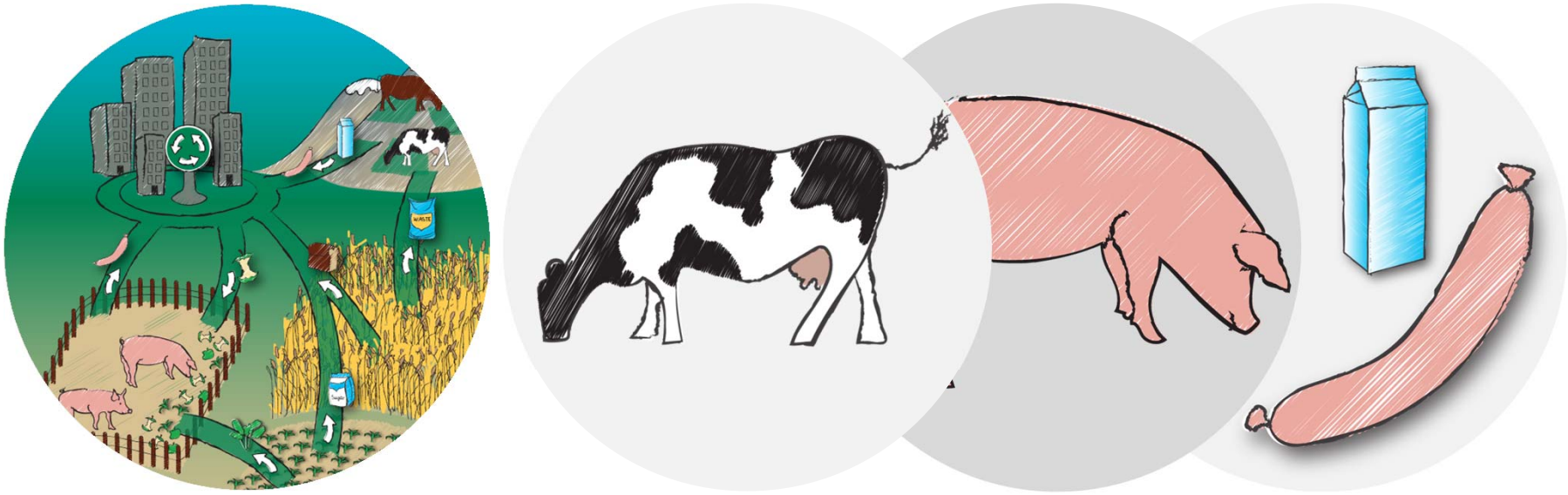
How much animal-source food can we produce while avoiding feed-food competition?

Hannah van Zanten

29-8-2016



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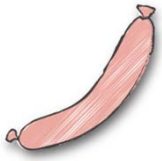
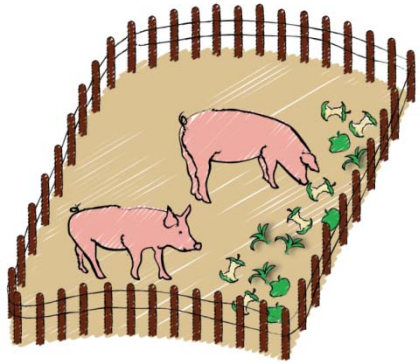
Demand for Animal Source Food

Current		2050
	258 million ton ⟶	455 million ton (76%)
	664 million ton ⟶	1077 million ton (62%)

Large impact on land use!

Feeding ‘leftover’ the solution?

