

# HOW SUSTAINABILITY AND HEALTH INTERSECT IN GLOBAL FOOD SYSTEMS

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# Disclosure Slide

- I am the director of the Arrell Food Institute, which is funded by the University of Guelph and the Arrell Family Foundation.
- I am a Canada Research Chair, which is funded by the Canadian Government.
- I am a scientific advisor for the Weston Seeding Food Innovation program.
- I am a board member for the Maple Leaf Centre for Action on Food Security.
- In the past five years I have received funding from:
  - NSERC, SSHRC, McConnell Foundation, Pierre Elliot Trudeau Foundation, Cdn. First Research Excellence Fund, and George Weston Ltd.





<http://pup.net.au/gallery/large/ARRahmanConcertCrowd%20.jpg>



*“In the next 40 years, humans will need to produce more food than they did in the previous 10,000 put together.”*















Food and Agriculture  
Organization of the  
United Nations



International Fund for  
Agricultural Development



World Food  
Programme

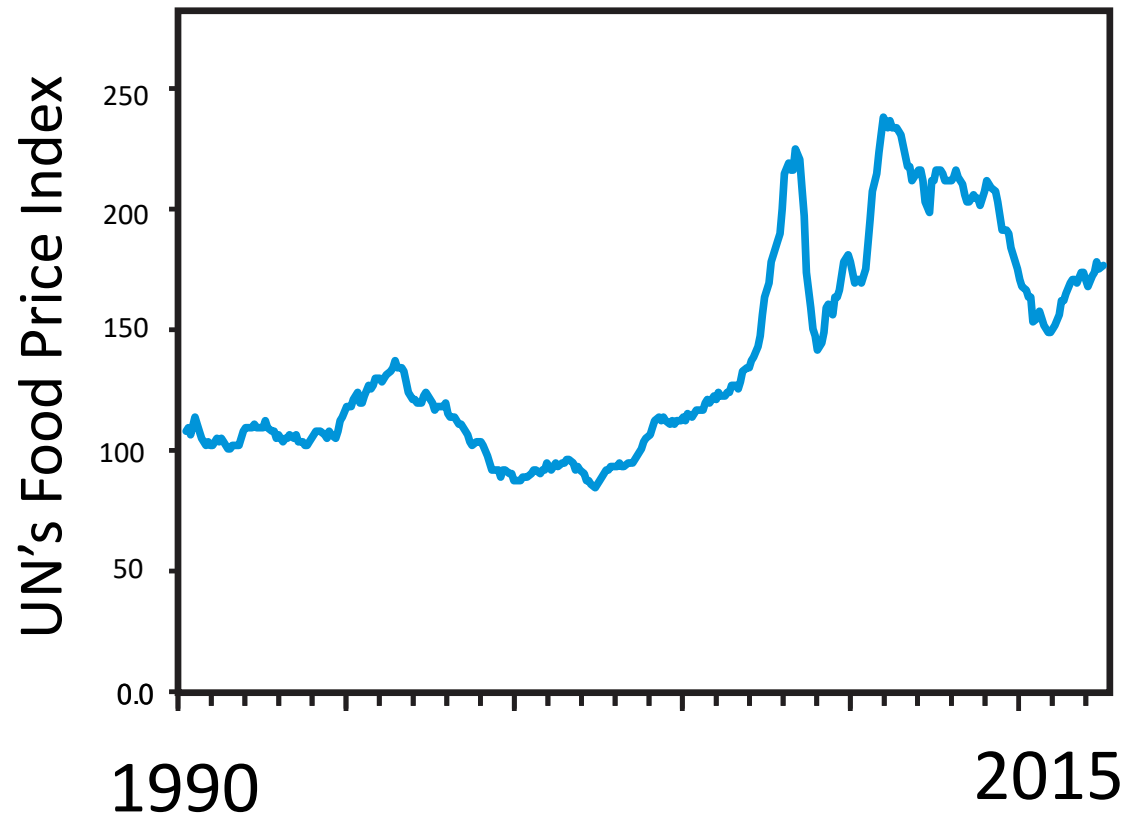


World Health  
Organization

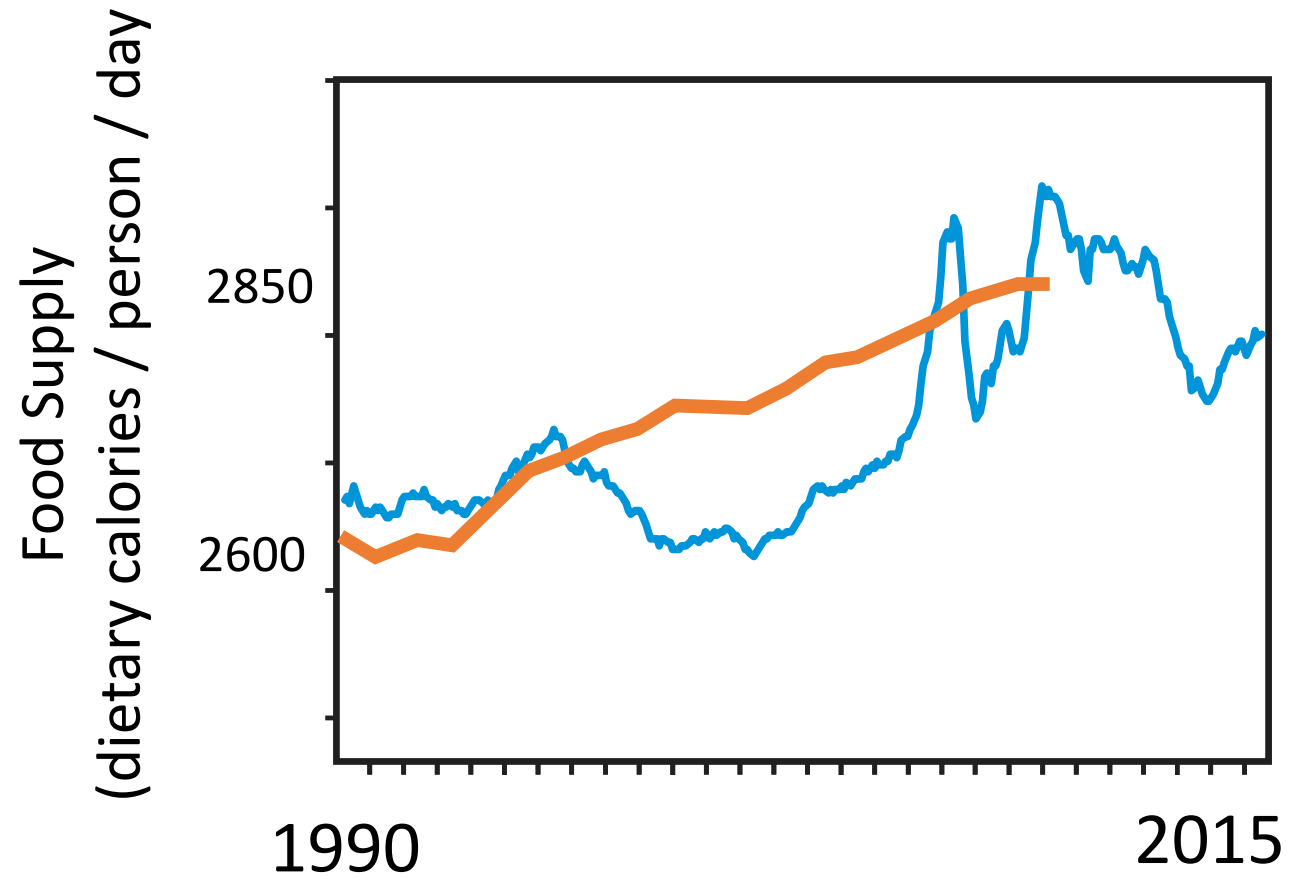
**2017**

**THE STATE  
OF FOOD  
SECURITY  
AND NUTRITION  
IN THE WORLD**

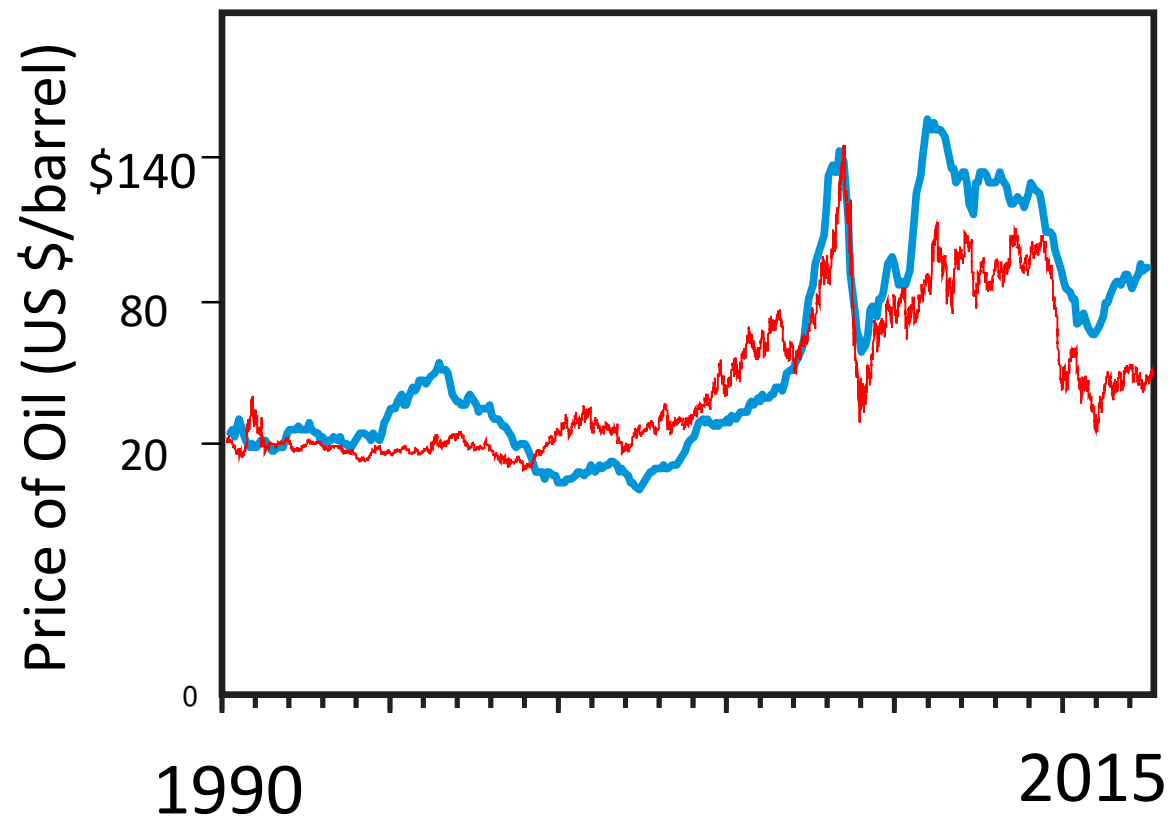














# *Hungry Planet*

by Peter Menzel and Faith D'Aluisio



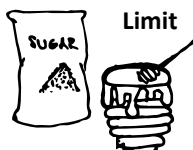
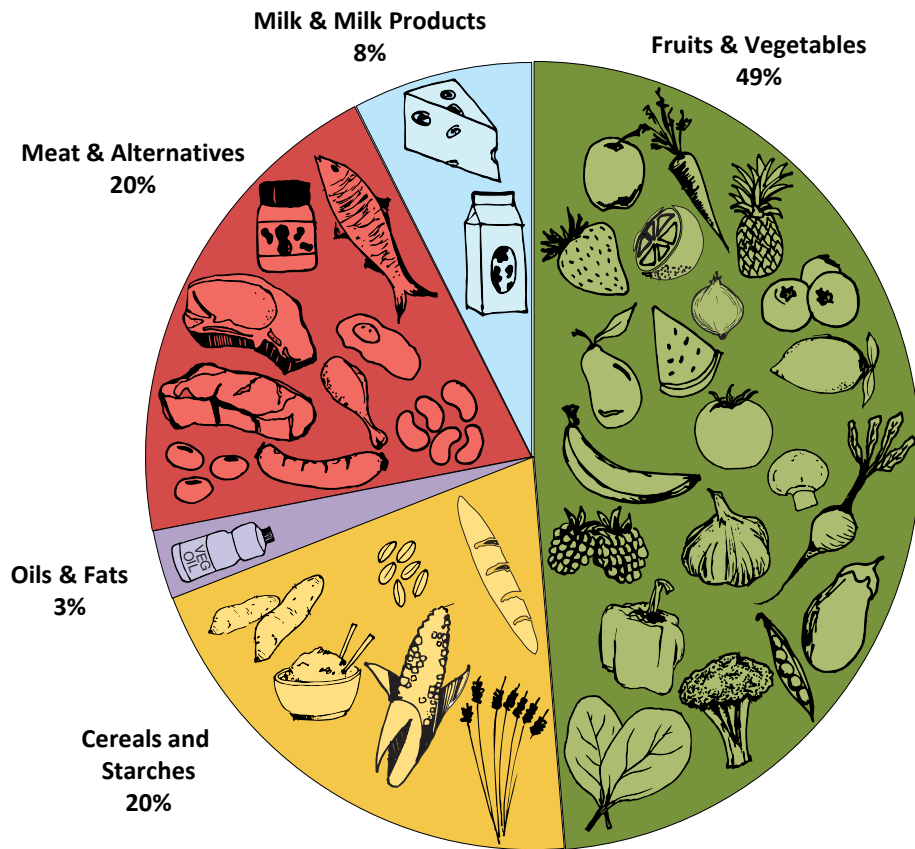




