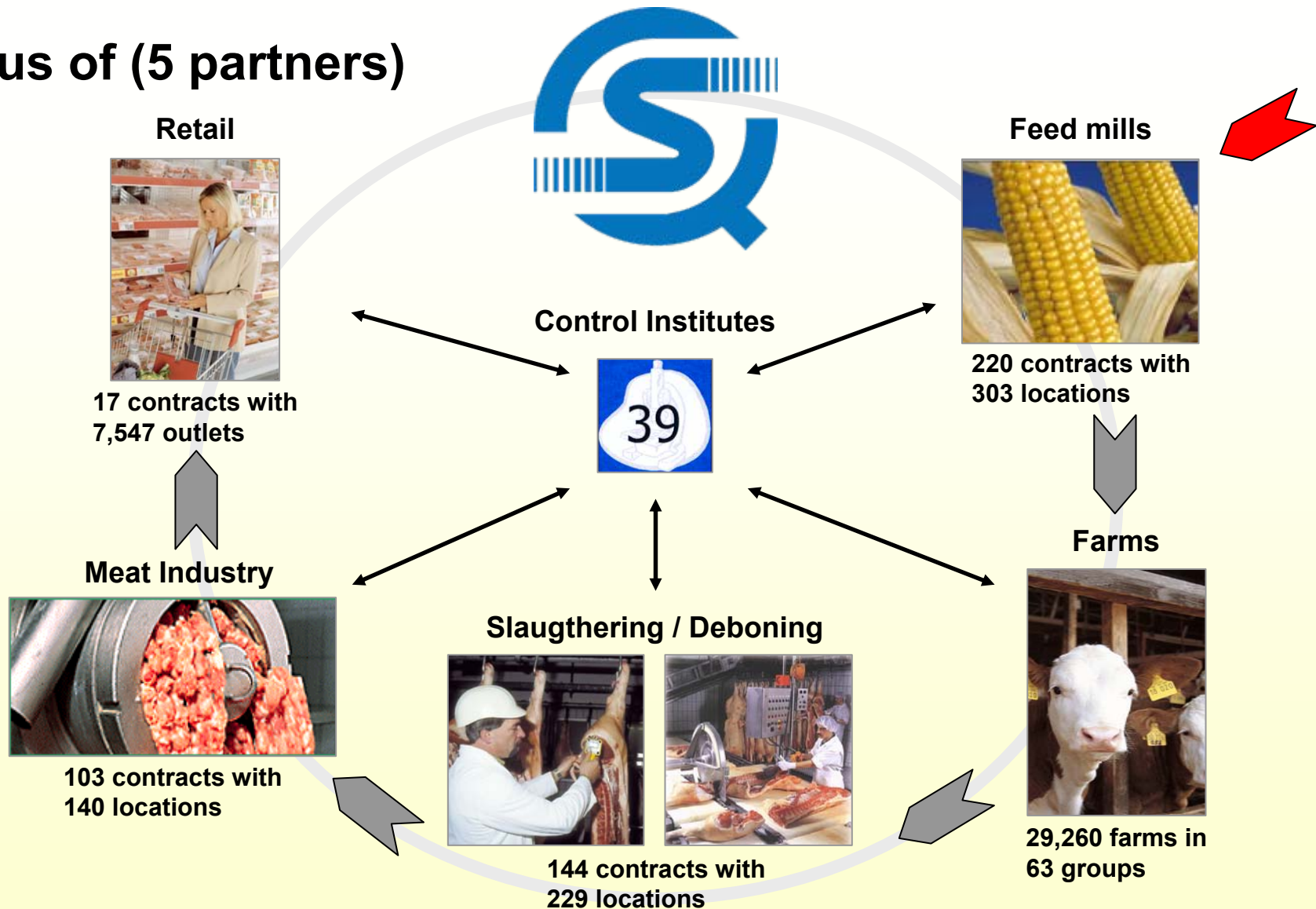
Source: KPMG 2004 in: Longson, I., International Food Symposium, 2005

Entire Traceability System: Barcoding with DNA Verification



Source: Moran, B., Whatman Inc., 2006

Status of (5 partners)



Source: Giesen, H., Westfleisch, World Pork Congress Birmingham, 2003

Food Quality and Safety Key Topics

Total Food Chain



- **Epidemiology of food related diseases and allergies**
- **Impact of food on health**
- **Traceability processes**
- **Methods of analysis/detection and control of chemical contaminants and pathogenic microorganisms**
- **Safer production methods and healthier foodstuffs**
- **Impact of animal feed and human health**
- **Environmental health risks**

