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It's not easy
being green –
how do we
keep beef
sustainable?

Coleg Cambria Llysfasi

11th February 2022

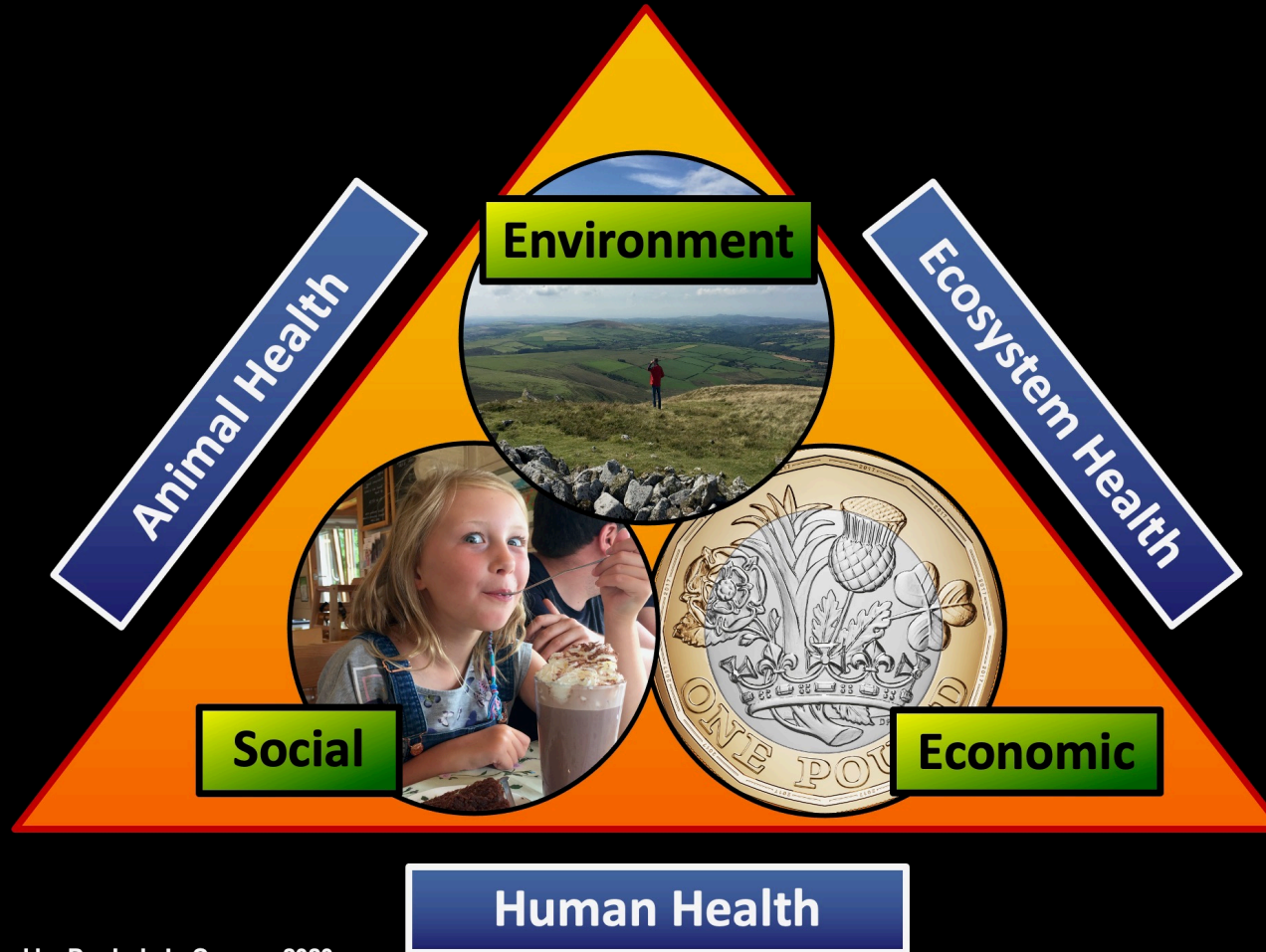
Source: Dr. Jude L. Capper, 2022



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



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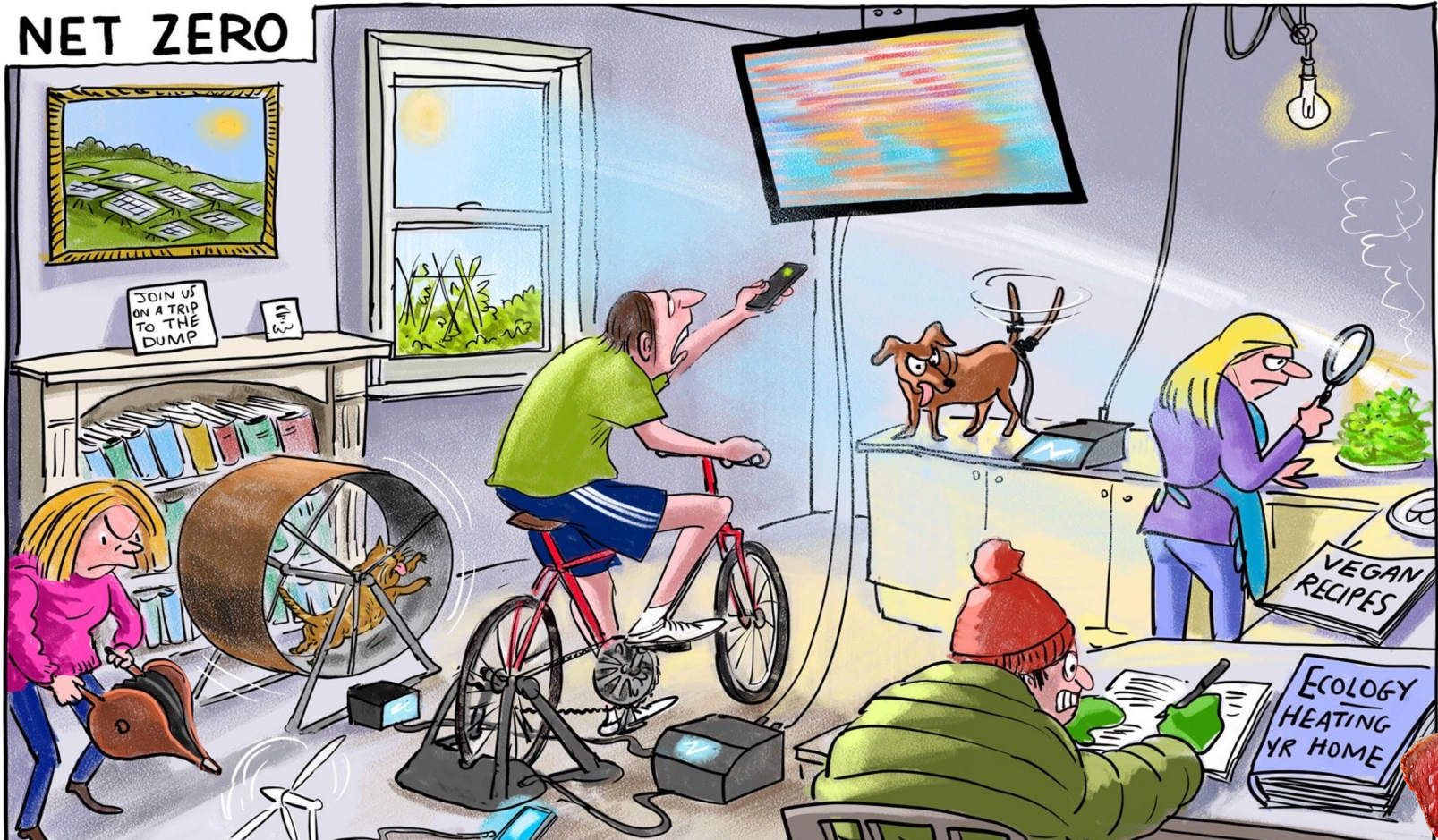
Source: Created by Dr. Jude L. Capper, 2020.