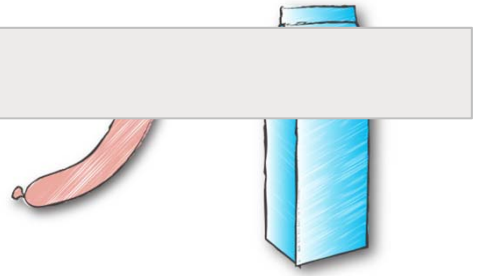
- Co-products



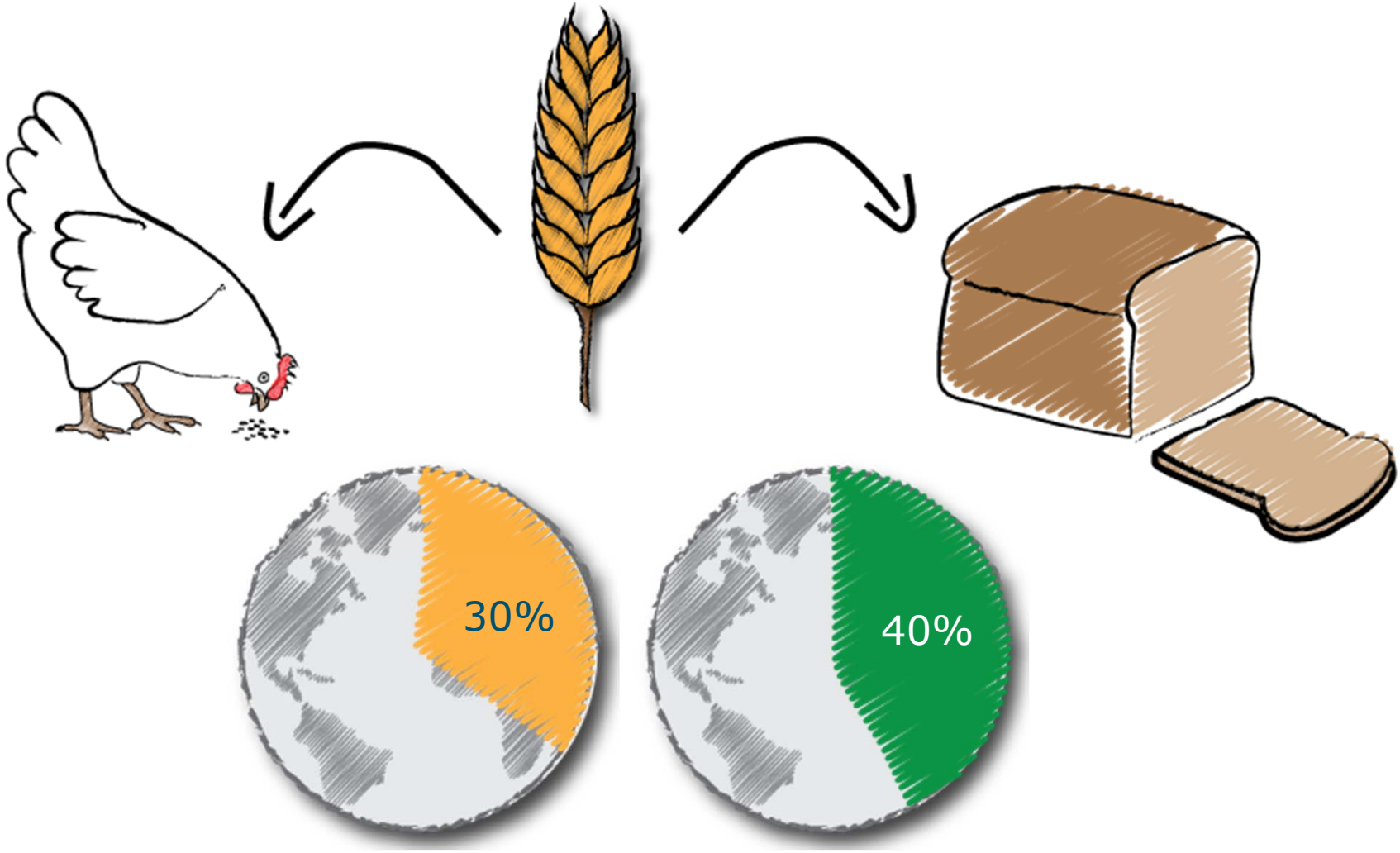
- Waste products

- Marginal land

Avoiding feed-food competition



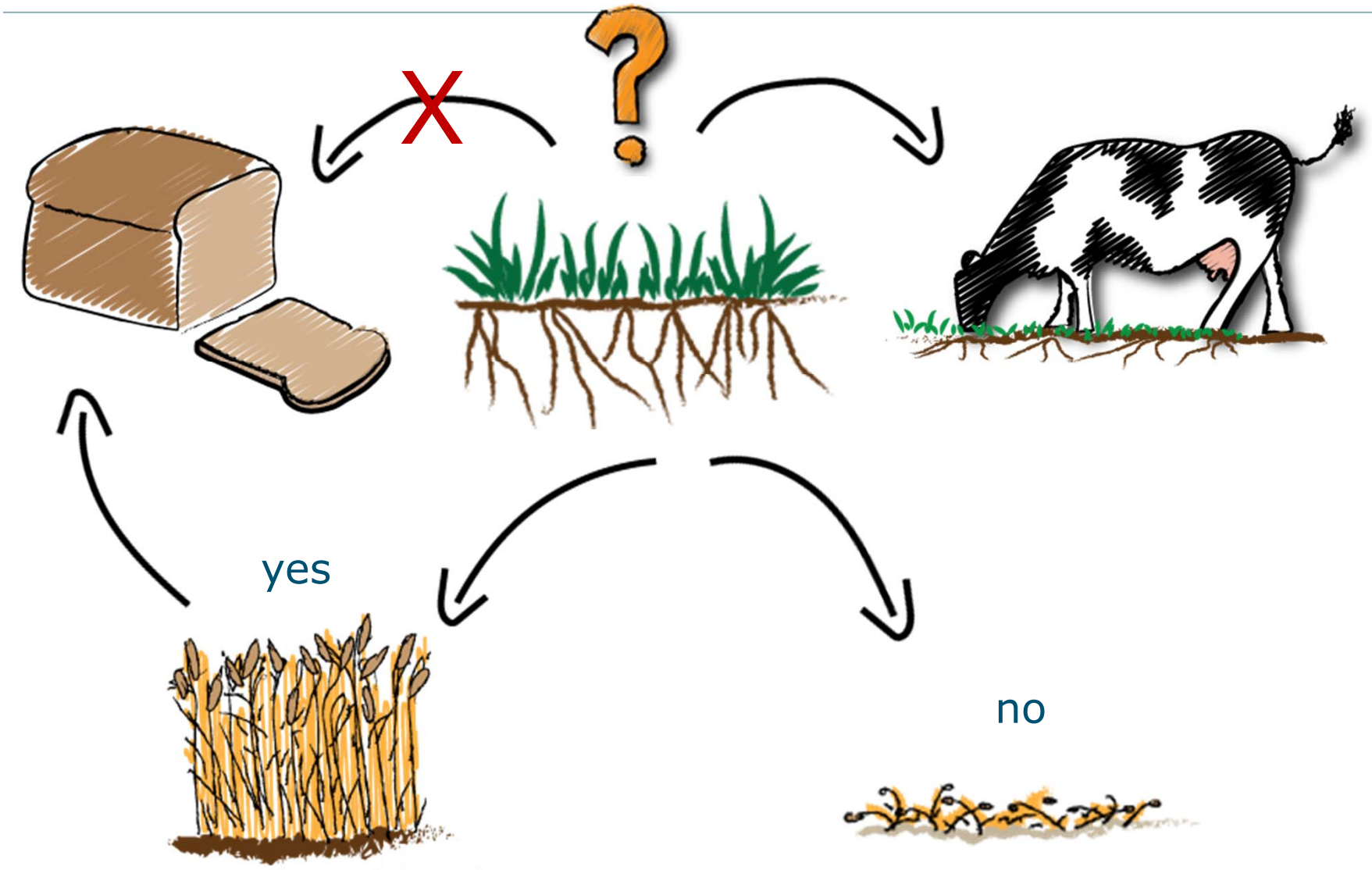
Direct competition



World grain production

World arable land

Indirect competition



Feed-food competition

Research question 1:

Are there livestock systems without feed-food competition?

- no method

Research question 2:

How much animal source food can we eat while avoiding feed-food competition?

Land use ratio

Van Zanten et al. (2016; IJLCA)

