GLOBAL CHALLENGES FOR ANIMAL PRODUCTION

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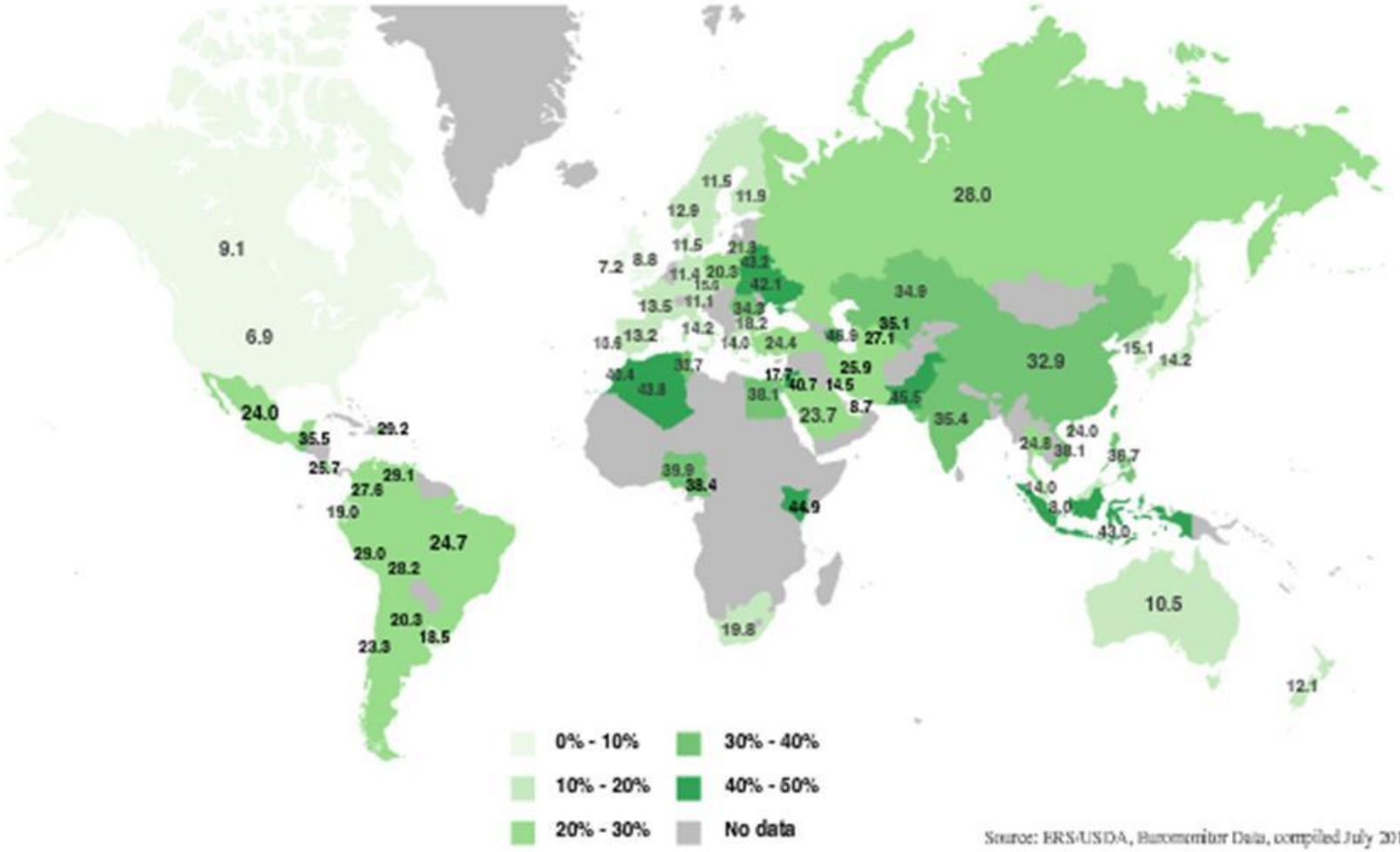
Family Le Moines, Montreuil, France
Weekly food budget 350€
Volvic
©Peter Menzel


Family Revis, USA
Weekly food budget 270€
©Peter Menzel


Family Aboubakar, Chad
Weekly food budget 1€
©Peter Menzel

How Much of Our Spending Goes Toward Food?

Less than 7 percent of the money Americans spend goes to buy food, the lowest of any country that keeps such data. Each number on the map represents a country and the percentage of people's total expenditures spent on food in that country. Click on the numbers for more details.

