Risks and opportunities for the cattle sector arising from the increasing demand for livestock protein

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The two Es

- The economy
- The environment

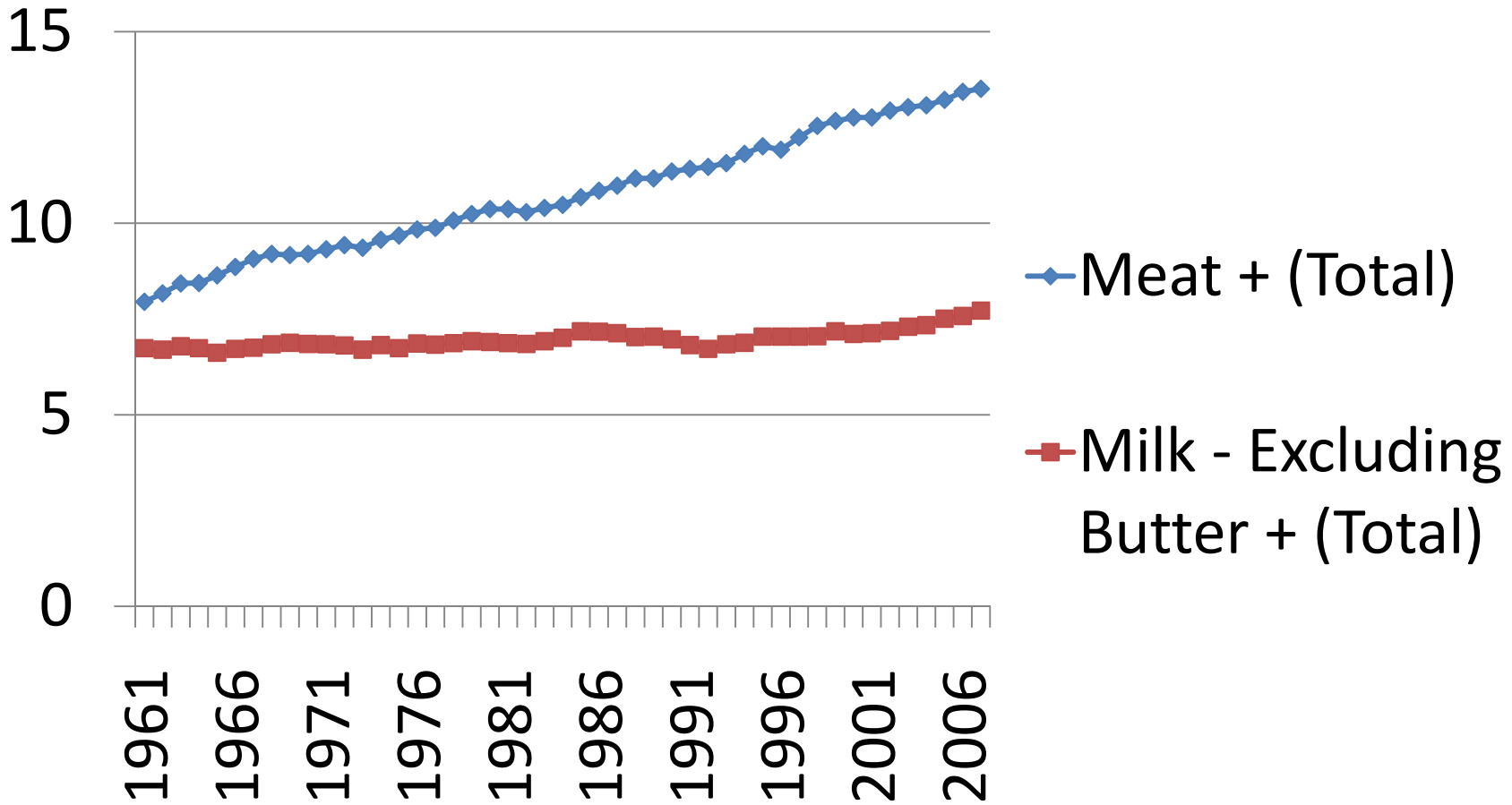
Increase in global food supply

	1969-1971	2005-2007
Global food supply kJ/capita	9.93	11.63
Global food supply g protein/capita	64.3	76.6