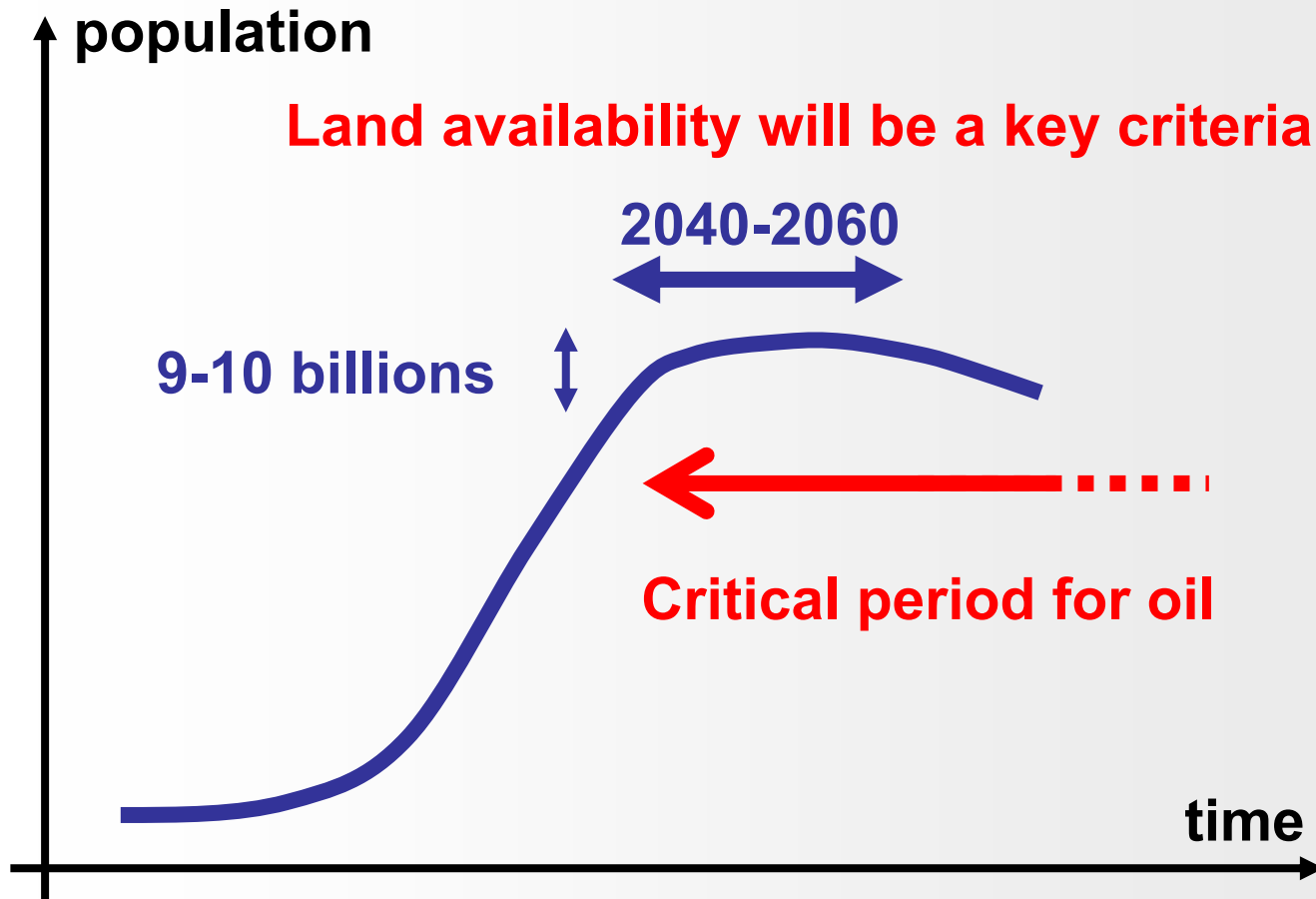
Source: Rossi, R., European Technology Platform Food, Food for Life, 2005

The Food Chain Needs Innovative New Veterinary Medicines to Guarantee Healthy Animals and Healthy Food in the Future

- Driven by emotional rather than rational considerations the requirements and hurdles for new Food Animal Products are getting higher and higher.
- Therefore less and less innovative veterinary pharmaceuticals enter the market.
- The R&D for Veterinary Medicines reflects the needs of farmers, veterinarians and consumers. **The Bayer products fulfill these needs as important part of the food chain.**
- The price are increasing R&D investments.
- The reduction of research hurdles could contribute essentially to food safety and quality and consequently to an acceptable cost-benefit ratio for both producers and consumers.

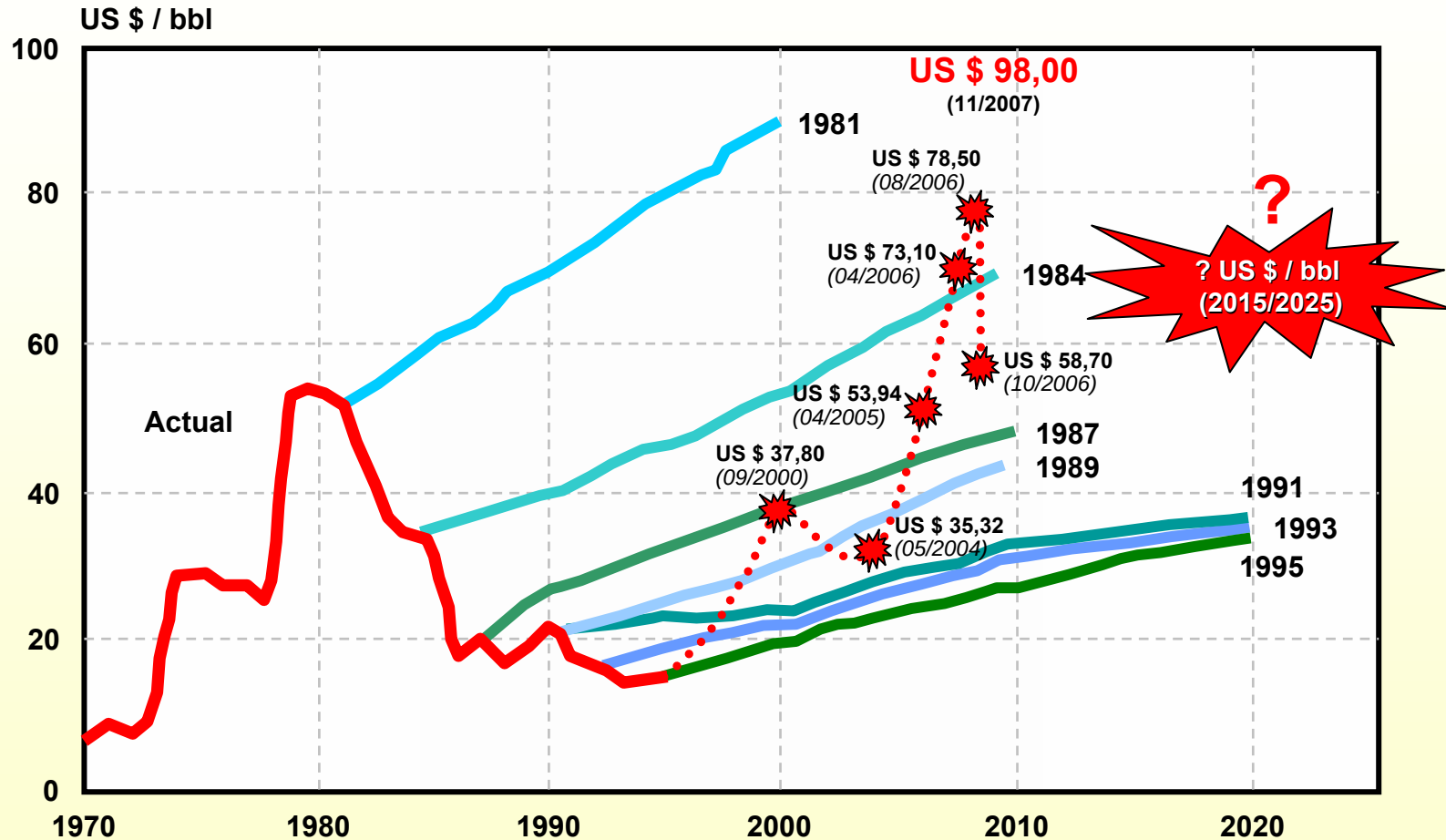
Source: Schmeer, N. Bayer HealthCare, 2006