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S

Net Zero is a clear priority

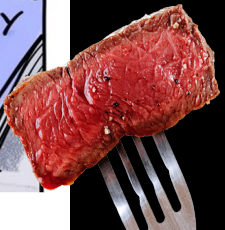


Source: Created by Dr. Jude L. Capper, 2021. Cartoon from: <https://twitter.com/Cartoon4sale/status/1384537729460056067?s=20>

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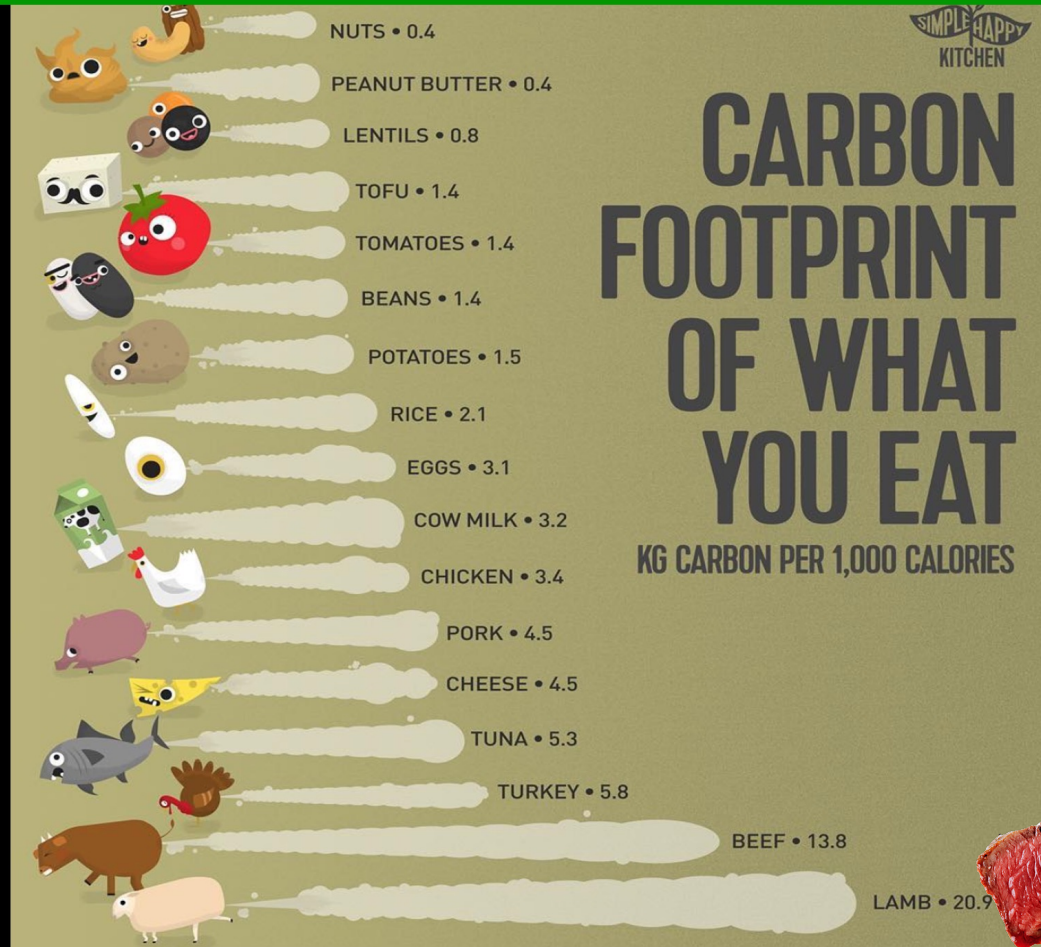
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Global averages are meaningless

The carbon footprints of the foods we eat vary considerably – global average figures are inappropriate when food production is regional



Source: Created by Dr. Jude L. Capper, 2020, infographic from: https://www.instagram.com/simple_happy_kitchen/

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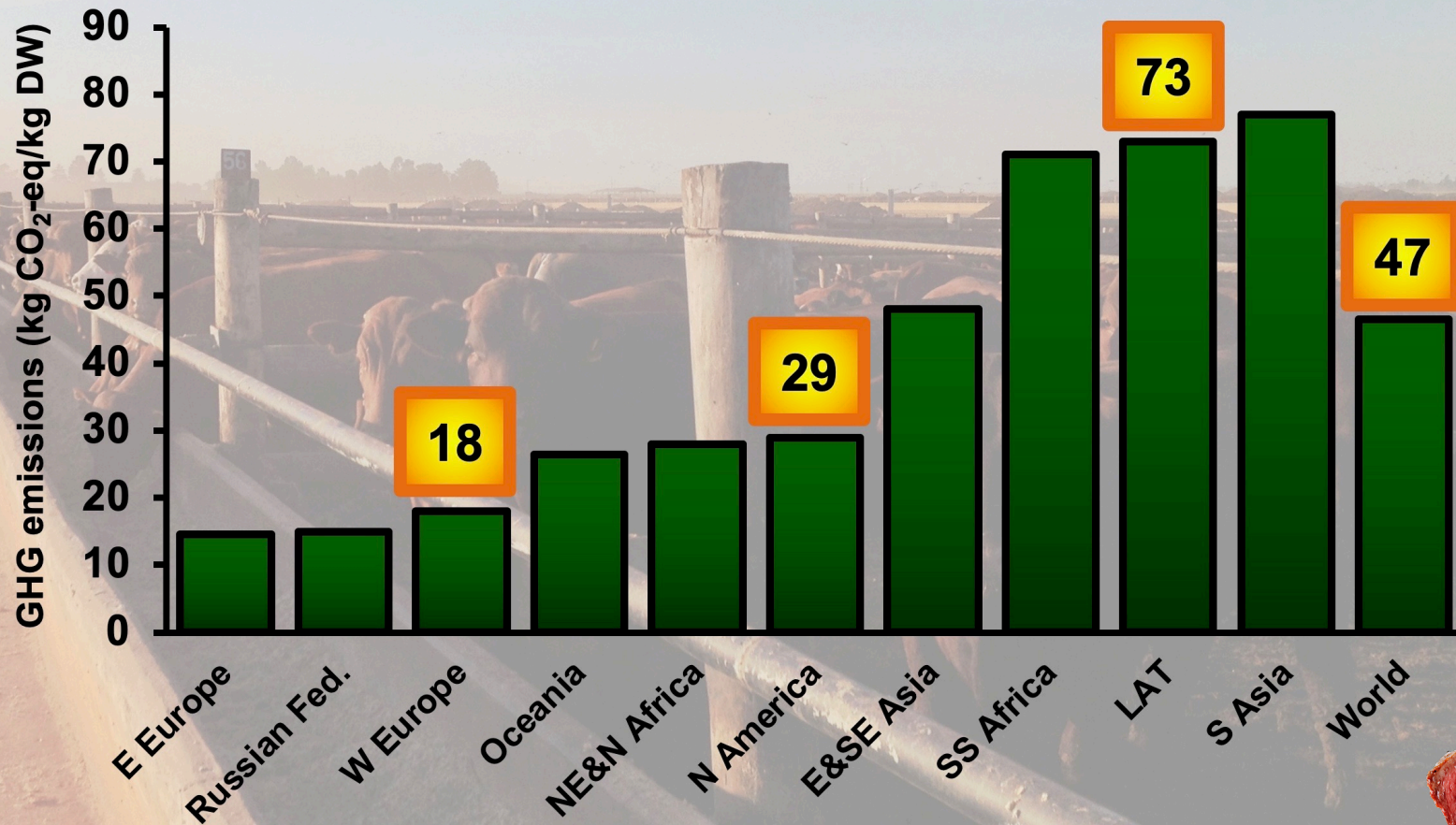
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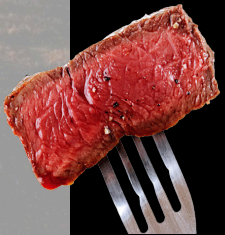
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The carbon footprint of beef production varies across the globe



Source: Created by Dr. Jude L. Capper, 2020; data from Gerber et al. (2013) Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. FAO, Rome, Italy.

