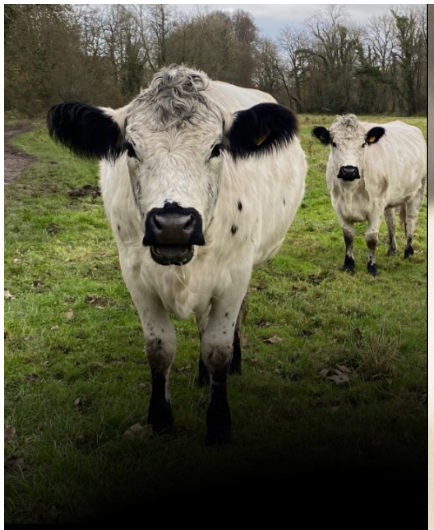

Are cows really killing the planet? The truths and myths behind British beef production

Prof. Jude Capper

PhD DSc (*h.c.*) ARAgS FRASE

15th January 2024

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Source: Jude L. Capper, 2024

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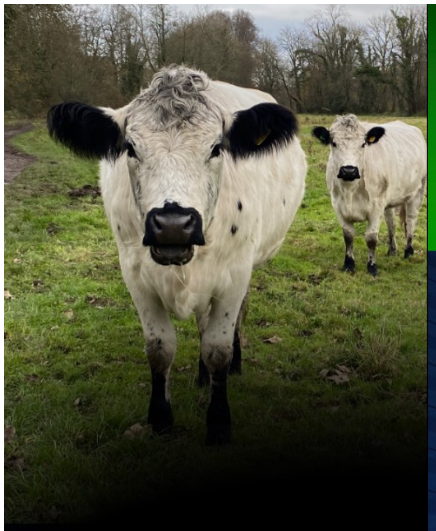

TF

What's special about this circle?

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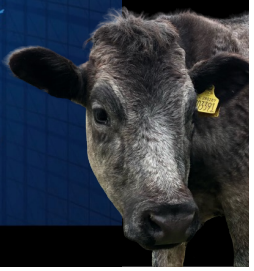

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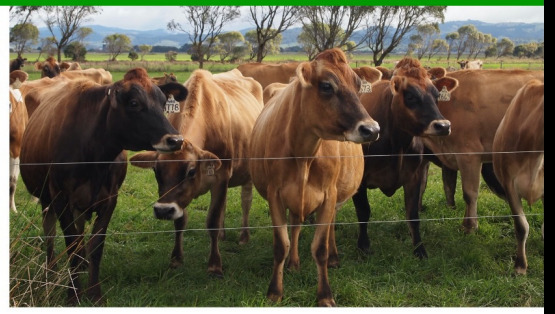
Source: Created by Jude L. Capper, 2023. Map from: http://www.psdgraphics.com/file/world-map-background.jpg

S

There is no definitive sustainable protein system – but every system can be sustainable









Source: Created and photos by Jude L. Capper, 2023.