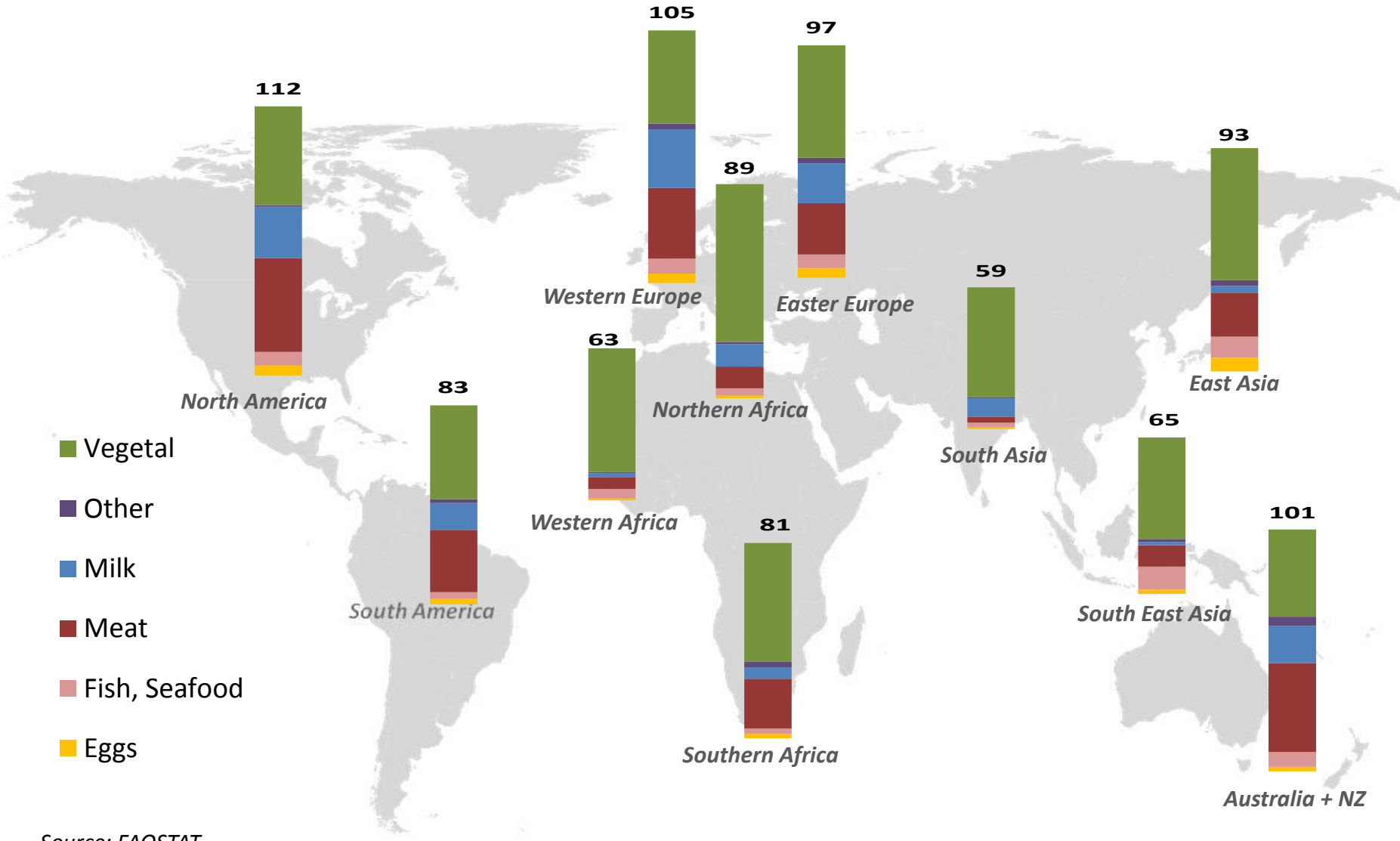


Source: ERS/USDA, Euromonitor Data, compiled July 2010, data for 2009

Data represents money spent on food at home

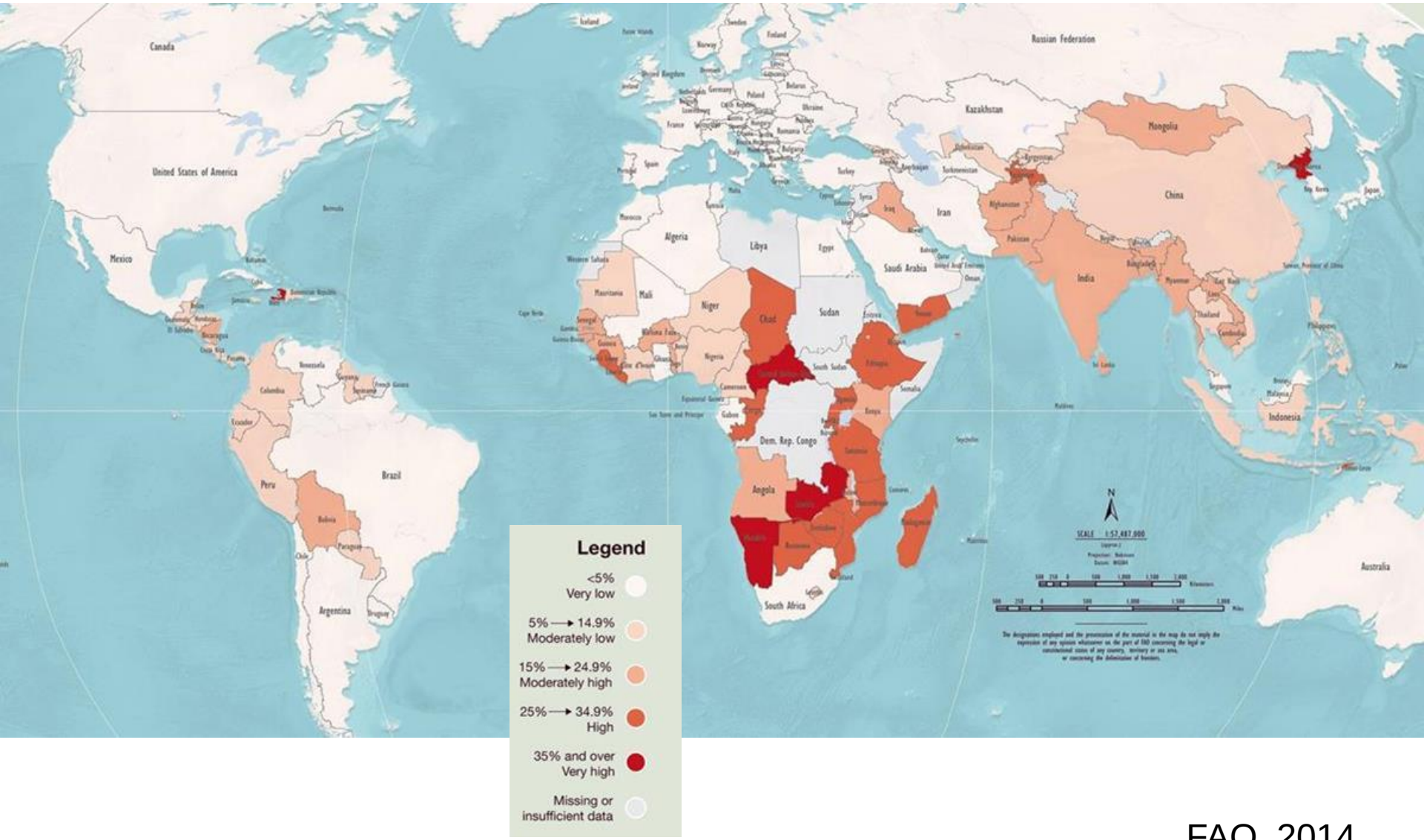
Icons from challiarch.com Creative Commons

PROTEIN CONSUMPTION (G/CAP/DAY)