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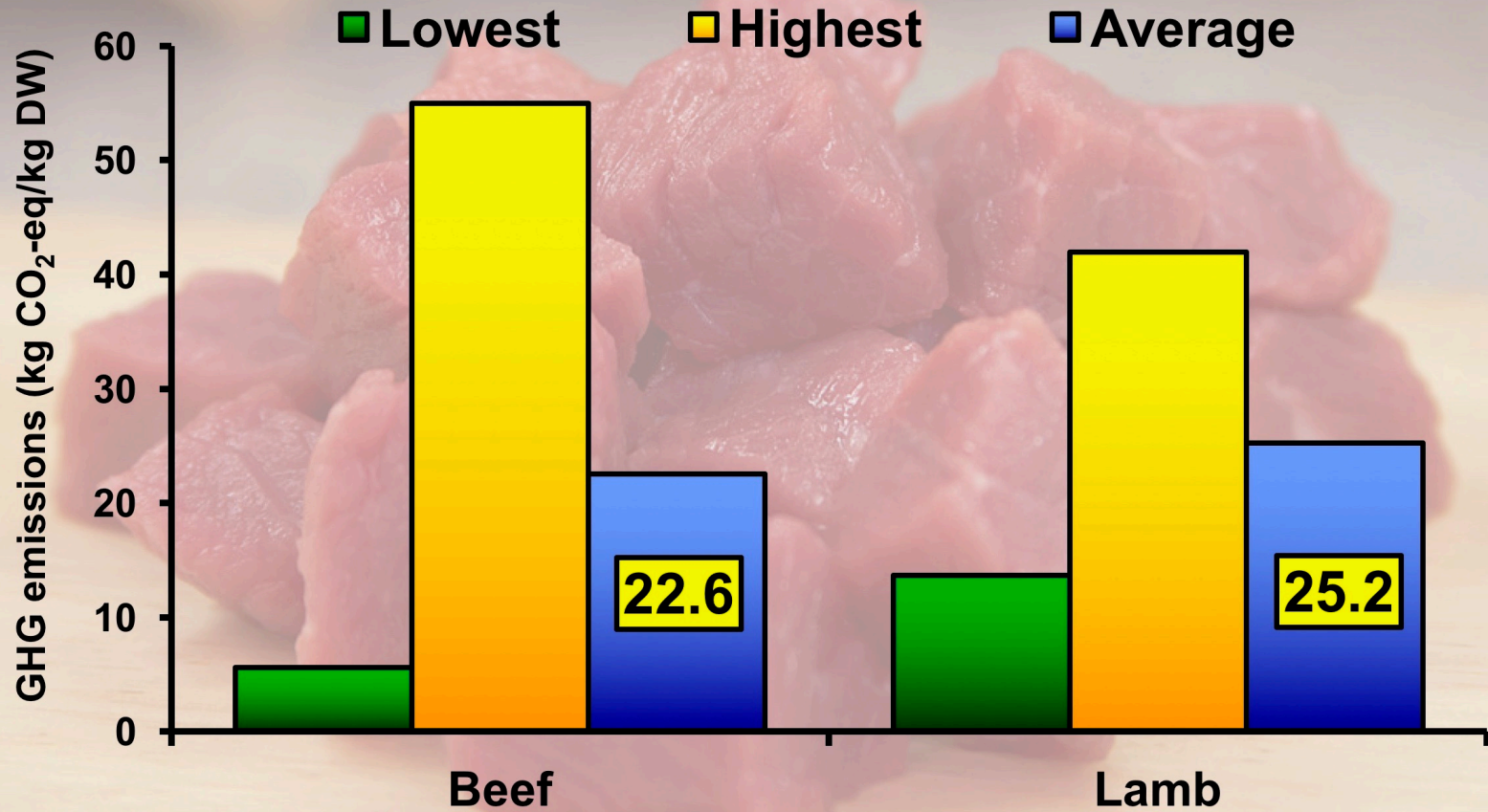


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Carbon footprints of English beef and lamb show significant variation



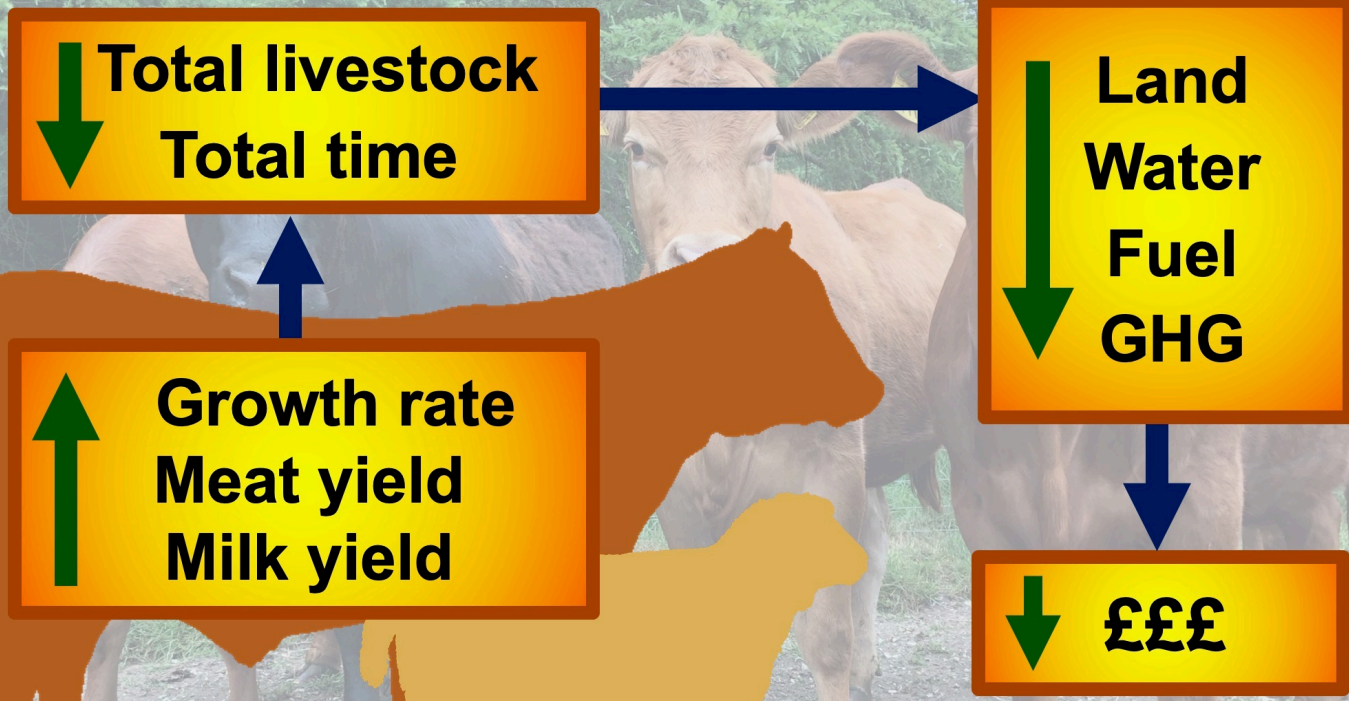
Source: Created by Dr. Jude L. Capper, 2016; data from 131 beef units and 57 sheep units analyzed by E-CO₂ and reported in: EBLEX (2012) Down to Earth – The Beef and Sheep Roadmap – Phase Three. AHDB, Stoneleigh, UK.

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Improving animal productivity reduces the environmental impact of milk and meat



Source: Created by Dr. Jude L. Capper, 2020. Data from: Capper, JL. 2015. Sustainability and One Health. In: Cockcroft, P. *Bovine Medicine*. Wiley-Blackwell, Oxford, UK.

