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# Cattle vets' role in making dairy production sustainable

*1<sup>st</sup> June 2022*

Source: Dr. Jude L. Capper, 2022

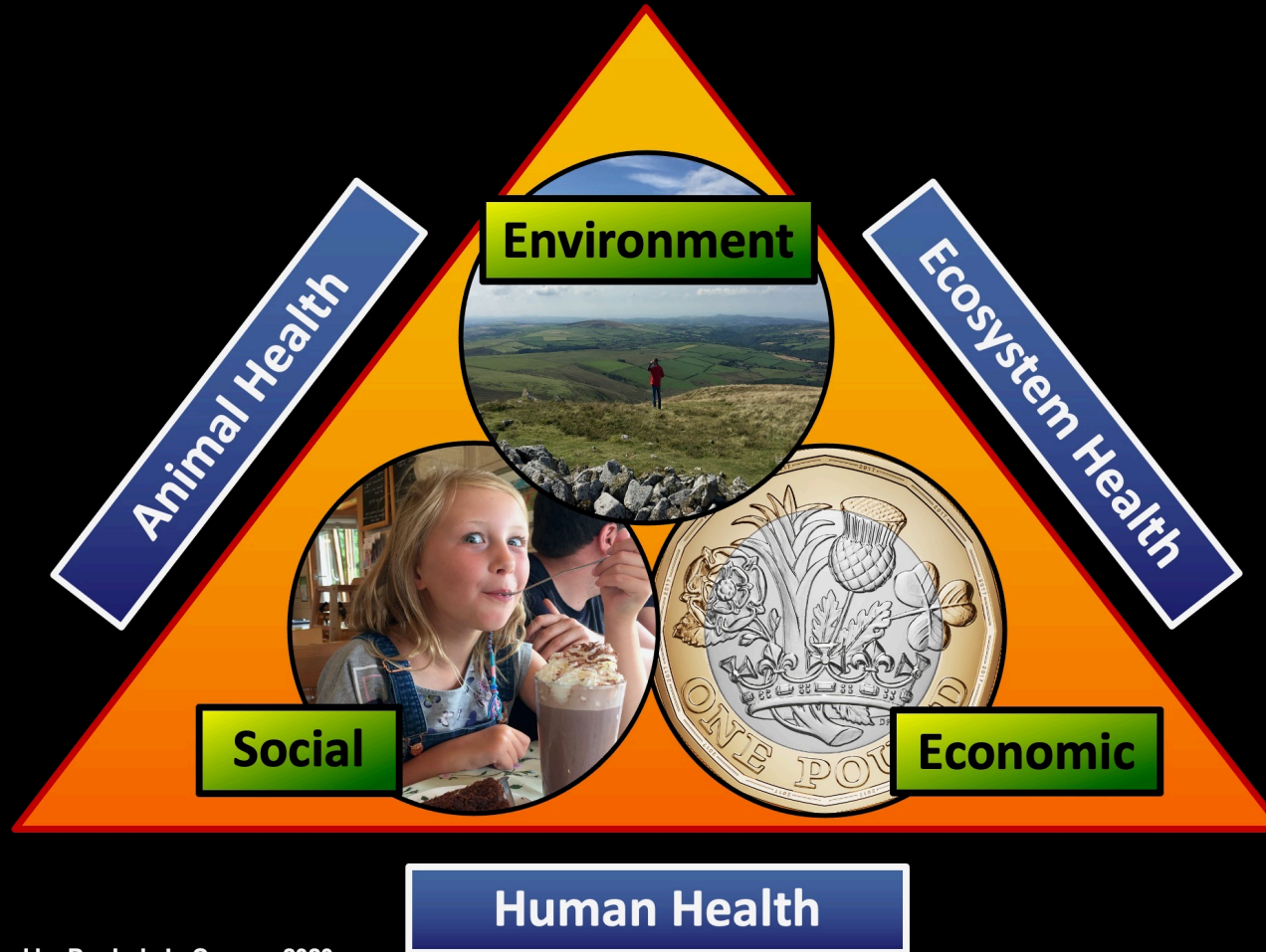
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S

# Sustainability comprises three pillars, all under the umbrella of One Health



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Source: Created by Dr. Jude L. Capper, 2020.

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B

To the consumer, small is beautiful



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Source: Created by Dr. Jude L. Capper, 2021

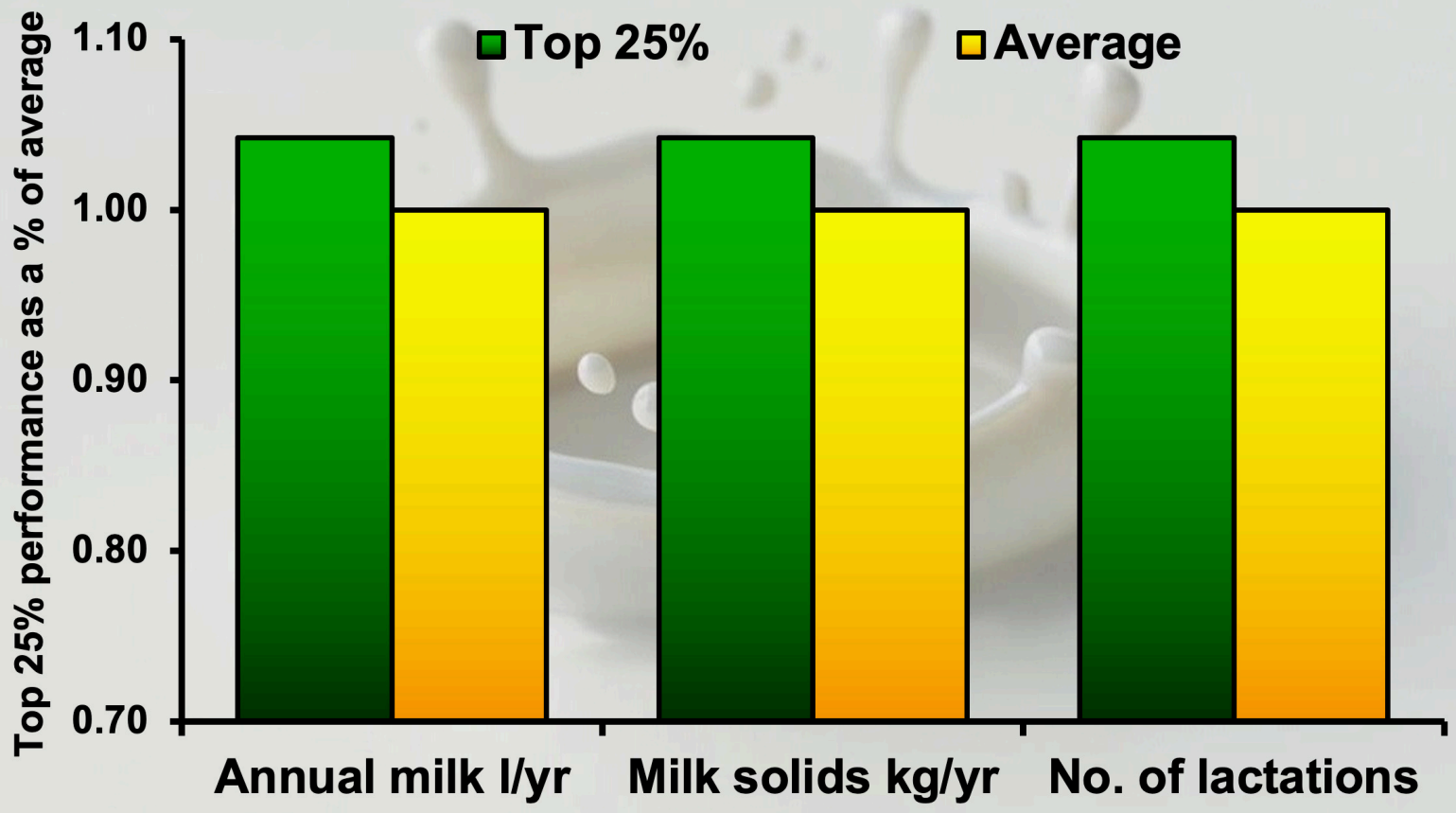
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DS

# Top 25% of dairy farms have higher yields, higher milk solids and lower cow turnover



Source: Created by Dr. Jude L. Capper, 2021. Data from: AHDB (2020) Dairy performance results 2018/19.  
[https://projectblue.blob.core.windows.net/media/Default/Dairy/Publications/DairyPerformResults3265\\_200317\\_WEB.pdf](https://projectblue.blob.core.windows.net/media/Default/Dairy/Publications/DairyPerformResults3265_200317_WEB.pdf)

