The role of livestock in food and nutrition security

By Jimmy Smith

University of Florida Global Nutrition Symposium

'Nurturing development:
Improving human nutrition with animal-source foods'

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Overview

Livestock and global food security

Issues of food security and nutrition

Multiple roles of livestock

Complexities and trade-offs for the future

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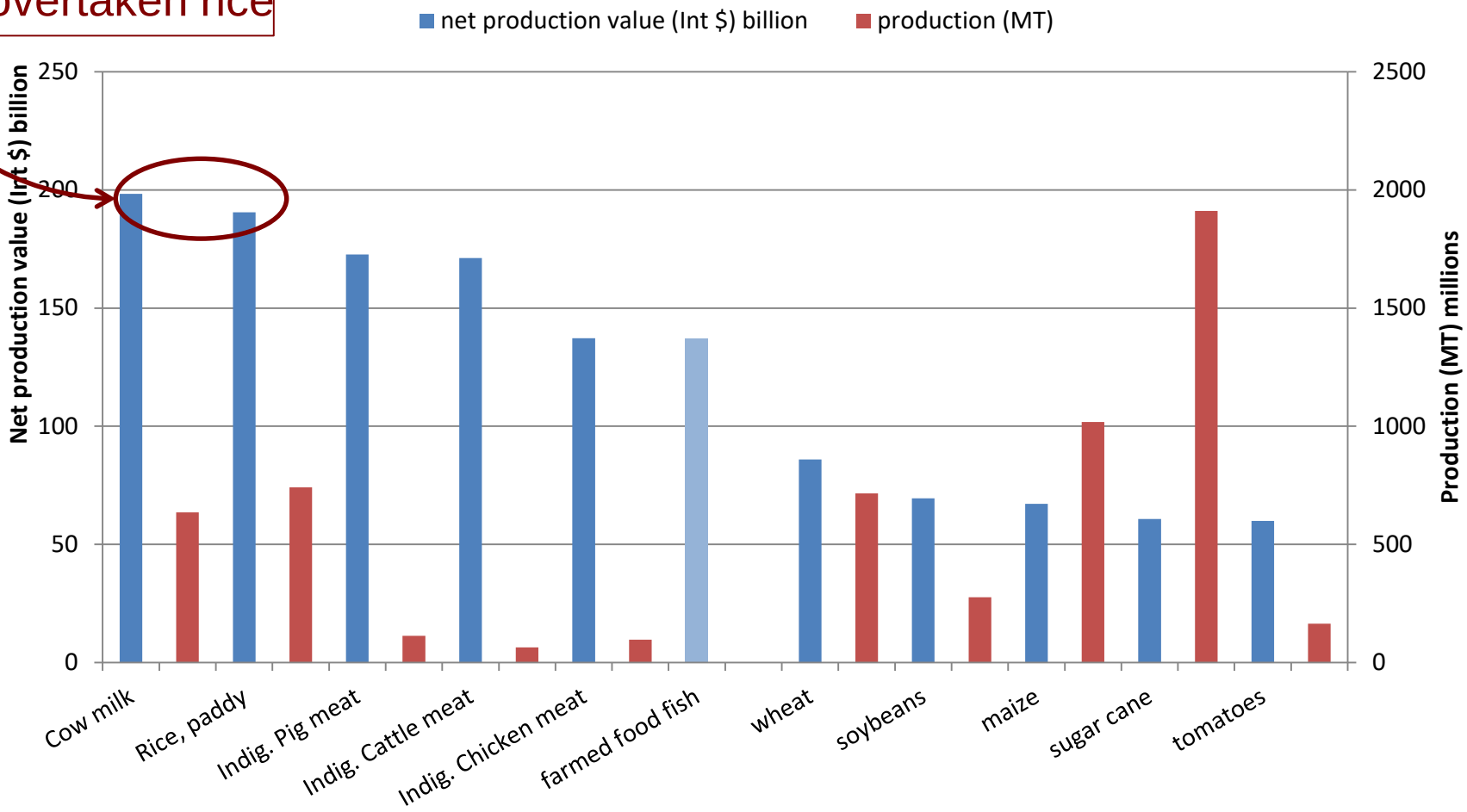
Livestock and
global food security
YOGURT
Strawberry
YOGURT
Ghee

Animal-source foods are valuable: 5 of 6 highest value global commodities (total value of these 5=US Int $715

Cow milk has overtaken rice



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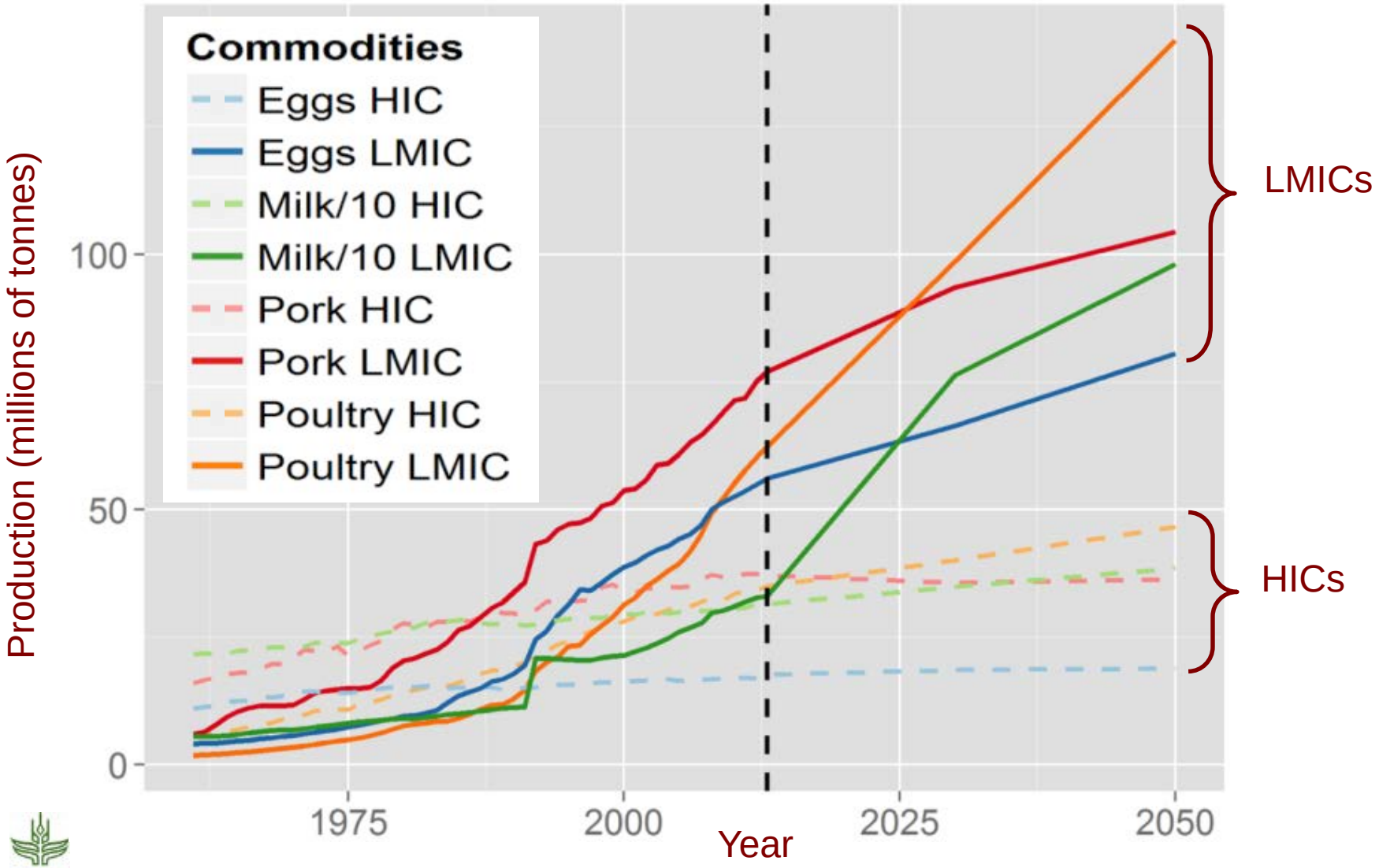
FAOSTAT 2015
(values for 2013)