Food-Fuel, a Challenge for the 21st Century



Source: Gosse, G., INRA, 2003

Crude Oil Price Forecasts: 2020



Source: International Energy Workshop, in: WBCSD Global Scenarios 2000 - 2050, 1997, MAZ, 21.09.00, FR 04.05.2004, wallstreet online, 12.04.2005, 27.04.2006, 31.10.2006

Biofuels Corporation plc, UK, 2005

Biofuels is in the process of building its first 250,000 mt biodiesel processing plant at Seal Sands, Middlesbrough on the north east coast of England.



early February



early September

We intend to be Europe's leading biodiesel producer.

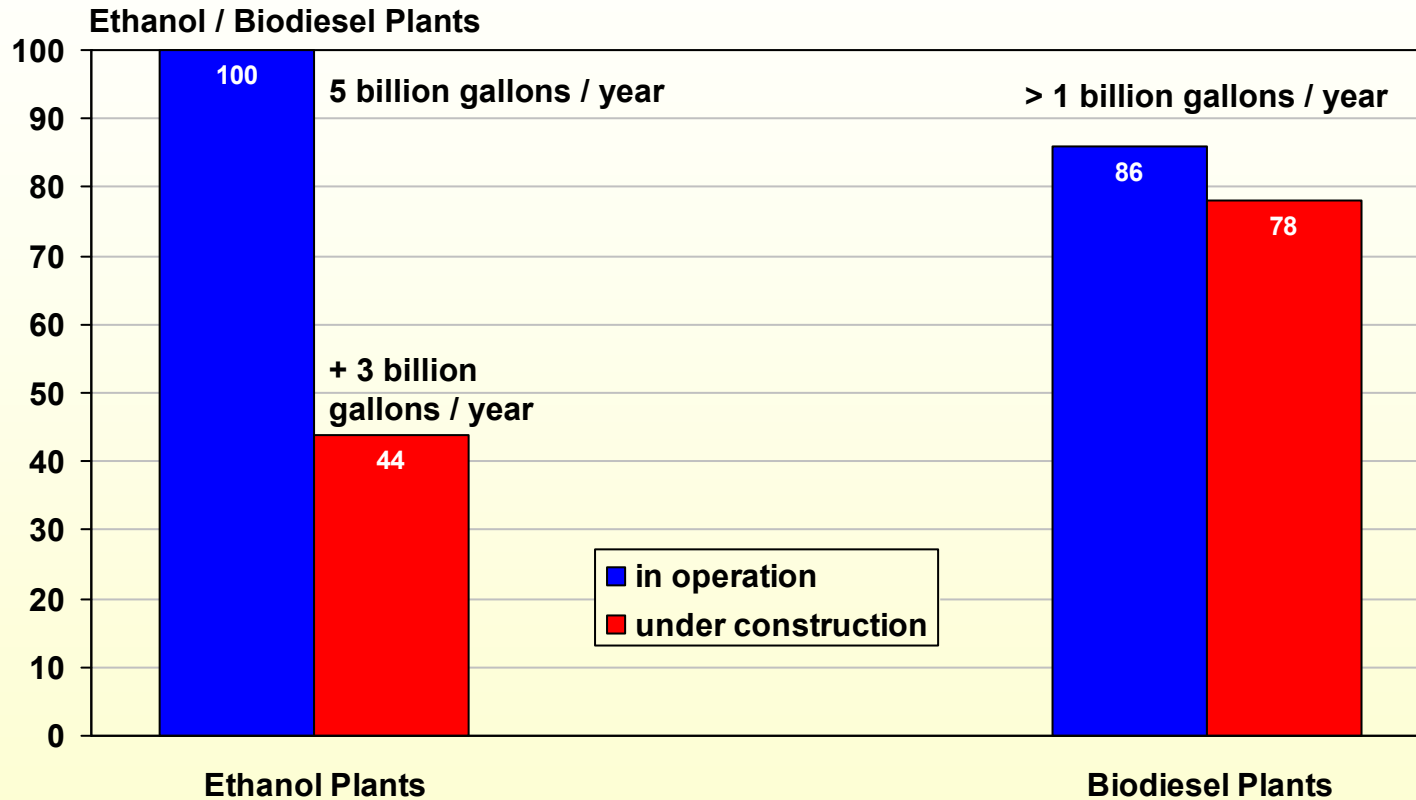
Source: Biofuels Corporation plc, 2005

Biofuels in the European Union: A Vision for 2030 and Beyond

- As there is no serious replacement available on the engine technology side, **the majority of powertrains available in 2030 will require liquid fuels**
 - The **largest increase in fuel** use for transport in absolute terms is expected **to be for trucks**
 - **50%** of the EU biofuel supply in 2030 could be covered by **domestic production** and the other **50% by imports**
- There is a need for a well-coordinated strategy for the production of biofuels