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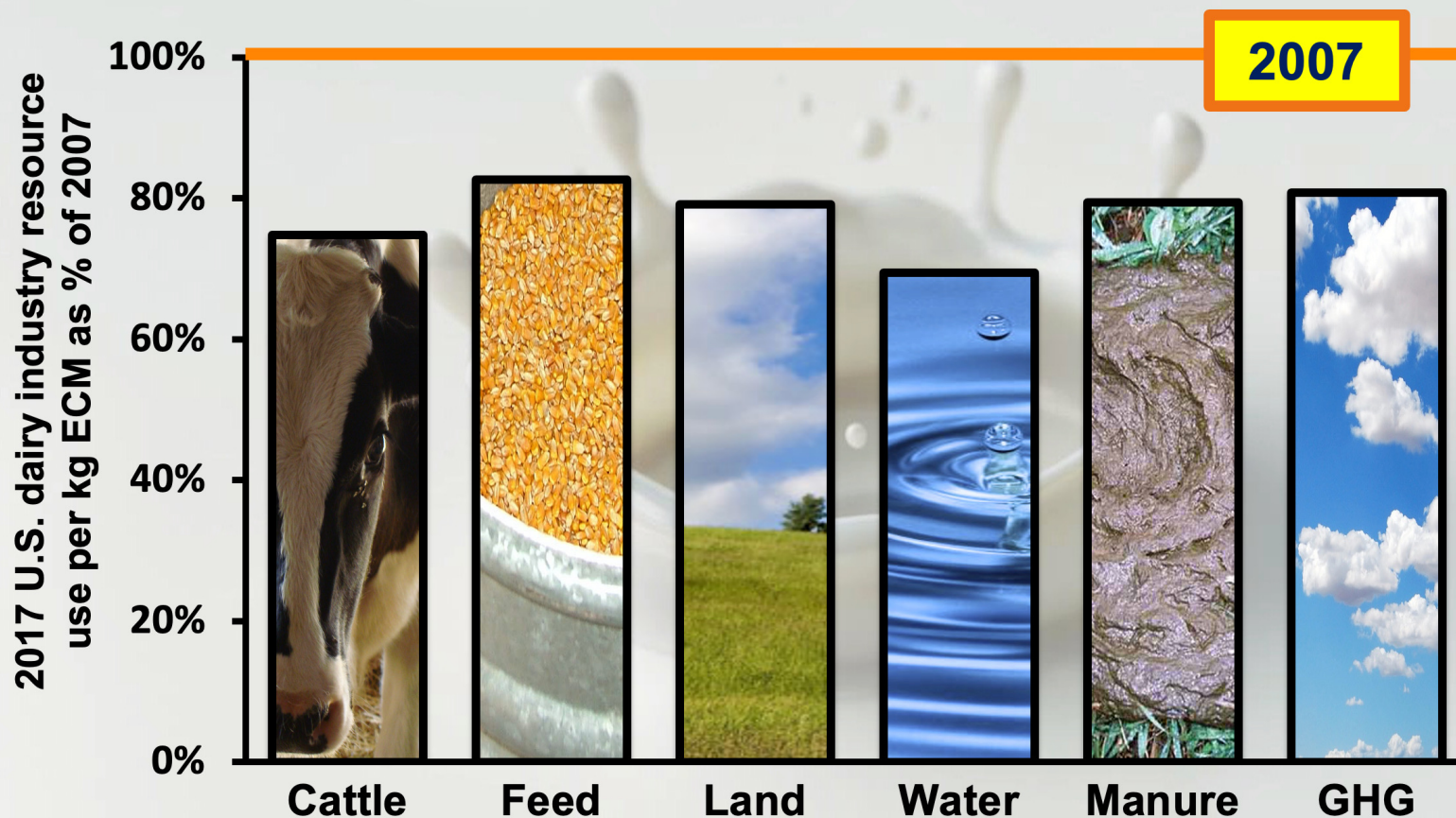
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# U.S. dairy producers cut greenhouse gas emissions by 19% between 2007-2017



Source: Created by Dr. Jude L. Capper, 2021. Data from: Capper, J. L. and Cady, R. A. 2019. The effects of improved performance in the U.S. dairy cattle industry on environmental impacts between 2007 and 2017. *Journal of Animal Science*. <https://doi.org/10.1093/jas/skz291>

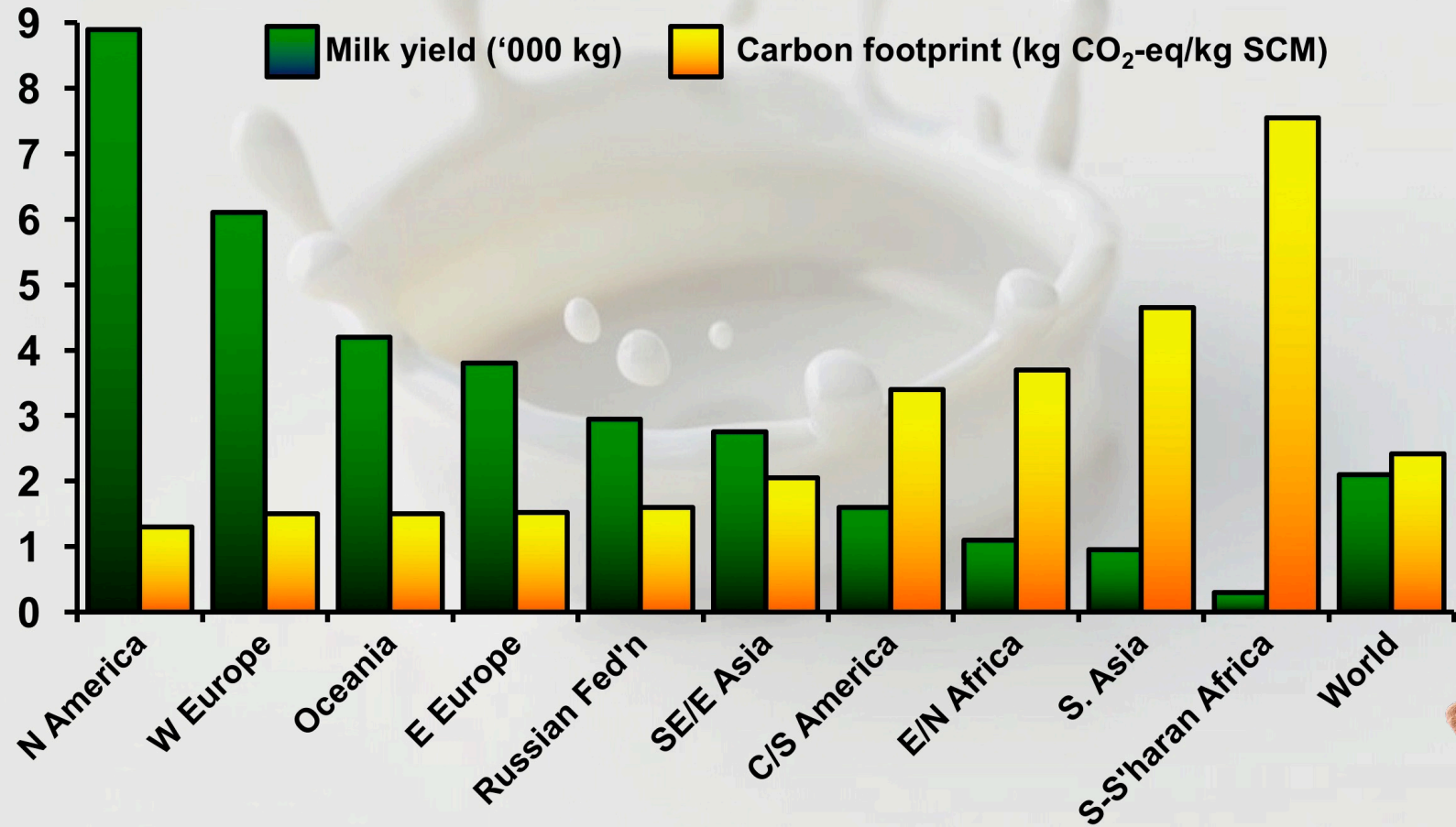
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# A negative correlation exists between milk yield and carbon emissions



Source: Created by Dr. Jude L. Capper, 2016; data from: FAO (2010) Greenhouse Gas Emissions from the Dairy Sector. FAO, Rome, Italy.

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What could global dairying look like if we improved health, nutrition and genetics?

Global average yield

2,577  
kg

UK average yield

8,140  
kg

Dairy cows

-181  
million

If all dairy cattle had UK yields, global milk supply could be maintained using 181 million fewer cows (69%).

At US average yields, 200 million fewer cows (75%)

Source: Created by Dr. Jude L. Capper, 2020. Data from: FAOSTAT (2020) <http://www.fao.org/faostat/en/>

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# What about smallholders?