Demand for animal-source foods



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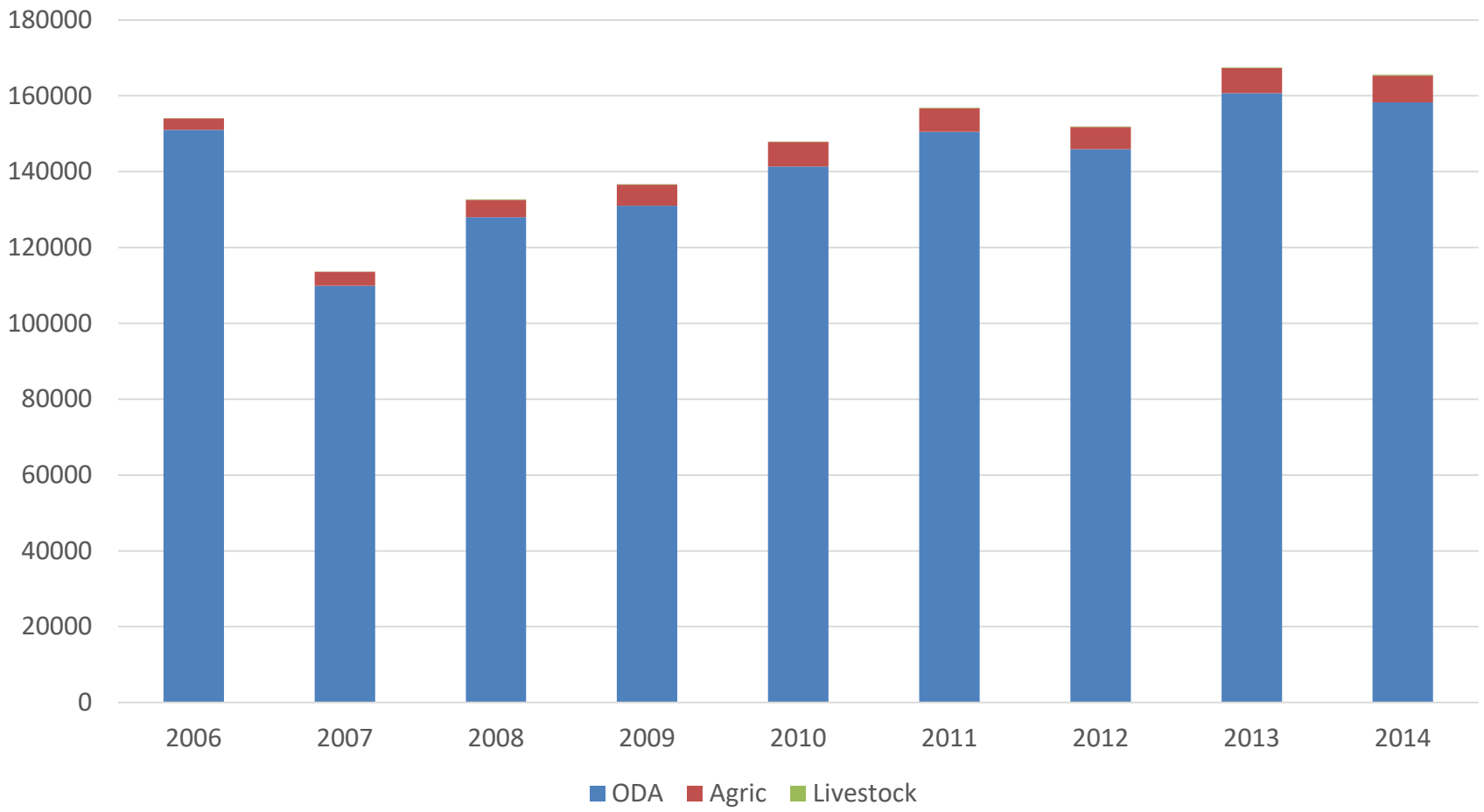
Smallholders still dominate livestock production in many countries

Region (definition of 'smallholder')	% production by smallholder livestock farms					
	Beef	**Chicken meat**	**Sheep/goat meat**	**Milk**	**Pork**	**Eggs**
East Africa (≤ 6 milking animals)				60-90		
Bangladesh (< 3ha land)	65	77	78	65		77
India (< 2ha land)	75	92	92	69		71
Vietnam (small scale)					80	
Philippines (backyard)		50			35	

BMGF, FAO, ILRI

Livestock: 40% of agricultural GDP and growing

Total ODA disbursements to developing countries, USD million



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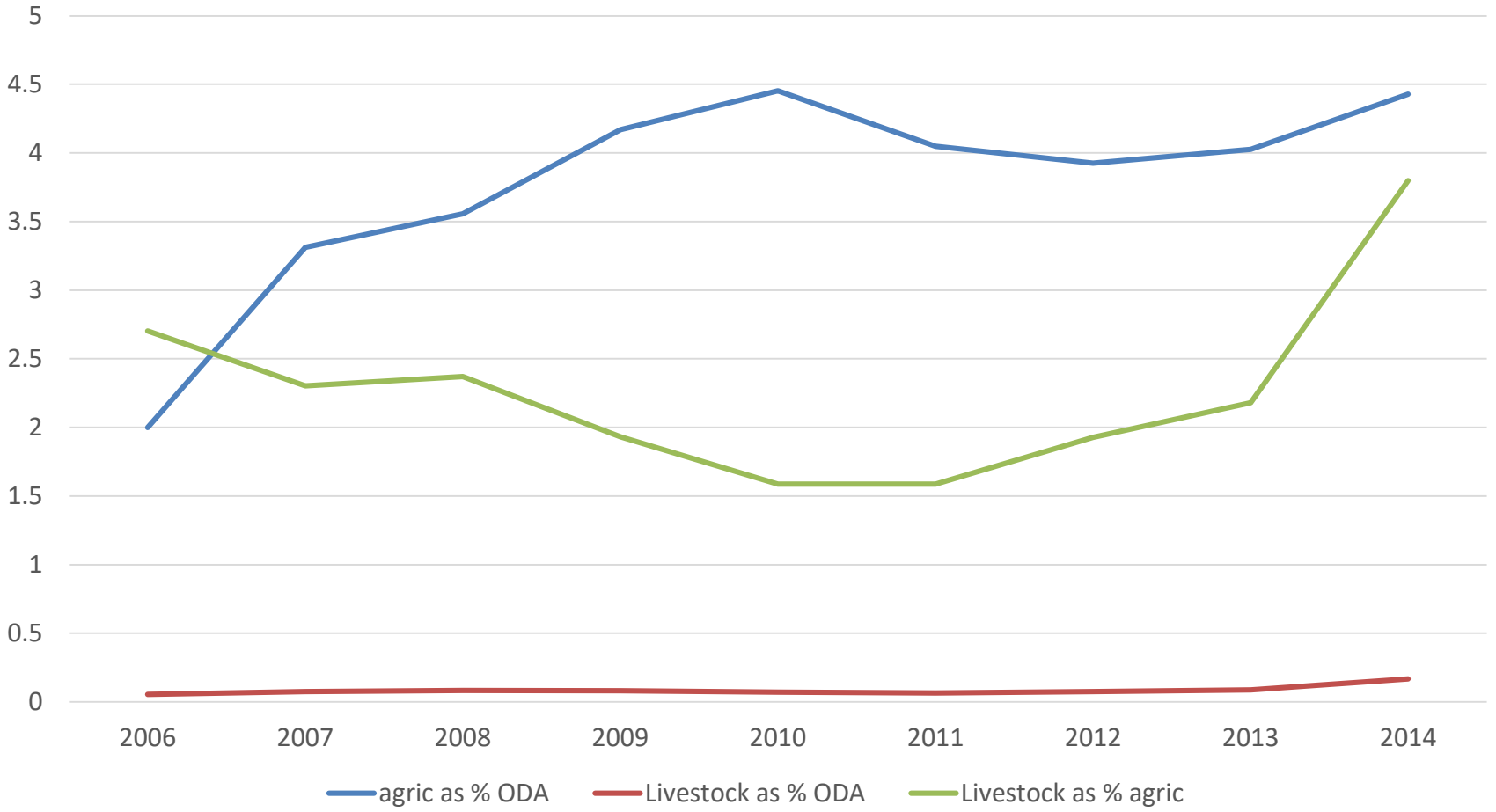
Percentage of ODA disbursements for agriculture and livestock