Source: FAOSTAT

PREVALENCE OF UNDERNOURISHMENT

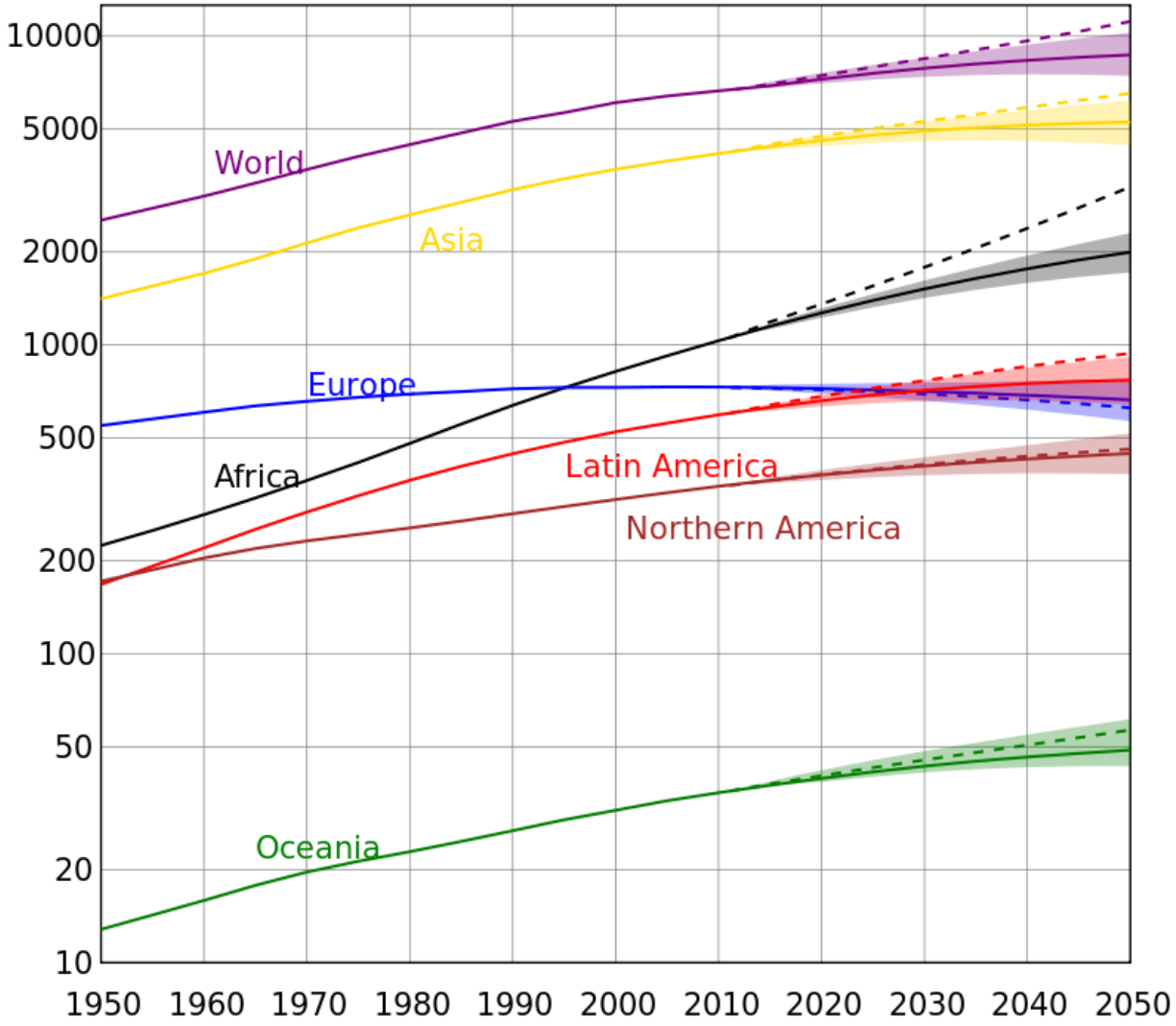


FAO, 2014

GLOBAL HUMAN POPULATION

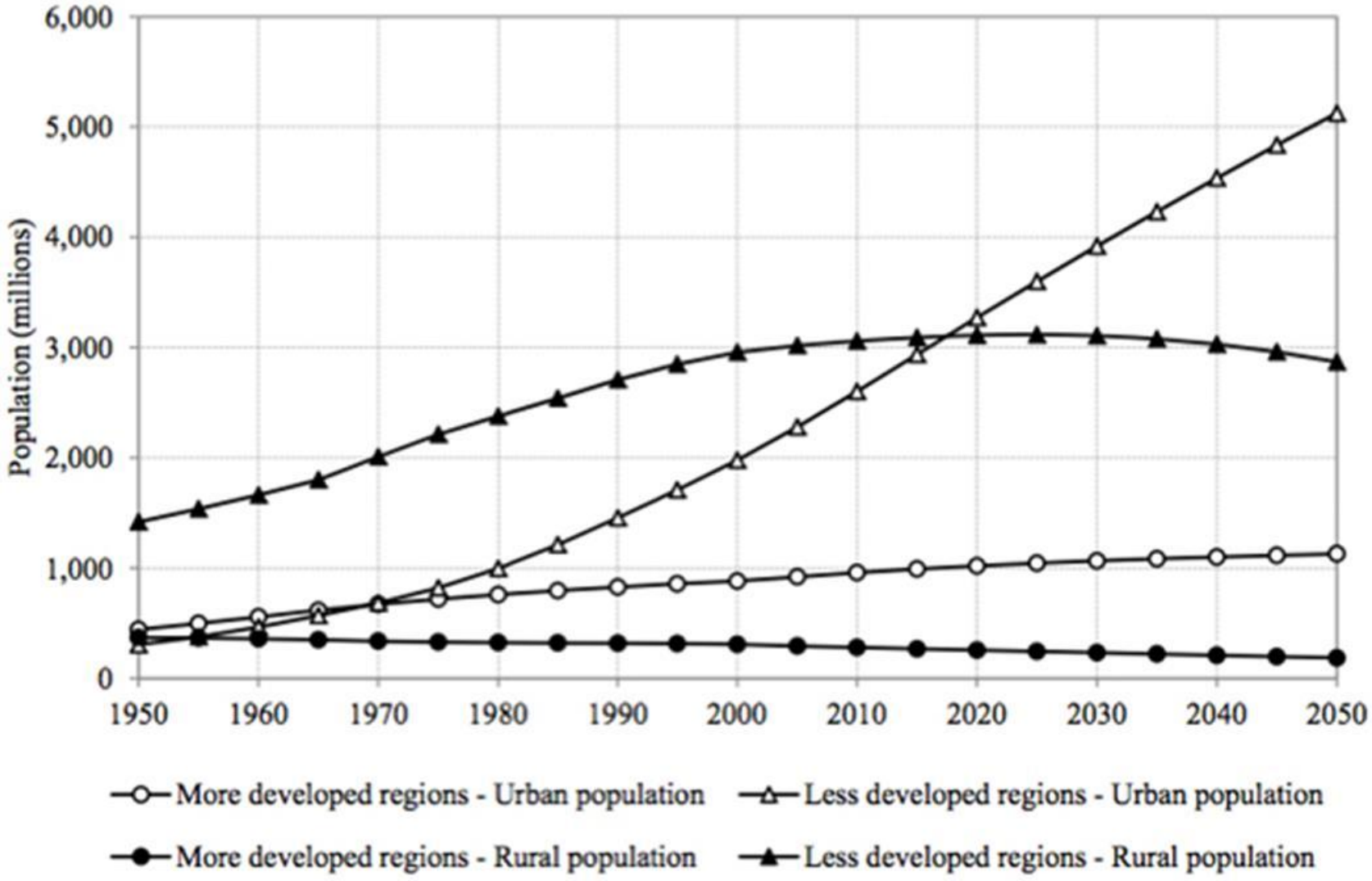
1950	2000	2050
2.6 billion	6 billion	9.6 billion

REGIONAL PROJECTED POPULATION GROWTH



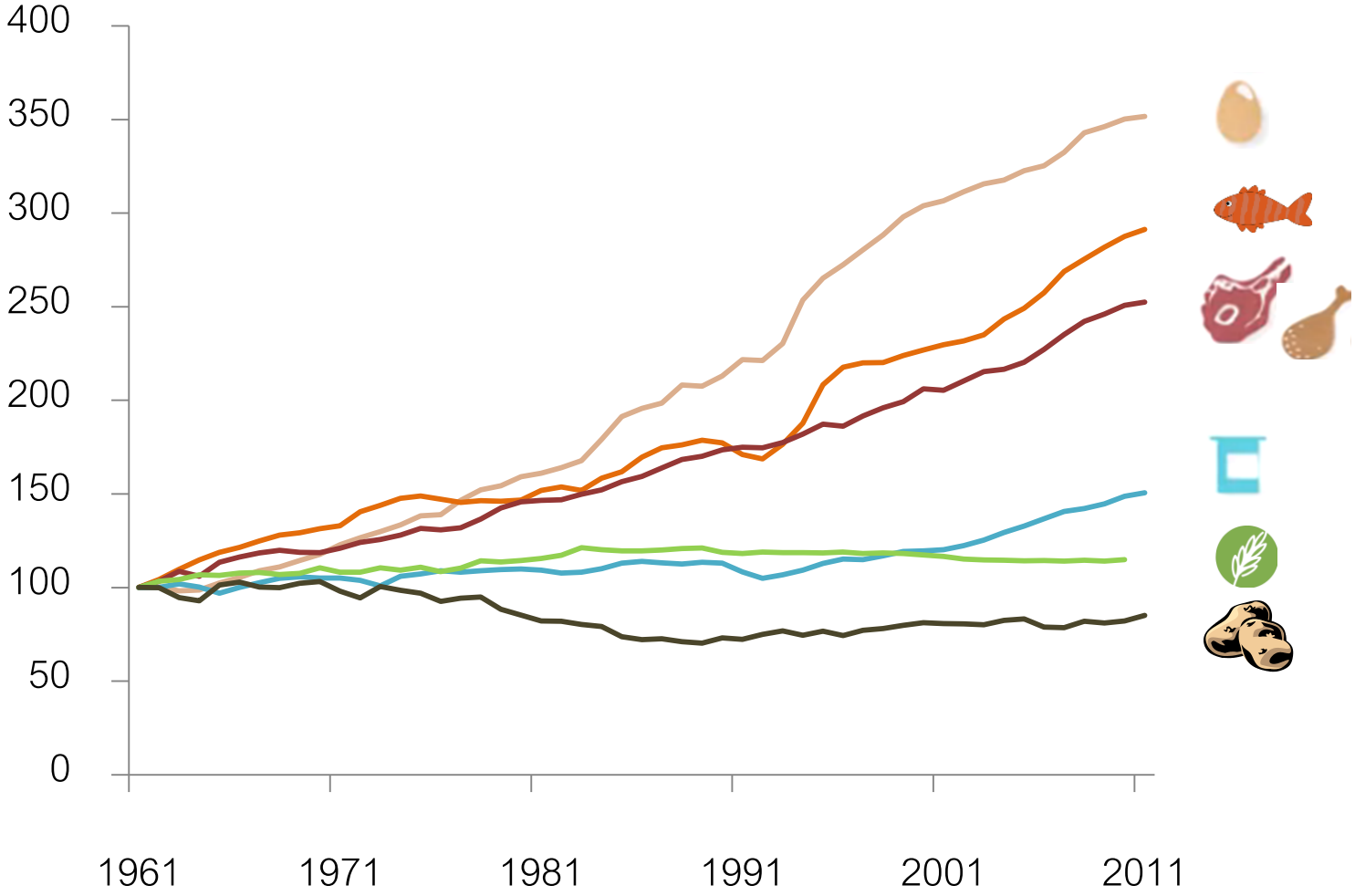
"World population (UN)" by Conscious for wikipedia