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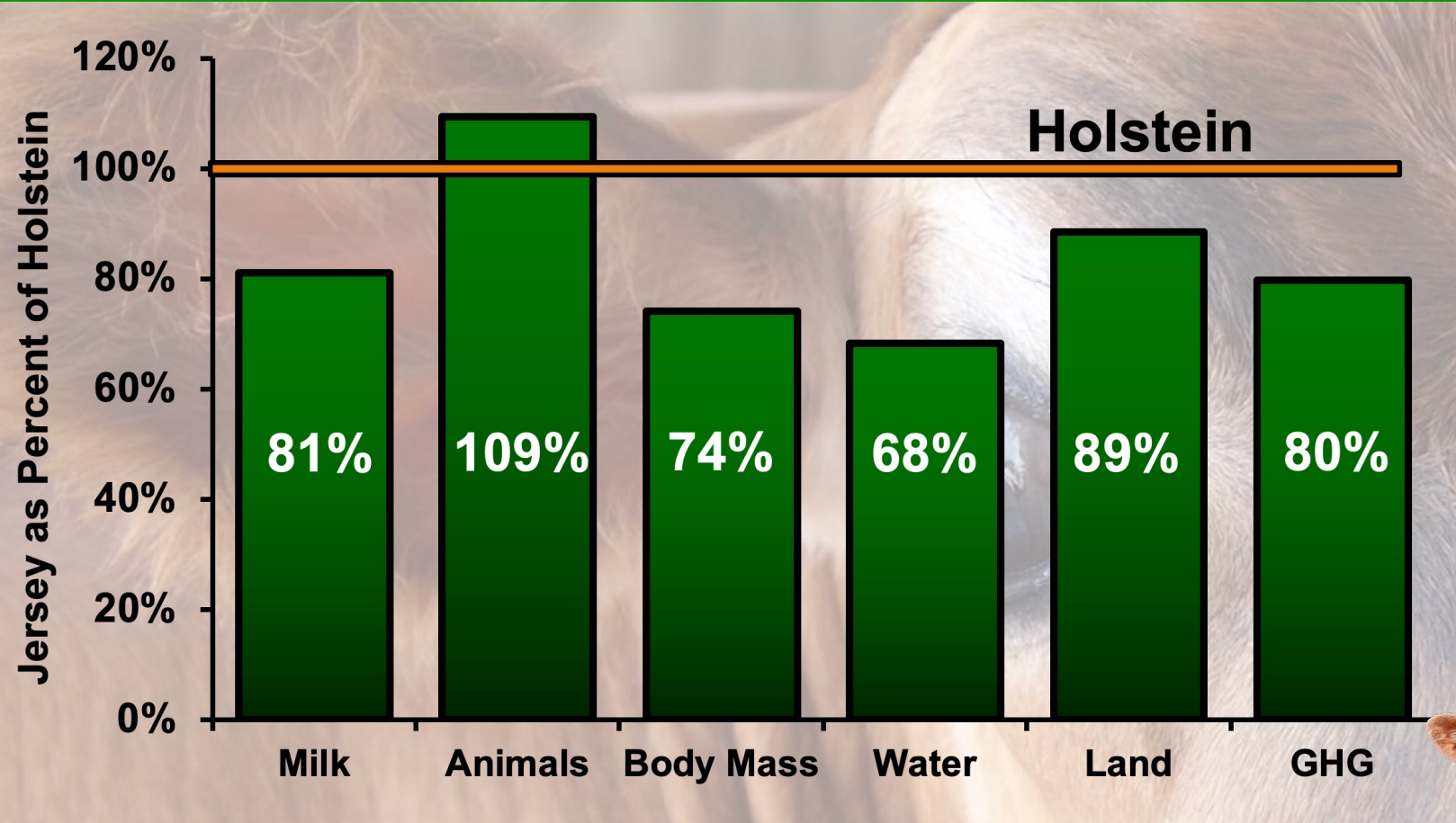
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# Jersey vs. Holstein: smaller cows have environmental advantage for cheese production



Source: Created by Dr. Jude L. Capper, 2020. Data from: Capper and Cady (2012) A comparison of the environmental impact of Jersey vs. Holstein milk for cheese production. *J. Dairy Sci.*

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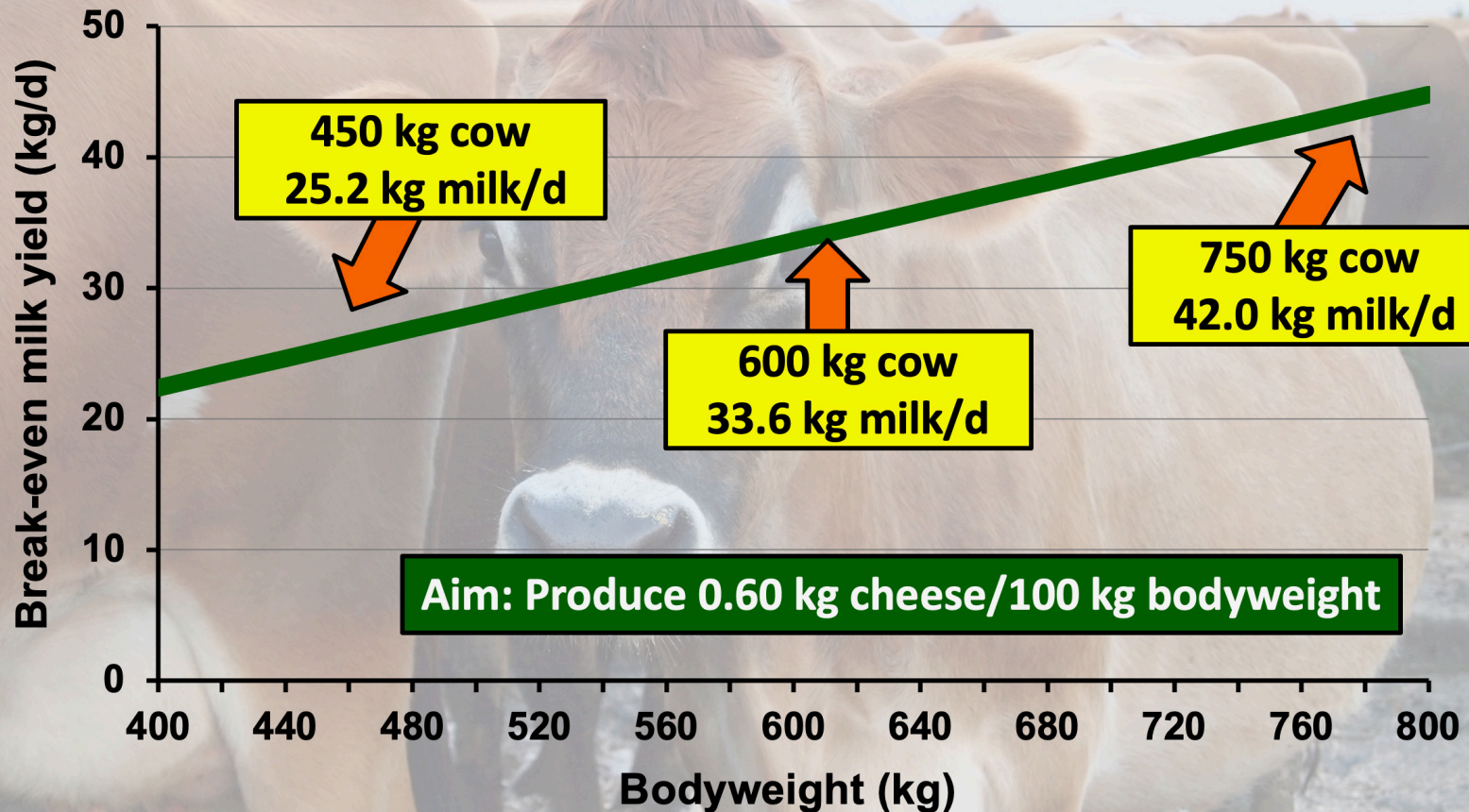


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# Output per kg bodyweight: smaller cow yielding less = big cow yielding more



Source: Created by Dr. Jude L. Capper, 2021. Adapted from Capper, J. L. and R. A. Cady (2012). A comparison of the environmental impact of Jersey vs. Holstein milk for cheese production. *J. Dairy Sci*

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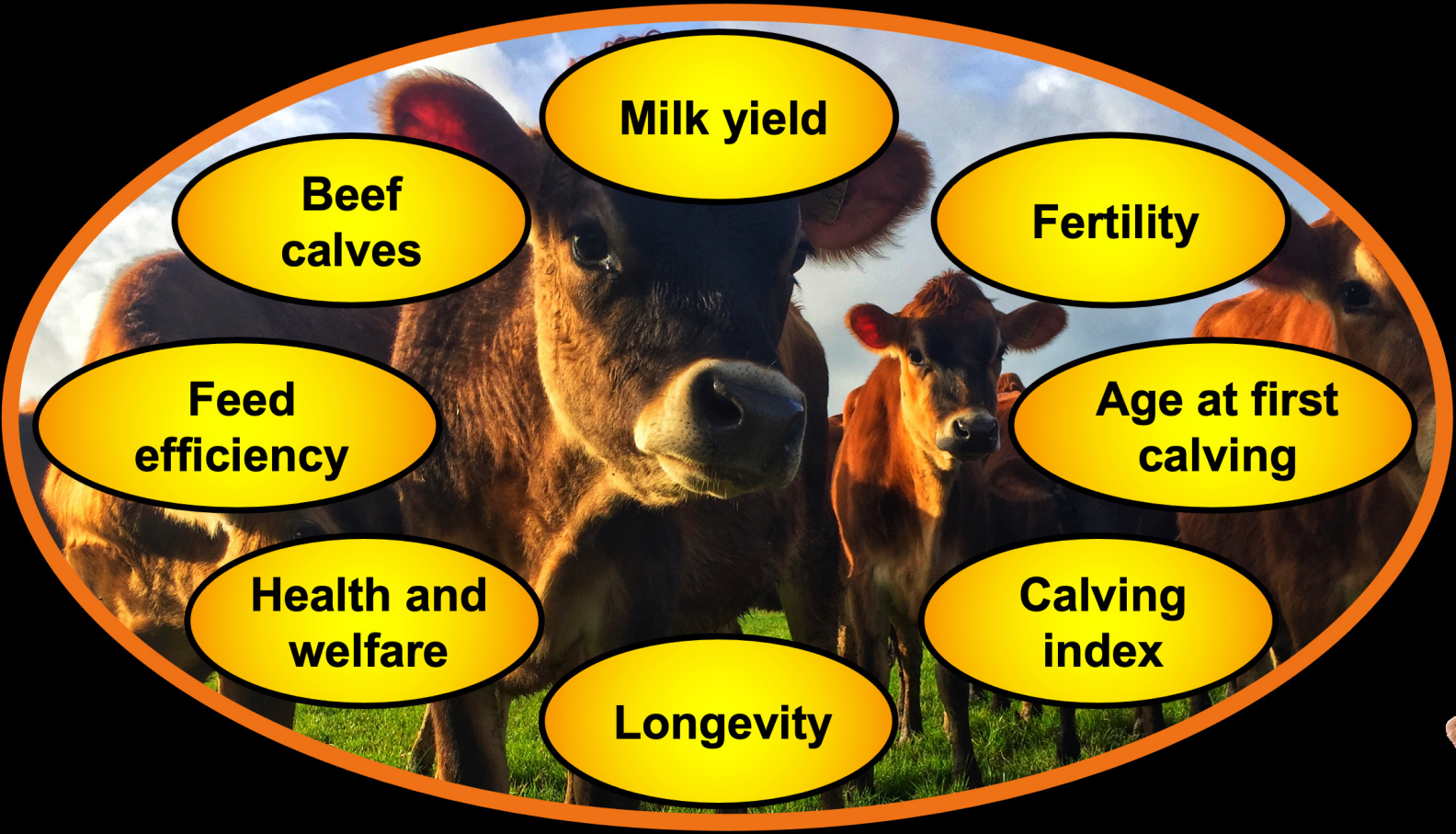
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# Improving performance indicators reduces GHG emissions...but how do they compare?