The context

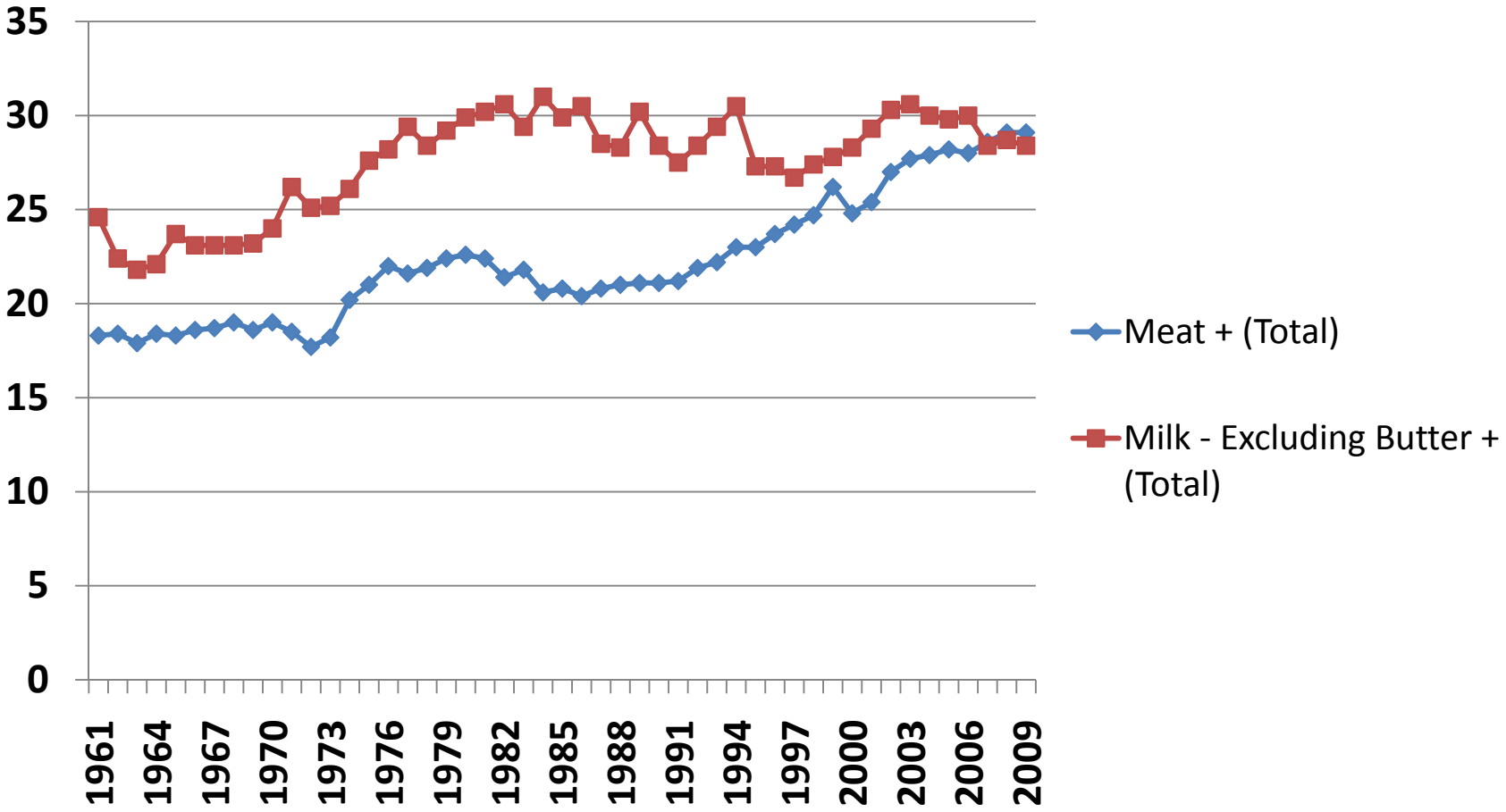
- Changing diets

World average supply of meat and milk (g protein/capita/day)



FAOSTAT data 2007

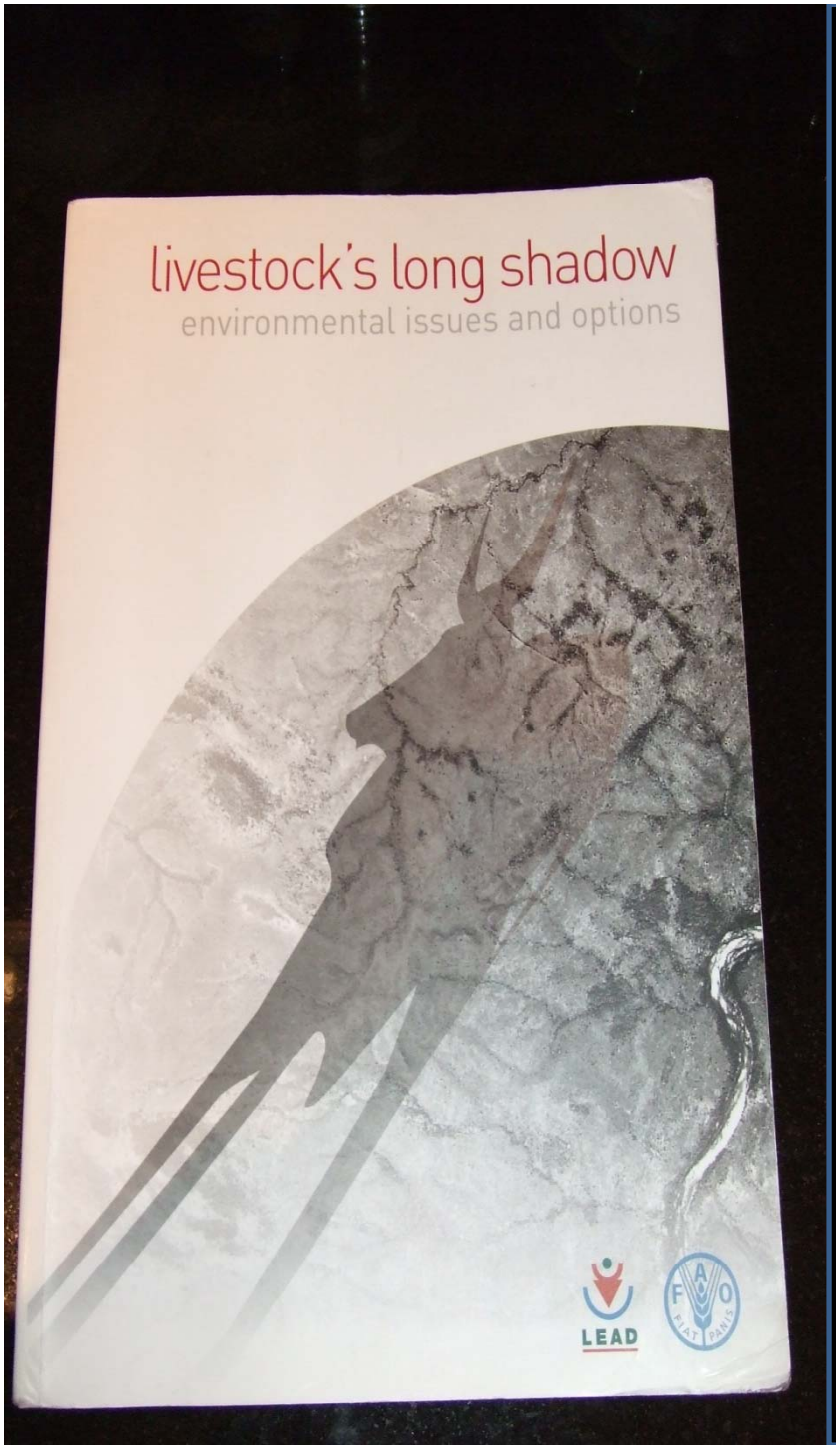
Supply of meat and milk in Sweden (g protein/capita/day)