Land feed

+

+

=

1 kg human digestible protein (HDP) from animal

→ kg HDP plant prod

+

→ kg HDP plant prod

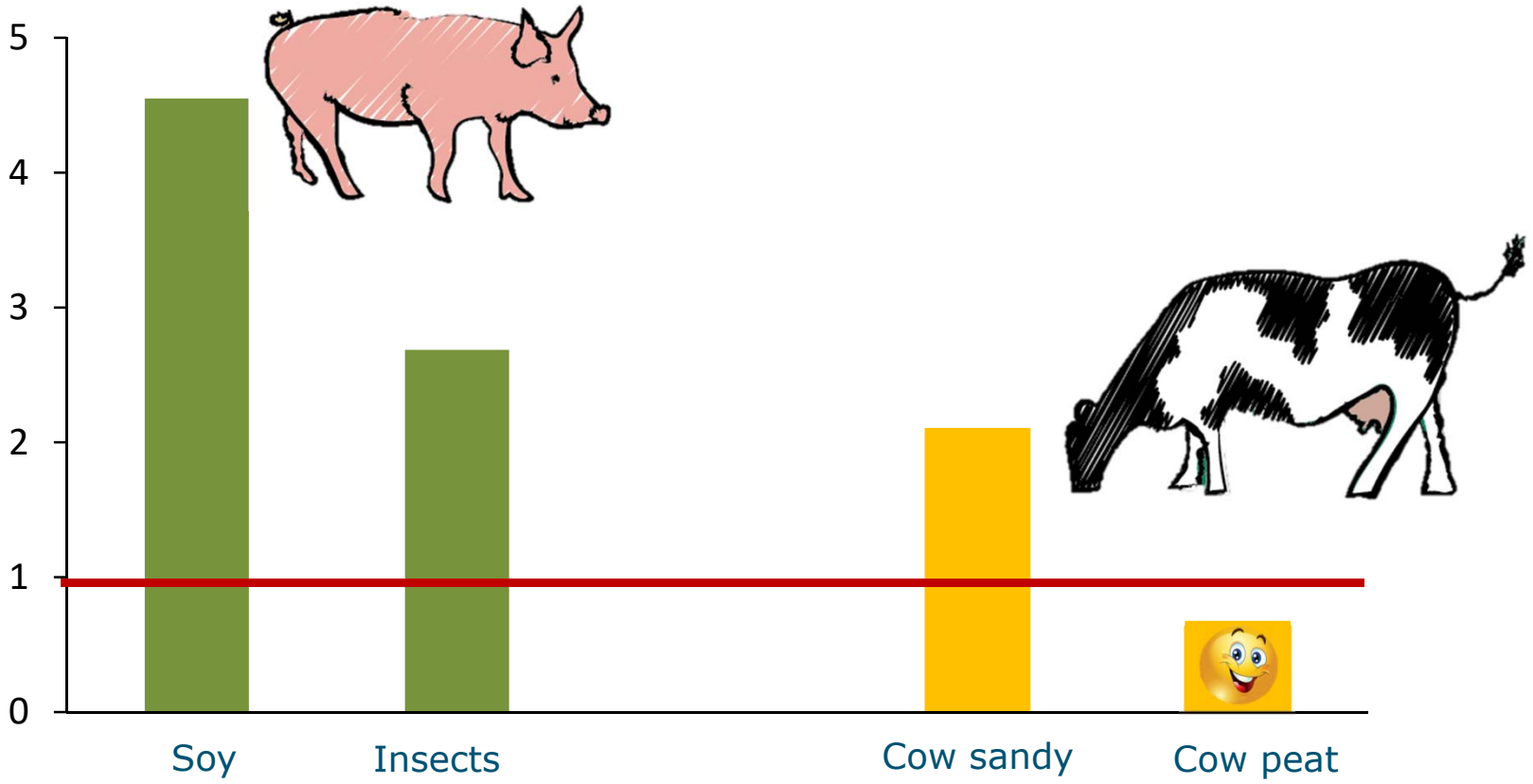
+

→ kg HDP plant prod

$$\frac{\sum \text{HDP plant prod}}{\text{HDP kg from animal}}$$