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Source: Created by Dr. Jude L. Capper, 2021





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# Guilt is a primary motivator for people considering going vegetarian or vegan

*"I sometimes feel guilty when consuming meat and dairy products"*

**66% of meat-eaters and flexitarians thinking of giving up meat said "yes" compared to 25% of national population**

**No guilt  
34%**

**Feel guilty  
66%**



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Source: Created by Dr. Jude L. Capper, 2020. Information from: YouGov (2019) Is the future of food flexitarian?  
<https://yougov.co.uk/topics/resources/articles-reports/2019/03/18/future-food-flexitarian>

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# Welfare, health and environmental concerns are paramount for people giving up dairy

Animal welfare

Healthiness

Environment

Labelling

Economic cost



*"Which, if any, of the following factors might encourage you to adopt a vegan/vegetarian diet?"*

Source: Created by Dr. Jude L. Capper, 2021. Information from: YouGov (2019) Is the future of food flexitarian?  
<https://yougov.co.uk/topics/resources/articles-reports/2019/03/18/future-food-flexitarian>

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# Does big = bad? Are welfare and GHG emissions linked?



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Source: Created by Dr. Jude L. Capper, 2021. Photo credit: Neil Baker, Bakers of Haselbury Plucknett.



AH

Disease losses are significant and preventable, but the sustainability impacts aren't quantified

Lost: 20%

Harvested: 80%

At the worldwide level, average losses due to animal diseases are more than 20% (OIE, 2008)

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Source: Created by Dr. Jude L. Capper, 2020. Data from: World Organization for Animal Health. 2008. <http://www.oie.int/for-the-media/editorials/detail/article/feeding-the-world-better-by-controlling-animal-diseases>

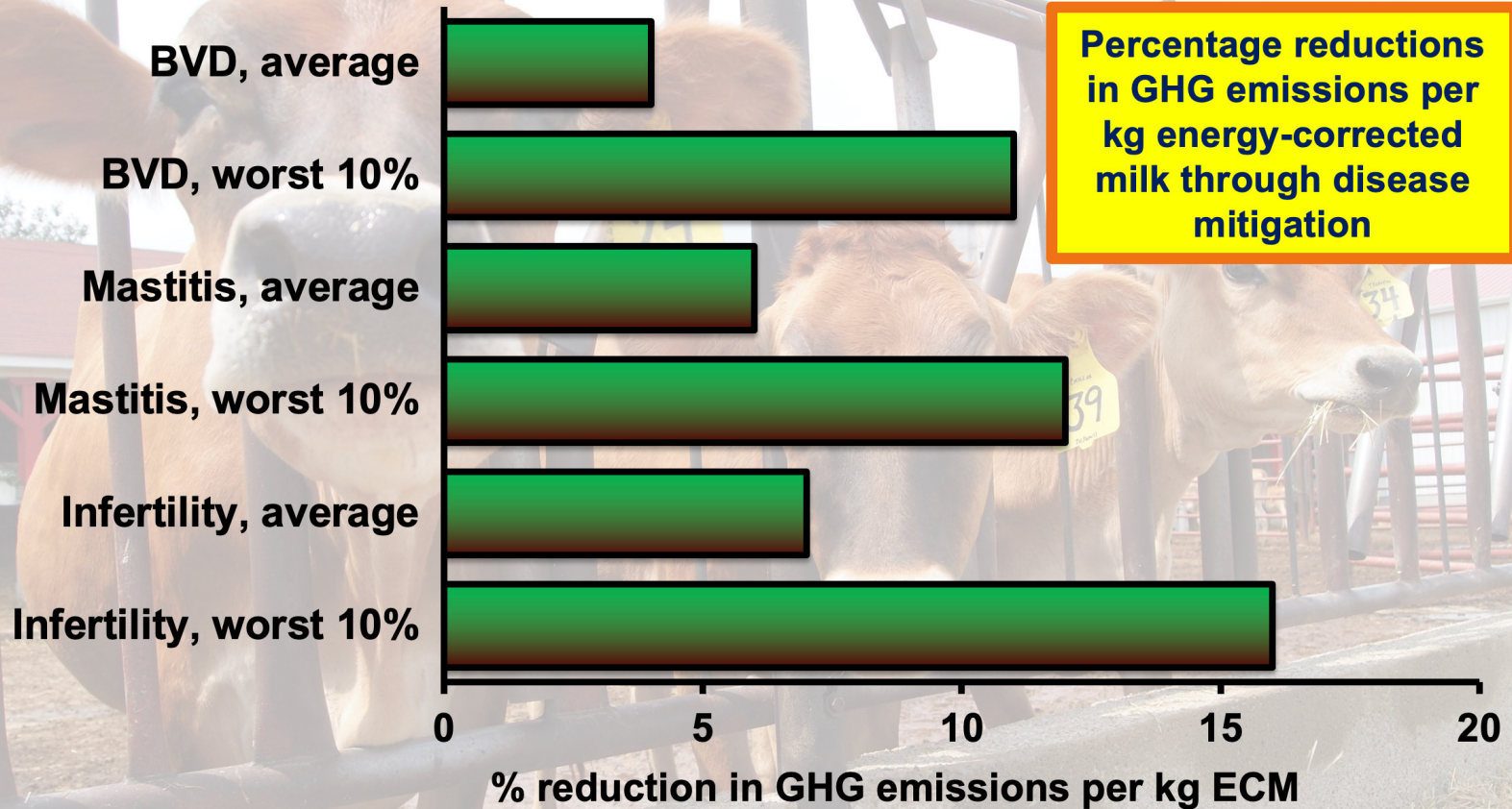
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# GHG emissions could be cut significantly by mitigating dairy diseases - UK



Source: Created by Dr. Jude L. Capper, 2021. Data from: Statham et al. 2021. Dairy Cattle Health and Greenhouse Gas Emissions Pilot Study: Chile, Kenya and the UK. Available from: <https://dairysustainabilityframework.org/wp-content/uploads/2020/10/Dairy-Cattle-Health-and-GHG-Emissions-Pilot-Study-Report.pdf>