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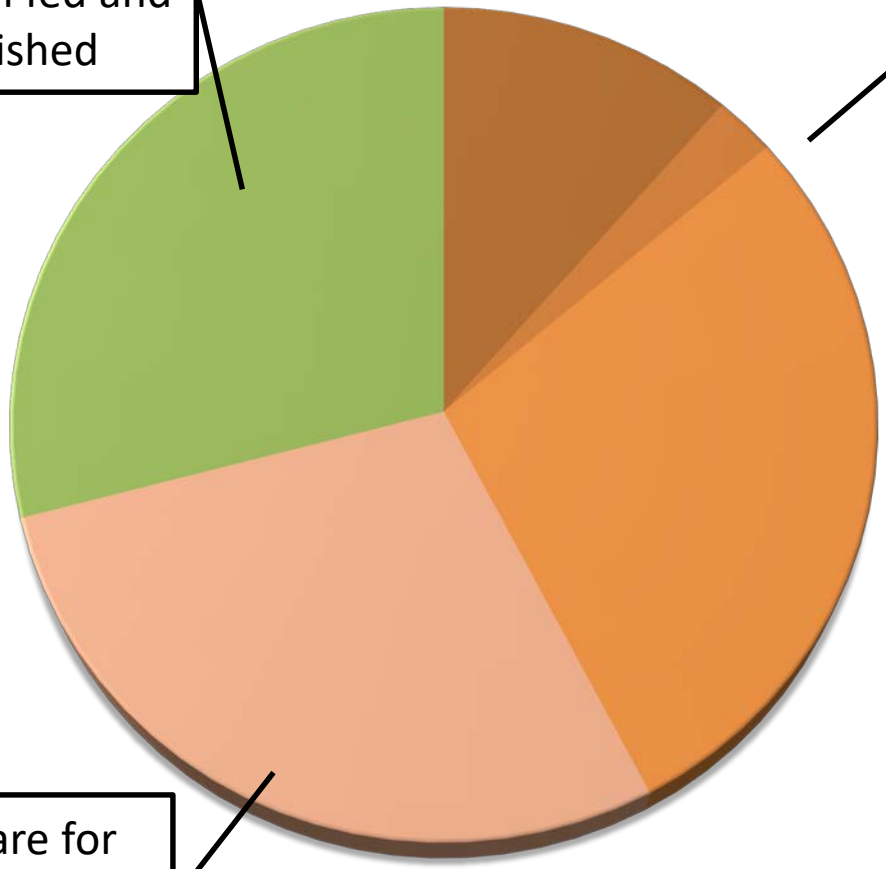
Issues of food and nutrition security

Nutritional divides among 7 billion people today

Less than one third well fed and nourished

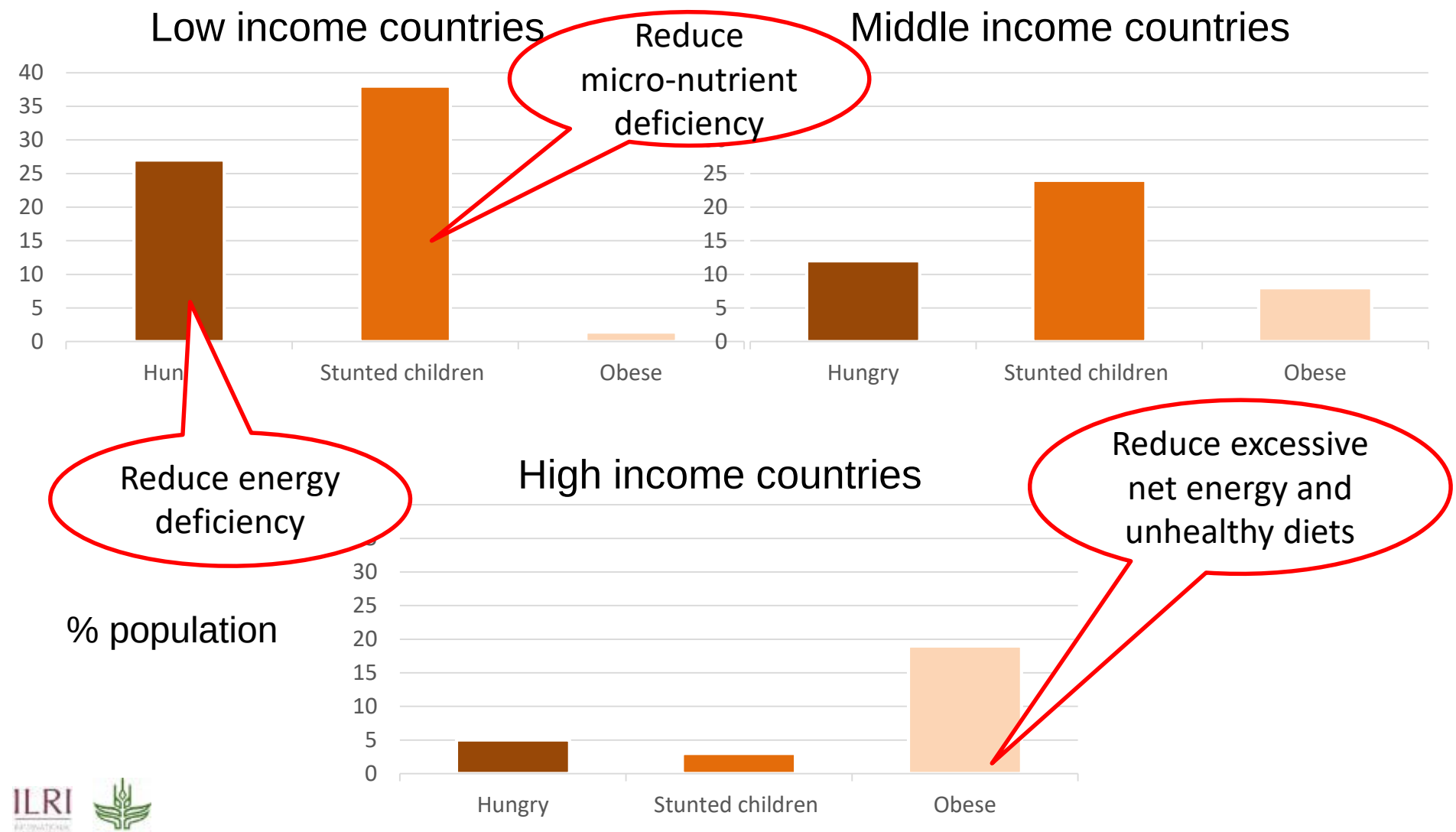
11% of GNP lost annually in Africa and Asia from poor nutrition