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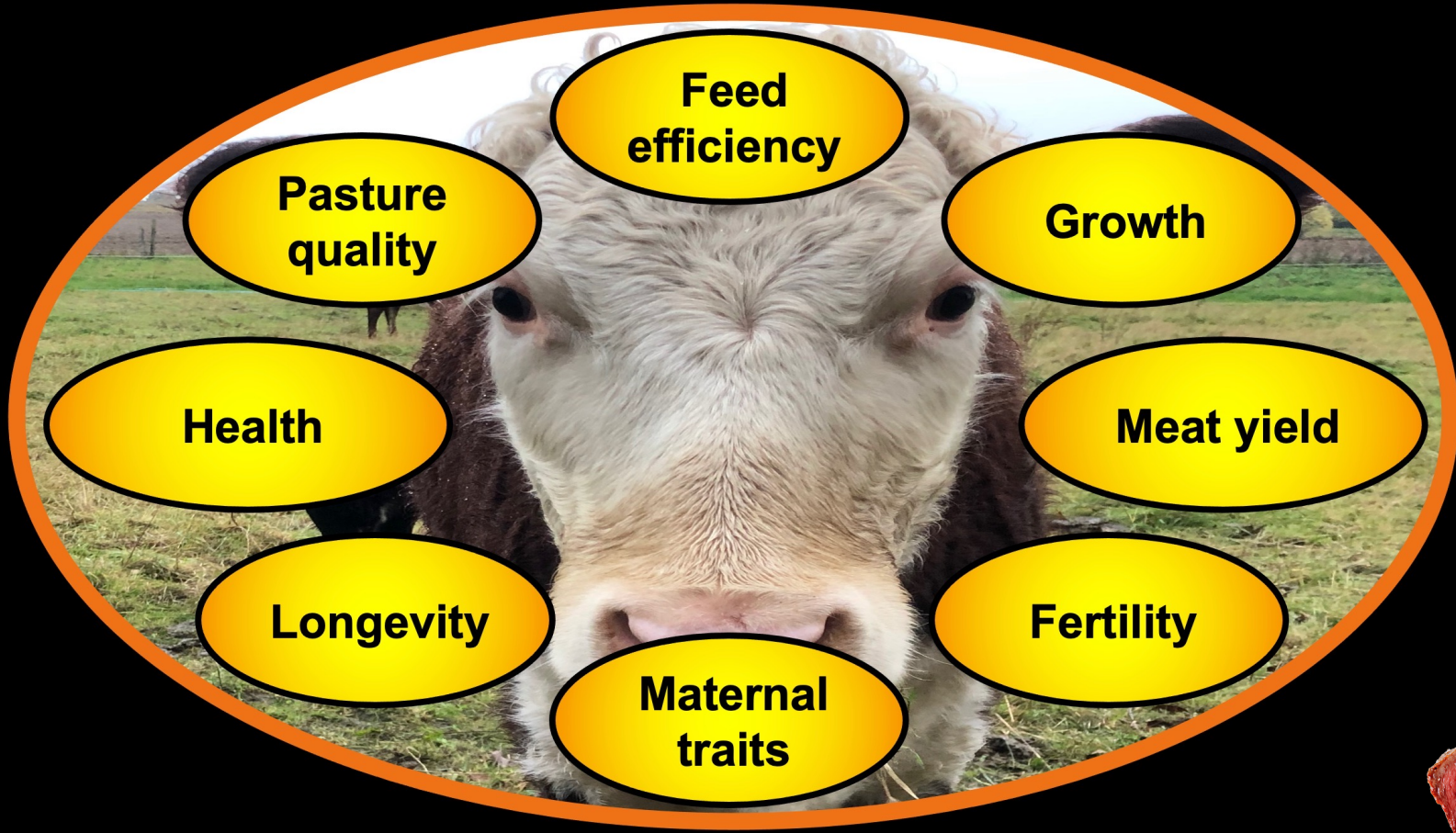


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Doing everything better on-farm improves economic and environmental sustainability



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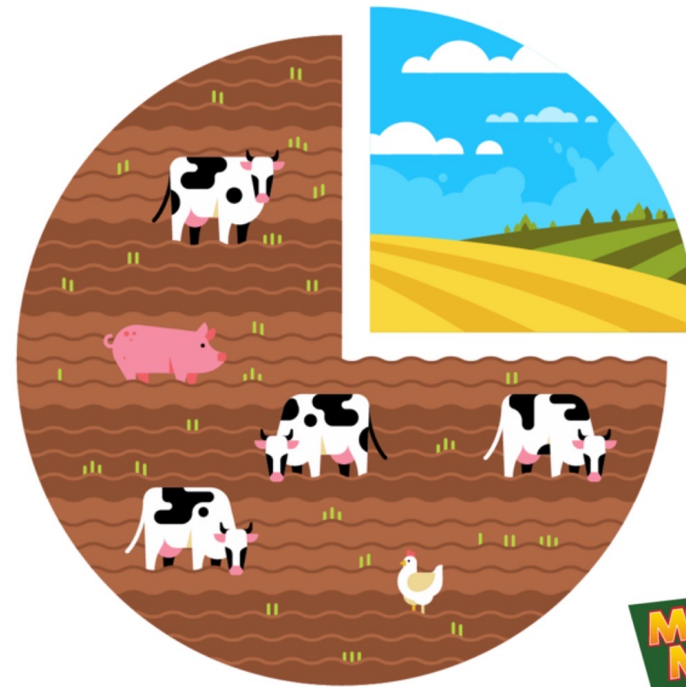
Source: Created by Dr. Jude L. Capper, 2021

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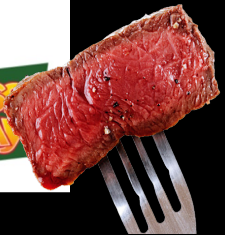
Bad news bias – need five positive stories to cancel out each negative

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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Can we grow human food crops everywhere?



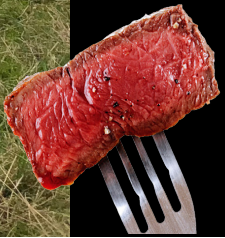
Source: Created by Dr. Jude L. Capper, 2021

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65% of UK land is not suitable for growing arable crops



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Source: Created by Dr. Jude L. Capper, 2020. Grazing land includes temporary grass on arable land (6% of total), land used for outdoor pigs or no agricultural purposes not shown (1.7% of total). Data from DEFRA. 2019. Farming statistics - provisional crop areas, yields and livestock population at 1 June 2019 – United Kingdom.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/837834/structure-jun2019prov-UK-10oct19.pdf



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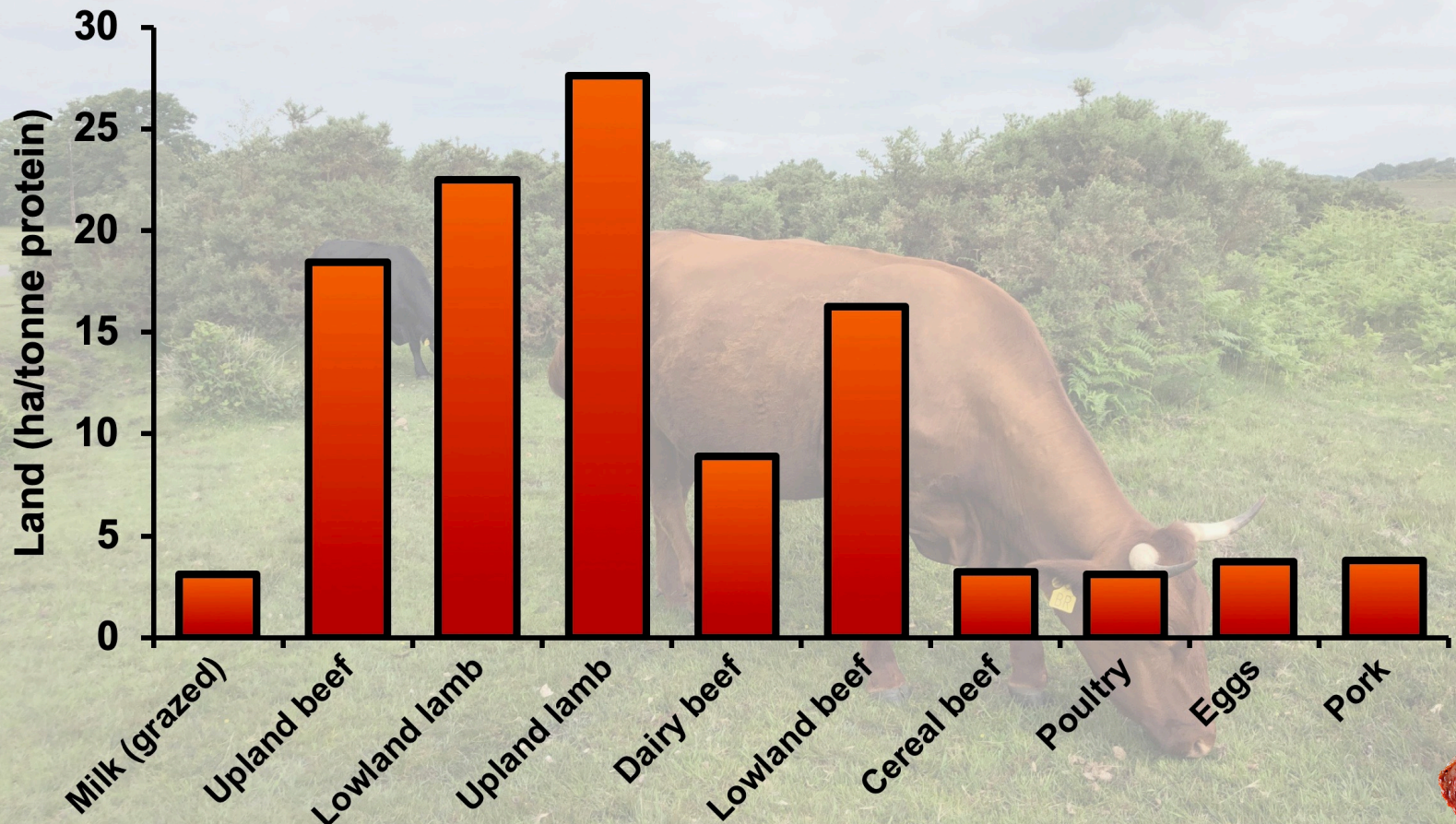
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Livestock systems vary widely in land use