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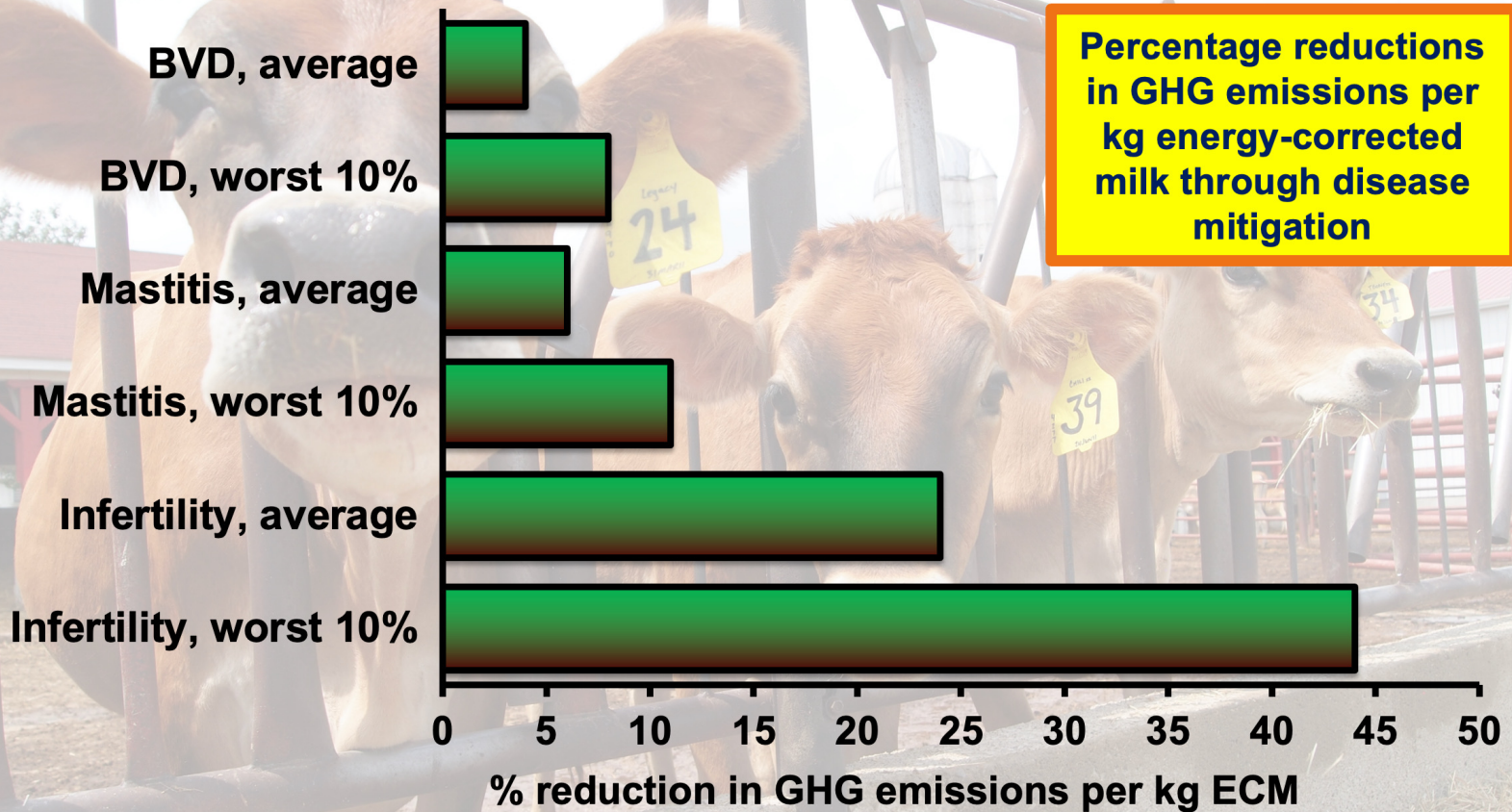
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# GHG emissions could be cut significantly by mitigating dairy diseases - Kenya



Source: Created by Dr. Jude L. Capper, 2021. Data from: Statham et al. 2021. Dairy Cattle Health and Greenhouse Gas Emissions Pilot Study: Chile, Kenya and the UK. Available from: <https://dairysustainabilityframework.org/wp-content/uploads/2020/10/Dairy-Cattle-Health-and-GHG-Emissions-Pilot-Study-Report.pdf>

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What are the milk, meat and greenhouse gas implications of global dairy cow mortality?



Annual milk yield  
**4,500**  
kg

Milk lost if cow dies  
**8,537**  
kg

Meat lost if cow dies  
**430**  
kg CW

Extra GHG emissions  
**3,751**  
kg  
CO<sub>2</sub>e

Source: Created by Dr. Jude L. Capper, 2021. Calculated as an example based on a 4,500 kg annual milk yield, 26 mo age at first calving, 14 mo calving interval, 248 kg carcass weight, 0.69 live calves born/yr, 0.50 calves reared for beef, and average of 1,731 kg CO<sub>2</sub>e GHG emissions per heifer/yr.

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# Sustainability indices will be increasingly present on meat labels in future

## Beef (animal-based) patty

**Nutritional value\***

Serving size: 227 g (8 oz) steak

# 78%

Pure beef protein  
- contains no  
lab-based  
ingredients!

**Sustainability index**



**Carbon footprint (under GWP\*)**



**Water footprint**



**Antibiotic footprint**



**Community support rating**



**Farm webcam and sustainability assessment data**



\*compared to ideal protein



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Source: Created by Dr. Jude L. Capper, 2020.

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Our biggest challenge is to keep meat and dairy in the diets of future food purchasers

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Source: Created by and photo from Dr. Jude L. Capper, 2021.

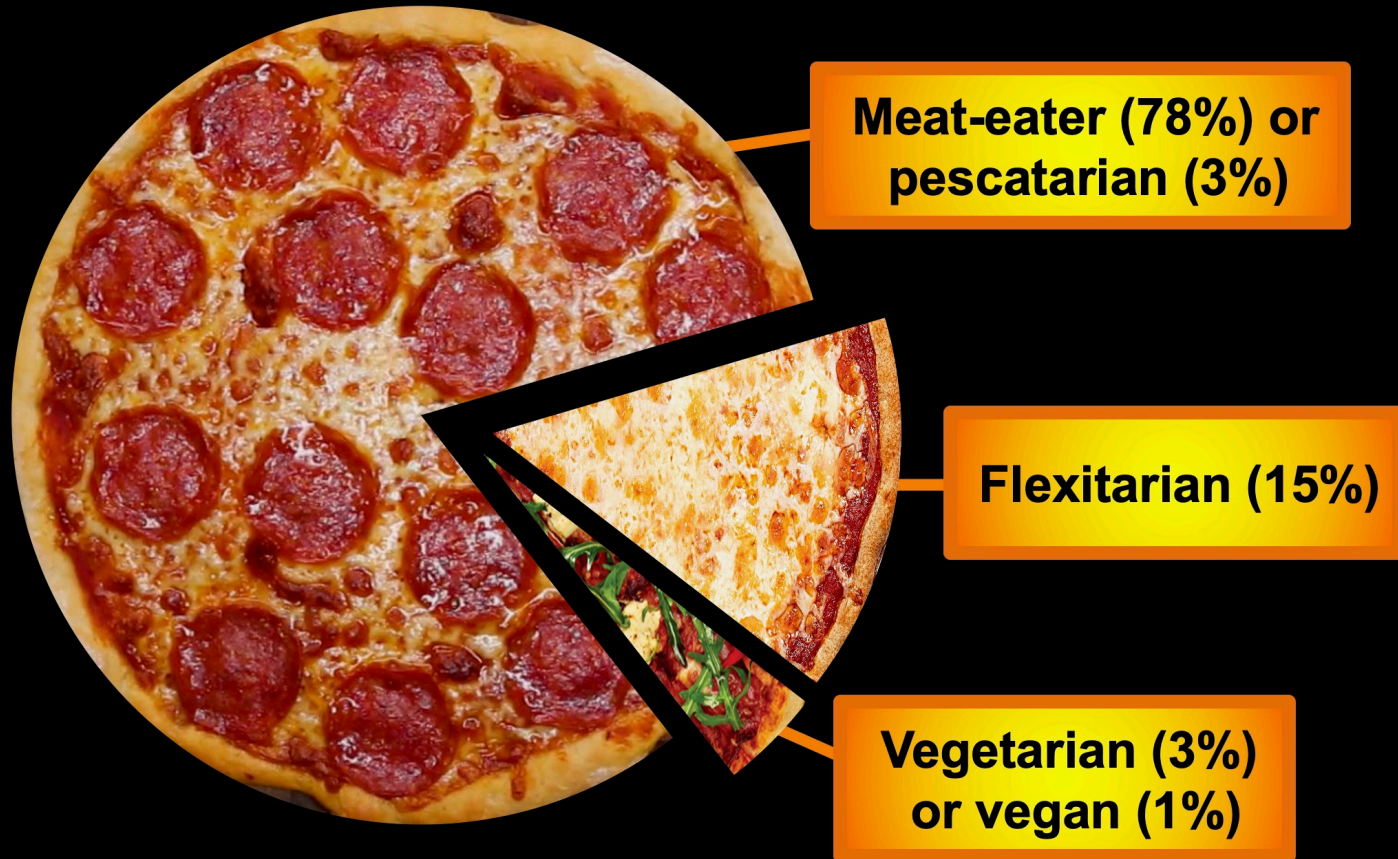
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# The future probably isn't vegan, but it may be flexitarian?



Source: Created by Dr. Jude L. Capper, 2020. Data from: YouGov (2019) Is the future of food flexitarian?  
<https://yougov.co.uk/topics/resources/articles-reports/2019/03/18/future-food-flexitarian> Question: "Which, if any, of these best describes your usual eating habits?" Results adjusted for people who answered "don't know" (3%) or "other" (3%).