- **Hungry people**
- **stunted children**
- **insufficient nutrients**
- **overweight/obese**
- **balanced diets**

Healthcare for obesity economic cost: $2 trillion

Diverse nutritional status demands diverse solutions



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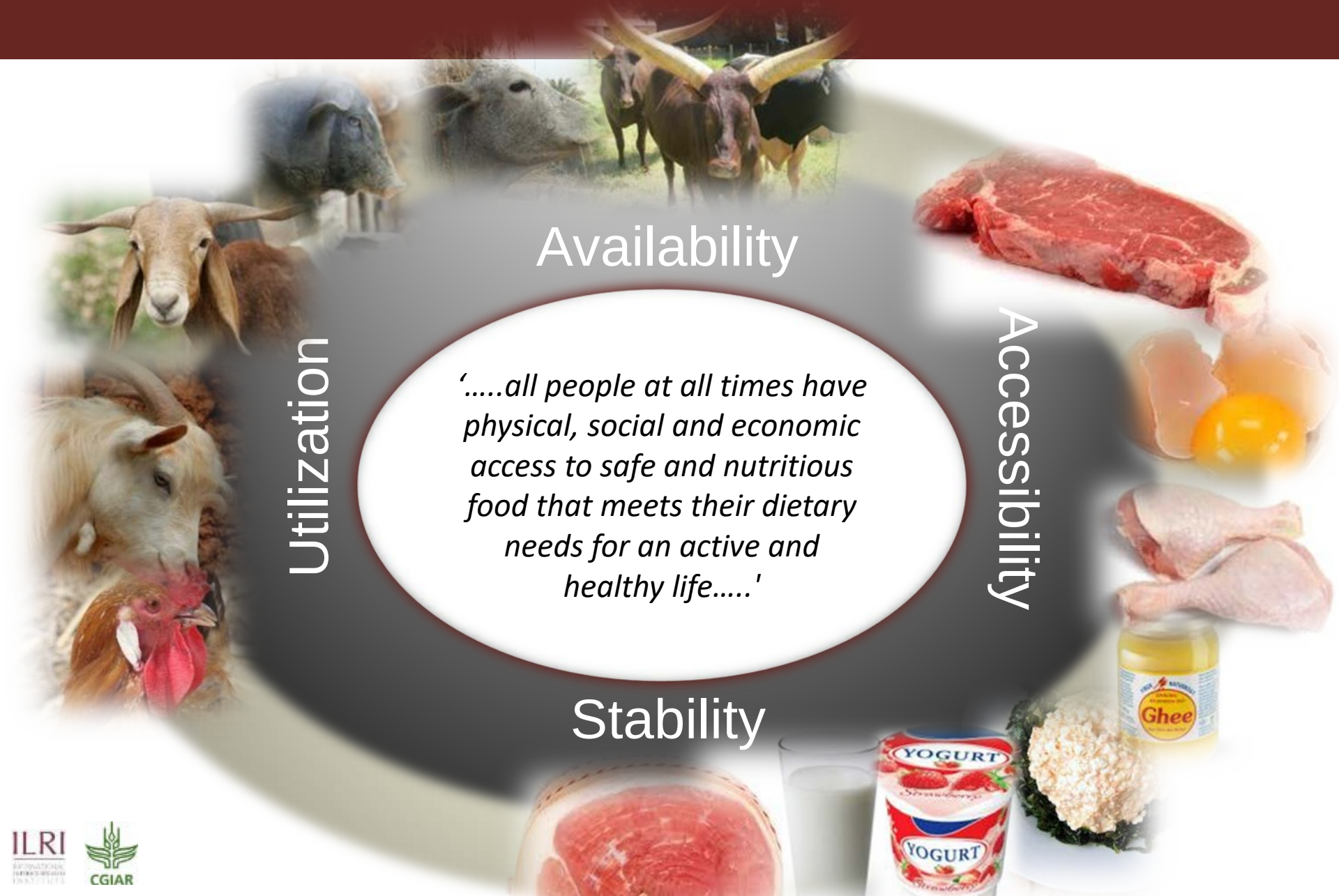
Food and nutrition security



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Multiple roles
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Food and nutrition security: Animal-source foods contribute to global food and nutrition

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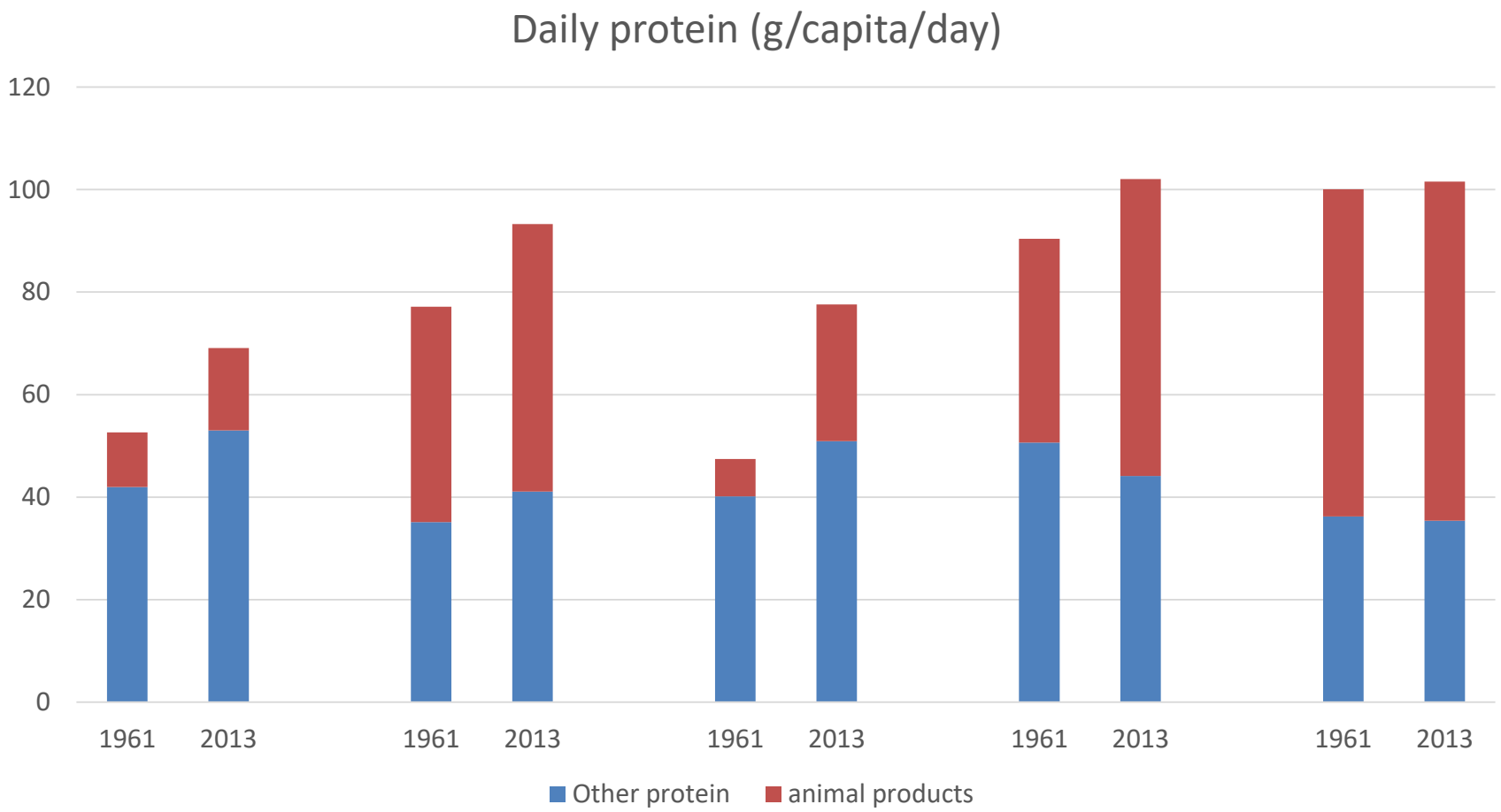
Animal products provide 40% of global daily protein supply (18% of total kcal)