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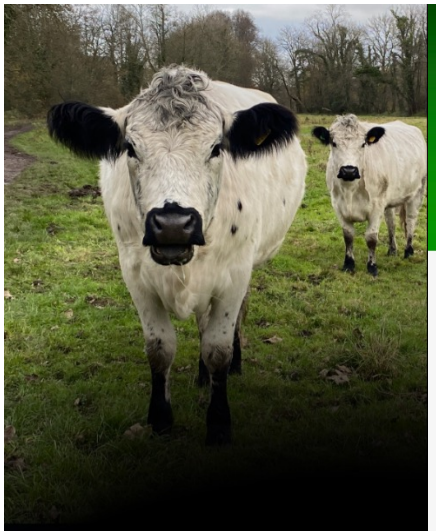
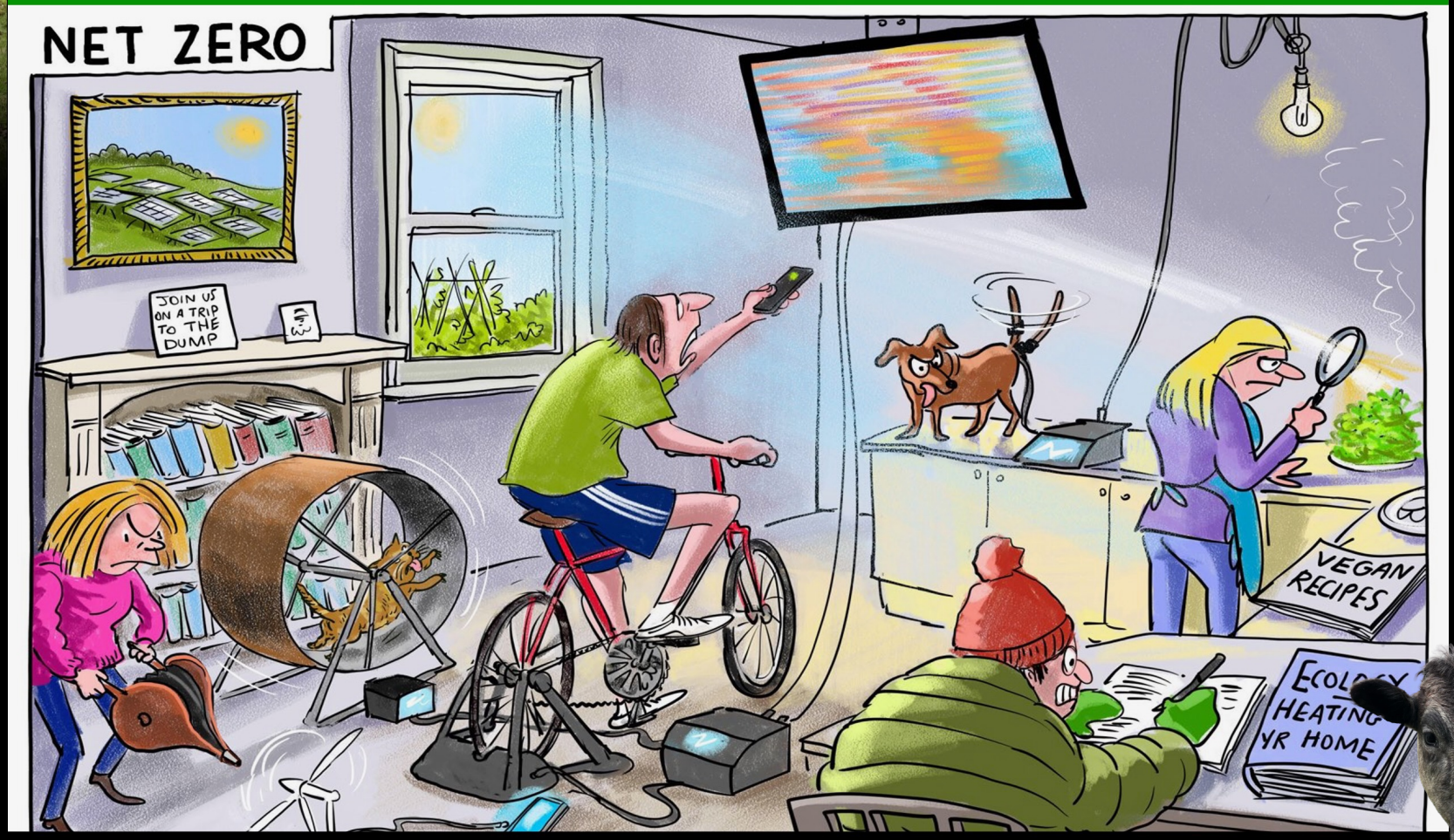


S

Net Zero is a clear priority



Source: Created by Jude L. Capper, 2023. Cartoon from: https://twitter.com/Cartoon4sale/status/1384537729460056067?s=20

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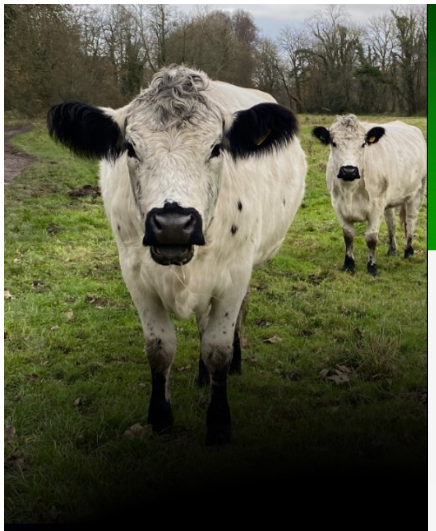

S

All foods have an environmental impact

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Source: Created by Jude L. Capper, 2023.