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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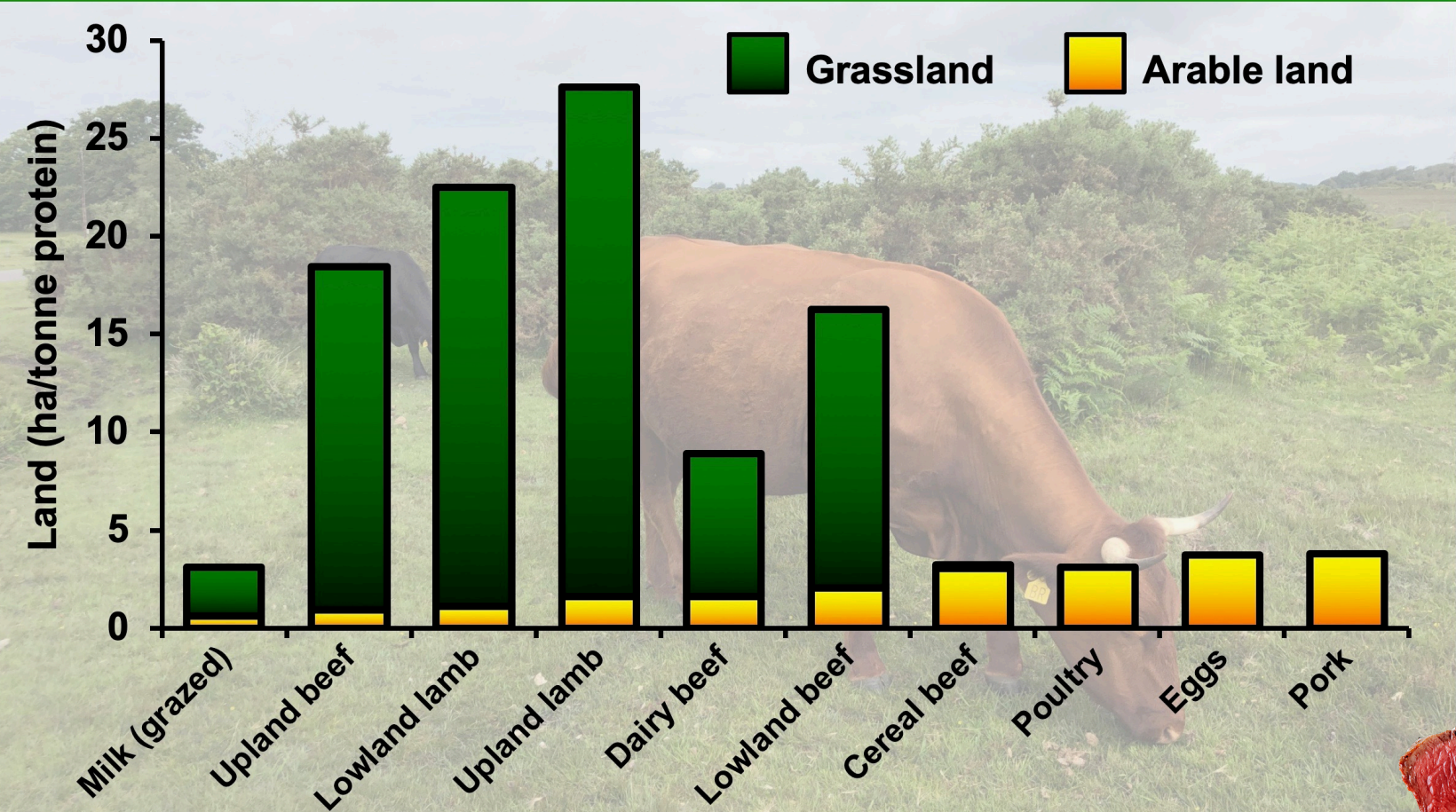


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Livestock systems vary widely in arable and grassland use



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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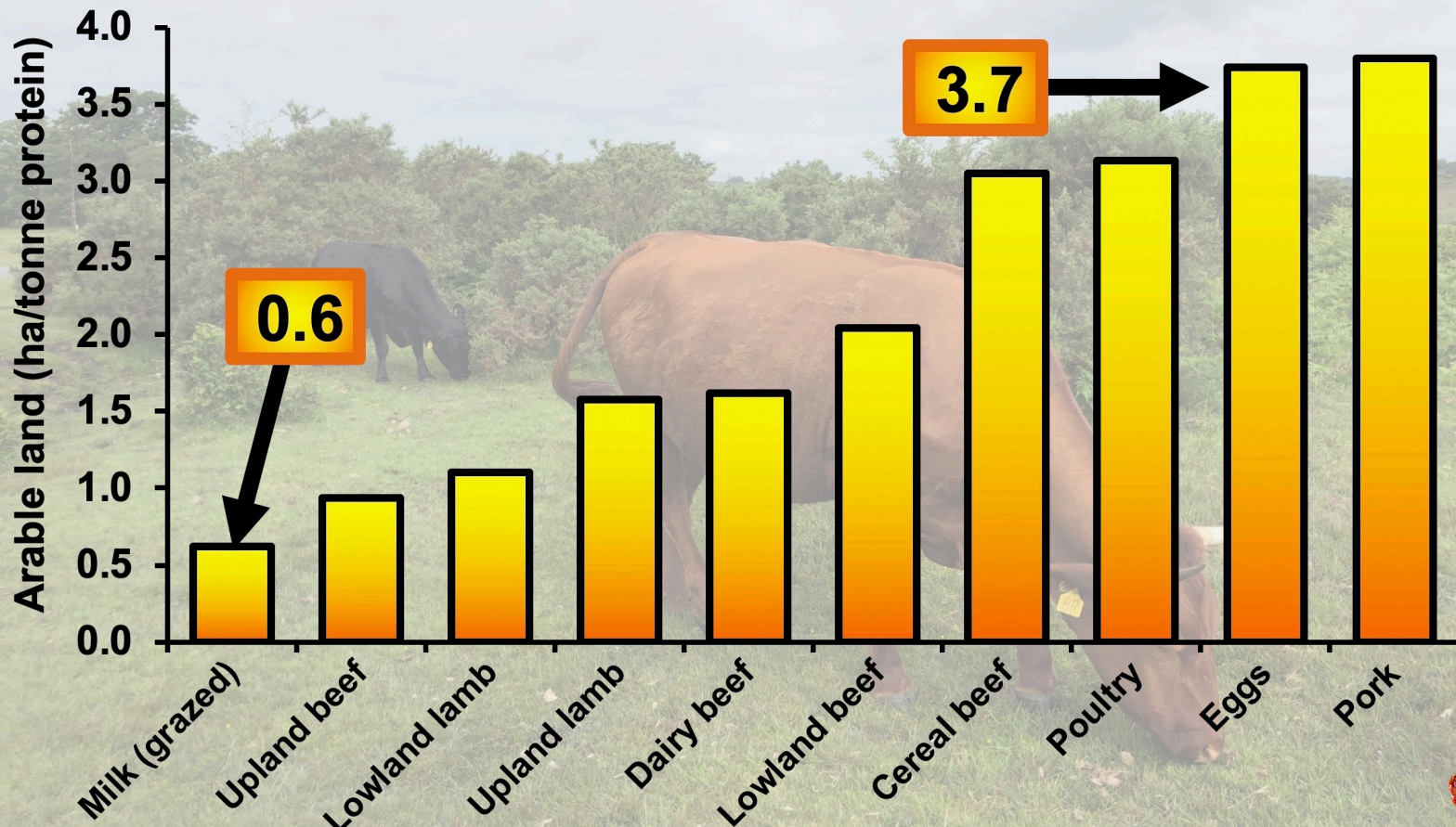
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Livestock systems vary widely in arable land use