The context

- Changing diets

- Increasing recognition of need to limit emission of greenhouse gases and awareness of methane (and other environmental negatives)from livestock



Livestock production:

- contributes 18% global GHG
- accounts for 8% of water used by humans at a global level
- threaten habitats of 10% species that are under pressure

and

- 60% of emerging infectious diseases in humans originate in livestock

The context

- Changing diets

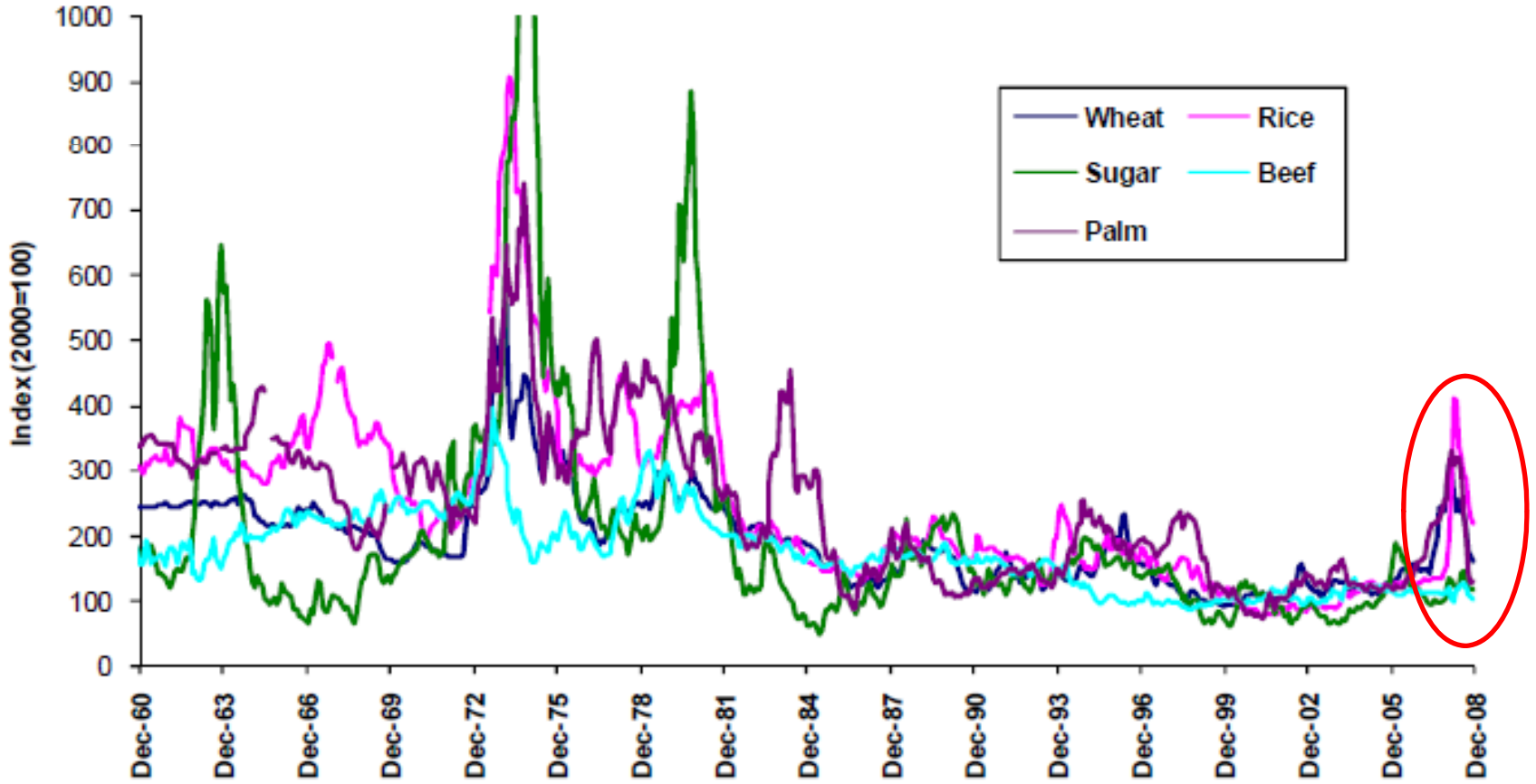
- Increasing recognition of need to limit emission of greenhouse gases and awareness of methane (and other environmental negatives)from livestock
- Increasing complexity of trade and governance of global food system leading to inter-dependency of markets for products and inputs

Global trade

- Global food retail sales are US$ 4 trillion (2009)
- Livestock share of agricultural exports rose from 11 to 17% between 1961 and 2006
- Livestock have a global asset value of at least US$1.4 trillion (2009)

Historical

Figure 2: Real price indices January 1960 – December 2008



ource: Defra

Reasons behind food price spike of 2007

- Low projected global stocks/use ratios in 2007/08
- Rapid increase in energy prices
- Significant weakening of the US $
- Export restrictions in a number of countries

Conclusion: we live in a dynamic and interconnected world

Aim of this talk: To explore how some of the perceived risks are turning into opportunities, while some opportunities need to be defined by local (rather than global) parameters.

Be wary of headlines and of taking global numbers as universally applicable

Risks – and how to manage them

- Public perception

Meat without feet

In vitro chicken, beef and pork could be better for people, animals and the planet. But will it catch on, asks

CAROL MIDGLEY

Here is a question that you must try to answer honestly. Would you eat meat that had been grown in a Petri dish? Let's be clear: I don't mean "mock" meat made rom soya, or even the flesh of a cloned nimal. I mean real, in vitro meat that has een cultured in a laboratory from, say, pig tem cells but has never formed part of a ving, breathing, kicking, oinking creature. leatro, if you like.