Figure I. Urban and rural populations by development group, 1950-2050



www.un.org

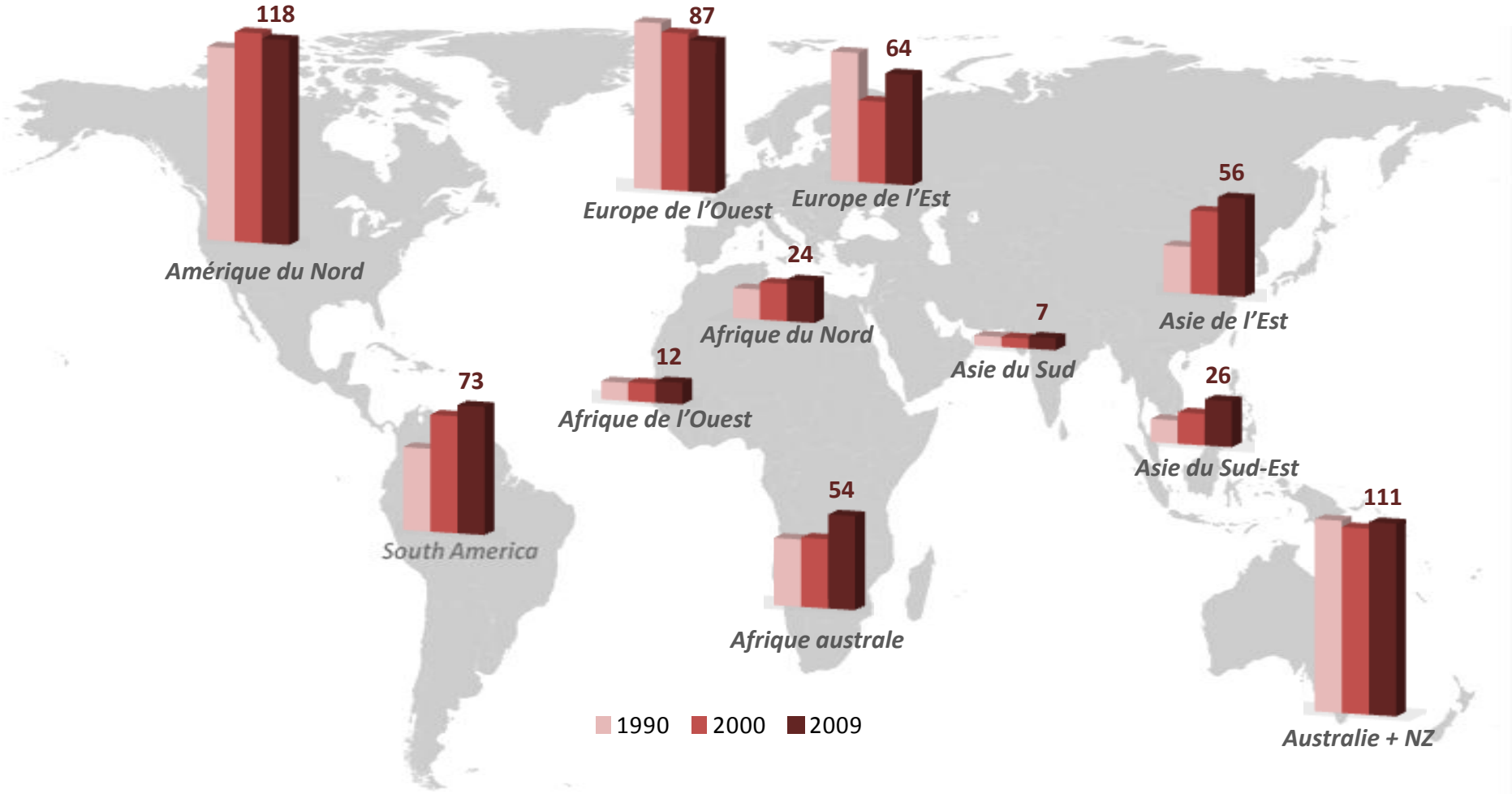
DEMAND IS GROWING FASTER IN DEVELOPING COUNTRIES



Source: FAOSTAT

MEAT CONSUMPTION

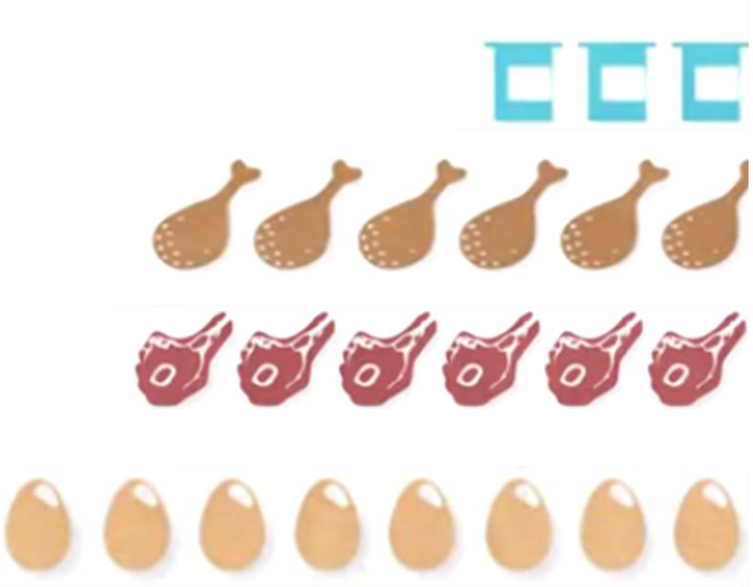
(KG PER CAPITA/YEAR)



Source: FAOSTAT

GLOBAL DEMAND FOR ANIMAL PRODUCTS

1990 - 2010



+30%

+60%

+80%

+70%

Source: FAO, 2012

DRIVERS OF DEMAND GROWTH

Population: +30% since 1990

+35% or 9,6 billions in 2050

Income: +1.5% /year since 1980

+2% /year in 2050

Urbanization: 40% in 1990, >50% in 2010

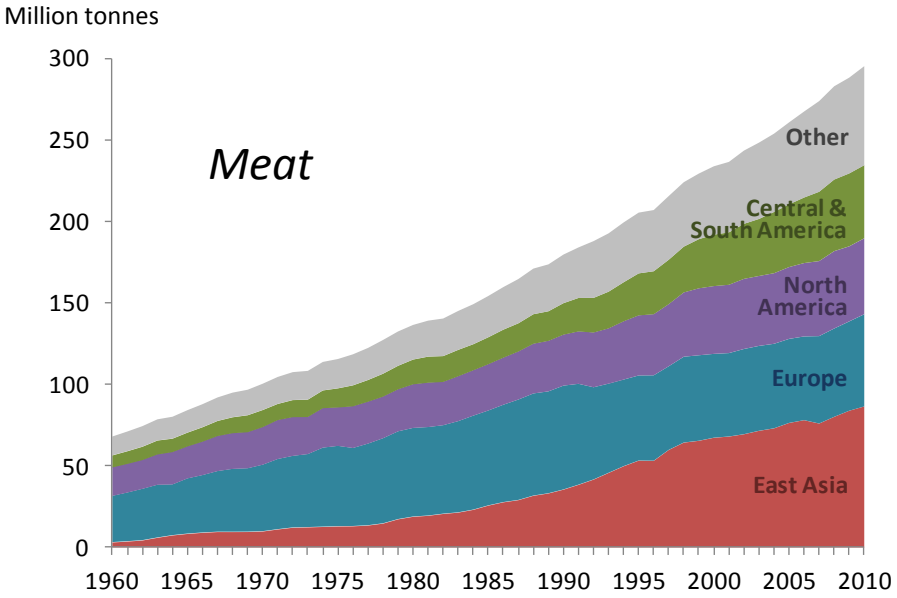
70% urban in 2050

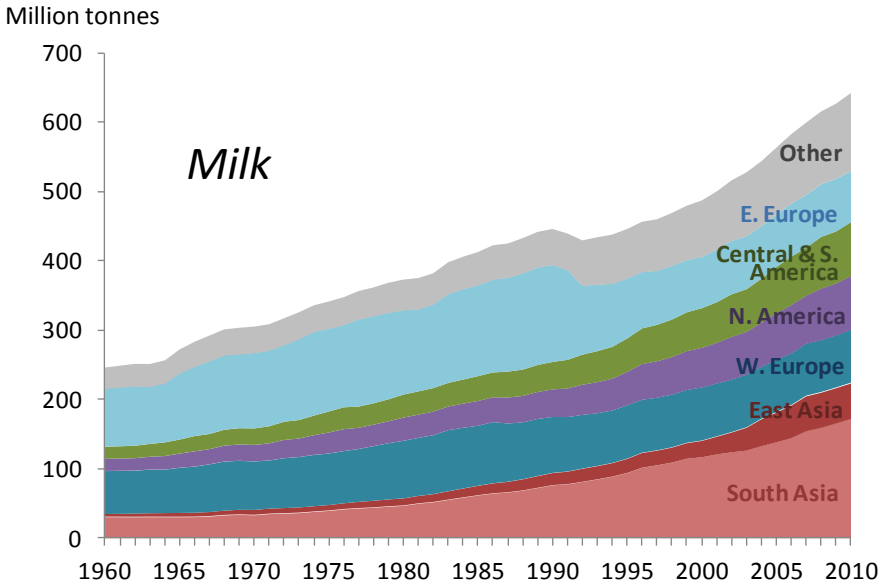
LIVESTOCK REVOLUTION

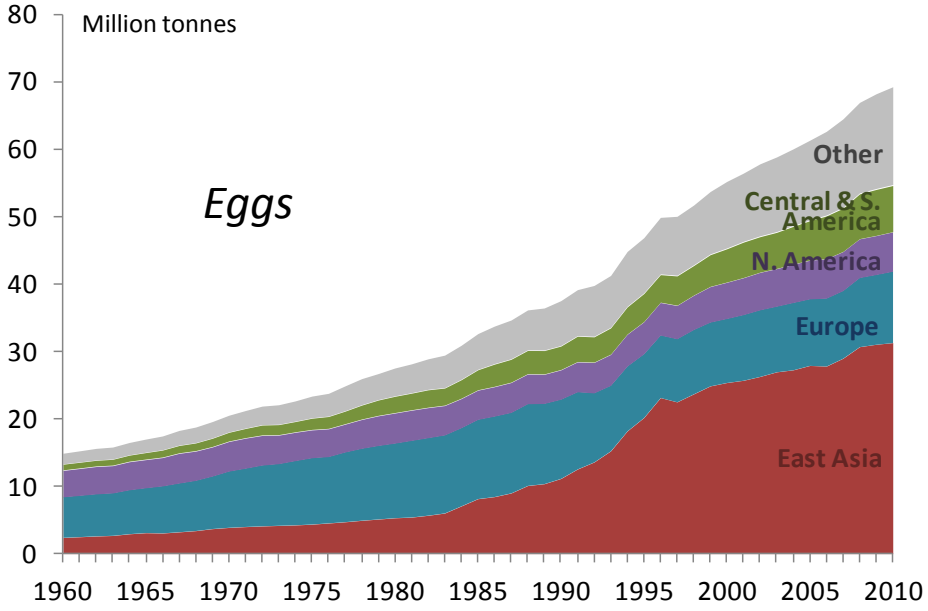
Rapid growth has led to:

- Up scaling : from smallholder mixed farms towards large scale specialized industrial production systems (80% of sector growth in industrial systems)
- Technological change, from breeding, feeding and housing to disease control, processing, transportation and marketing
- A shift in the geography of demand and supply to the developing world and peri-urban areas;
- A shift in species with production of monogastrics growing rapidly, while the growth of ruminant production slows
- An increasing emphasis on global sourcing and marketing

LIVESTOCK SECTOR TRENDS: WORLD PRODUCTION







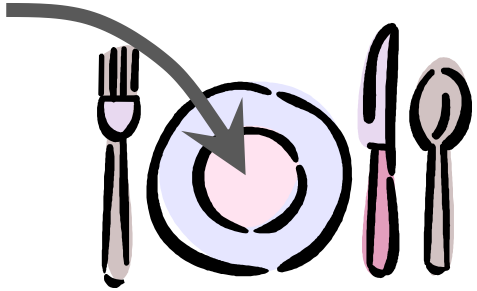
Source: FAOSTAT

LEAST DEVELOPPED COUNTRIES DEPEND MORE AND MORE ON IMPORTS

NON OECD NET MEAT EXPORTERS

BRAZIL, CHINA, INDIA, THAILAND

IMPORTS:
1960: 1%
2010: 8%



ANIMAL PRODUCTS CONSUMTPION IN LDA

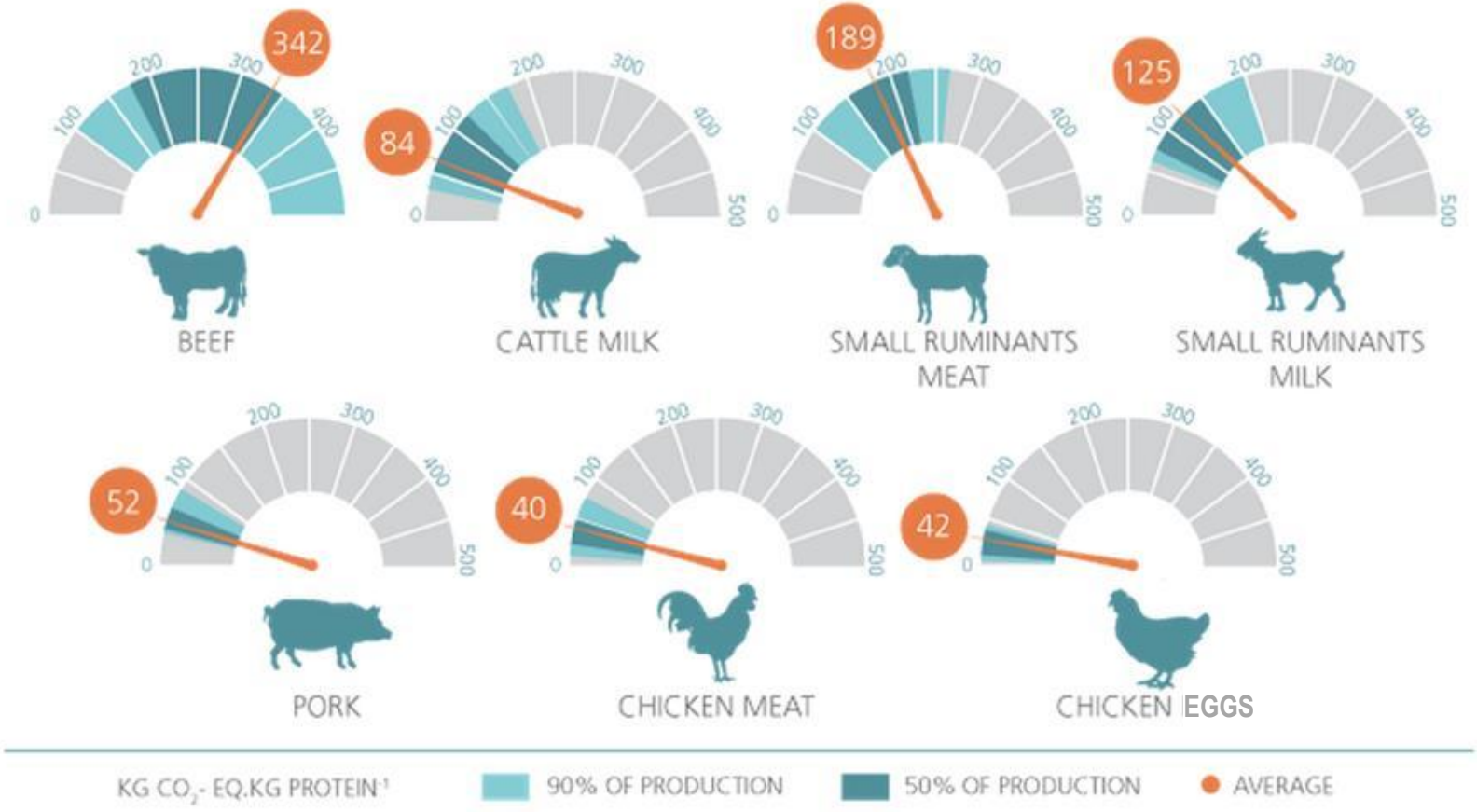
30% of all land


25% of nitrogen fertilizers


8 to 15% of water resources


14.5% of all GHG emissions

EMISSION INTENSITIES VARIABILITY

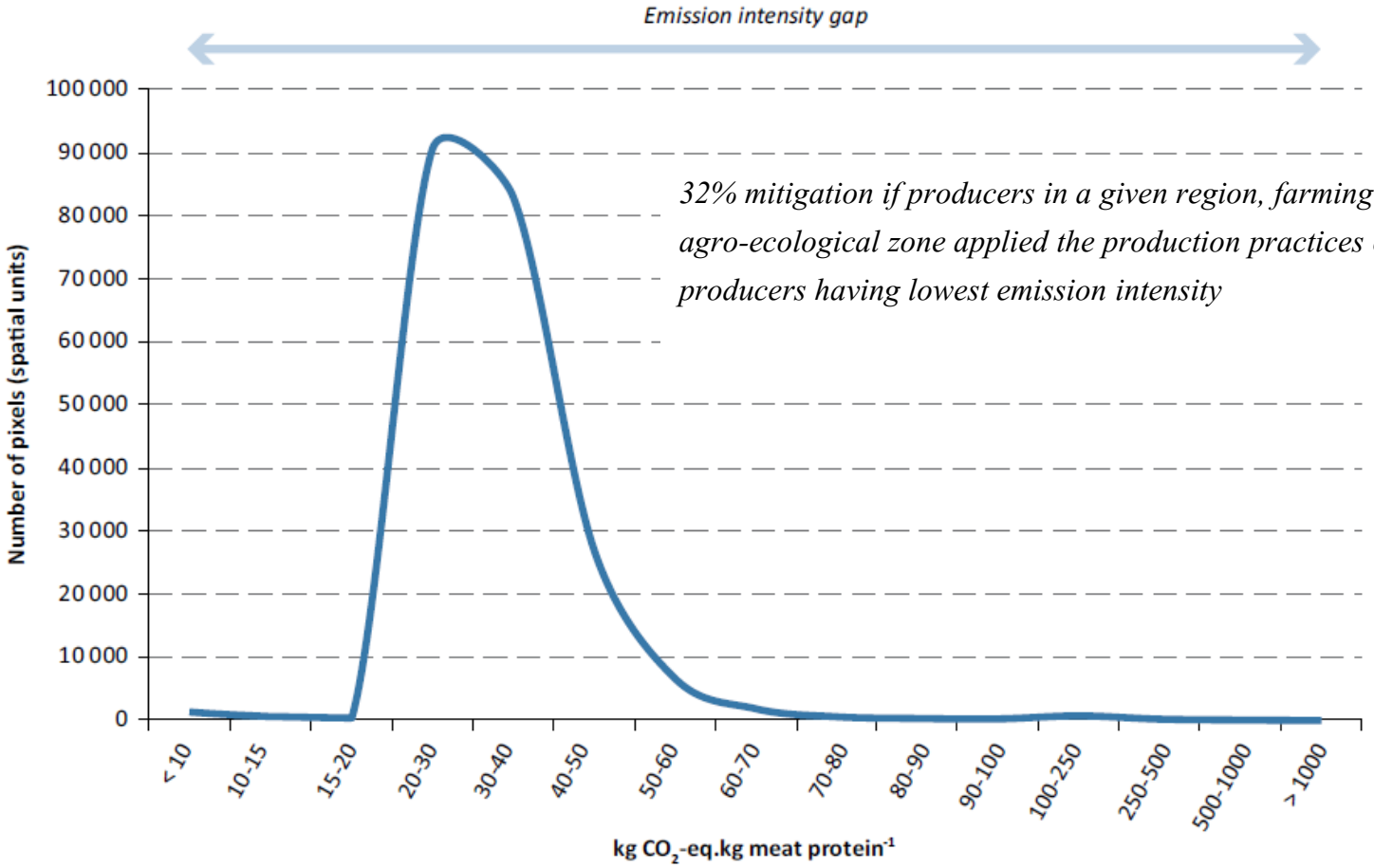


***Global emission intensities by commodity**. All commodities are expressed in a per protein basis. Averages are calculated at global scale and represent an aggregated value across different production systems and agro-ecological zones.*

FAO, 2013