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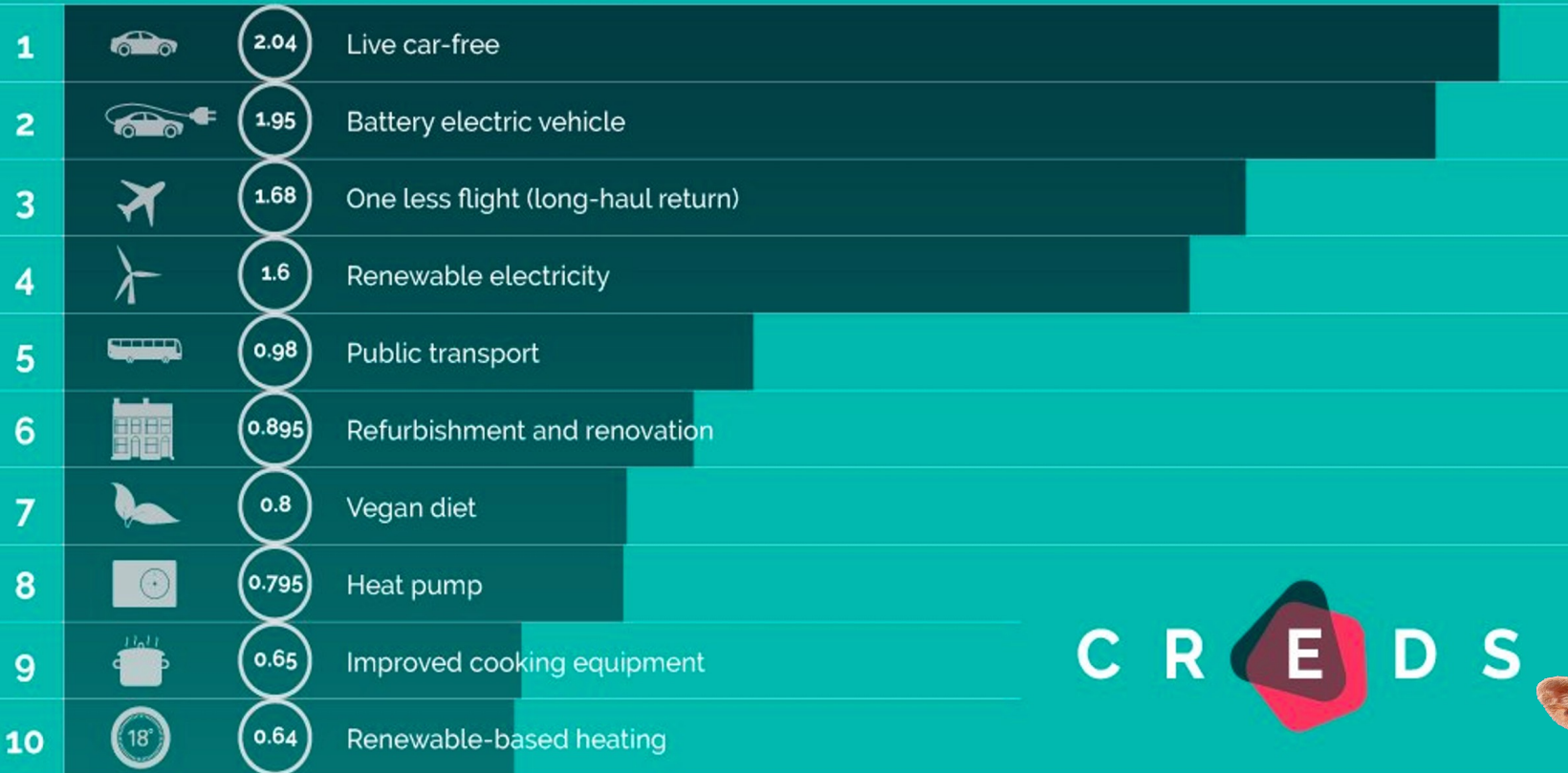




CV

# New CREDS report puts transport, energy and food choices into context

## Top 10 options for reducing your carbon footprint



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Source: Created by Dr. Jude L. Capper, 2020. . Infographic adapted from Centre for Research into Energy Demand Solutions (2020). Available at: [https://twitter.com/CREDS\\_UK/status/1262984570175176704?s=20](https://twitter.com/CREDS_UK/status/1262984570175176704?s=20)

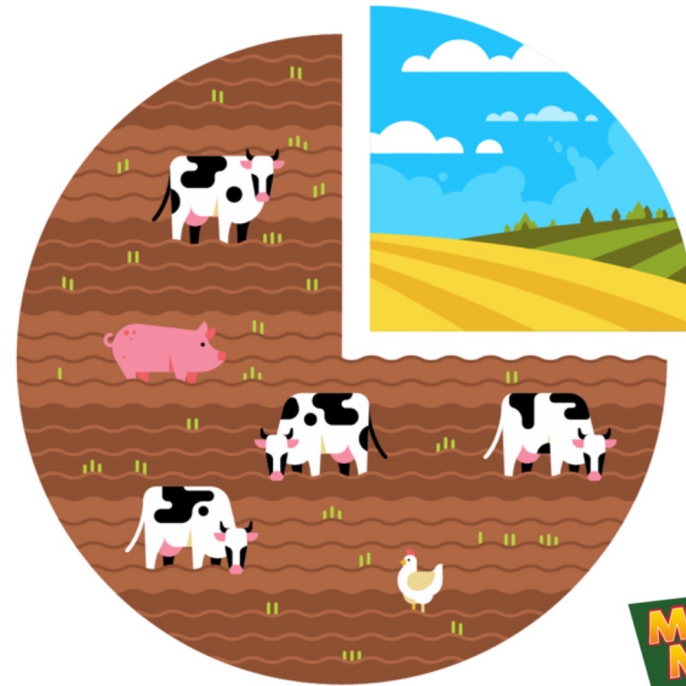


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Bad news bias – need five positive stories to cancel out each negative

We are programmed to believe bad news stories. Tidal wave of factual information needed to overcome them.

LIVESTOCK PRODUCTION USES 75% OF THE EARTH'S AGRICULTURAL LAND.



MEATLESS MONDAY

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Source: Created by Dr. Jude L. Capper, 2020. Infographic from: <https://www.pinterest.co.uk/pin/254383078939543245/>

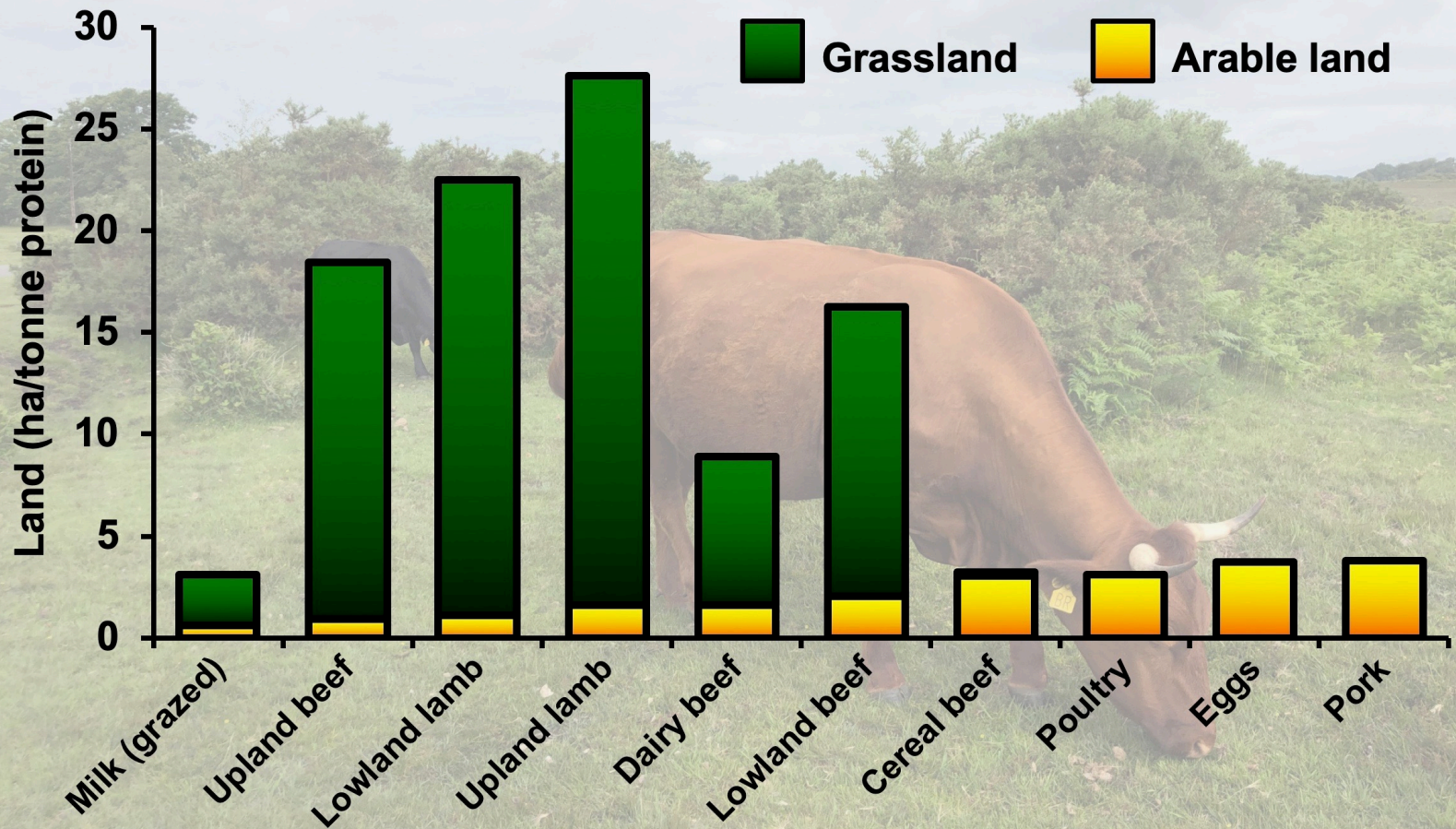
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# Livestock systems vary widely in arable and grassland use



Source: Created by Dr. Jude L. Capper, 2020; data from Wilkinson and Lee (2018) Review: Use of human-edible animal feeds by ruminant livestock. *Animal*.