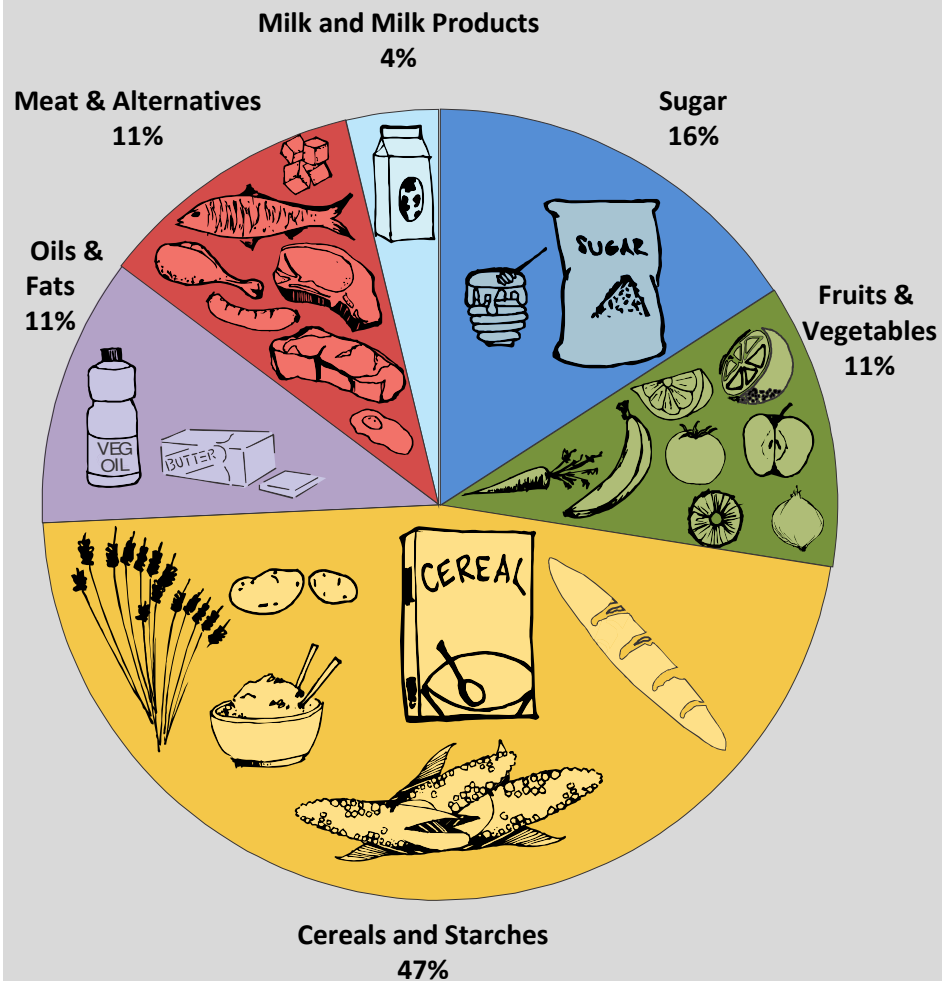


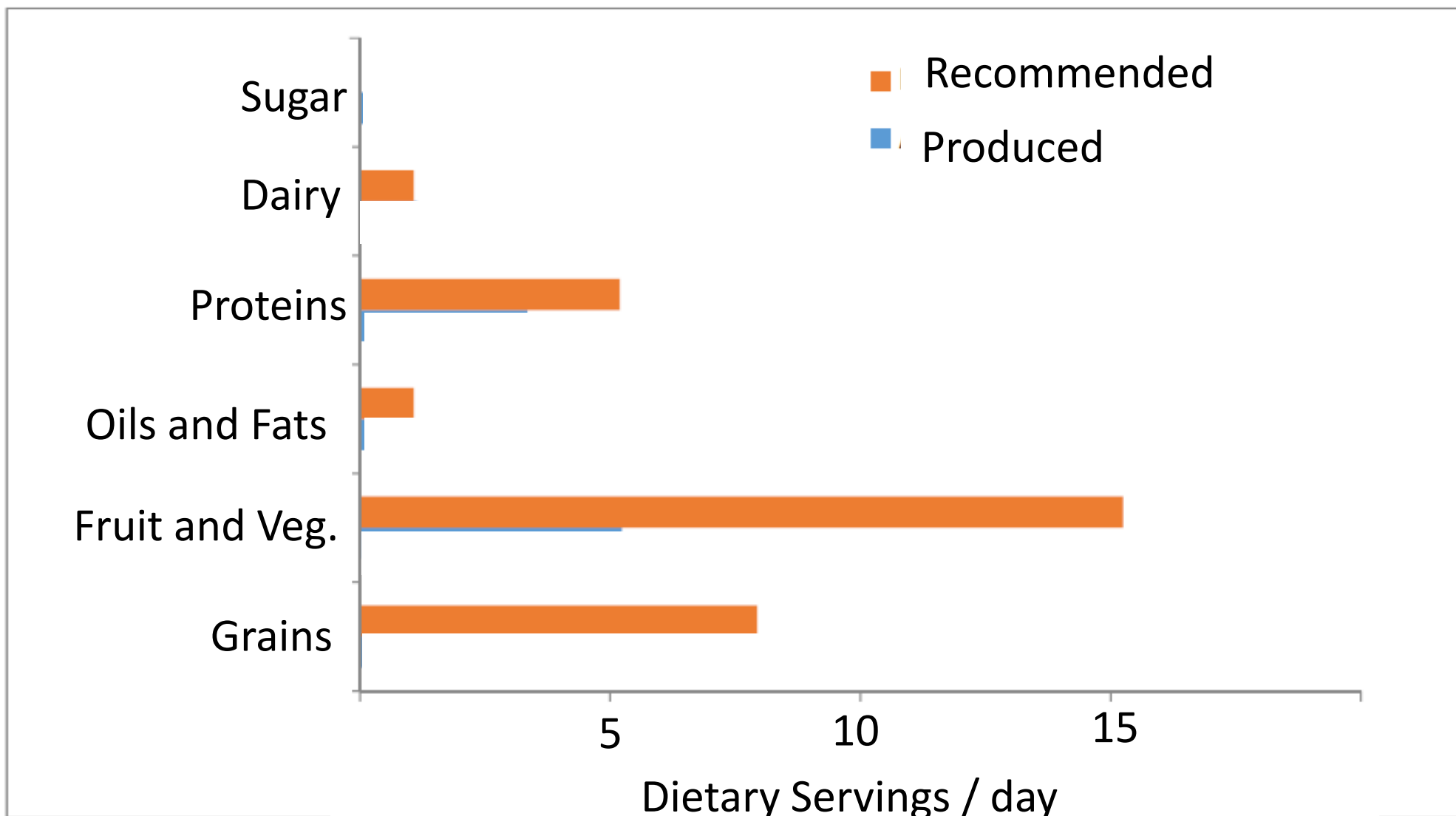


## What we should be eating (Harvard's Healthy