If the idea makes you reach instinctively r your Tesco vacuum-packed streaky con, perhaps you had better steel your- lf and get used to it. Last month, in beef, pork or chicken — bought off the shelf could become a reality within the next decade.

What might propel the process along even faster was a radical move last week by People for the Ethical Treatment of Animals (Peta). The organisation, which has long promoted vegetarianism, has offered a $1 million (£507,400) prize to "the first person to come up with a method to produce commercially viable quantities of in vitro meat at competitive prices by 2012". The rules specify that the meat in question must be chicken, with the same taste and texture as meat taken from a living bird. Peta says that the world's use and abuse of chickens is the most urgent issue to be tackled, as billions of them are slaughtered each year — 100 times more than pigs and 200 times more than cattle.

Some members of the organisation are incensed by the gesture. Ingrid Newkirk, its co-founder and president, says that it has caused "near civil war" in the Peta offices. Many purist animal rights campainers abhor absolutely the idea of eating meat, even if no animal died to produce it, regarding it as a moral surrender.

The other view, growing in credence among both carnivores and vegetarians, is that, since human beings seem unlikely ever to kick their meat-eating habit, this may be the ideal — indeed, the only — compromise. It is a possible "third way" that would, theoretically, be kinder to both the animal kingdom and the environment. And, because the meat would not have been pumped full of steroids and antibiotics and fed on grisly reconstituted foodstuffs, it would be healthier. Harmful saturated fats

Peta president Ingrid Newkirk; below, the April Fool's Day "Newkirk Nuggets"

> Our consumption of meat is not sustainable. In the US, a million chickens are eaten every hour

whole idea far-fetched? Not necessarily. Researchers have already produced small amounts of the meat in laboratories, and have been able to get heart cells to beat in test tubes. The technology still has a long way to go, and at present the process is prohibitively costly (it would cost nearly $1 million to turn out a 250g piece of beef). But with enough research and funding, it is not inconceivable that one day the scientists could produce a steak or a lamb chop.

The question then would be: will people eat it? A quick survey of the carnivores I know reveals an instinctive revulsion from at least 70 per cent. "It's perverted," says my colleague at the next desk. "It's a disgusting, freakish idea." Which, to a vegetarian (like me), is deeply weird. How can it possibly be more disgusting than, say, eating chickens that have ulcered backsides from sitting for weeks in their own excrement, bodies five times their natural size, with leg abscesses the size of 50p pieces, and end their lives strung upside down with their heads hacked off?

Personally I would have nothing against eating in vitro meat in principle, because it was never a conscious animal in the first place and never had to travel hundreds of miles in an airless van, live in a cage or come within a country mile of the slaughterman's knife. If it supported an industry that would eradicate the need to keep animals in factory conditions, then I'd not only eat it, I'd buy shares in it.

Realistically, though, there is bound to be initial distrust of a relatively untested field of science with possible health implications. Words such as "Frankenfood" are

Production of edible products and use of concentrate feeds (million tonnes)

Production of meat, milk and eggs (million tonnes 2007)	**1025**
Use of feed concentrates (million tonnes 2005)	1250

Media coverage of meat & climate change

2004	2005	2006	2007	2008	2009	2010
~10	~100	~250	~700	~700	~1100	*>200*

From study by Anderson et al of IIED in 2010 of the British media

Using the media

As a sector we need to be better at showing the benefits of livestock

Risks – and how to manage them

- Public perception

- Environmental policies

Lowland grassland

- 90% of natural grassland in UK lowlands lost since 1945

- Condition of Scottish lowland grassland sites of special scientific interest improved from 41% to 72% between 2000 and 2010

UK National Ecosystem Assessment (2011)

CAP Reform 2013

- CAP needs reforming to meet challenges of :

  ..... climate change and sustainable management of natural resources

- Proposal introduces ‘greening component’ into 1st pillar (30%) e.g. Maintaining permanent pasture