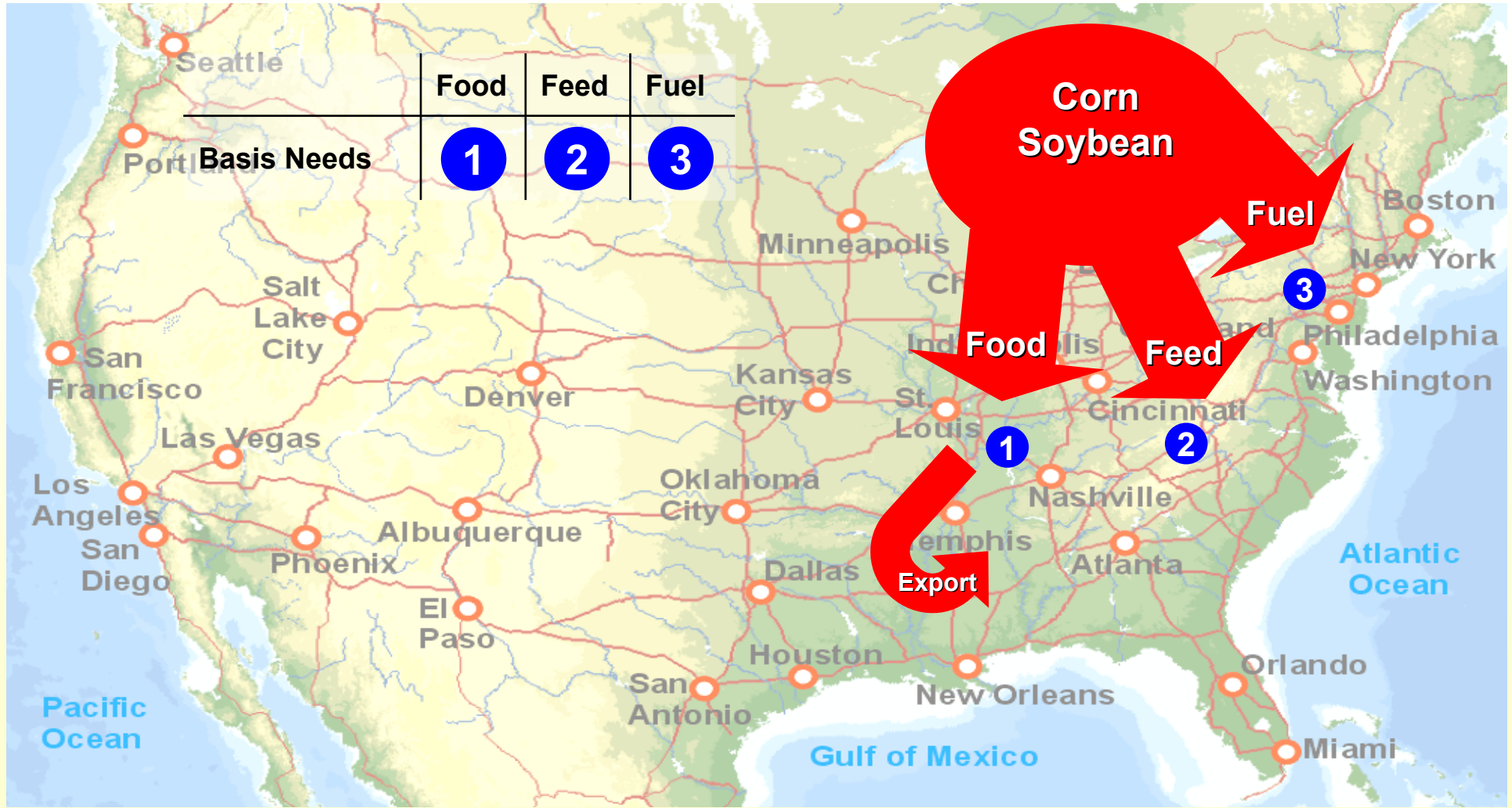
Source: Kern, M. modified after Final draft report of the Biofuels Research Advisory Council, 2006

Biodiesel and Ethanol Plants in the USA, 2006



Source: Rich, D., New era of bioenergy has begun, 2006

Impact of Future Biofuel on Food, Feed, Fuel, Flour and Value Trends, USA, 2006, 2015



	Food	Feed	Fuel
Basis Needs	1	2	3
Value US \$	2	3	1

The map shows the following distribution of products (indicated by red circles with numbers):

- Food:** 1 (Central US), 2 (Midwest), 3 (Northeast)
- Feed:** 1 (Northeast), 2 (Midwest), 3 (Central US)
- Fuel:** 1 (Northeast), 2 (Midwest), 3 (Central US)

Other regions marked with red circles and numbers include: 1 (Central US), 2 (Midwest), 3 (Northeast), 1 (Northeast), 2 (Midwest), 3 (Central US), 1 (Northeast), 2 (Midwest), 3 (Central US).