BRIDGING THE EFFICIENCY GAP

Distribution of intensive broiler supply chains according to their emission intensity in temperate zones of East and Southeast Asia

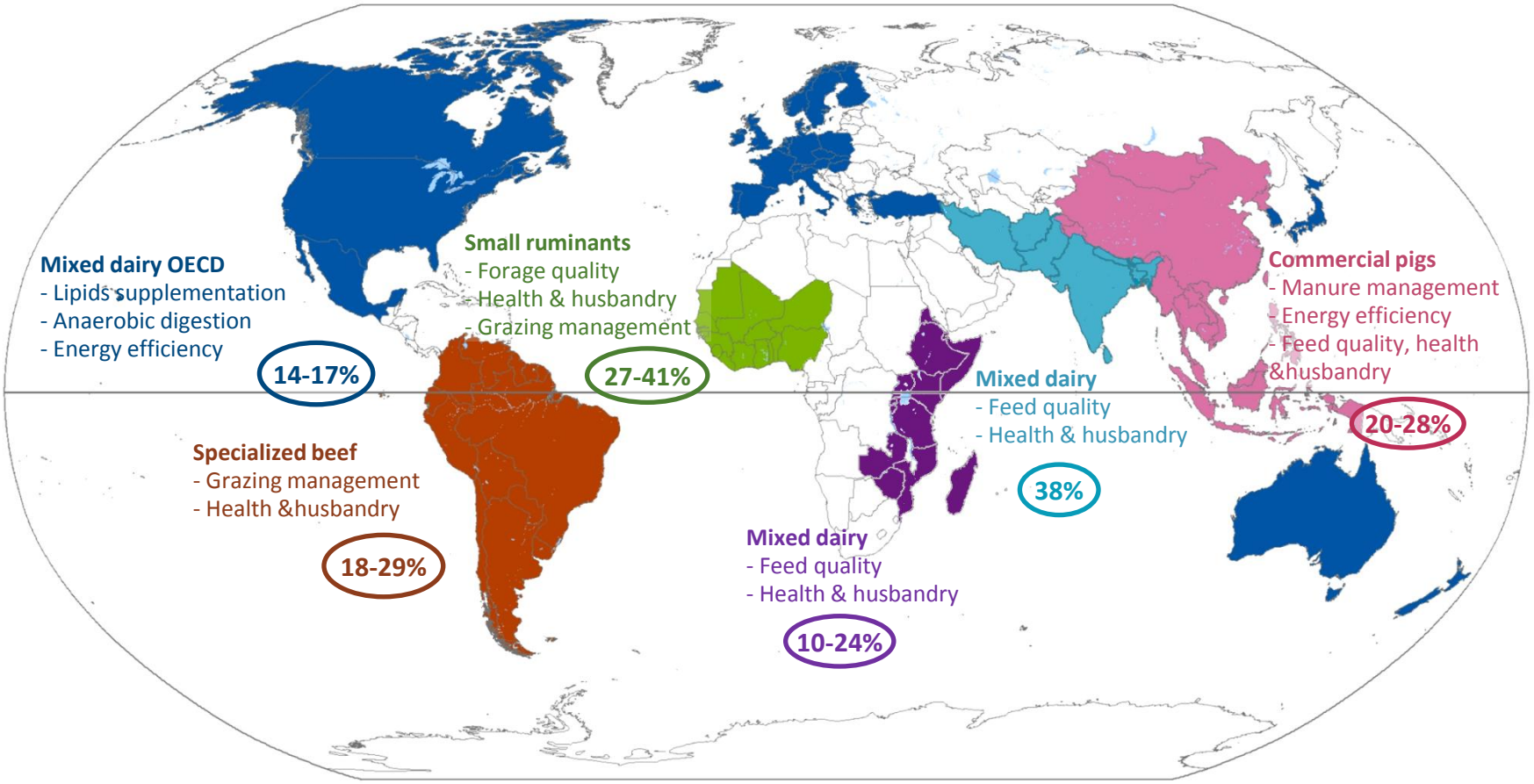


32% mitigation if producers in a given region, farming system and agro-ecological zone applied the production practices of the 10% producers having lowest emission intensity

Source: GLEAM.

FAO, 2013

CASE STUDIES: MITIGATION POTENTIAL



FAO, 2013

SYNERGIES AND TRADE-OFFS IN EFFICIENCY

THE EXAMPLE OF CLIMATE CHANGE MITIGATION

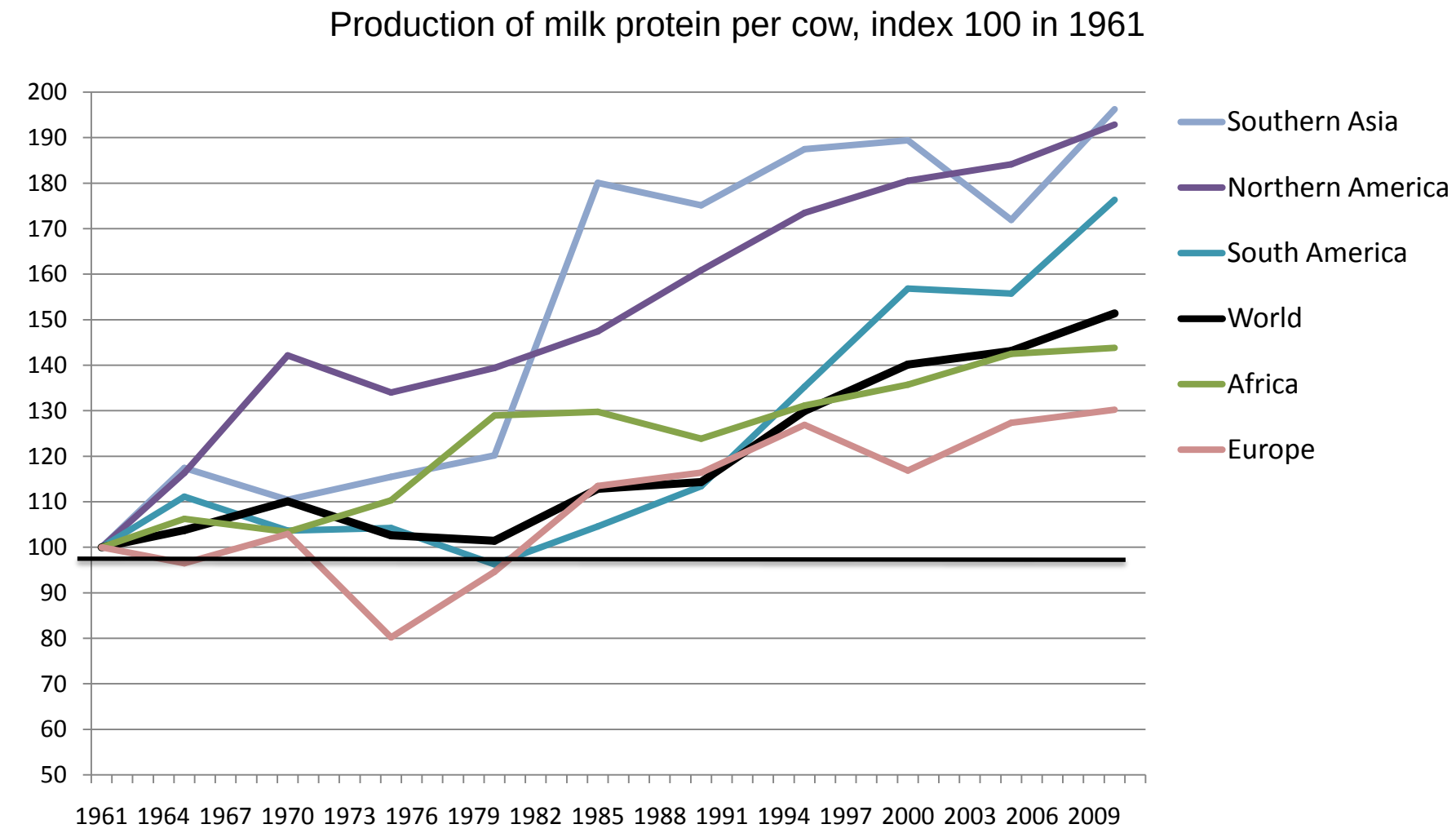
- Livestock uses 30% of total land: one third of crop lands for feed production + more than 3 billion ha of grasslands
- Improving efficiency in livestock production has therefore direct impacts on land based emissions
- Low carbon feed sourcing can also contribute significantly to reduce land based emissions (e.g. maize/soybean)
- On the other hand, crop related mitigation options that affect feed digestibility have impact on enteric fermentation and methane emissions but also on livestock productivity (e.g. forage cover crops, feed crop substitution)