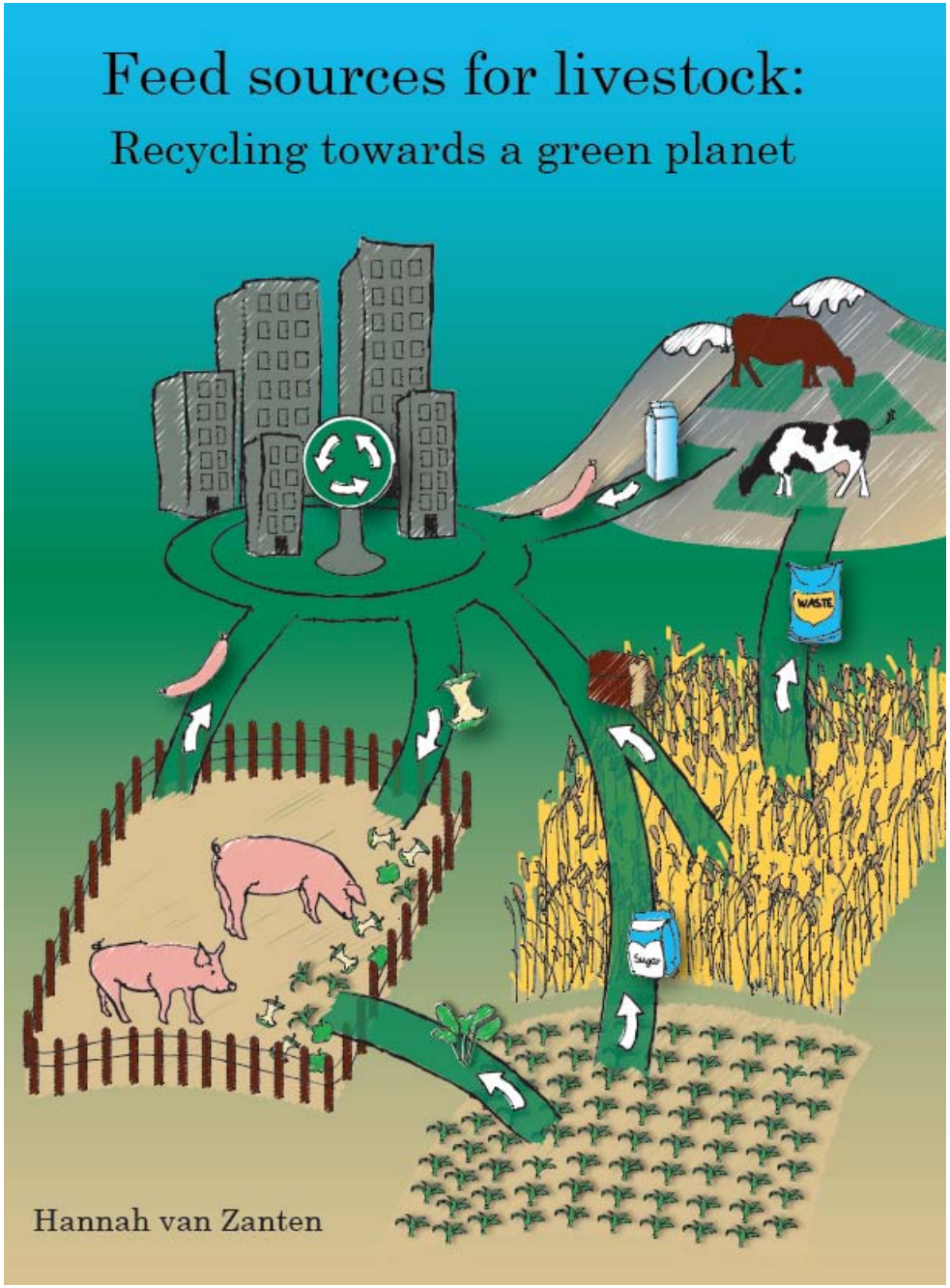
Results

<1 animal production more efficient



Conclusion: livestock production can be more efficient than crop production
..... but systems should change

How Much?



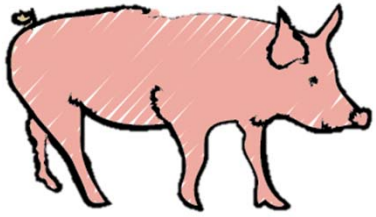
How much?

How much??