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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What do these industries have in common? They all provide by-products fed to animals



Source: Created by Dr. Jude L. Capper, 2013

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Attractively presented misinformation can be difficult to counter

the leading cause of climate change

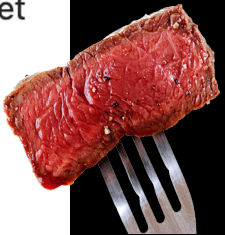


So much is being emitted that life on Earth is collapsing!



get.plant.ed Is animal agriculture responsible for 87% of annual greenhouse gases? A new study by [@climatehealers](#) says yes! When accounting for cumulative human-made greenhouse gas, aerosol emissions and the impact of deforestation, the scientists found that animal agriculture is responsible for more global warming than all the CO2 from fossil fuel sources combined. This contradicts other reports that claim animal agriculture only causes 14.5% of greenhouse gases. Either way, the consensus is that animal agriculture is unsustainable, and switching to a plant-based diet is the most effective action you can take to help the planet

Source: Slide created by Dr. Jude L. Capper, 2021. Screenshot from [@get.plant.ed](#) on Instagram.



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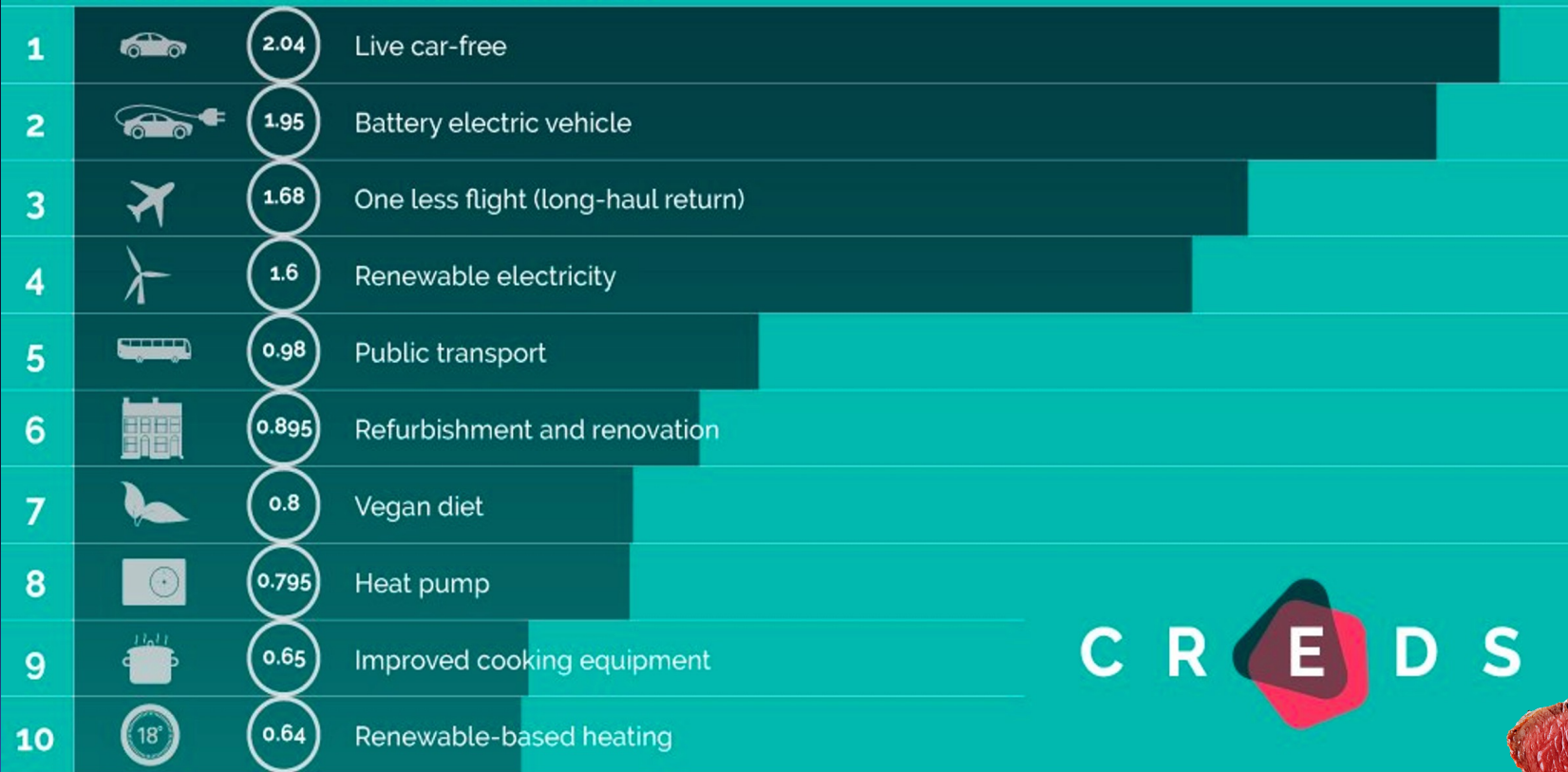