Eating Plate Model)



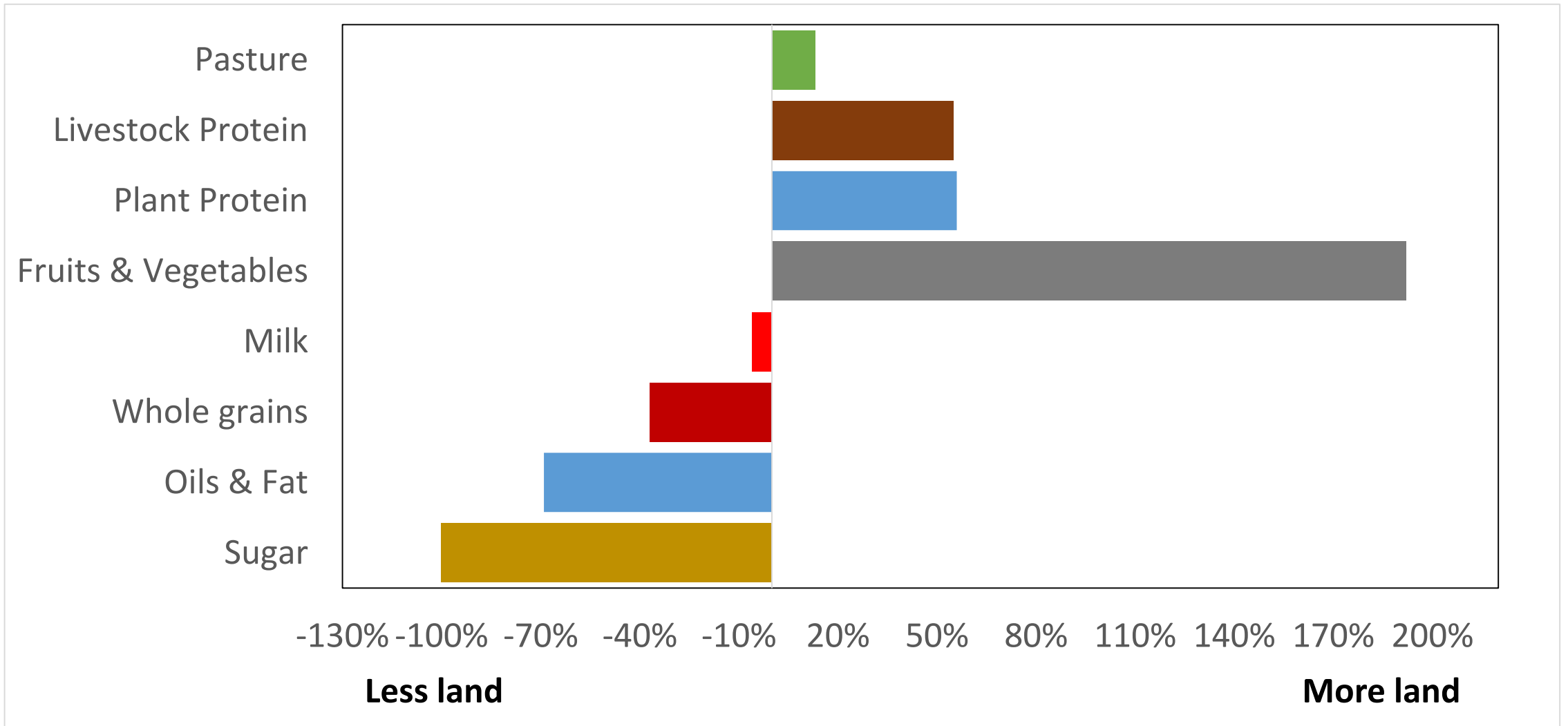
## What we are actually producing (According to 2011 FAO)