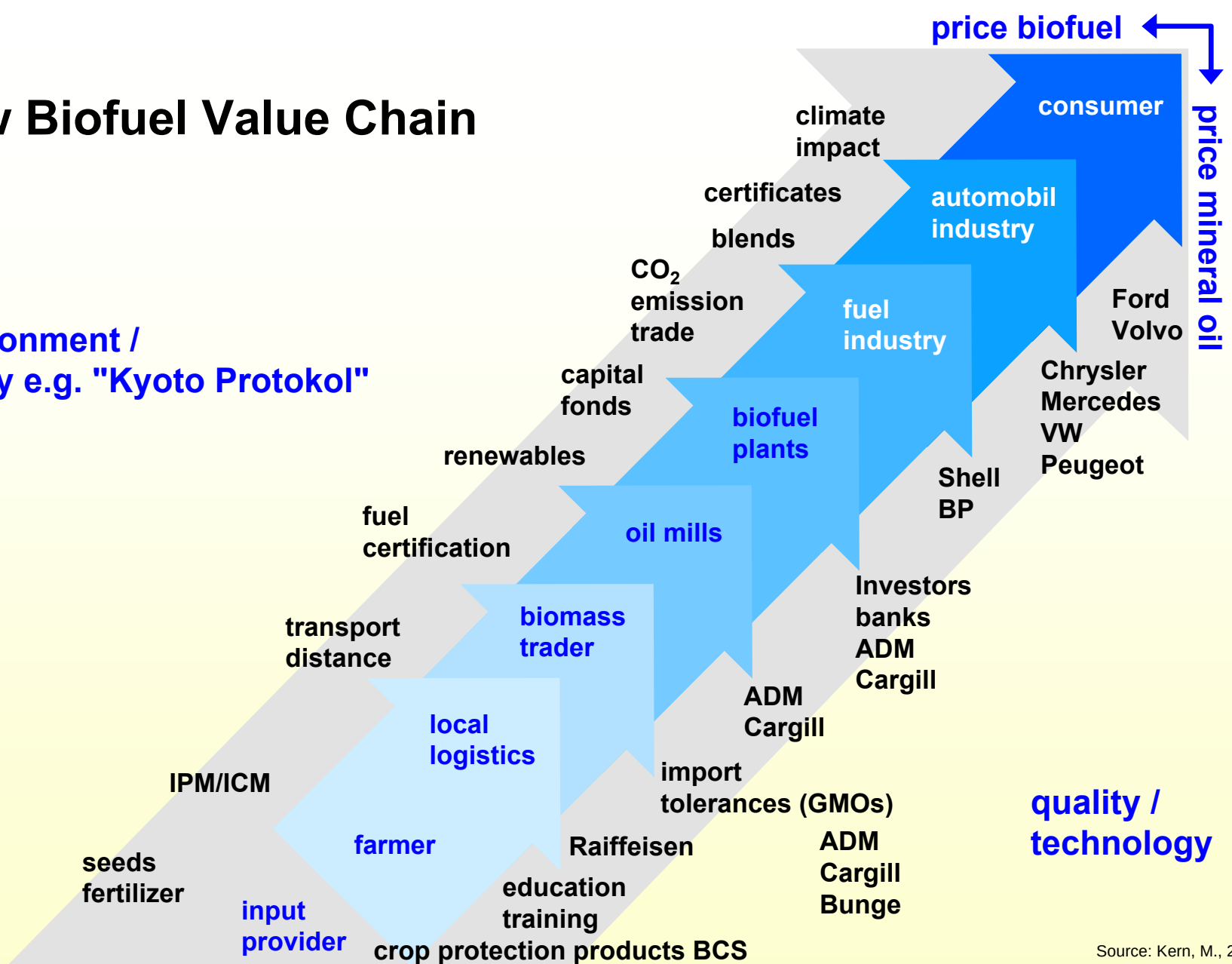
Enlargement of Arable Land in Brazil, 2005



