



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Future Agriculture

Will beef and dairy have a place on our plate in the future?

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Current western dietary patterns are not sustainable

- environmental impact & health¹
- curb overconsumption & waste¹
- decrease consumption of resource-demanding foods²
- vegetarian or vegan diets → environmental & health benefits³

¹ Foley et al., 2011; Sabaré & Soret, 2014; Smith & Gregory, 2013

² Garnett et al., 2011; Bajzelj et al., 2014

³ Scarborough et al., 2014; Tillman & Clark, 2014

Current western dietary patterns are not sustainable (cont.)


However,

- dairy & egg production for vegetarian diets → meat
- land types unsuitable for cultivation of crops
- grazing needed for biodiversity conservation

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A semi-natural pasture in Sweden, featuring a stone wall in the foreground, lush green grass, and a dense forest of trees in the background. The scene is brightly lit, suggesting a sunny day.

**Sweden: 440 000 ha
semi-natural pastures
- steadily reforested**

SWEDEN'S ENVIRONMENTAL
OBJECTIVES

— AN INTRODUCTION

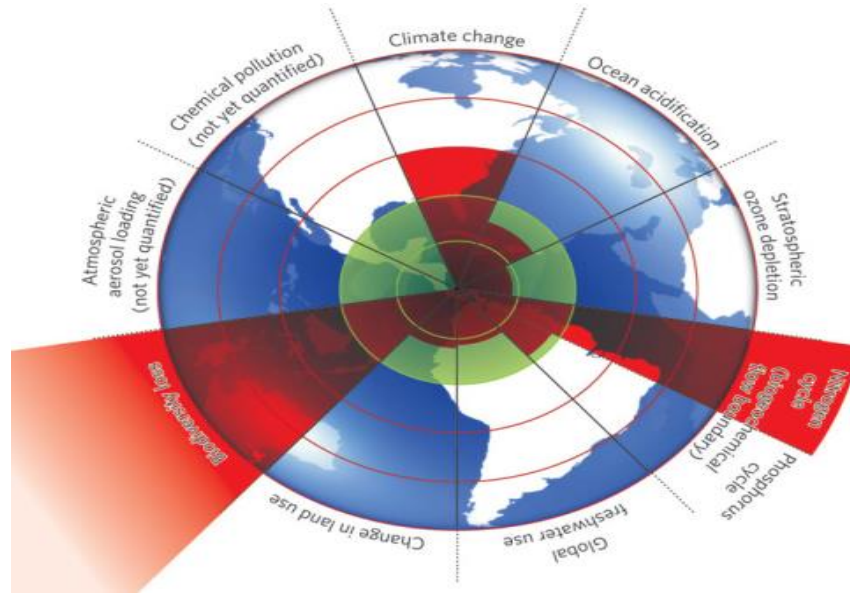


- **“A Varied Agricultural Landscape”**
- **“A Rich Diversity of Plant and Animal Life”**

**If we let cattle
graze all the 440 000 ha...**



- ... how much beef and dairy would we get?
- how about the "safe operating space"?



Rockström et al, 2009. A safe operating space for humanity

Calculations based on five principles

- 1. Cattle grazing all semi-natural pastures**
2. Human diets follow nutritional recommendations
3. Arable land for food production and winter feed
4. By-products used as feed
5. We have 0.21 ha arable land per capita

Two scenarios

Intensive dairy

- 9300 kg ECM
- Heifers grazing
- Bull calves reared intensively
- By-products used for feed + silage & cereal grains

Extensive dairy

- 4600 kg ECM
- Dairy cows, heifers and steers grazing
- By-products used for feed + silage

How many animals are needed?