FAOSTAT Food Balance Sheet

Balanced nutrition: The critical and unique role of animal-source foods

Animal-source foods

- High density of macro- and micro-nutrients per 100 g
- Contain essential nutrients difficult or impossible (e.g. vitamin B12) to find in other foods
- Contain micronutrients in biological forms enabling easier uptake into the body (bioavailability)
- Better digestibility and biological value of proteins, with amino acid profile matching human needs
- Contain lower levels of anti-nutrient factors (i.e. compounds that interfere with absorption of nutrients)

Hidden hunger (missing nutrients)

- E.g.: stunted children in Malawi lacked amino acids that are deficient in plant foods

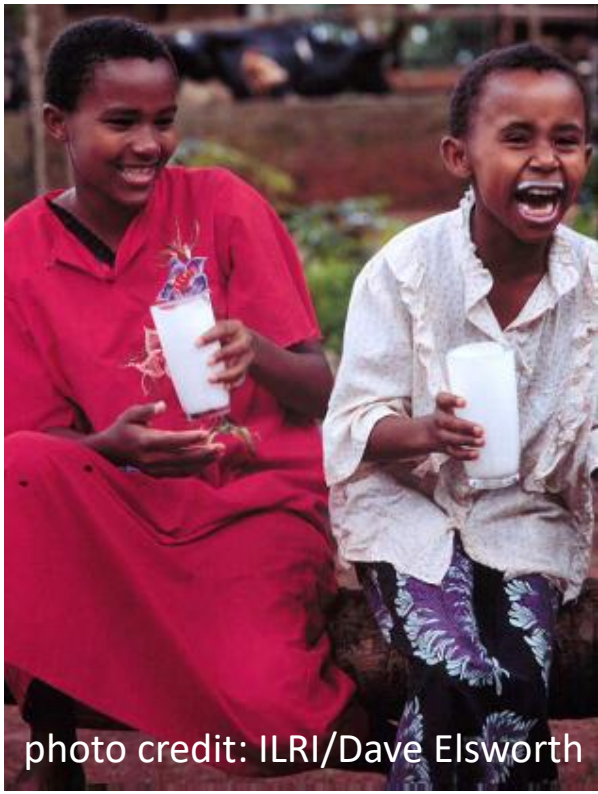


photo credit: ILRI/Dave Elsworth

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Livestock-derived foods enhance the nutrition of mothers & of infants in the first 1,000 days of life

Milk: improves children's growth, prevents stunting

Meat: improves long-term cognitive ability

Livestock interventions improve

- production, incomes, expenditure
- nutrient composition and diets
- nutritional outcomes in children and women

Diseases associated with livestock-derived foods

- Disproportionate burden for children under 5
- Pregnant women more vulnerable to foodborne diseases

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Evidence?

In Ethiopia

- Cow ownership reduced stunting by 6-13%

In millennium development village clusters

- Households with livestock are more likely to consume animal-source foods
- Linking animal-source food consumption with anthropometric measures is complex and influenced by other variables

photo credit: ILRI/Apollo Habtamu

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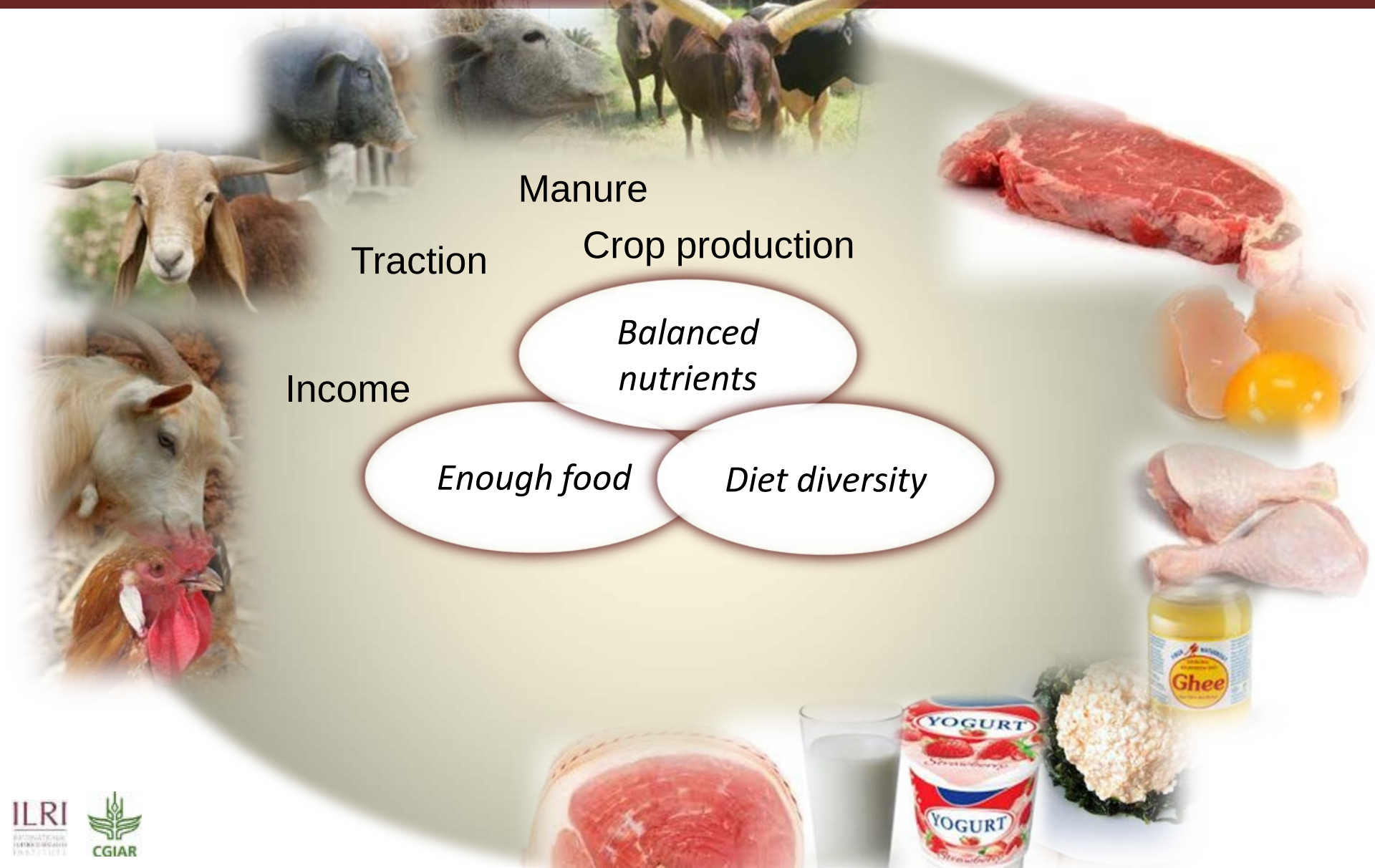
Food and nutrition security: Livestock contribute to crop production



