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# The role of livestock in a sustainable diet: a land use perspective

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Hannah van Zanten - Animal Production Systems group

B. Meerburg, P. Bikker, M. Herrero, I.J.M. de Boer



# Demand for Animal Source Food

Current

2050



258 million ton



455 million ton (76%)



664 million ton



1077 million ton (62%)

**Needed:** 60 g protein in  
plant + ASF per day

**Consumed:** 32 g protein  
from ASF per day

50%

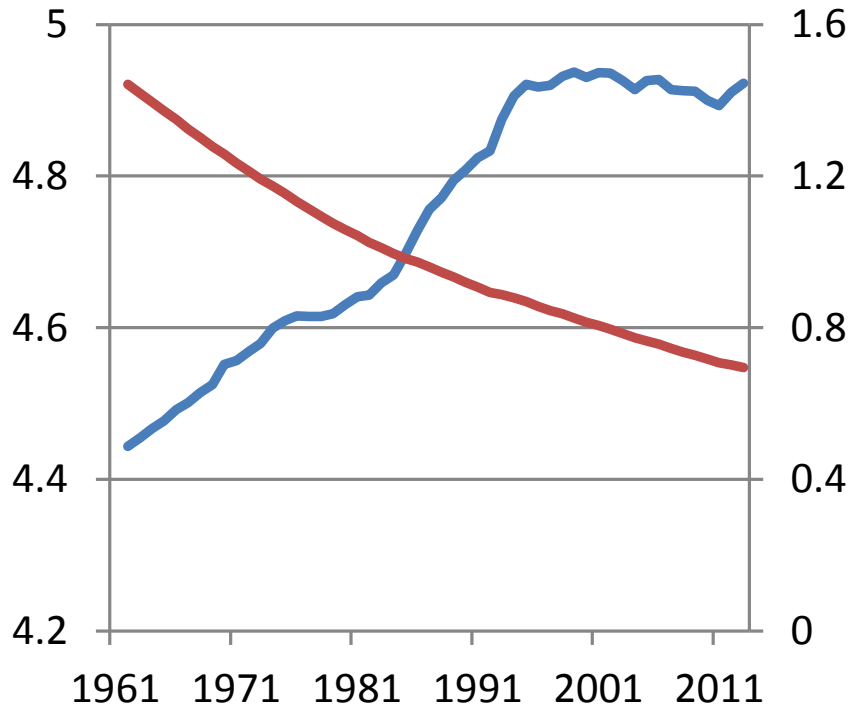
How to increase livestock production?

How ensure global nutritional security?  
Land use perspective

# Agricultural land use

4.9 billion ha agricultural land  
3.4 billion ha permanent meadows and pasture  
1.6 billion ha cropland

— agricultural land (bn ha)      — ha per capita



Prediction 2050

0.16 ha per person

Vegan diet:

0.07 - 0.12 ha per person

Western diet:

0.19 - 0.21 ha per person

Area for crop production scarce in future

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# Should we shift to vegan diets?

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- grass-based ruminant systems on marginal land  
→ more efficiently than food crops
- land use minimal with ASF  
→ co-products



# Livestock fed with leftovers

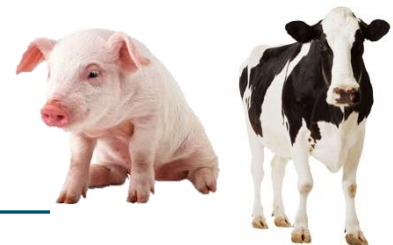
- Food waste



- Co-products



- Marginal land



How much animal source food (meat and milk)  
can we eat  
based on livestock systems that only use leftovers?



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# Amount of leftovers

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- Food waste



- Co-products



- Marginal land



# Amount of leftovers

■ Food waste



■ Co-products



10%

51

182

233 kg  
per person  
per year

Vegan diet





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# Feed composition

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<b>Ingredients</b>	<b>%</b>
SBM RC<45 RC<480	26.00
Wheat grem	15.60
Sugar beetpulp <100	10.60
Wheat middlings	9.70
Wheat bran	9.30
Soybeans heat treated	8.00
Wheat feed flour	5.00
Soybean hulls RC 320-360	4.40
Sugar beet molasses	3.50
Potato starch (dried)	2.10
Potato cut pre fried	1.40
Bread meal	1.30
Oil (soy)	0.80
Limestone	0.72
Sugar	0.60
Premix	0.40
Potato peels steamed	0.40
Salt	0.18

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<b>Nutrient content</b>	<b>MJ</b>	<b>g/kg</b>
Net energy	8.54	
Lysine		11.50
Methionine		3.01
Cysteine		2.93
Threonine		6.83
Tryptophan		2.47

Amino acids no limitation  
Net energy limitation



# Protein production

Growing pig



2878  
MJ NE



1665  
MJ NE



Vegan diet



0.58  
pigs

98 g  
meat

19 g protein per person  
per day



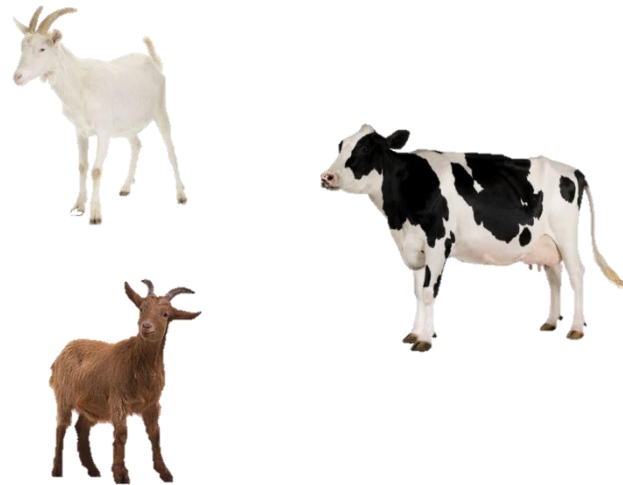
# Protein from marginal land

3.36 billion ha permanent meadows and pasture

1.15 marginal land



2.21 potential crop production



6 g protein per person per day





# Livestock fed with leftovers

■ Food waste



19 g protein per day

■ Co-products



■ Marginal land



6 g protein per day

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25 g protein per day

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# Livestock fed with leftovers

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■ Food waste



19 g protein per day

■ Co-products



■ Marginal land



6 g protein per day

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First estimation!!

# Livestock fed with leftovers

■ Food waste



High quality

Oil

SBM

19 g protein per day

■ Co-products



Low quality

6 g protein per day

■ Marginal land



25 g protein per day

# Livestock fed with leftovers

■ Food waste



21.3 g protein per day

■ Co-products



■ Marginal land



6 g protein per day

Livestock  
density

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25 g protein per day

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# Conclusion

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Current

2050



258 million ton



455 million ton (76%)



664 million ton



1077 million ton (62%)

**Needed:** 60 g protein in  
plant + ASF per day

Livestock does contribute to sustainable diets

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# Thank you for your attention

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