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CV

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

Top 10 options for reducing your carbon footprint



CREDS



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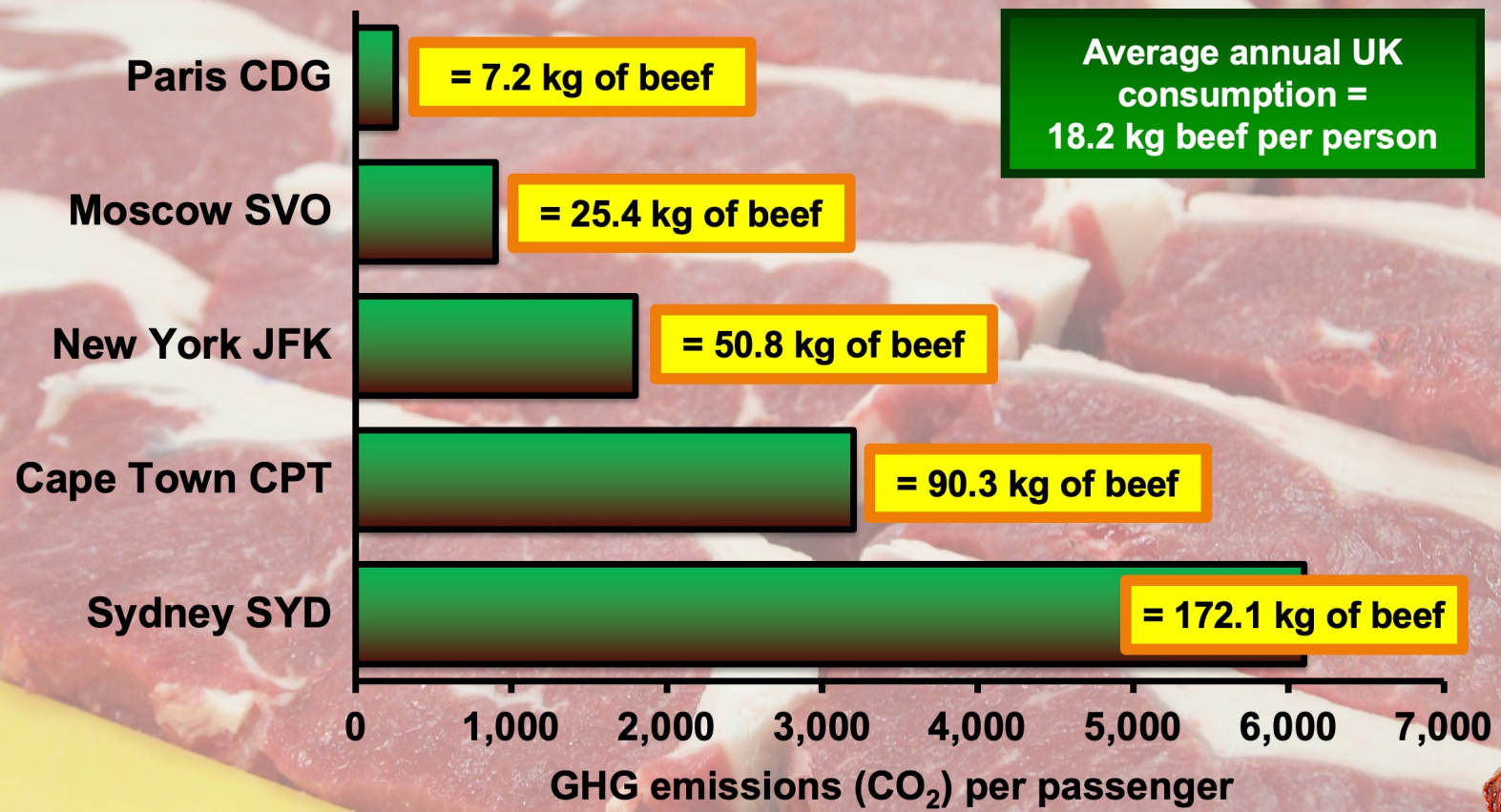


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Source: Created by Dr. Jude L. Capper, 2020. . Infographic adapted from Centre for Research into Energy Demand Solutions (2020). Available at: https://twitter.com/CREDS_UK/status/1262984570175176704?s=20

CV

International flights emit considerable quantities of carbon compared to beef production



Source: Created by Dr. Jude L. Capper, 2020. Calculations based on GHG emissions flight data from: https://co2.myclimate.org/en/flight_calculators/new, and on a carbon footprint per kg of boneless beef of 35.5 kg CO₂-eq (under GWP100) from AHDB: http://beefandlamb.ahdb.org.uk/wp-content/uploads/2013/05/p_cp_down_to_earth300112.pdf

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



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

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"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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Animal welfare and human health are major concerns for people giving up animal products

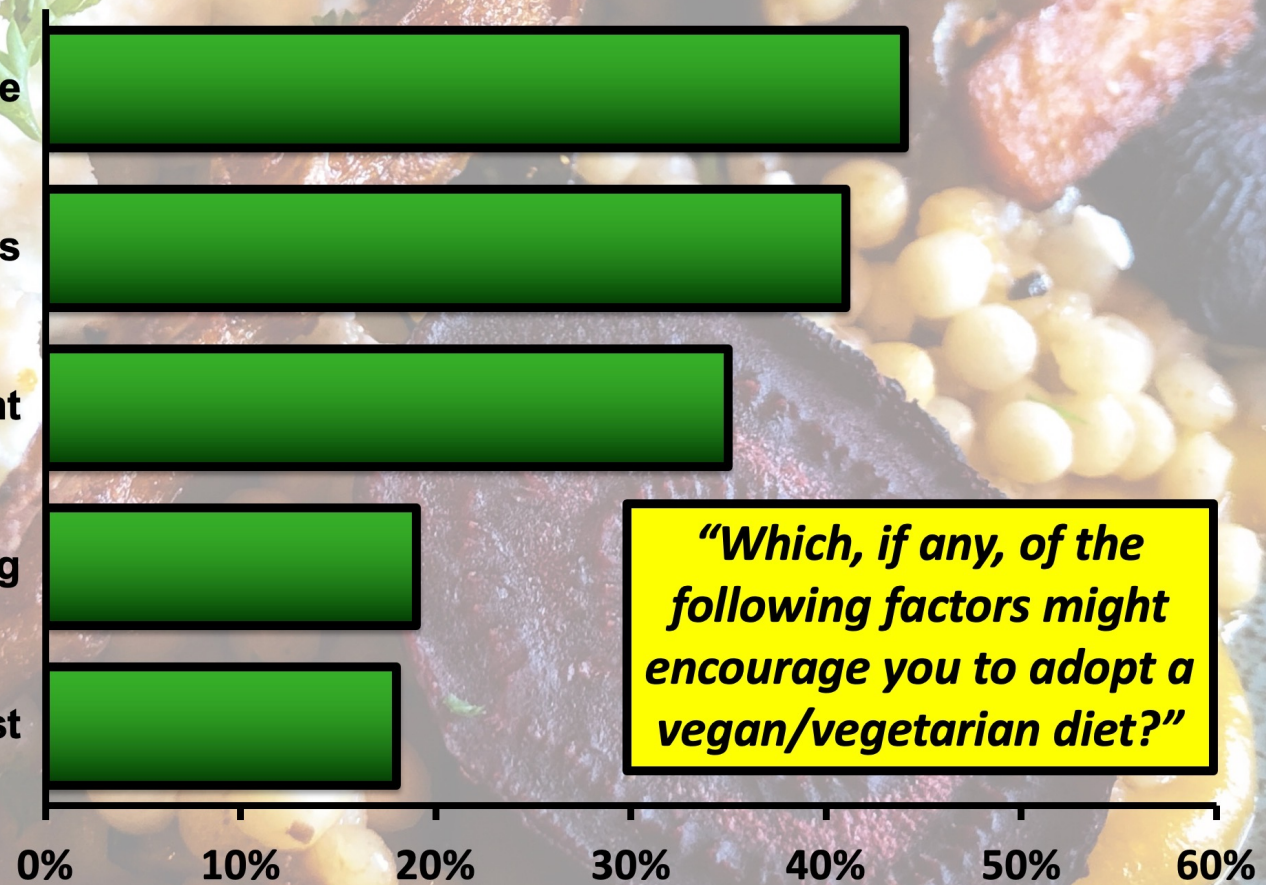
Animal welfare

Healthiness

Environment

Labelling

Economic cost



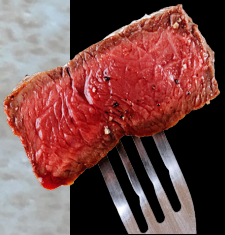
Source: Created by Dr. Jude L. Capper, 2020. Information from: YouGov (2019) Is the future of food flexitarian?
<https://yougov.co.uk/topics/resources/articles-reports/2019/03/18/future-food-flexitarian>

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Do 582,538 Veganuary participants amount to more than a hill of beans?

**JOIN THE
NEW YEAR'S
REVOLUTION**



- Slightly smaller than the population of Sheffield
- If all participants were UK-based they would comprise <1% of the UK population
- Average of 2,787 per participating country
- 62% of participants already vegan, vegetarian or pescatarian

Source: Created by Dr. Jude L. Capper, 2021. Information from: <https://veganuary.com/>