Making use of the rumen

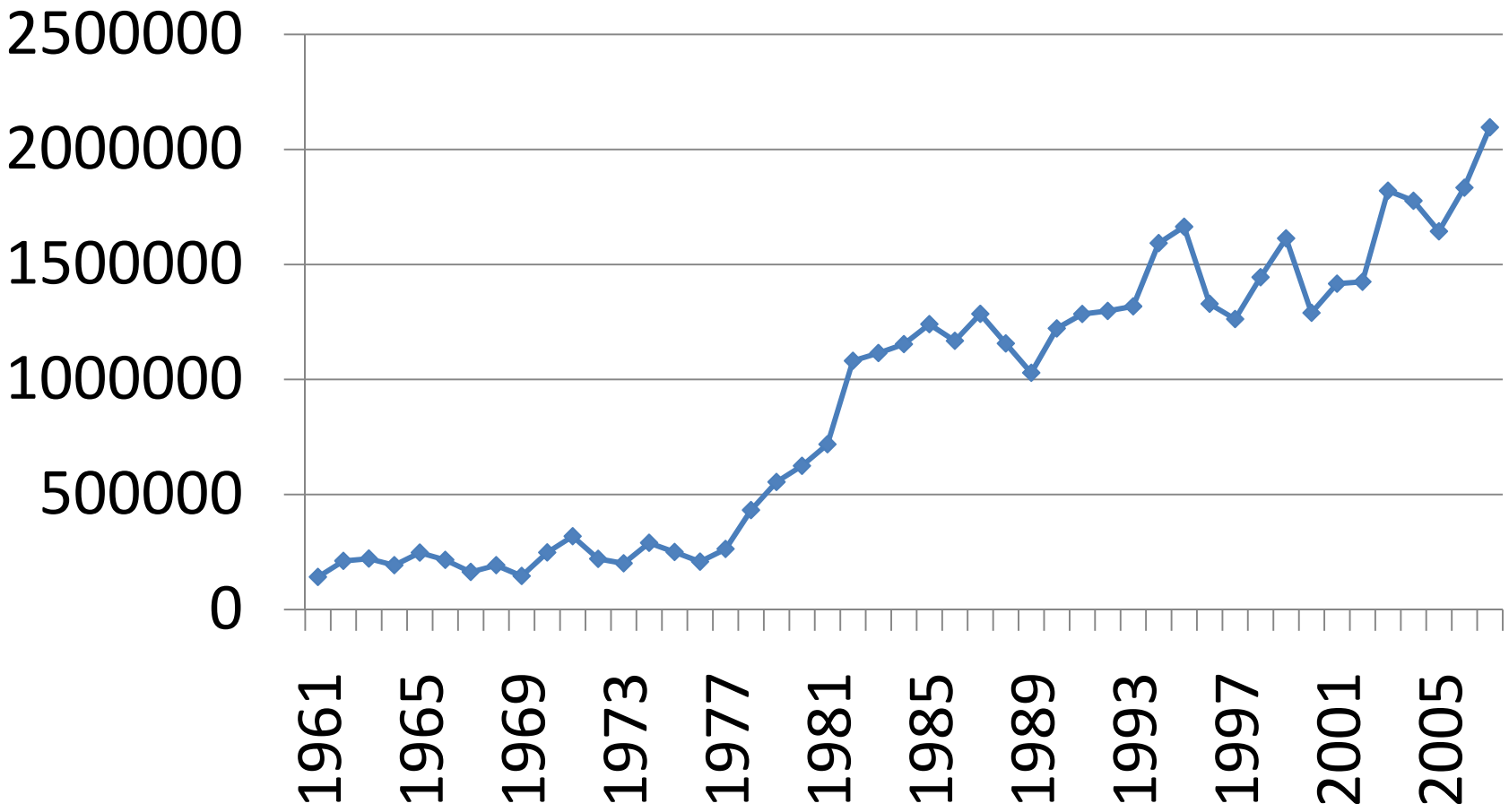
- Ruminants convert non-human-edible grass into high quality human-edible protein while keeping carbon in the soil

- Maintaining grasslands in Europe as they are now is important for biodiversity

Risks – and how to manage them

- Public perception
- Environmental policies
- Supply of imported feed

Imports of Soybean cake into UK 1961-2007 (tonnes)



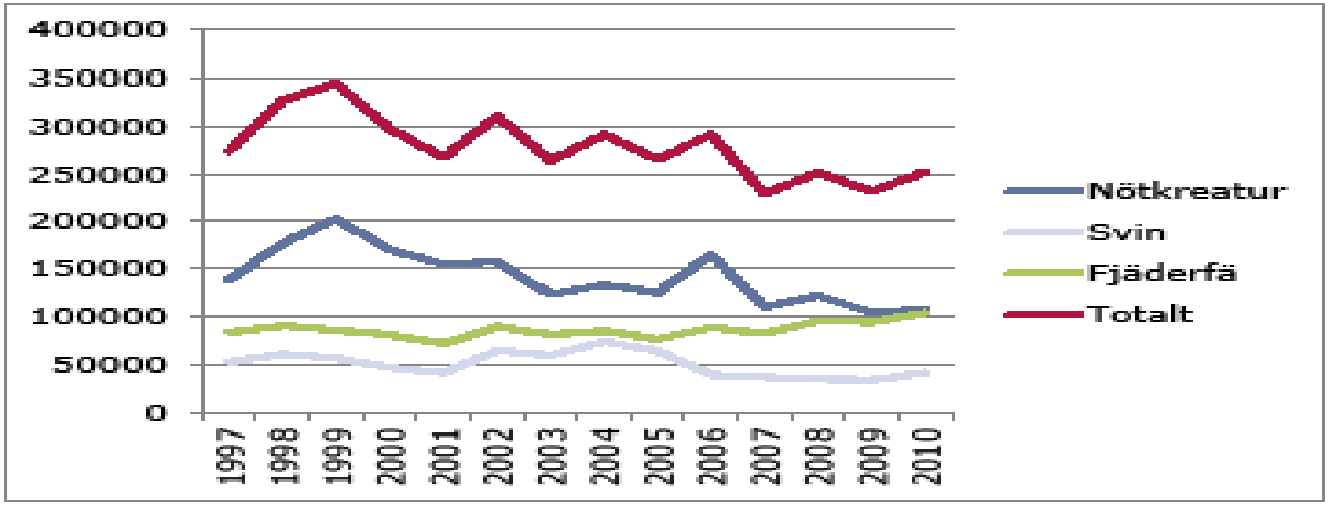
Brazil and soyabeans

In 2009 Brazil exported 28.5 million tonnes soyabeans equivalent to ~180,000 tonnes of nitrogen

9 Planetary boundaries – natural limits that we stray over at our peril

- Climate change
- Ocean acidification
- Stratospheric ozone depletion
- Disruption of biogeochemical cycles
  - nitrogen
  - phosphorous
- Global freshwater use
- Change in land use
- Biodiversity loss
- Atmospheric aerosol loading
- Chemical pollution

Stockholm Resilience Centre Rockstrom et al (2009) Ecology and Society



Figur 1. Ton sojaprodukter i foderblandningar. Källa: Jordbruksverkets foderkontroll.

With thanks to Christian Svensson

Assuming soyabeans are ~40% protein that is trans border movement of 16,000 tonnes Nitrogen

Challenge

- Can we decrease global movements of nitrogen by finding alternatives to soya protein?

Opportunities – are they real?