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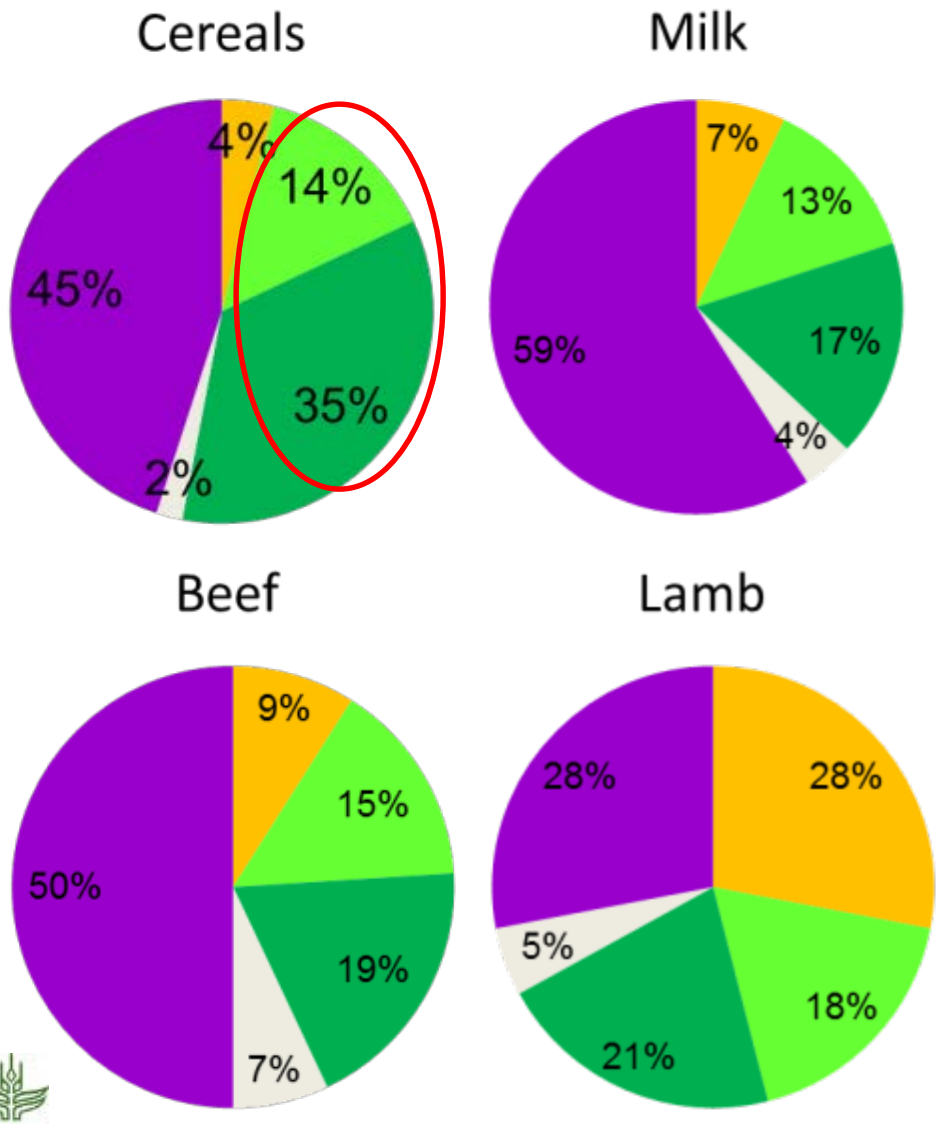
At least half the cereals in the world can *only* be produced with animals in the farm system



Developing-country mixed crop-livestock systems, most of them smallholders, supply a large proportion of cereal and livestock products

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Soil fertility: 23% of nitrogen for crop production in crop-livestock systems comes from manure

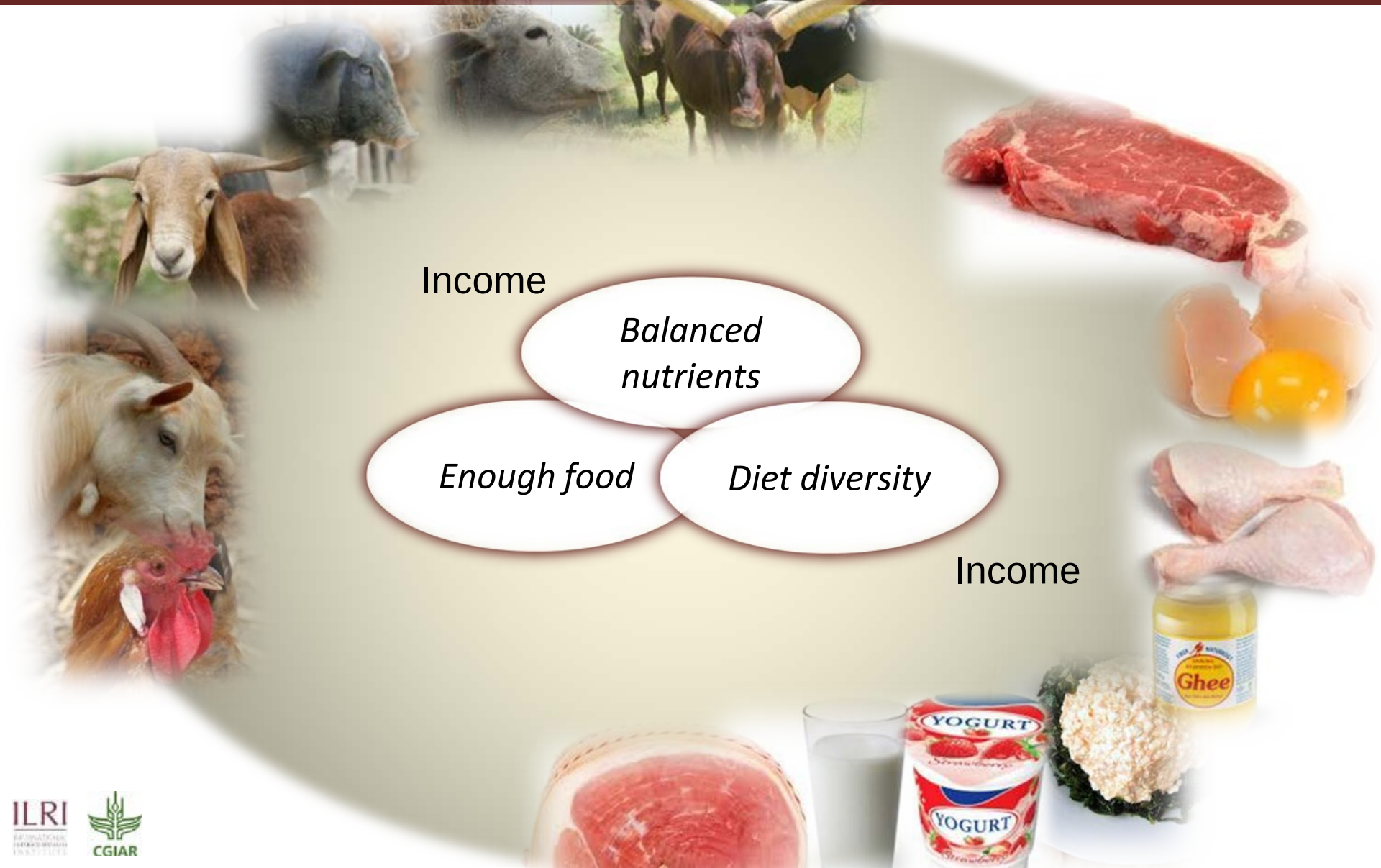
In Europe as much as 38% of the nitrogen inputs come from manure