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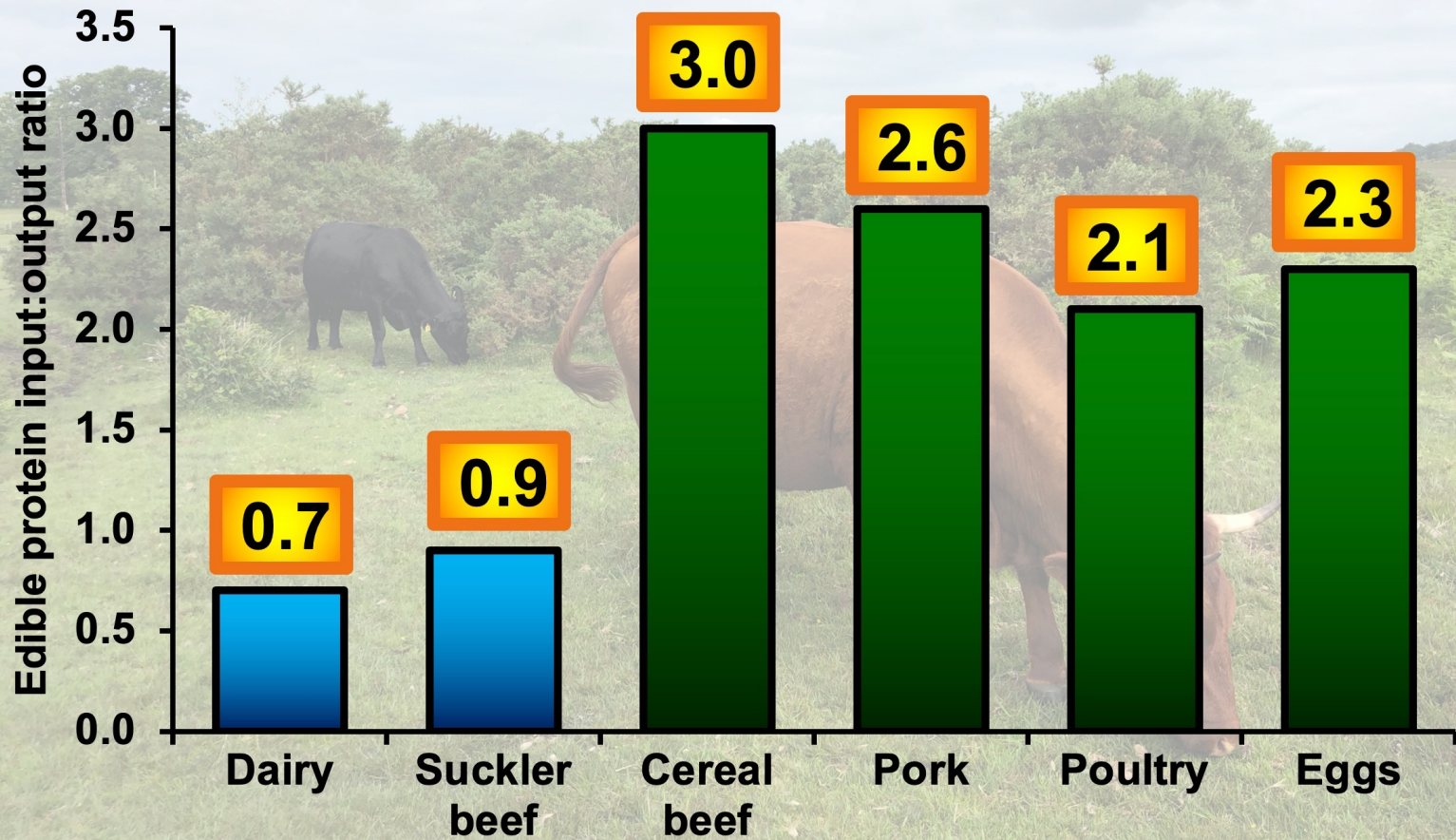
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# Grazing cattle systems produce more human-edible protein than they consume



Source: Created by Dr. Jude L. Capper, 2020; data from Wilkinson (2011) Re-defining efficiency of feed use by livestock. *Animal*.

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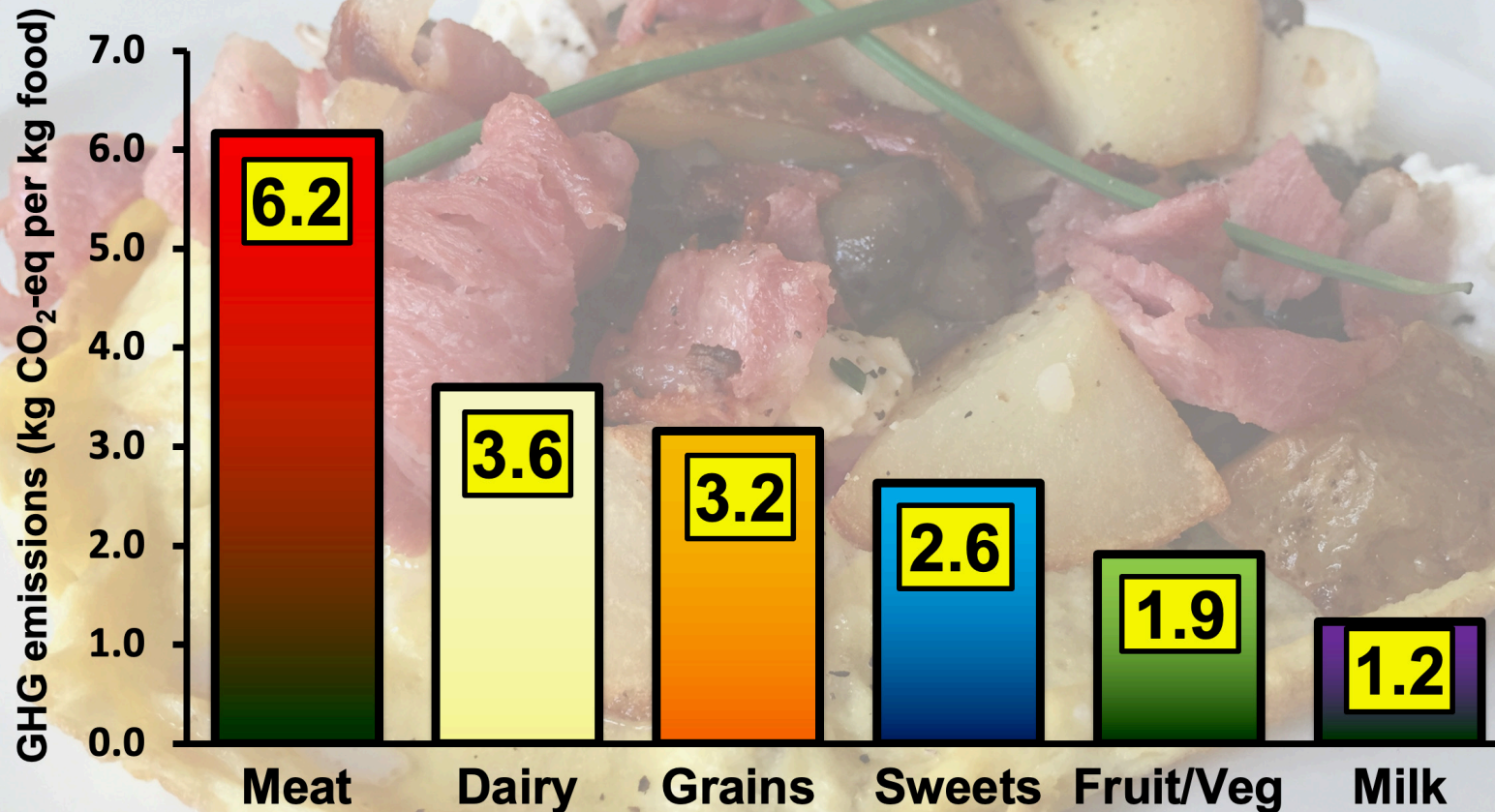
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# Carbon footprints vary between foods



Source: Created by Dr. Jude L. Capper, 2021. \*All food groups refer to product categories (i.e. dairy products rather than milk) and fruit/veg refers to processed products. Product data from: Drewnowski et al (2015) Energy and nutrient density of foods in relation to their carbon footprint. *American Journal of Clinical Nutrition*. Milk data from: DairyCo (2013) Greenhouse gas emissions on British dairy farms. AHDB, Stoneleigh, UK.

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## Drinks vary in nutrient density and greenhouse gas emissions

	Nutrient density	Carbon footprint g CO <sub>2</sub> /100 g drink
Whole milk	53.8	99
Orange juice	17.2	61
Soya juice	7.6	30
Oat juice	1.5	21
Red wine	1.2	204
Soda	0.0	109
Beer	0.0	101
Water	0.0	10

Source: Created by Dr. Jude L. Capper, 2020. Data from: Smedman et al. (2010). Nutrient density to climate impact (NDCI) index of beverages. Food & Nutr. Res.