- Co-products

- Food-waste

- Marginal land



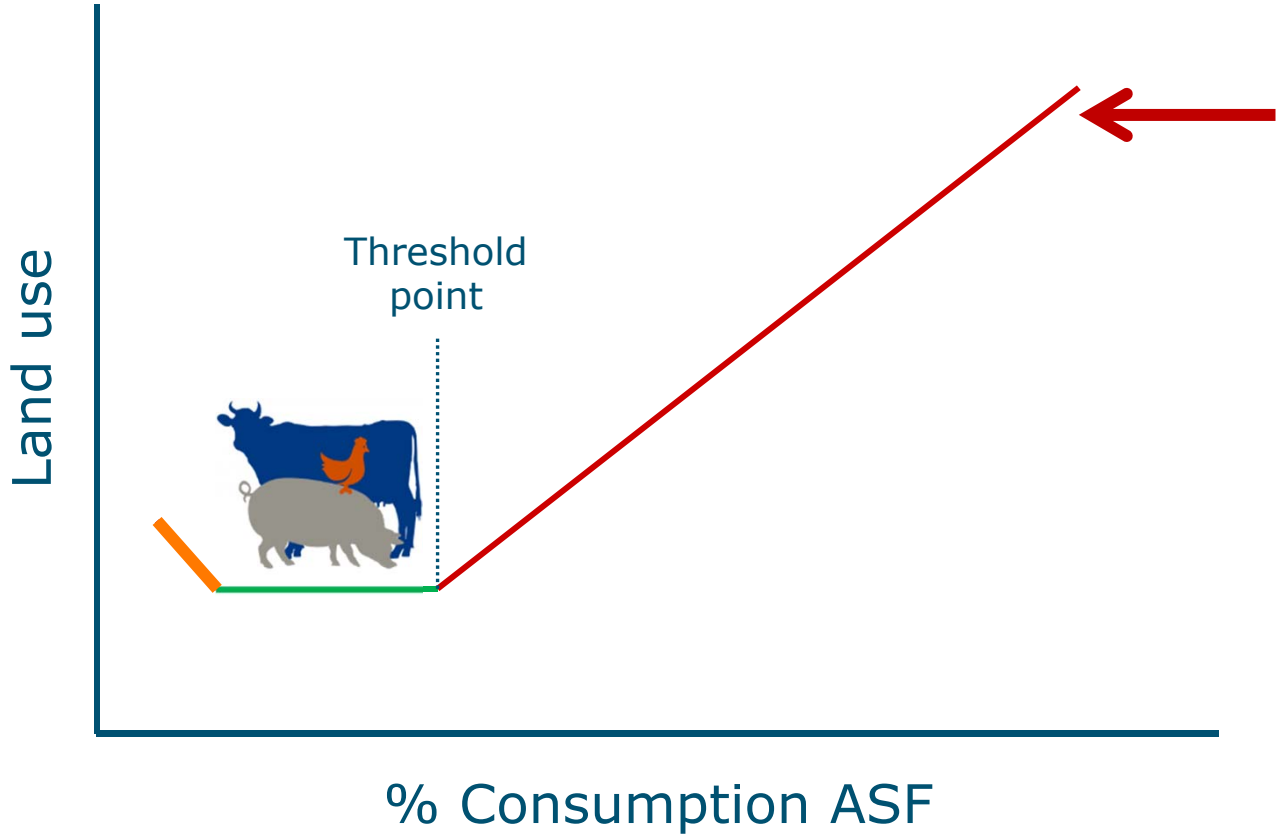
→ 14 g protein per day

→ 3 to 7 g protein per day

21 g protein per day

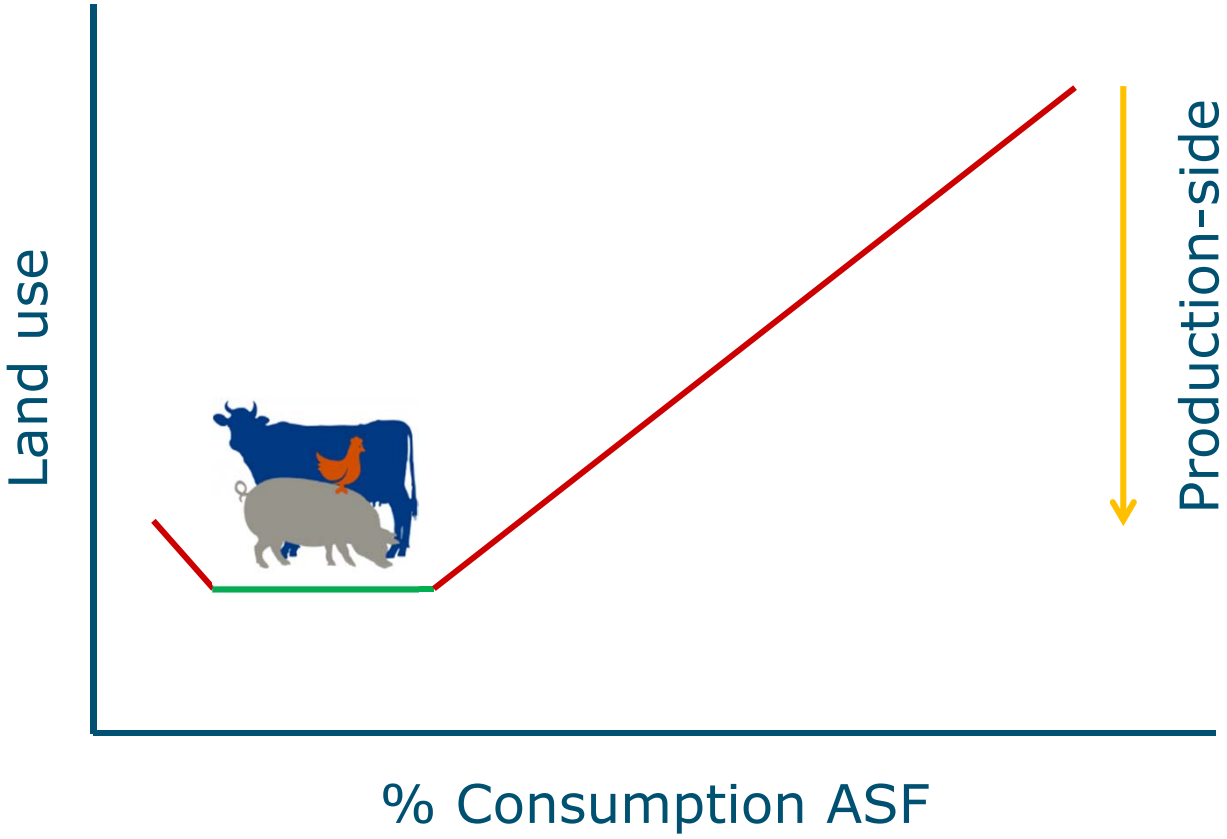
60 g protein needed
Livestock important role in global food supply

Hockeystick figure



Consuming small amount of animal source food most optimal from a land use perspective