Source: Fava Neves, M., 2005

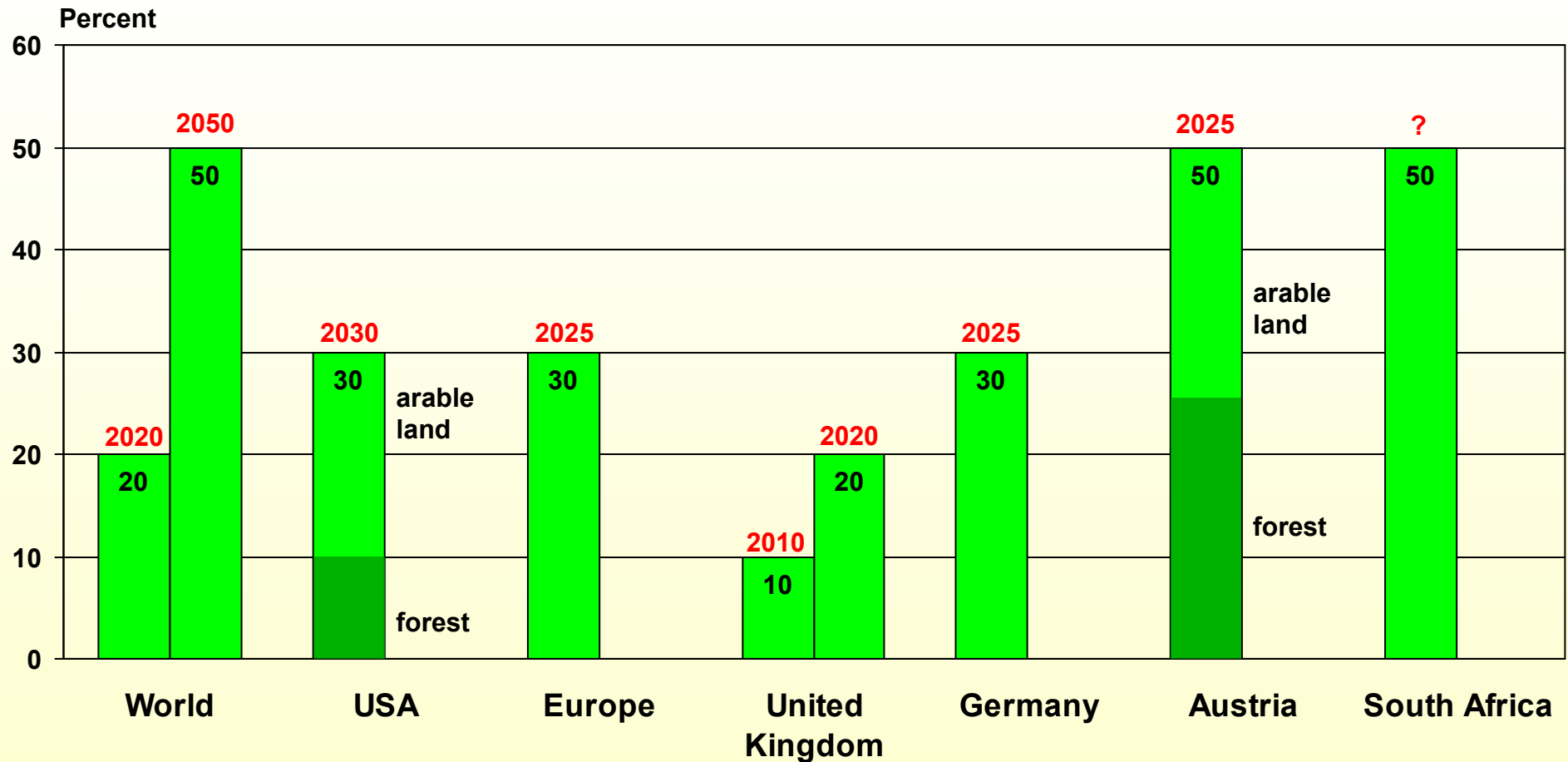
The New Biofuel Value Chain

environment /
policy e.g. "Kyoto Protokol"



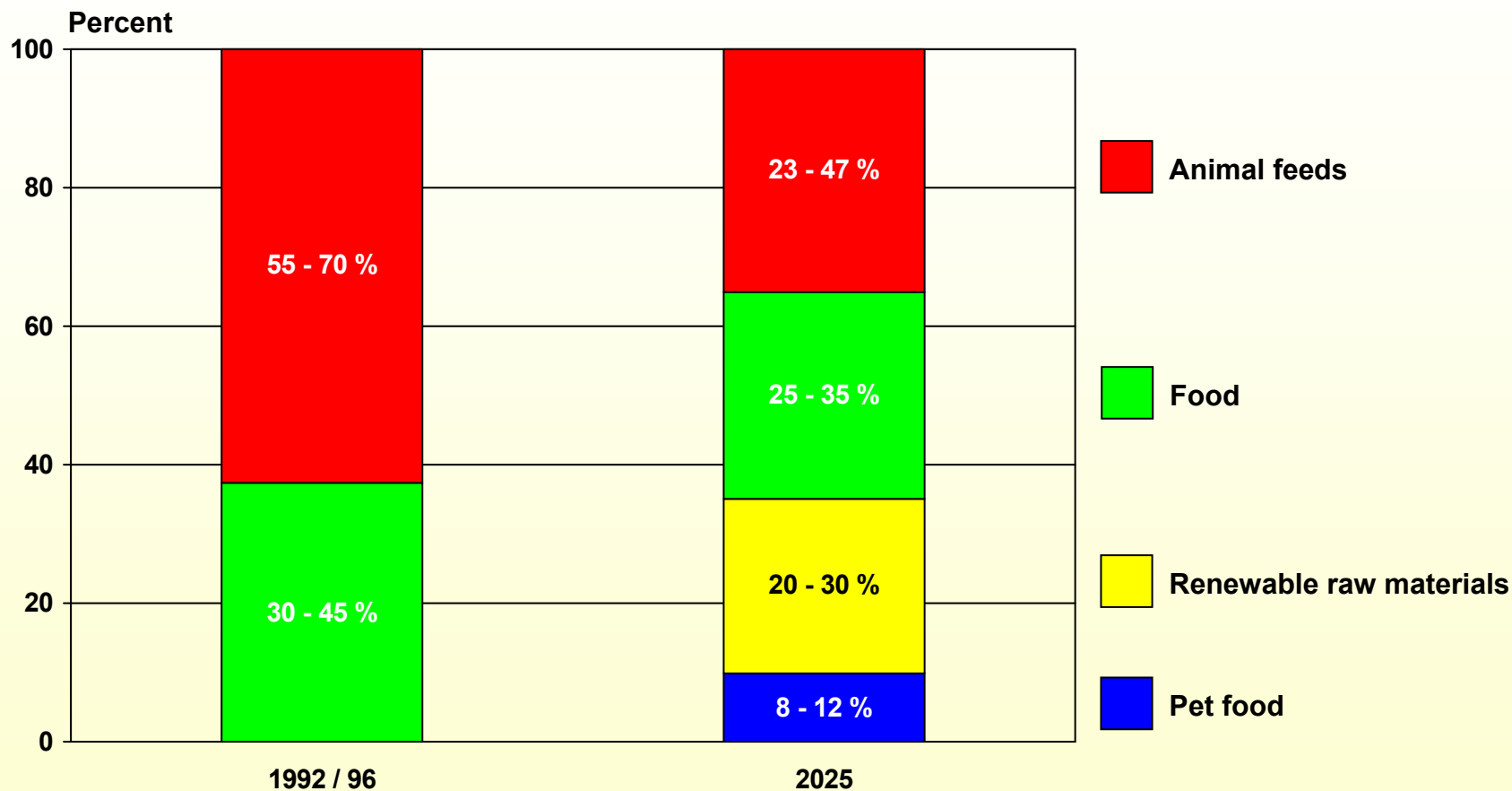
Source: Kern, M., 2005

Goals: Renewable Energy from Biomass, 2005 - 2050



Source: Kern, M., 2005

Worldwide Uses for Cereals, 1992/96 - 2025, estimated



Why Food Costs More in Canada, 2007,

John Greenwood, Financial Post, Canada

- Canadians paid **3.8% more for food (12% for vegetables)** in April 2007 compared to 2006
 - Global milk prices are rising at the fastest rate ever; **powdered milk +60%** last six months
 - **Beef** prices have jumped nearly **30%** since year 2000
 - - China, India, food demand, biofuels, etc.
 - - **Hedge funds are the biggest culprits behind inflation – “This is a new game!”**
US\$30-billion to more than US\$100-billion they have invested in commodities.
Now they have moved into food.
 - Since rise in agriculture started gaining altitude last spring, hedge funds have been pouring money into commodity exchanges, driving up prices.
Since 2005, corn has nearly doubled, wheat is up by 50%, canola has climbed 34%.
Global markets have become disconnected from fundamentals, prices rocket have little to do with supply and demand.
- Hedge funds + China/India + biofuel + subsidies + global climate-change policy**
= increase of commodity prices + higher food costs