THE SPECIAL ROLE OF GRASSLANDS IN CLIMATE CHANGE MITIGATION

- Specificity of the livestock sector, 3 billion ha
- Grazing management: prevent over grazing but also under grazing. High potential in marginal areas, including positive impact on productivity
- Grassland restoration and grass variety management
- Uncertainties in storage potential in a wide variety of agro-ecological conditions. Need further assessments and MRVs.
- Henderson et al., 2015:

148 Tg CO_2 yr^{-1} (0.148 Gt). Soil C sequestration potential of 203 Tg CO_2 yr^{-1} for legume sowing. However, N_2O emissions from legumes offset 28%. N_2O emissions from N fertilization exceeded soil C sequestration, in all regions.

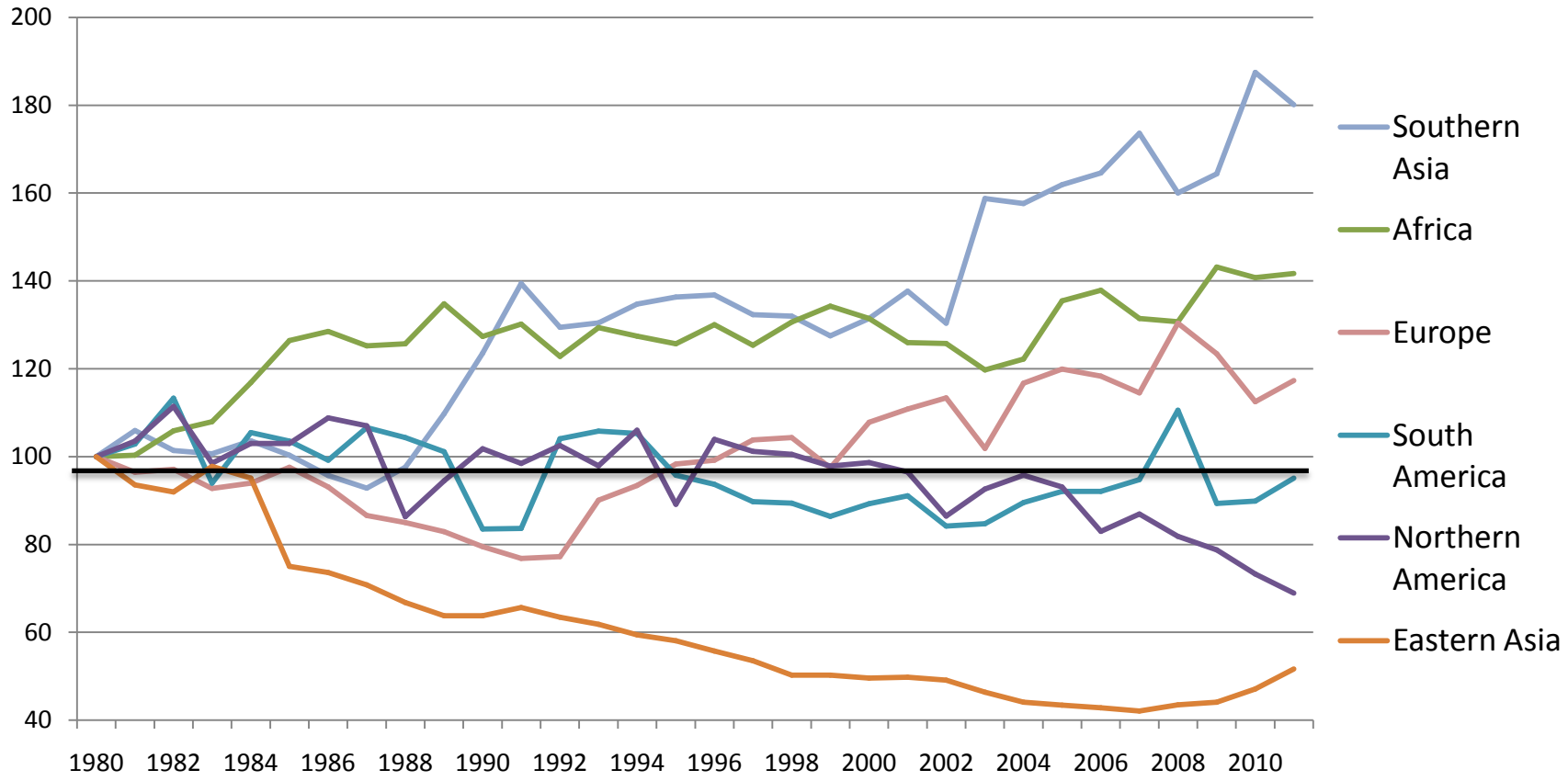
EFFICIENCY GAINS



Source: FAOSTAT

FEED USE EFFICIENCY

Cereals and oil crops used as feed per protein output (index 100 in 1980)