# Land use implications of better diets (today)

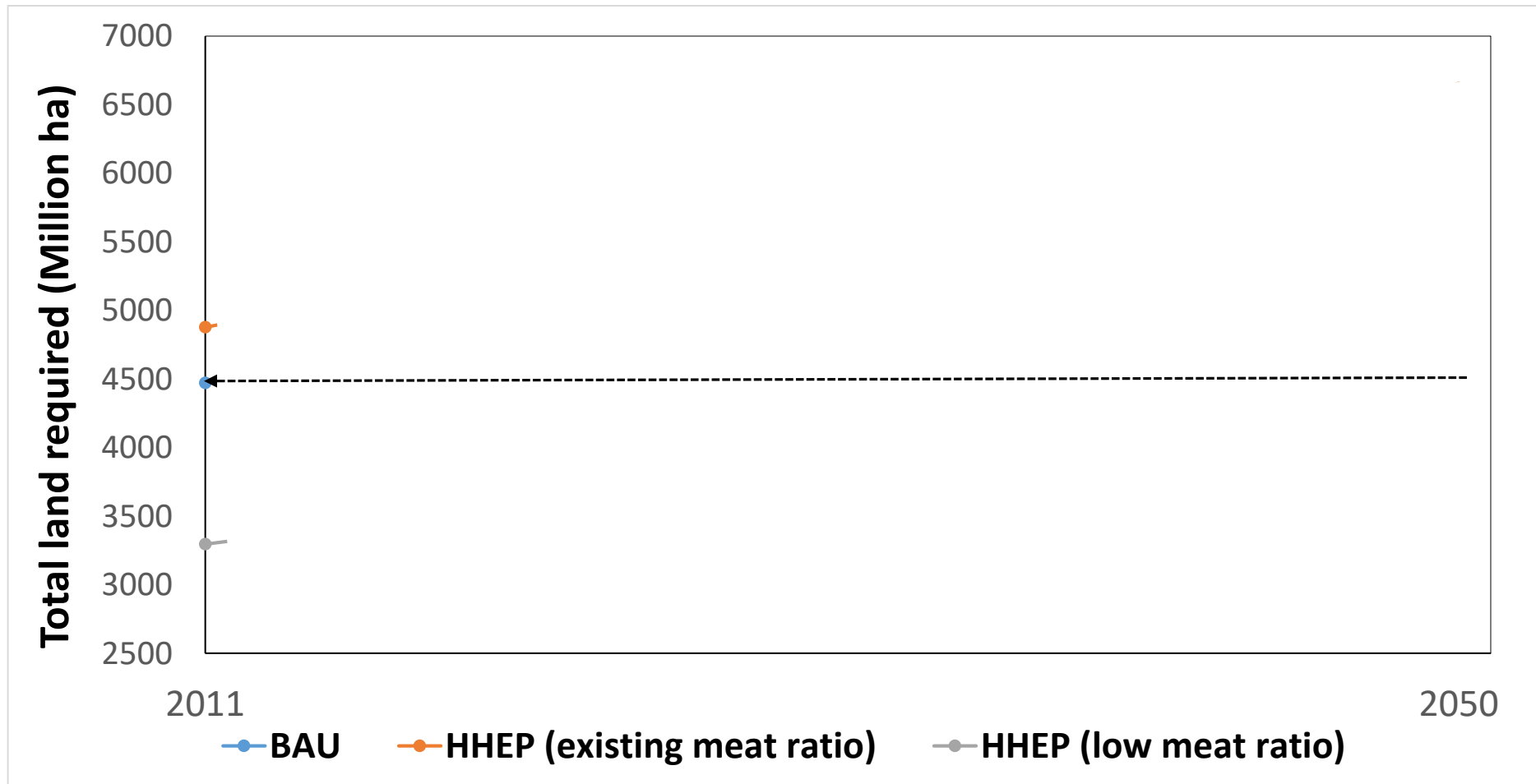


# Pasture versus arable

- When we only consider arable land, switching to the Harvard Healthy eating plate would ***save us 51 million ha of land.***
- However, much of the world's protein comes from pasture land and if we keep producing the same amount of meat and dairy on pasture then ***we'd need an extra 458 m ha of land.***

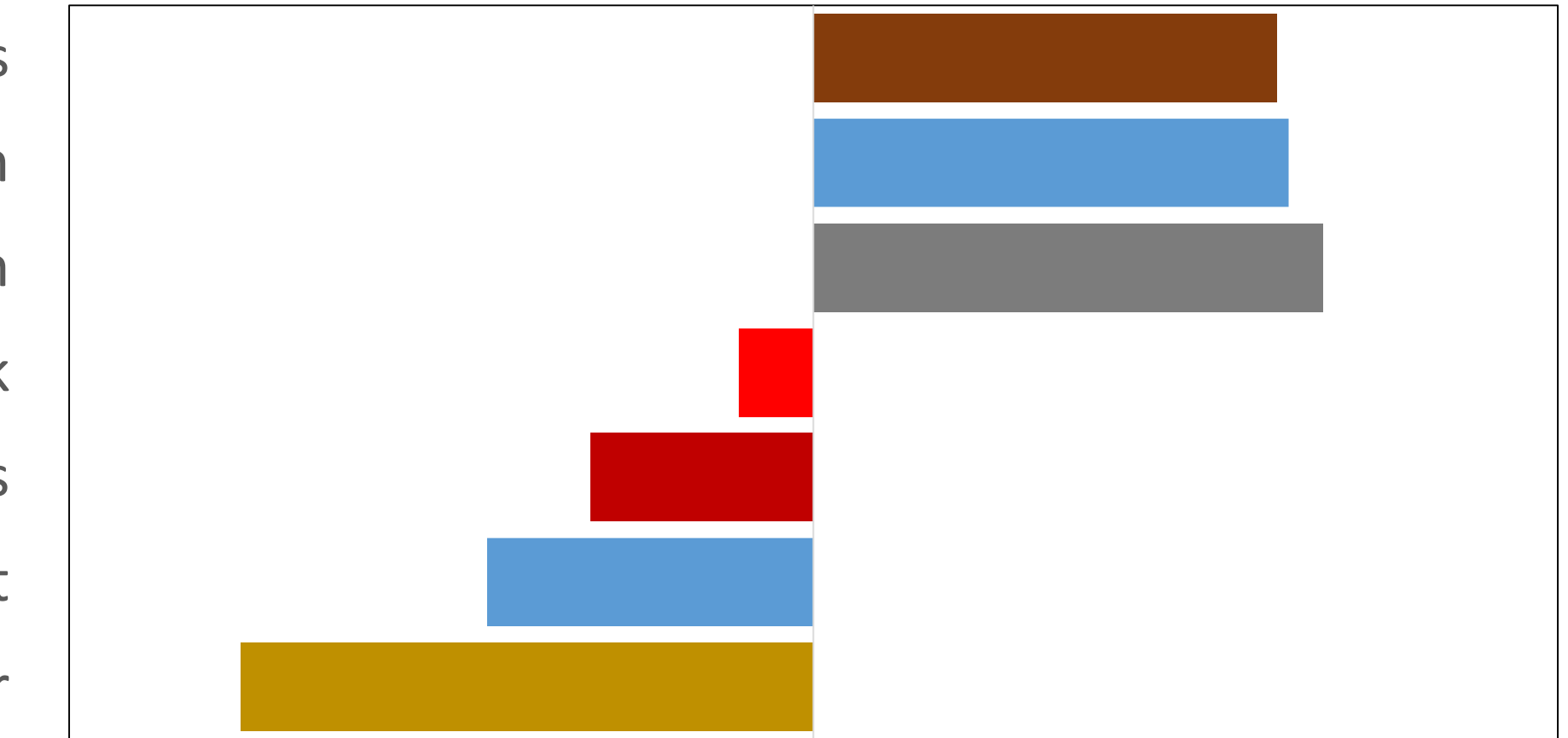


# Land use implications of better diets (in the future)



# GHG implications of better diets (today)

Fruits & Vegetables  
Plant Protein  
Livestock Protein  
Milk  
Whole grains  
Oils & Fat  
Sugar