Source: National Post, May 19, 2007

DWS Investments Deutsche Bank Group, 2007

1st CHOICE FOR YOUR MONEY

DWS Global Agribusiness Fund

**Investing in a global megatrend:
The business of feeding the world**

DWS GO Agriculture Activ TR Index Zertificate

Agribusiness – A Global Megatrend

The following areas along the entire food supply chain could offer promising investment opportunities:

- **Land property** companies are expected to take advantage of booming land prices due to the scarcity of arable land.
- **Agrichemicals** will be seeing an increased demand to produce more effective pesticides for crop protection.
- **Biotechnology** will play a large part in achieving increased yields by producing crops of better quality that are more weather and pest resistant.
- **Agro-Technology** will be needed to supply agricultural machinery, water systems and other infrastructure to increase yields.
- To meet the increasing demand for higher protein foods of the developing markets, **livestock and aquaculture** production is expected to grow significantly.
- **Soft commodities** like coffee, sugar, cocoa and fruit are set to boom from increased demand and changing consumption patterns.
- Demand for **biofuels** such as biodiesel made from palm oil and bioethanol from potatoes, sugar, corn or wheat will be driven by higher oil prices.
- Due to **climate change agrometeorology** expertise will be needed to provide farmers with more accurate weather information and warning systems.

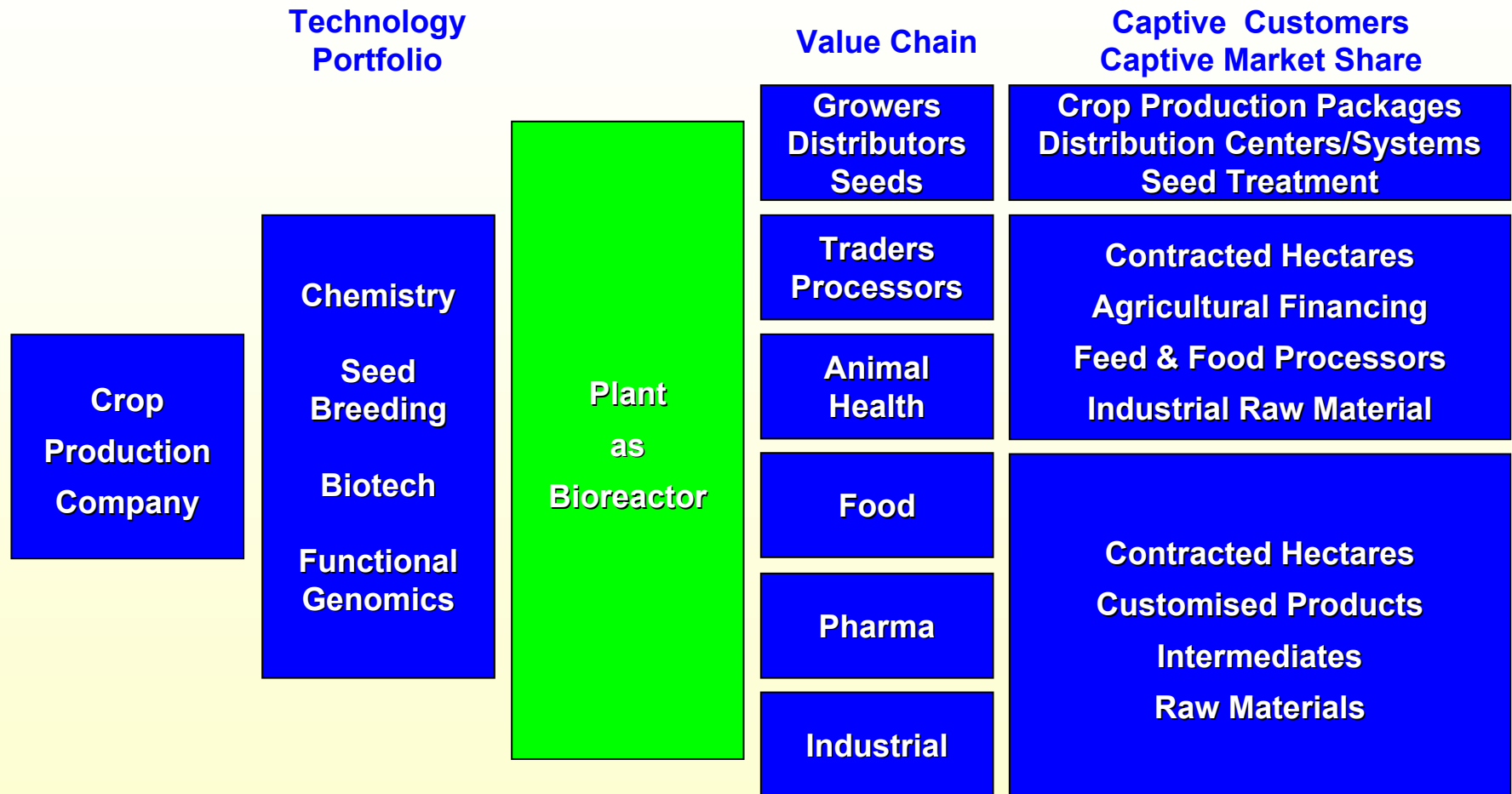
Source: DWS Investments, Deutsche Bank Group, 2007