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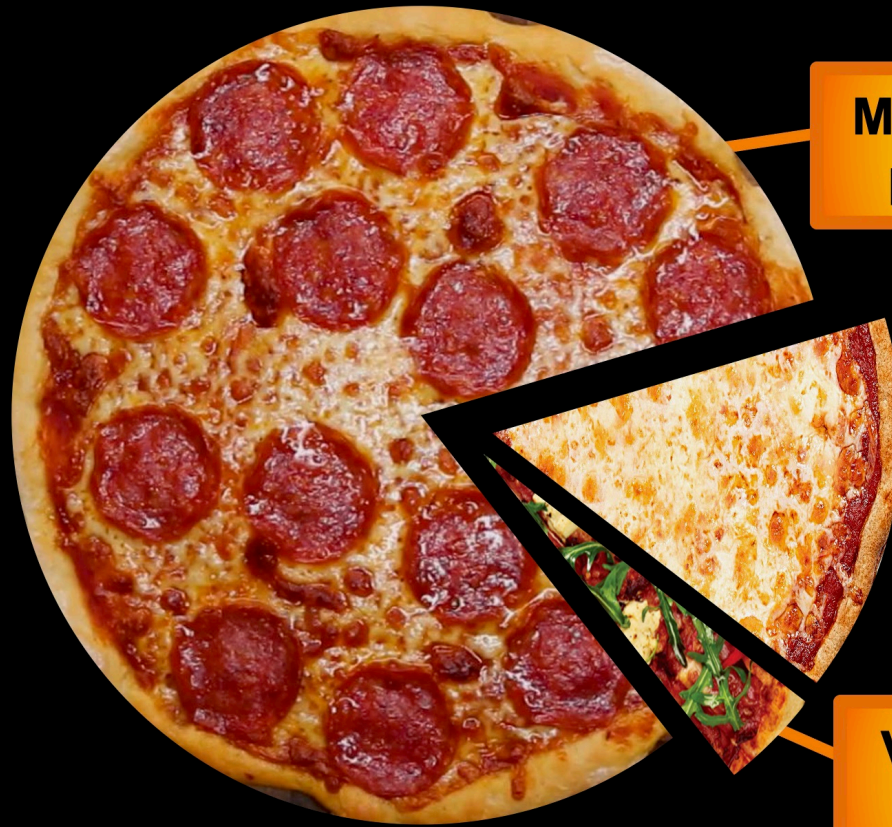


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The future probably isn't vegan, but it may be flexitarian?



Meat-eater (78%) or pescatarian (3%)

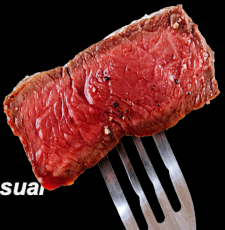
Flexitarian (15%)

Vegetarian (3%) or vegan (1%)

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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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What is "better" beef?

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Source: Created by Dr. Jude L. Capper, 2022.



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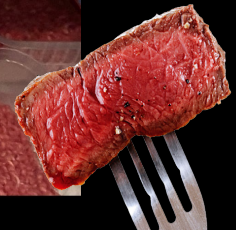


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How do we make meat sexy?



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Source: Created by Dr. Jude L. Capper, 2022.

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Source: Created by Dr. Jude L. Capper, 2022.

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Source: Created by Dr. Jude L. Capper, 2022.



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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



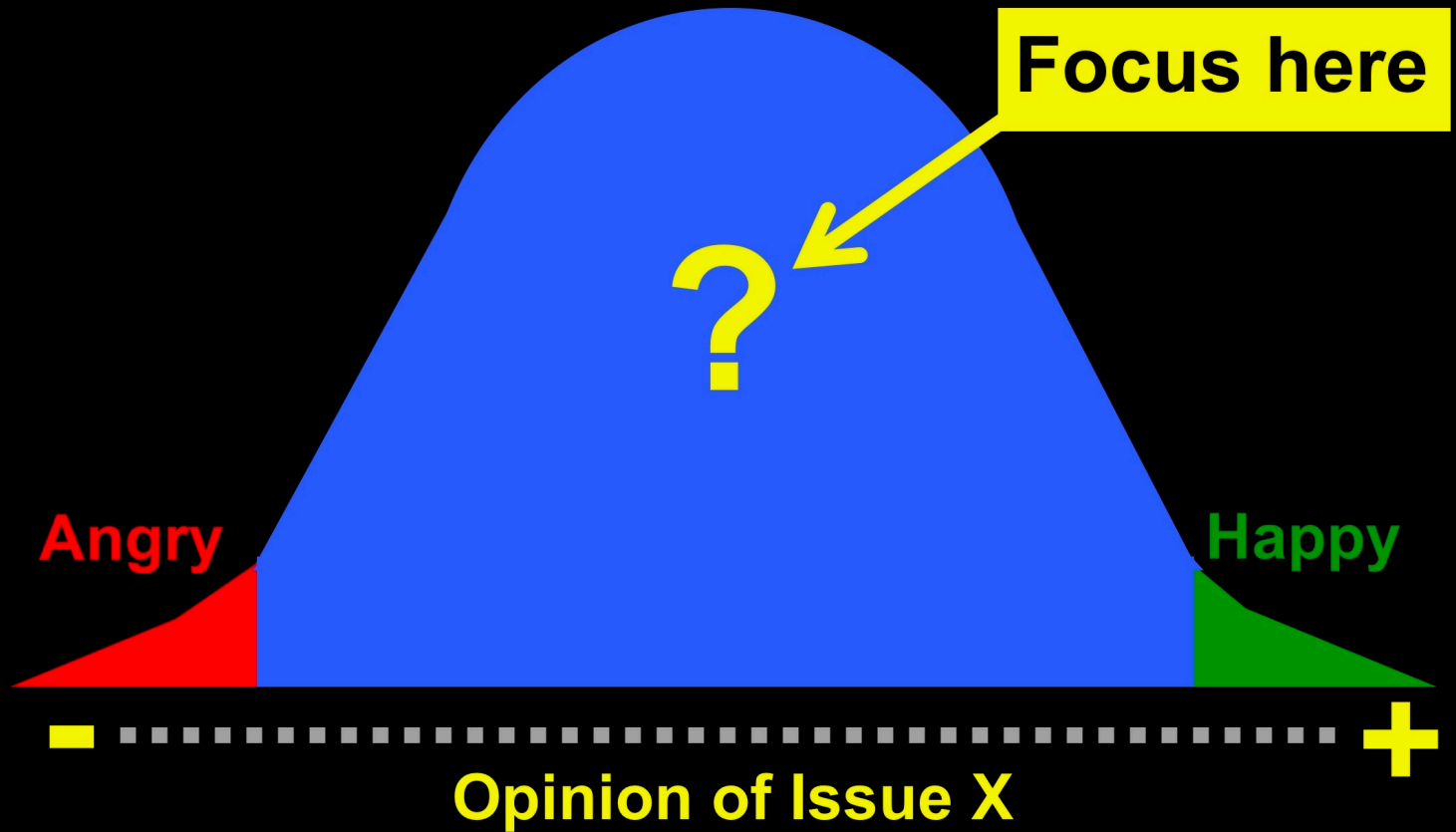
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We need to communicate with consumers who don't yet have fixed opinions of agriculture



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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*.

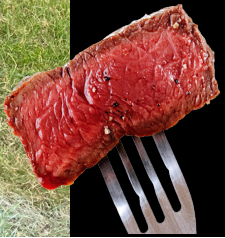
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You don't have to be the biggest,
you do need to do your best

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

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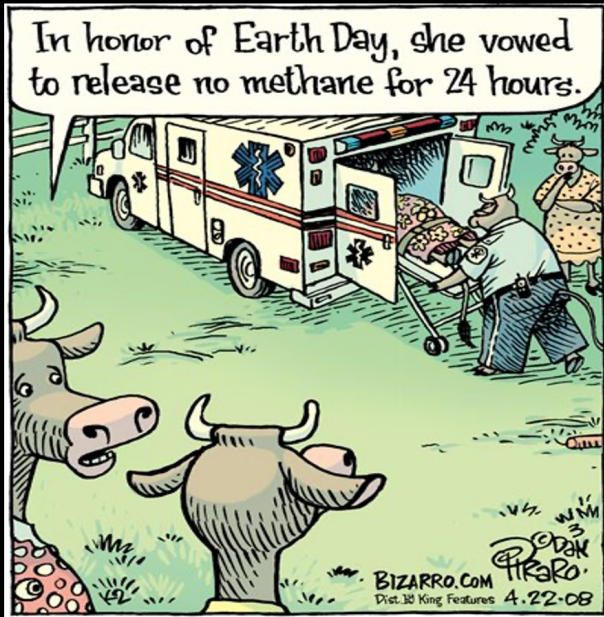
Thank you!

jcapper@harper-adams.ac.uk

<http://bovidiva.com/presentationlinks>

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Questions?



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Source: Created by Dr. Jude L. Capper, 2020. Cartoon from: <http://snipurl.com/methanecartoon>