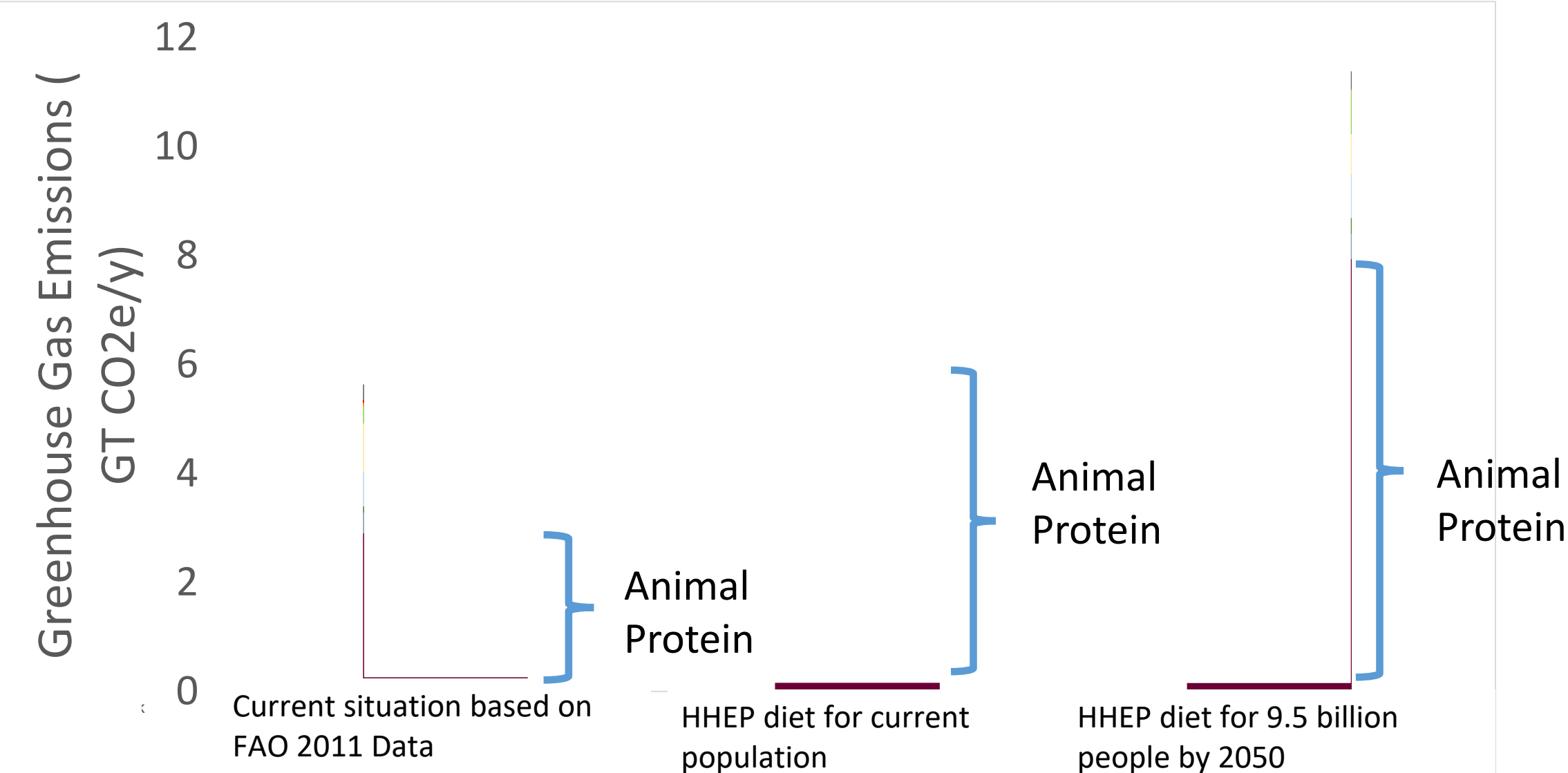
-130% -100% -70% -40% -10% 20% 50% 80% 110%