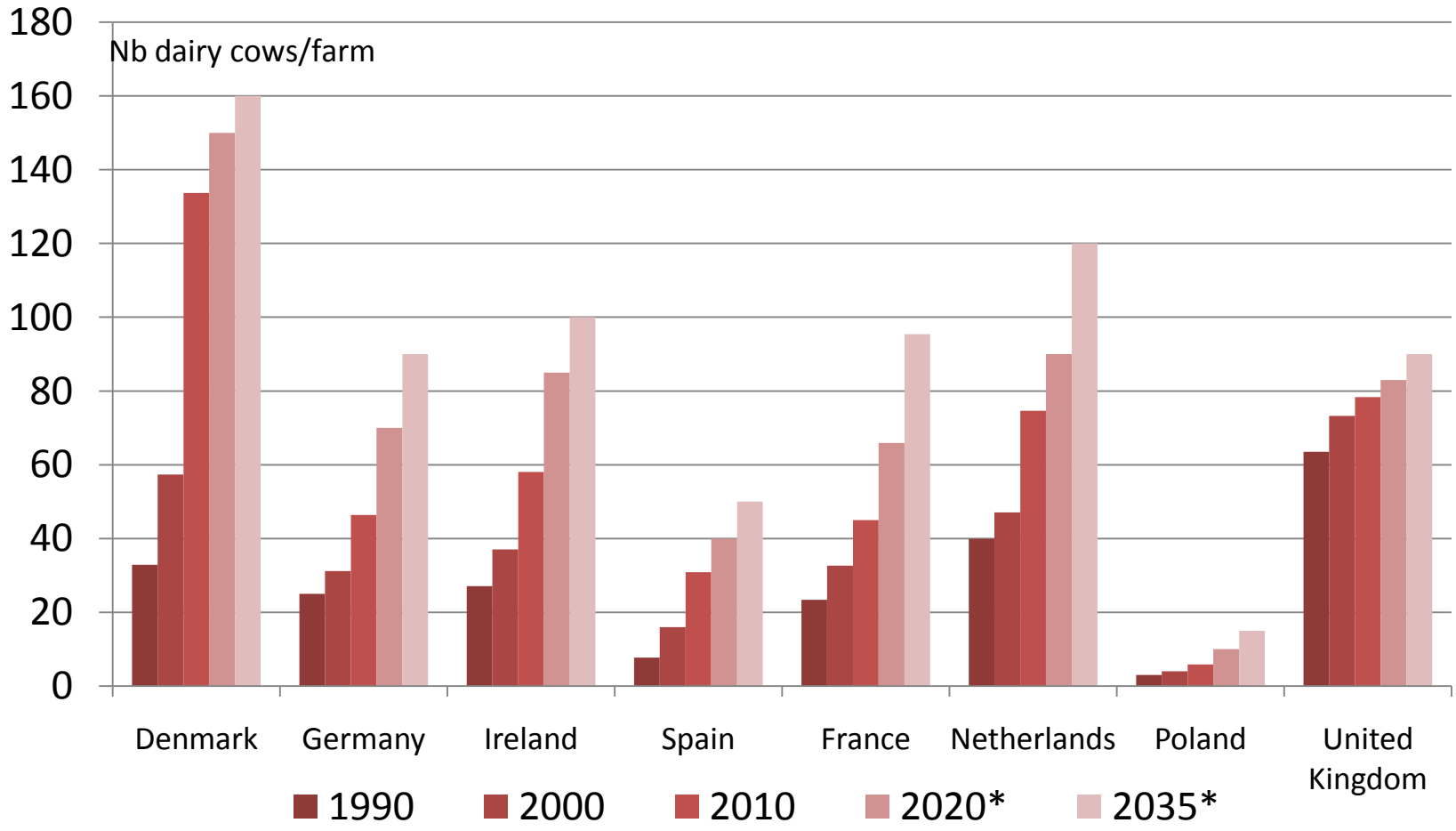


Improve feed use efficiency: precision feeding, increased use of by-products, biotech

Source: FAOSTAT

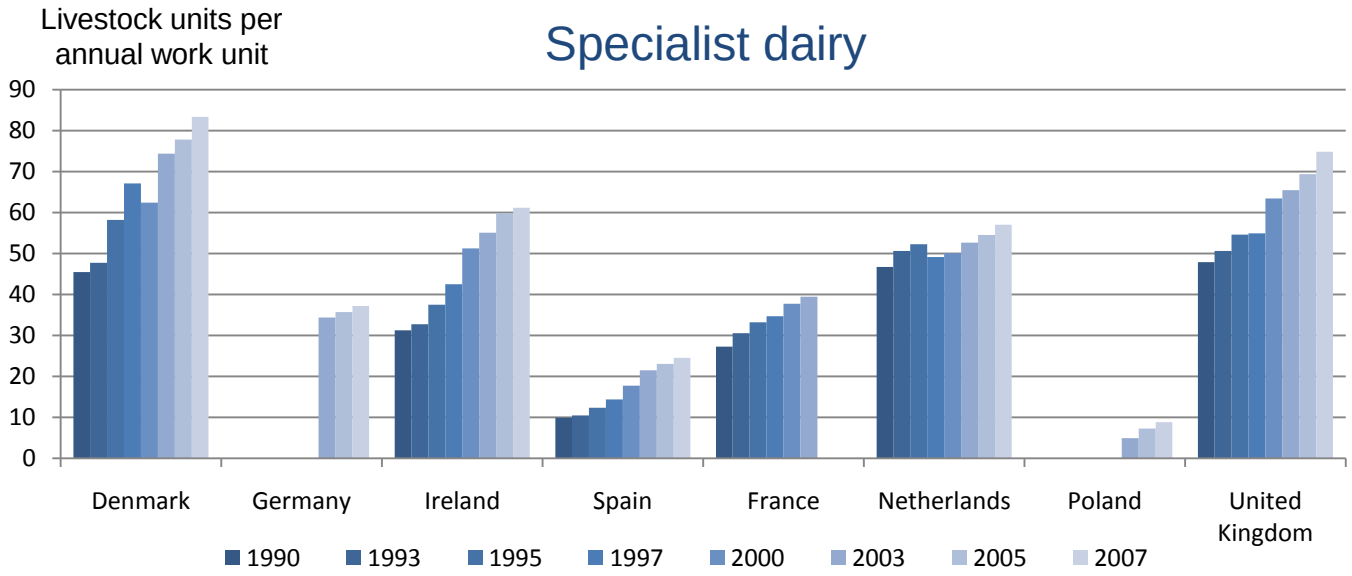
DAIRY FARM CONSOLIDATION IN THE EU

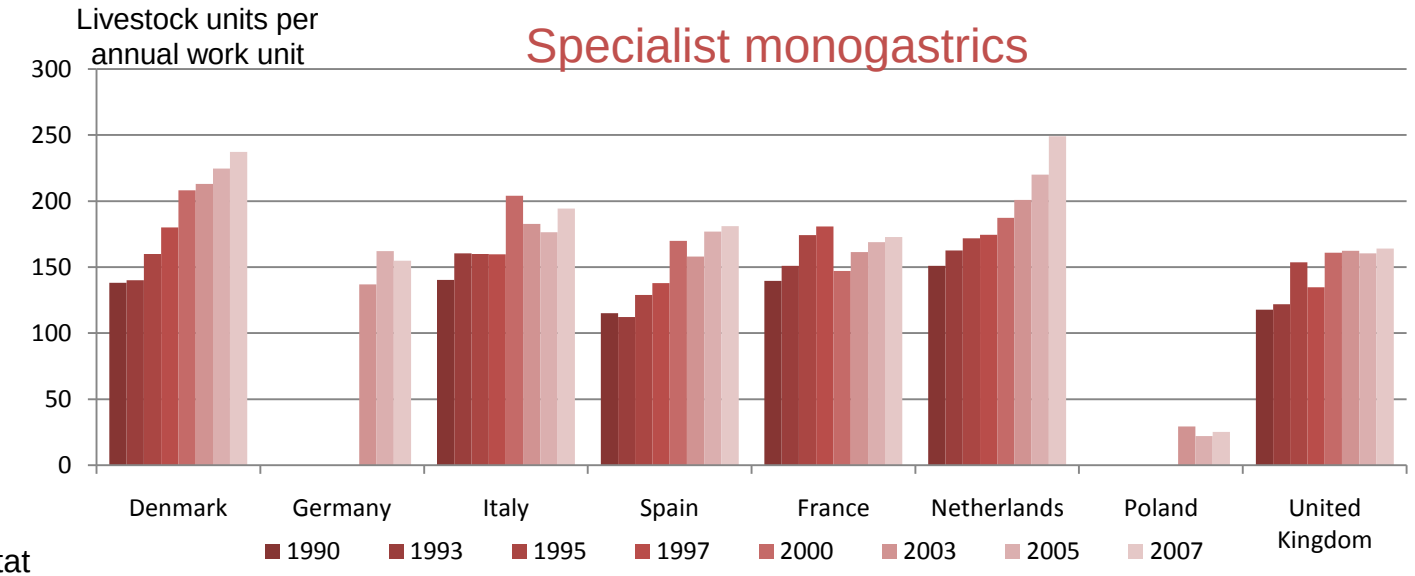
MORE ANIMALS PER FARM



Source: Eurostat

MORE ANIMALS PER FARMERS





Source: Eurostat

LIMITS OF THE EFFICIENCY CONCEPT

- Emission intensity vs absolute emissions. Demand is part of the problem
- Marginal gains for systems already operating close to optimum. At what cost?
- What is socio-economic efficiency? Performance doesn't mean access to resources or market
- Efficiency gains = more profitable systems → further expansion. Need protection of natural resources as well
- Trade-offs between efficiency and resilience (e.g. breeding)

CONCLUSIONS

- Growing global market means opportunities (trade, transfer of technology…)
- In a world of finite resources, optimization is an evidence that makes environmental, social and economic sense
- We also need regulation to avoid further depletion of natural resources (land, water, nutrients, climate…)
- Potential for PLF is important at global level but at what cost? What should be the incentives?
- EU leading role in R&D and in policy development
- Requires that farmers work with scientists, but also governments for enabling policies, civil society for social demand, and the industry: multi stakeholder initiatives

GLOBAL AGENDA FOR SUSTAINABLE LIVESTOCK

- Closing the efficiency gap
- Restoring value to grasslands
- Waste to worth

leap
LIVESTOCK ENVIRONMENTAL ASSESSMENT AND PERFORMANCE PARTNERSHIP