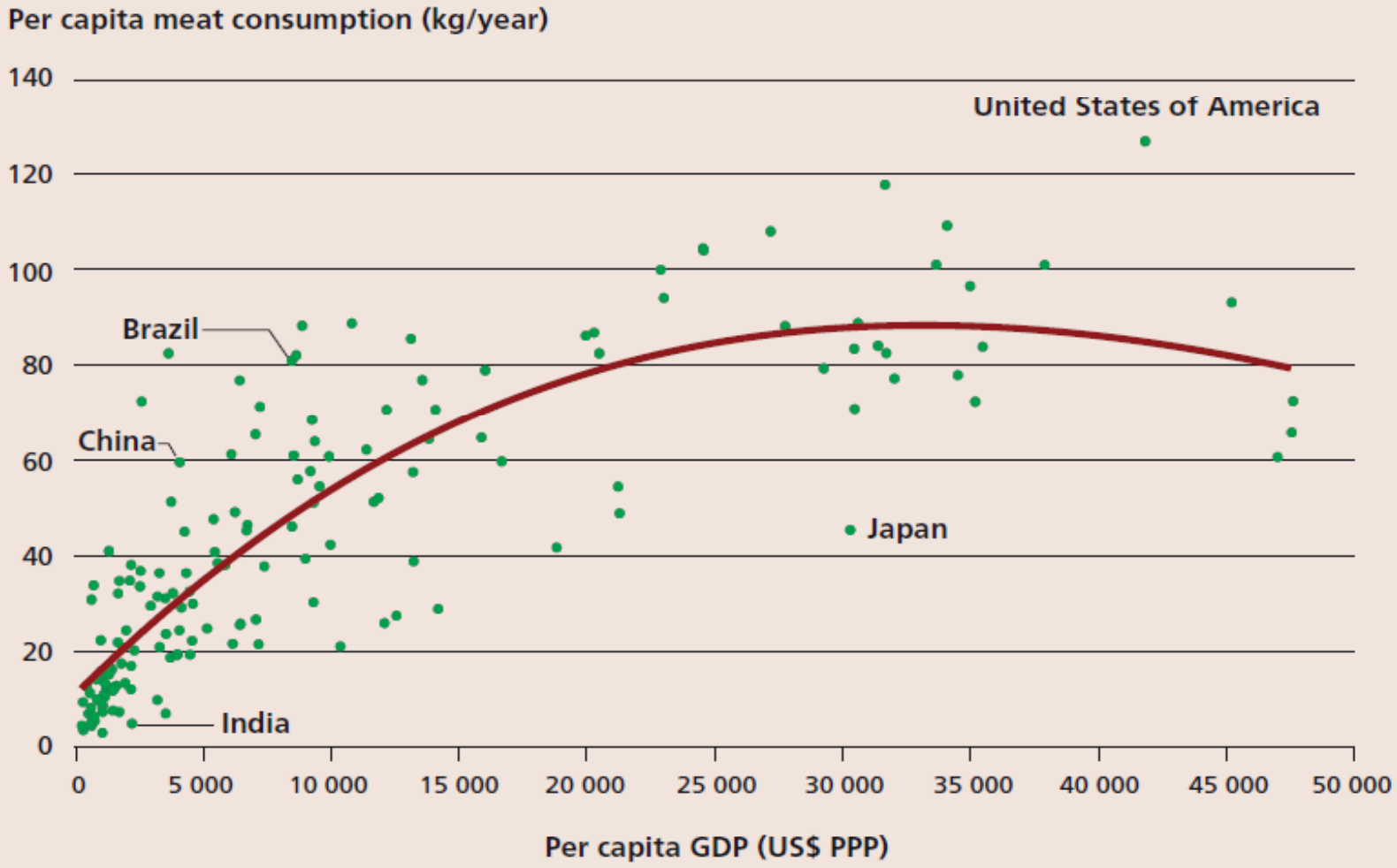
- Increasing global demand for livestock products

Drivers of Consumption Growth in Meat

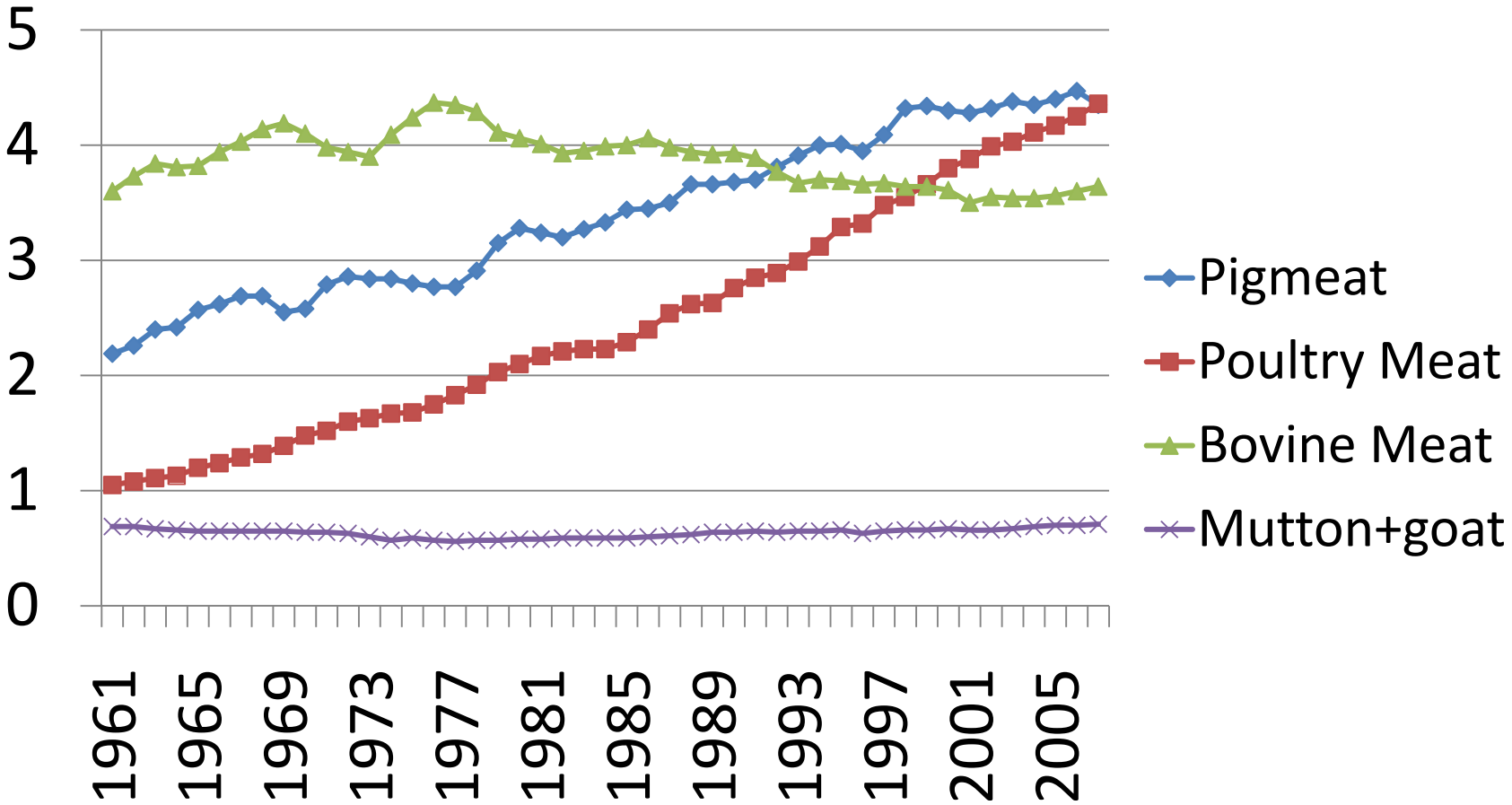
(FAO 2009 – The State of Food and Agriculture)