**Less GHG**

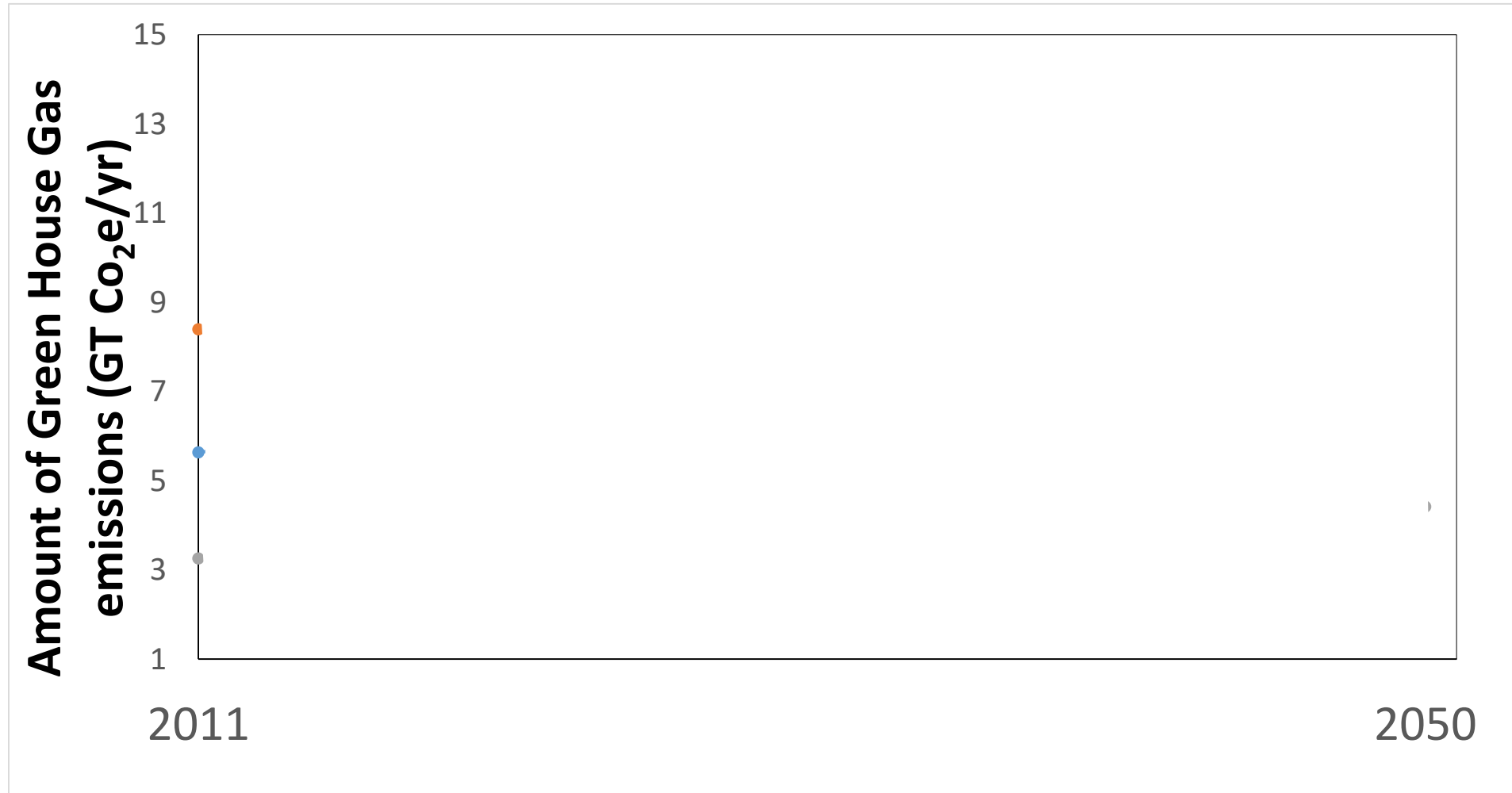
**More GHG**



# Bottom line on GHGs



# GHG implications of better diets (in the future)





# Key results

- Switching to a “healthier” diet will reduce the amount of arable land we need.
- But unless we also increase the amount of plant-based protein this transition will also result in more total land used and more GHGs.
- If we switch to the “healthier diet” and reduce the % of meat in our diet we can save land, reduce GHGs and be healthier.





<https://4.bp.blogspot.com/Mv4nKnBf08I/Vz3MiV4L0yl/AAAAAAAAALBU/gJWoDWzvrIUAW1vsZ2qjEdYdVhAYDmfCgCLcB/s1600/Real%2Bfarm%2Banimals%252C%2Bwallpaper%252C%2Bzoo%2Banimals%252C%2B%2Bcollection%2Bdomestic%2Banimals%2B%25288%2529.jpg>







Crickets require 12\* less feed and 13\* less water than cattle

Pigs produces 10 - 100 \* more GHGs per edible kg as mealworm.

<http://news.ubc.ca/2014/09/25/bug-bites/>



Quorn causes 5 times less GHGs than beef and 1.5 times less than chicken.

<http://www.cabi.org/cabdirect/FullTextPDF/2010/20103346525.pdf>; see also:  
<http://webarchive.nationalarchives.gov.uk/20140729081412/http://www.ktponline.org.uk/ktp-provides-carbon-footprint-certification-for-quorn-tm/>

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CHEDDAR CHEESE 3.99







**EXO**

MADE WITH  
CRICKET FLOUR

PEANUT BUTTER  
AND JELLY

NET WT.  
1.50g (5.3oz)

100% PROTEIN







Lloyd Longfield  
@LloydLongfield

Following

Interesting... Add cloves and cinnamon to insect protein. Yum. Sustainable food supply available anywhere. Bugs.



RETWEETS  
7

LIKES  
19



11:43 AM - 18 Mar 2017





# Arrell Global Food Innovation Awards



<https://arrellfoodinstitute.ca/innovation-awards/>



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