Hockeystick figure

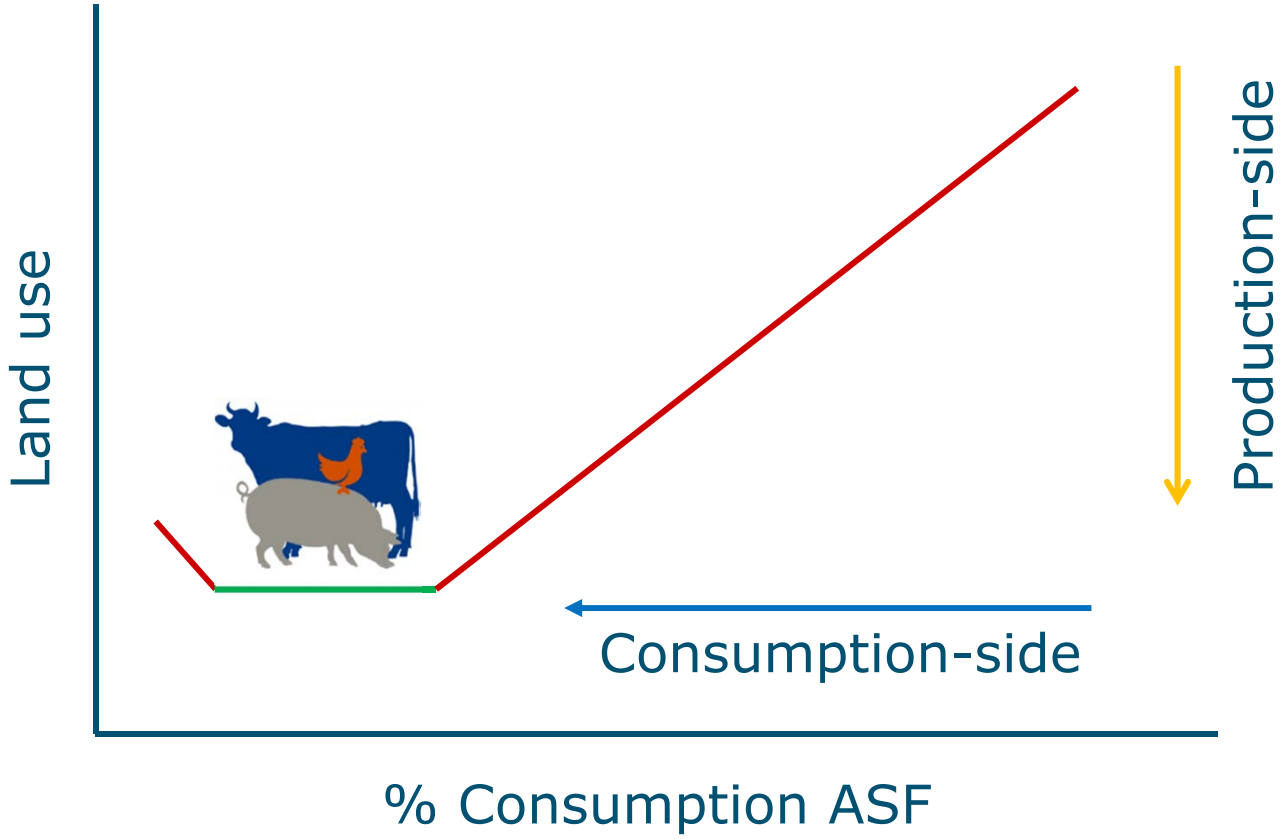


Existing system

Intensification

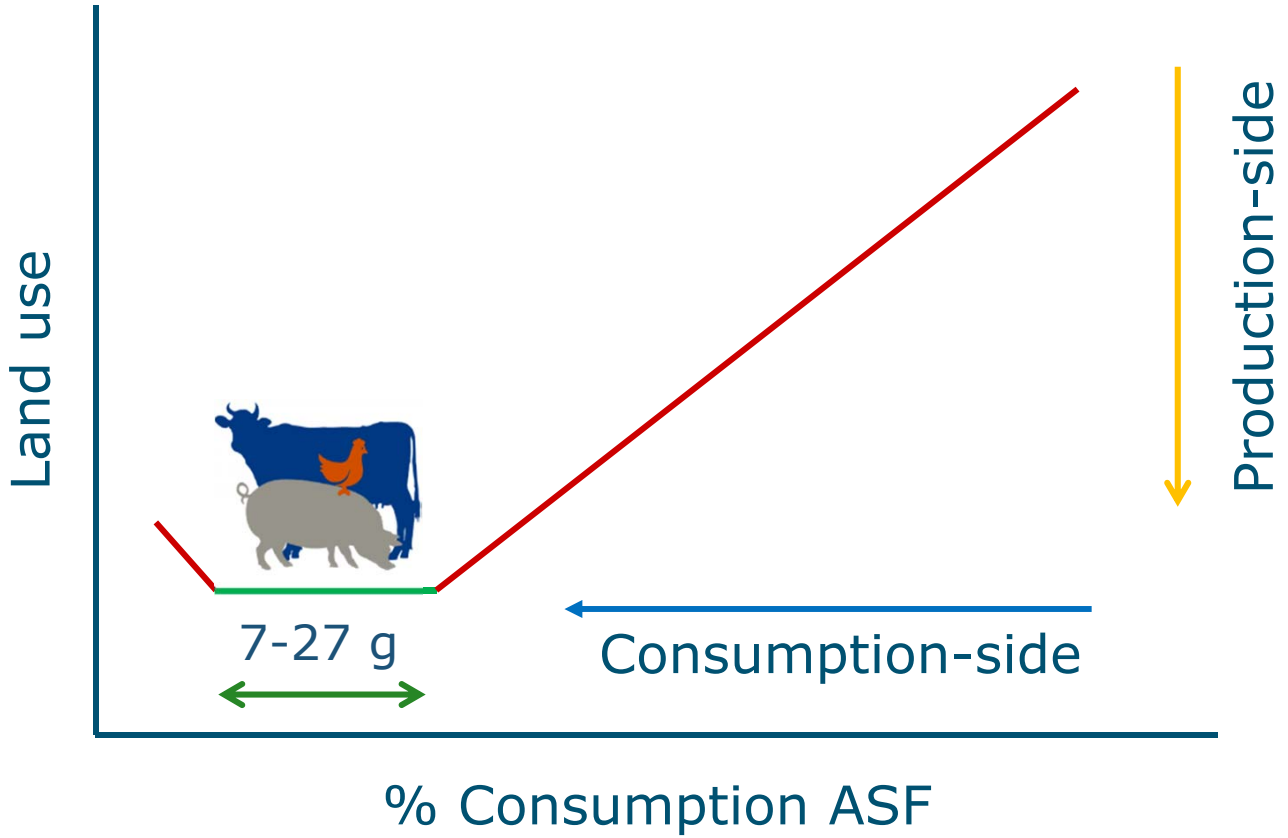
- Breeding strategies
- Feeding strategies