Some Reactions Due to “*Bio-Energy-Boom*” in Germany, 2007

Food processors:	-	-	-
Bakeries:	-	-	-
Feed traders:	-	-	-
Beer producers:	-	-	-
Animal/hog producers:	-	-	-
Commodity traders:	+	-	-
Organic agriculture:	+	-	-
Environmental Assoc.:	+	+	-
Consumer:	+	+	-
Biogas farmers:	+	+	-
Crop producers:	+	+	+
Investors:	+	+	+
Fonds-Managers:	+	+	+
Agro services:	+	+	+
Policy:	+	+	+

Source: Kern, M, 2007

Agriculture 2025: Consequences for Future Players



Quelle: Kern, M., 2000/2007

For Tomorrow's World

How can we...

... improve value creations in plant and animal production?

... realize a added value agriculture?

**... develop a more efficient and effective use of land, energy,
and resources?**

... safeguard the production of safe food?

or

How can we establish a superior 'Industrial Ecology'?

Source: Kern, M., 2002

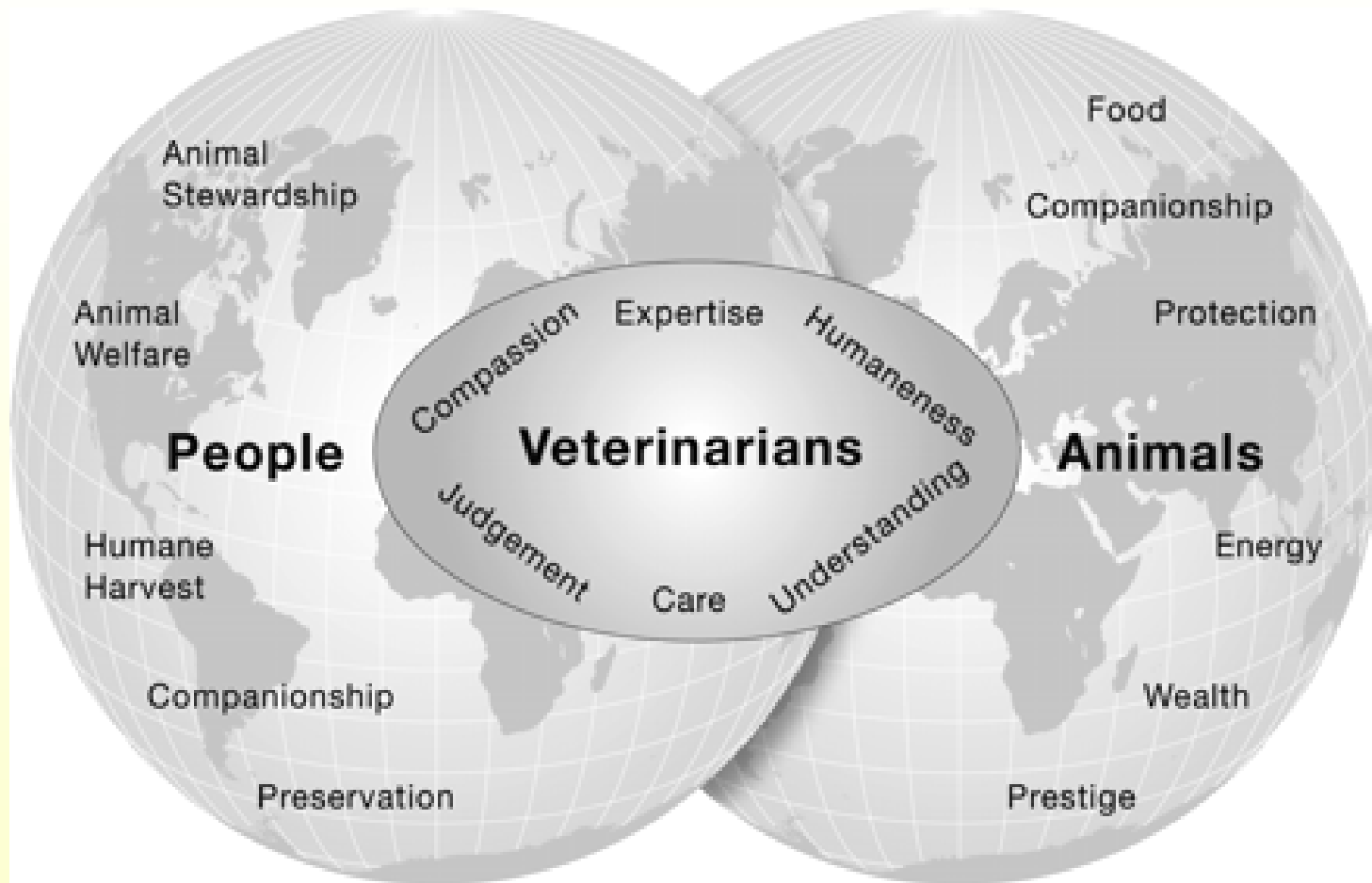
Relevant Strategic Factors

- To look ahead over a 20- to 25-year time horizon
- To seek perspectives from the future rather than extending thinking from the present – what might come in the future, not for what can be seen now!
- To respond to new needs of society, new social trends
- To recognize, that the role of animals in human society and in the ecosystem has changed and is changing
- To analyze and to capitalize new technologies and solutions to seek greater collaboration with key stakeholders in the field
- To promote new image and make clear to the public at large the range of roles of vet med plays in society, and the value it brings to society

How to protect animal health in future, 2025/2050?

Source: Kern, M., modified after: Willis, N.C. et al., 2007

Envisioning the Future of Veterinary Medical Education, 2007



Source: Willis, N. G., et al. J. Vet. Med. Education 34/1, 1-41, 2007