Animal traction remains essential for crop production, especially in Africa

15% farms in southern Africa and 81% in northern Africa depend on traction for ploughing

7 million oxen are the main source of power for tilling soil in the Ethiopian highlands

Food and nutrition security: Livestock provide income to purchase nutritious food



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Livestock generate income, some of which is spent on food

Income–*value of meat, milk, eggs*

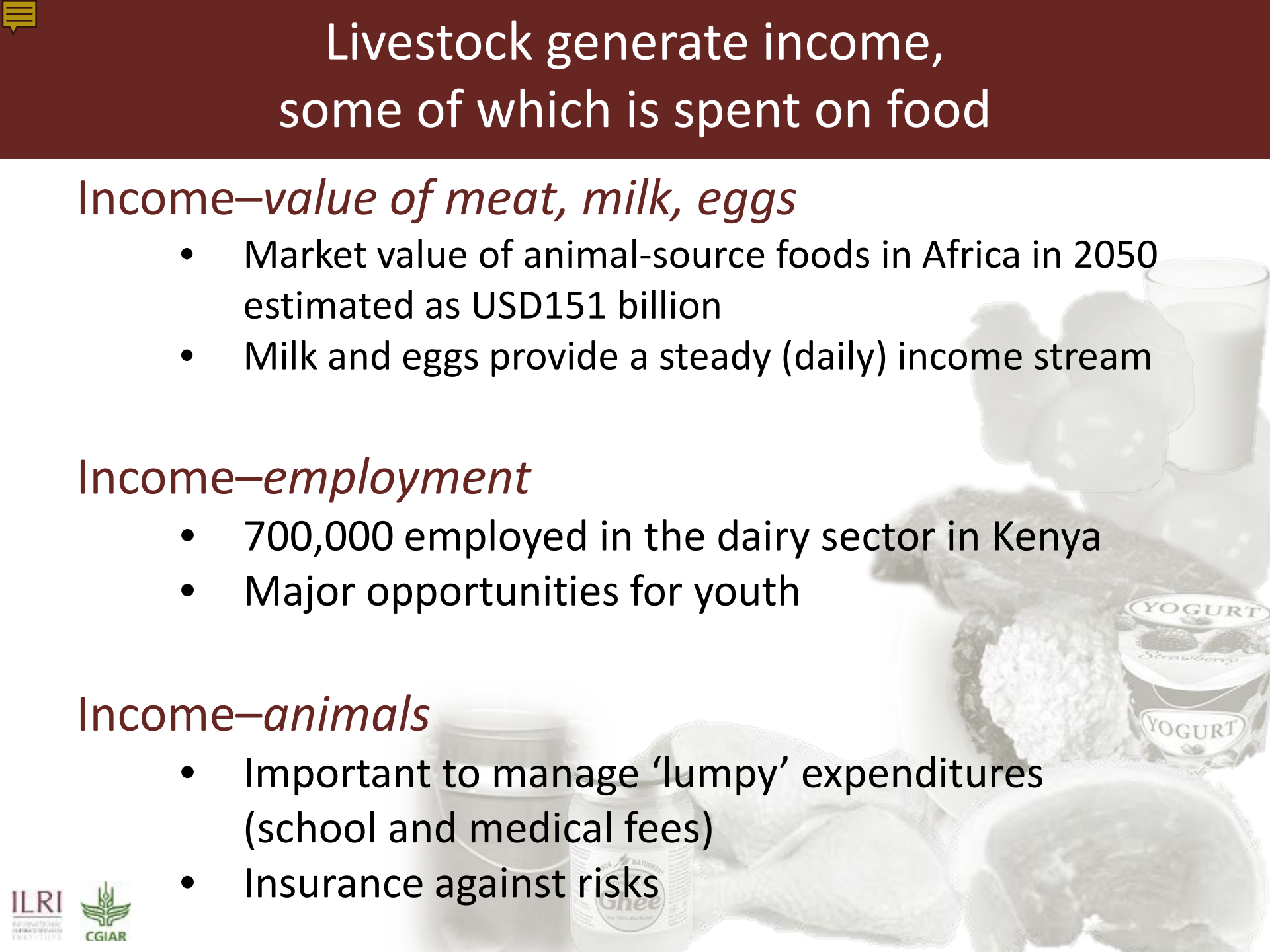
- Market value of animal-source foods in Africa in 2050 estimated as USD151 billion
- Milk and eggs provide a steady (daily) income stream

Income–*employment*

- 700,000 employed in the dairy sector in Kenya
- Major opportunities for youth

Income–*animals*

- Important to manage 'lumpy' expenditures (school and medical fees)
- Insurance against risks



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Income used for food (2015)

Engel's law (economics):
'As income rises, the proportion of income spent on food falls, even if absolute expenditure on food rises.'

8 countries spent less than 10% of household income on food: Australia, Austria, Canada, Ireland, Singapore, Switzerland, UK, USA

9 countries spent more than 40% of household income on food: Algeria, Azerbaijan, Cameroon, Guatamala, Kenya, Kazakhstan, Nigeria, Pakistan, Philippines