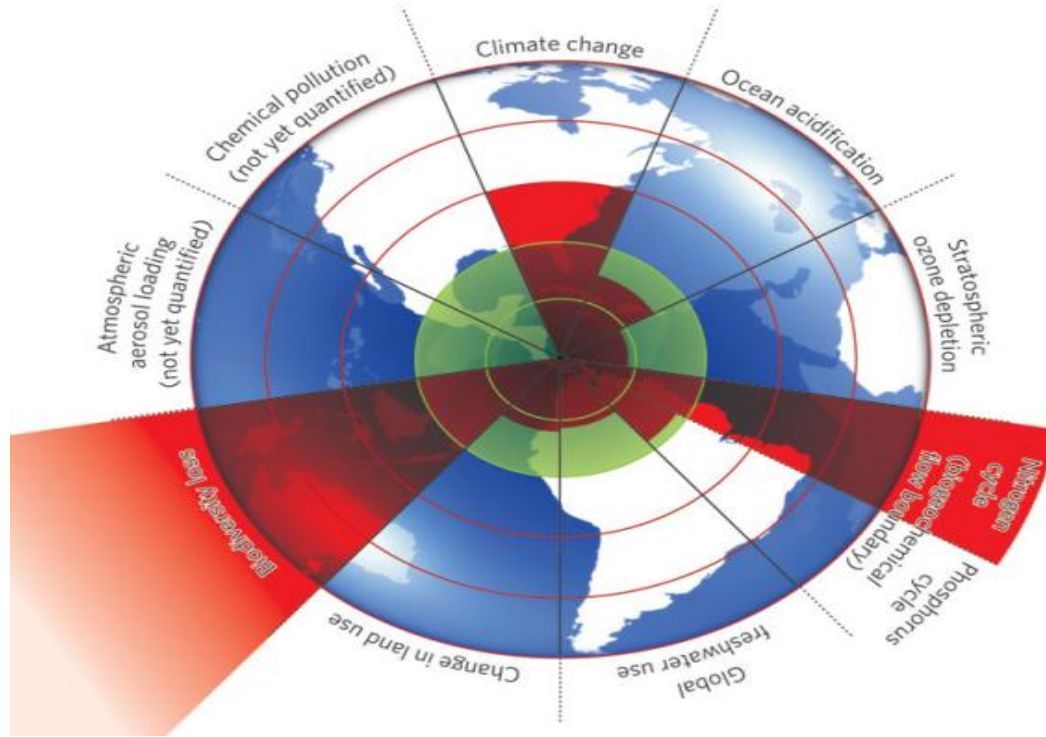
	Currently (Sweden)	Intensive dairy	Extensive dairy
Dairy cows	346 000	633 000	304 000
Heifers/bulls/steers	450 000	1 200 000	560 000
<i>Swedish production</i>			
Milk, tons/yr	2 900 000	5 900 000	1 400 000
Bone free beef, tons/yr	99 000*	133 000	64 000

*Cattle from suckler systems
included

So, how much beef and dairy do we get?

Amount per person	Current consumption in Sweden	Intensive dairy	Extensive dairy
Bone free beef servings/week	3.5	1.5	0.7
Milk, yoghurt litres/day	0.3	0.8	0.15
Cheese slices/day	5	3	1

What about the planetary boundaries?



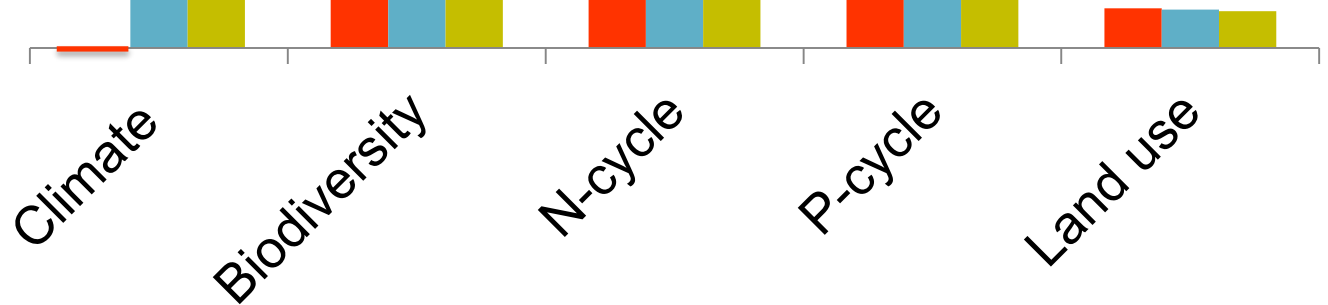
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Annual per capita impact

■ Planetary boundary

■ Intensive dairy

■ Extensive dairy



Conclusions

- The criteria for sustained biodiversity & land use was fulfilled in both scenarios
- Enough food was produced but beef consumption was reduced by 55-80%
- Room for improvement in C-footprint, N & P
- Surplus milk in intensive dairy scenario – export?
- But, exported milk must replace food of higher carbon footprint to be justified



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Acknowledgements:

Future Agriculture, SLU, for funding the project

www.slu.se/futureagriculture

Thank you for your attention!

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