Hockeystick figure



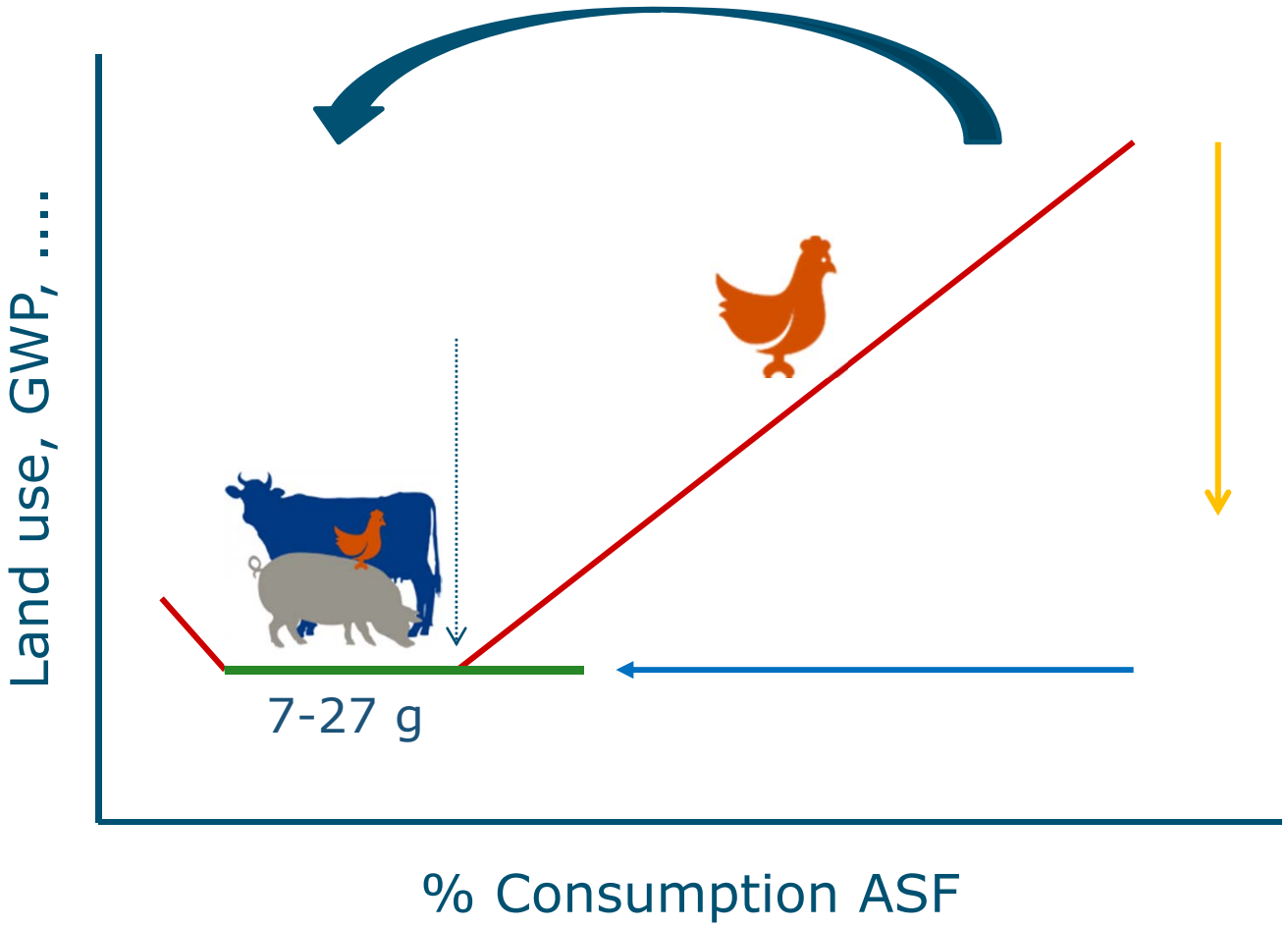
- Replace ruminant meat with monogastric meat
- Alternative protein sources
- Reduce consumption of animal source food

Hockeystick figure



- Crop-residues
- Biomass marginal land
- Co-products
- Food waste

Paradigm shift



Not increasing efficiency of the animal but increasing efficiency of food system

Thank you

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