FIGURE 3

Per capita GDP and meat consumption by country, 2005



Trends in global meat consumption (g protein/capita/day)



FAOSTAT data 2007

Opportunities – increasing demand

- Demand increasing with income and local production increasing

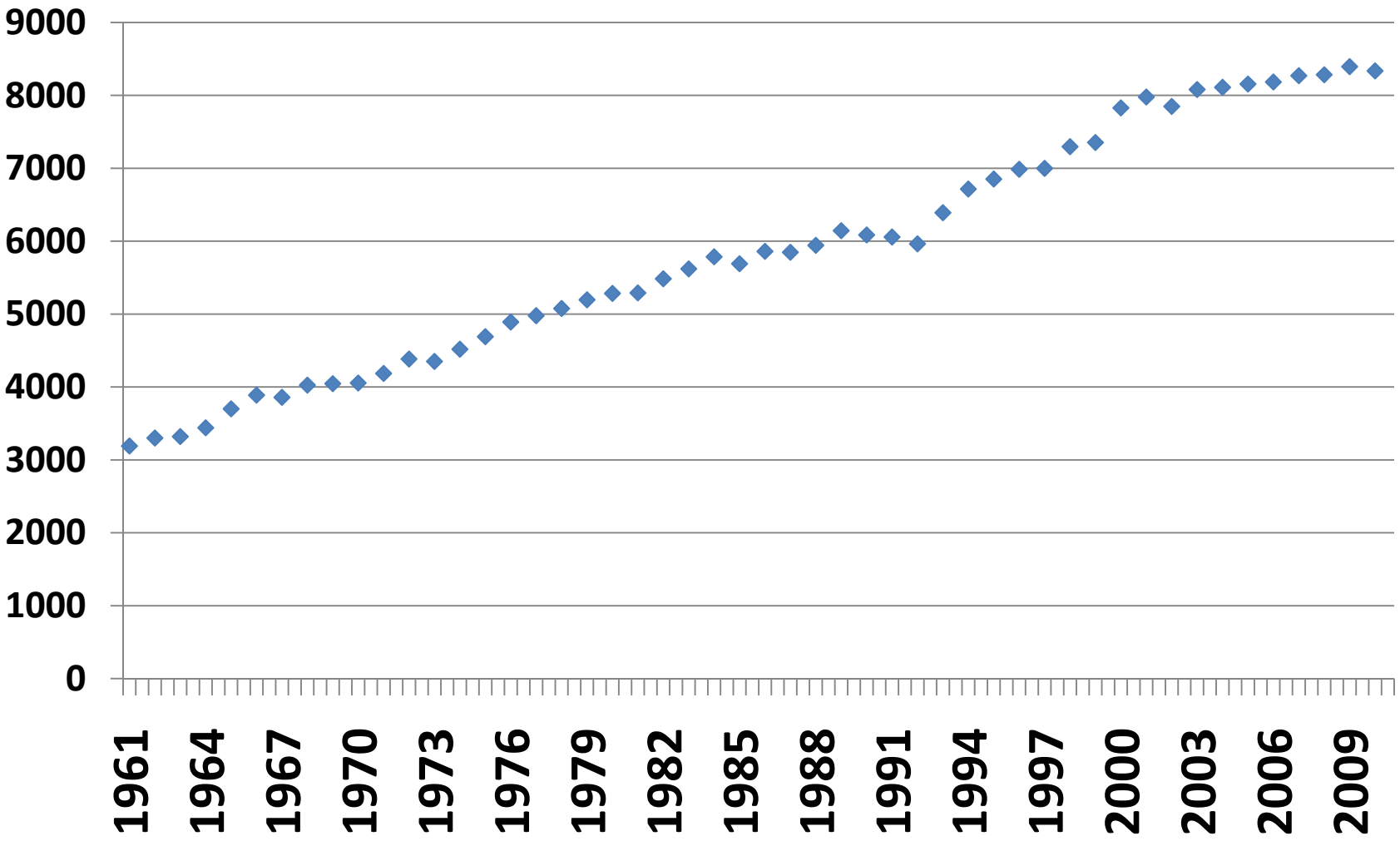
- In Europe potential more likely to be in value added/quality cuts, processed products or speciality production systems

Opportunities – are they real?