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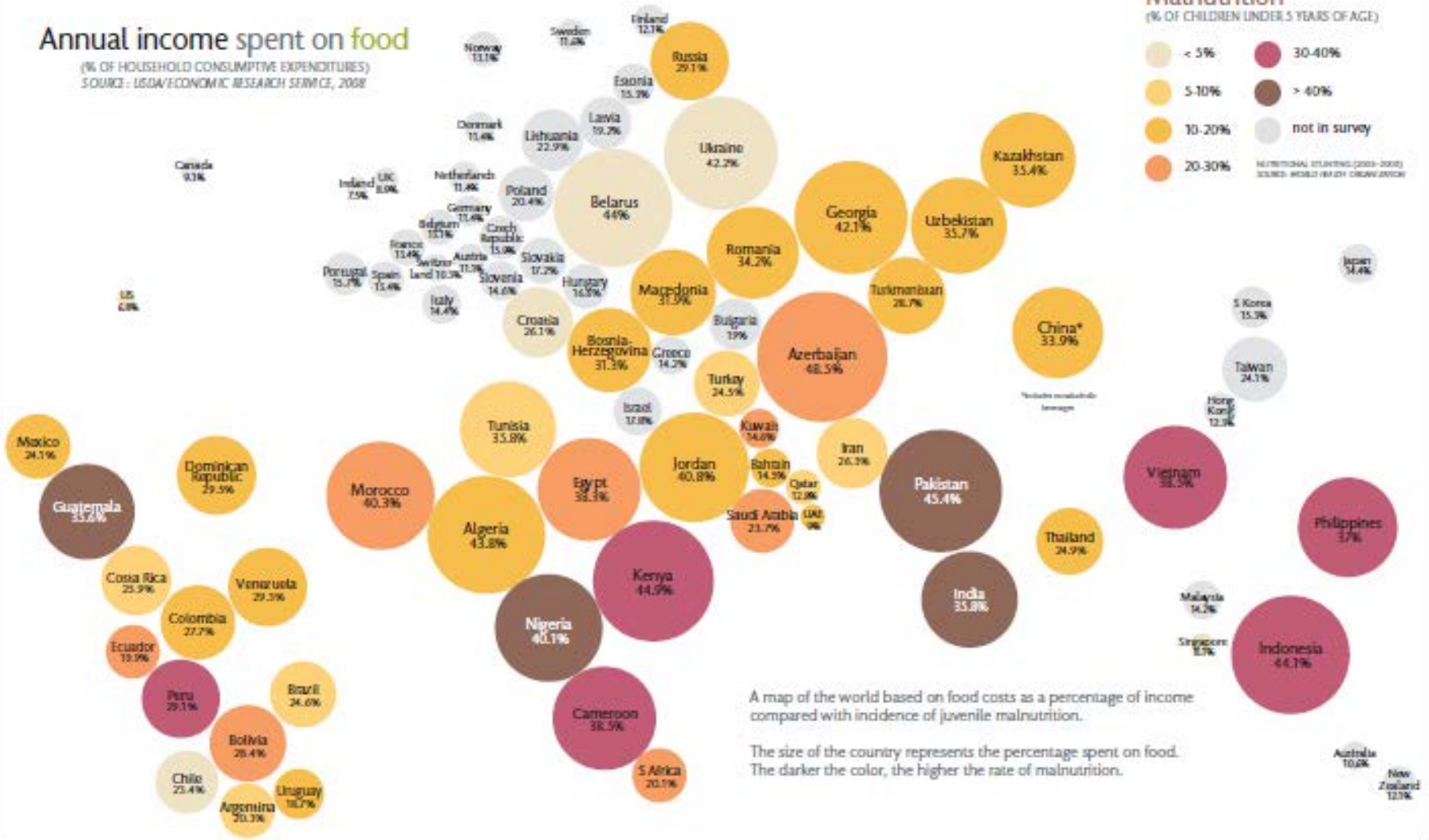
WASHINGTONSTATE magazine

WASHINGTON STATE UNIVERSITY

BILLIONS SERVED

Annual income spent on food

(% OF HOUSEHOLD CONSUMPTIVE EXPENDITURES)
SOURCE: USDA/ECONOMIC RESEARCH SERVICE, 2008



A map of the world based on food costs as a percentage of income compared with incidence of juvenile malnutrition.

The size of the country represents the percentage spent on food. The darker the color, the higher the rate of malnutrition.

Role of livestock in increasing income results in more diverse diets

Zambian households that received animals (via Heifer):

- Increased their dietary diversity via:
  - Direct consumption (1/3 more for dairy)
  - Increased expenditure on more food groups
- Decreased their poverty (from 78% to 59% below $1.25/day for dairy cow recipients)
- Increased 'sense of security' and improvement in welfare

Beyond recipients

- Influence on local food markets (e.g. more affordable dairy)

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Complexities
and trade-offs
for the future
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Today's producers: Tomorrow's enterprises

750 million smallholder livestock producers are diverse:

- 1/3 will find alternate livelihoods
- 1/3 may or may not remain
- 1/3 will succeed at market-oriented livestock livelihoods

Opportunities to respond to food and nutrition security

Smallholders to smartholders:
To thriving enterprises, part of a vibrant, productive and resilient food system . . . with particular opportunities for women and youth


photo credit: ILRI/ Camille Hanotte

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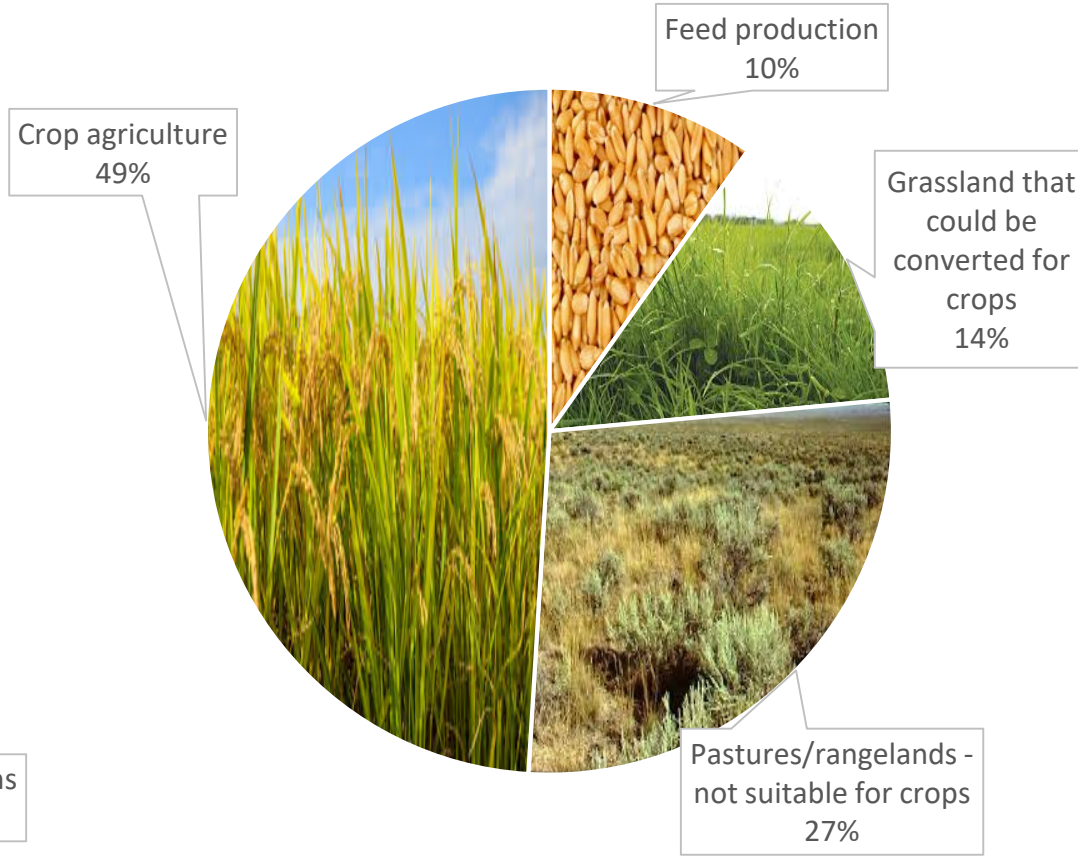
Competition for land and grains? Maybe not!

6 billion tonnes dry feed

5 billion ha global agricultural area



Latest for 1 kg boneless meat:
2.8kg human-edible food for ruminants
3.2kg human-edible food for monogastrics

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Trade-offs and opportunities in responding to future demand

- Livestock contribute to GHG emissions but are also one of the key ways to reduce future emissions
- Livestock production is intimately linked to the environment
- Transforming markets present new opportunities for safe food

3 interlinked principles:

- Improve resource use efficiency
- Strengthen resilience
- Improve social equity/ responsibility outcomes

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Patron: Professor Peter C Doherty AC, FAA, FRS
Animal scientist, Nobel Prize Laureate for Physiology or Medicine–1996

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