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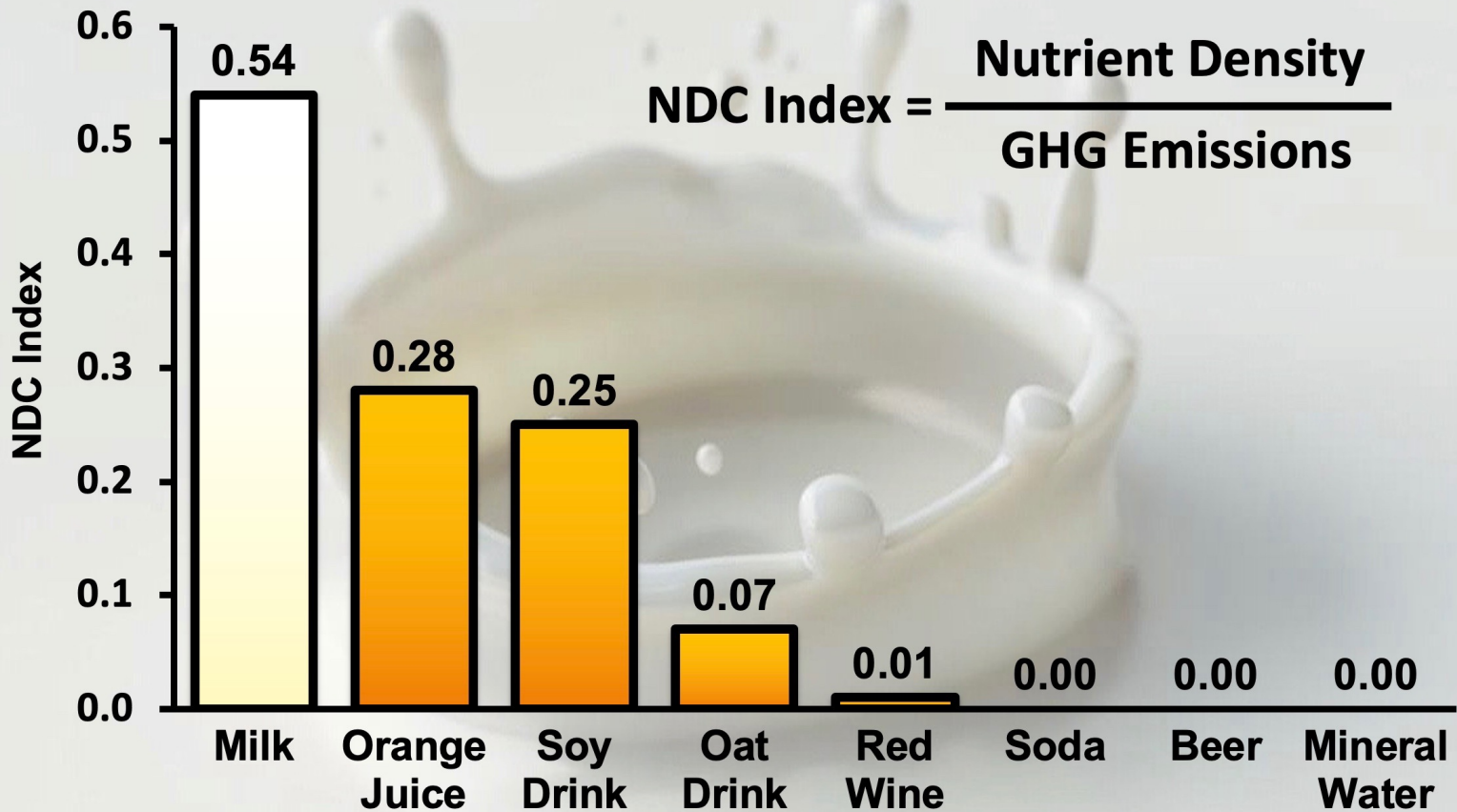
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# Nutrient density should be included when assessing carbon footprint



Source: Created by Dr. Jude L. Capper, 2020. Data from: Smedman et al. (2010). Nutrient density to climate impact (NDCI) index of beverages. Food & Nutr. Res.

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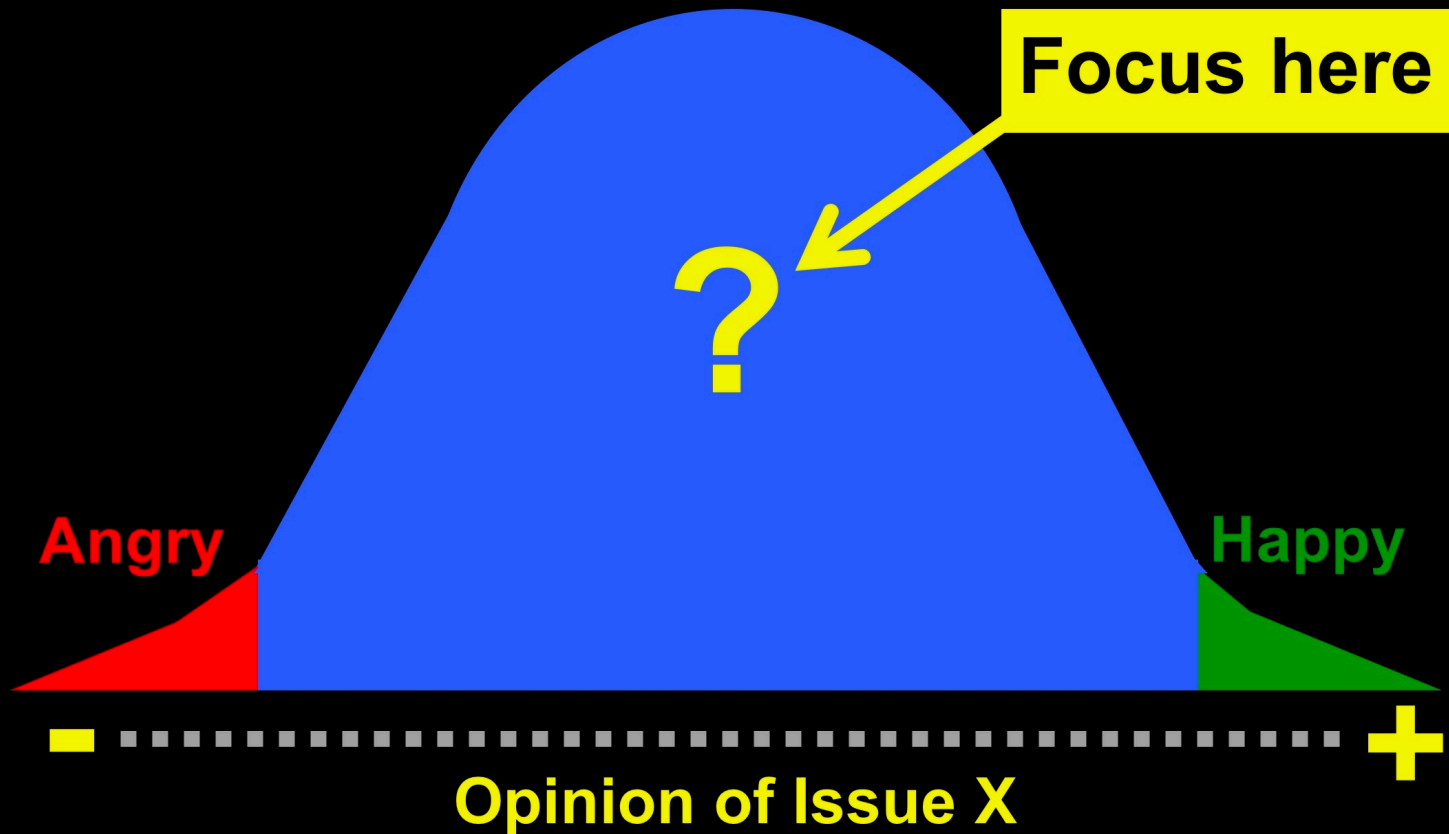
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We need to communicate with consumers who don't yet have fixed opinions of agriculture



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Source: Created by Dr. Jude L. Capper, 2017

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## 5 easy tips for positive communication

**Share your values**

**Stay positive, polite and personal**

**Keep it short, simple and see-through**

**Focus on the important**

**Know when to walk away**

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Source: Created by Dr. Jude L. Capper, 2019. Adapted from: Capper and Yancey. 2015. Communicating Animal Science to the General Public. *Animal Frontiers*.



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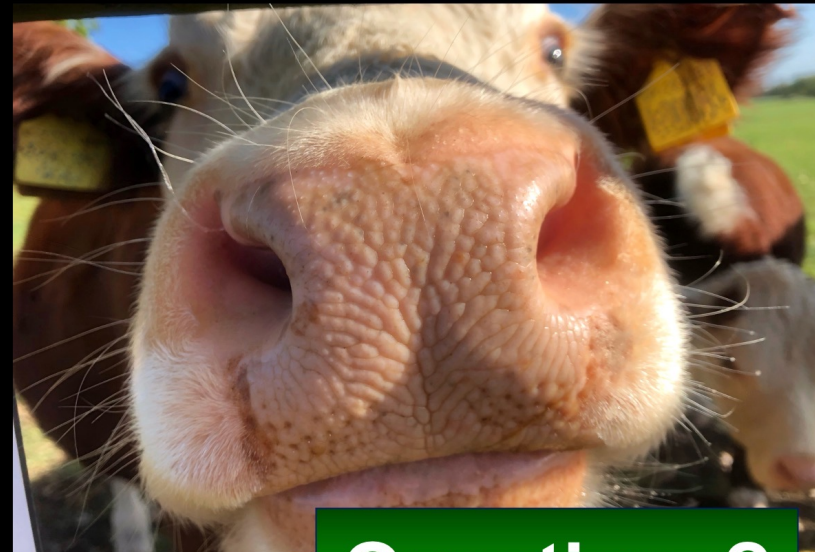
# Thank you!

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<http://bovidiva.com/presentationlinks>

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## Questions?

Source: Created by Dr. Jude L. Capper, 2022. Cartoon from: <http://snipurl.com/methanecartoon>

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