- Increasing global demand for livestock products

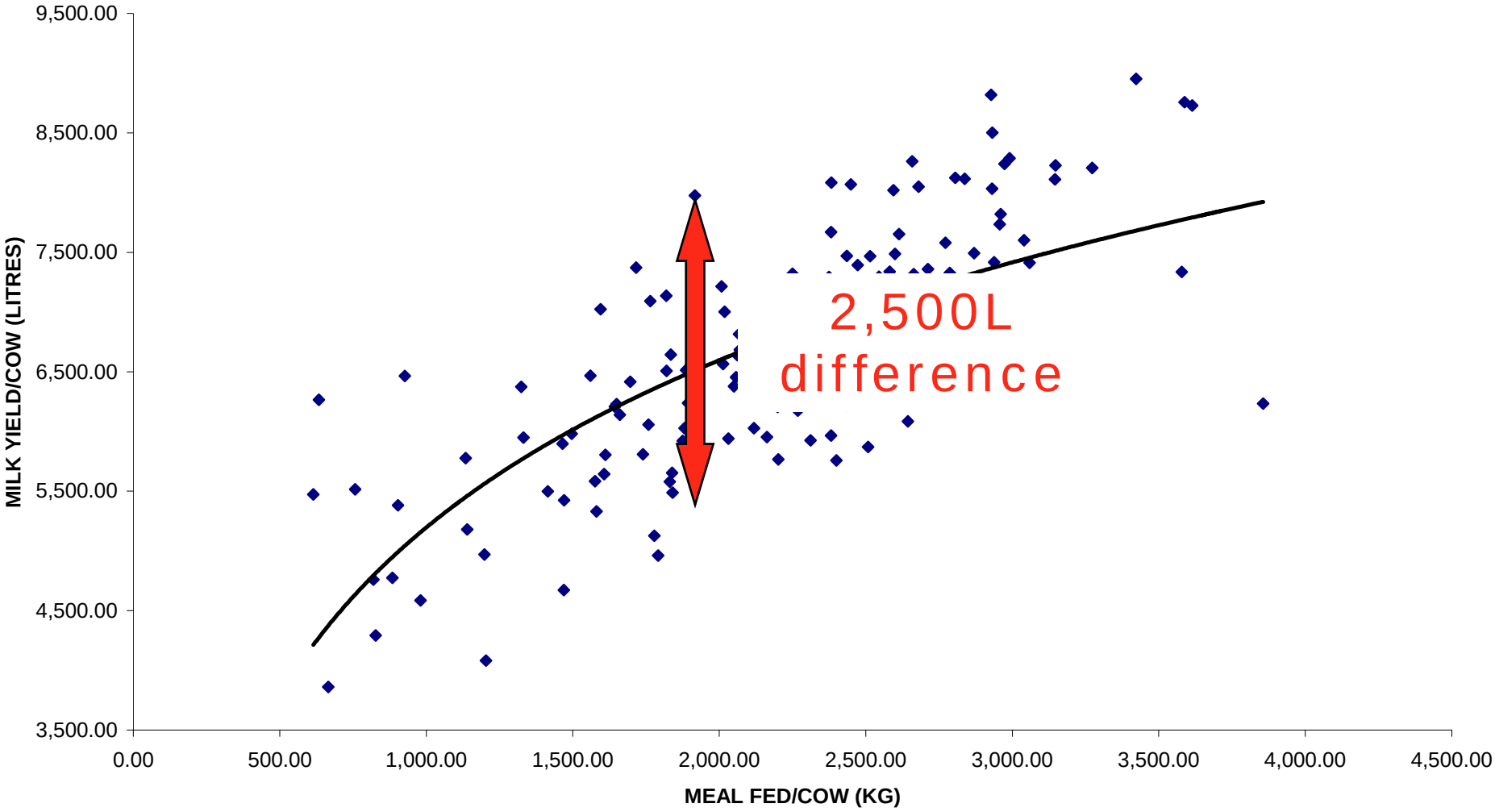
- Greater benefits from increasing efficiency of production

Cow milk, whole, fresh (kg/cow)
Sweden 1961 to 2010



Priorities for the UK Dairy Industry

Variation in Technical Performance on Farm



Source: CAFRE, DARD

Opportunity – to improve farming standards

- Most countries have a range in efficiencies of production between farms.
- From my perspective we need to tackle low levels of productivity from livestock
- CAP Reform could be used to incentivise improved efficiency and so provides an opportunity for greater financial rewards for good farming

Opportunities – are they real?

- Increasing global demand for livestock products
- Greater benefits from increasing efficiency of production
- Greater benefits from increased use of fibrous resources

Proportional contribution of livestock species in UK to production & GHGs

Species	Contribution to production	Contribution to GHG emissions
Poultry	0.48	0.26
Pigs	0.21	0.16
Cattle	0.22	0.27
Sheep	0.1	0.21

Efficiency of feed protein use by different species in US (CAST, 1999)

	Gross efficiency	Human edible efficiency
Beef	0.08	1.19
Pigs	0.19	0.29
Poultry	0.31	0.62

Ranking of efficiency of conversion of human edible feed protein to animal product

Country	Species	g product protein/g feed protein
South Korea	Cattle	6.57
Argentina	Cattle	6.12
USA	Cattle	1.19
USA	Poultry	1.04
Argentina	Poultry	0.69
South Korea	Poultry	0.62
South Korea	Pigs	0.51
USA	Pigs	0.29
Argentina	Pigs	0.11

Opportunity – for less competition with food for humans

Rethink diets for ruminants and express efficiencies on human-edible basis

Take-away messages

- Some risks can be turned into opportunities
- Opportunities need to be defined locally
- The livestock sector has the potential to contribute more to global food security, the economy and the environment – the challenge is to define how success should be measured and how policy can be used to help achieve that