B

Honesty is the best policy

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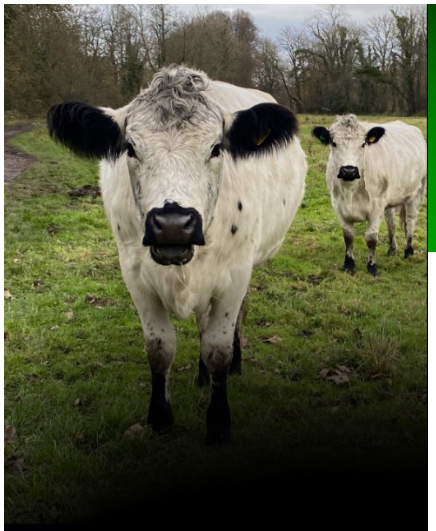
Source: Created by Jude L. Capper, 2024.

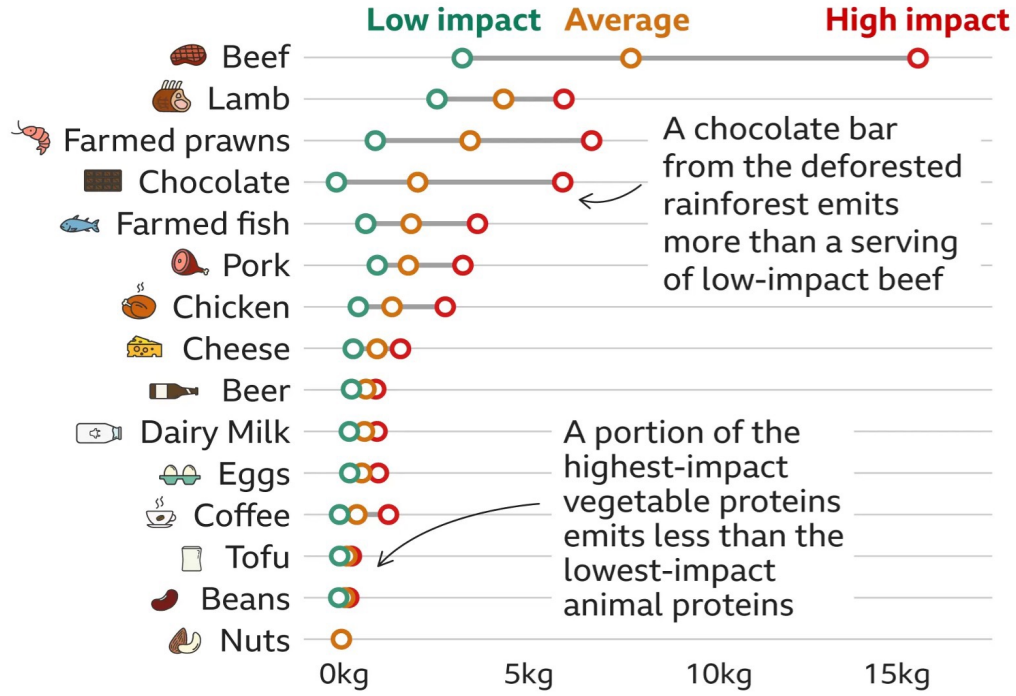


B

Media articles tend to focus on beef

Beef has the biggest carbon footprint – but the same food can have a range of impacts

Kilograms of greenhouse gas emissions per serving



Note: The figures for each food are based on calculations from 119 countries. Serving sizes are from the British Dietetic Association (BDA) and Bupa.

Poore and Nemecek's paper is often-quoted, reporting beef GHG emissions of 4-15 kg CO_2e per serving. But is this the whole picture?

Source: Created by Jude L. Capper, 2024. Infographi from the BBC (https://www.bbc.co.uk/news/science-environment-46459714) citing Poore and Nemecek (2018) https://doi.org/10.1126/science.aaq0216

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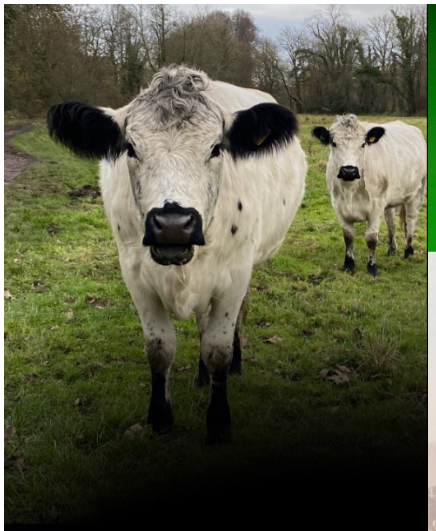
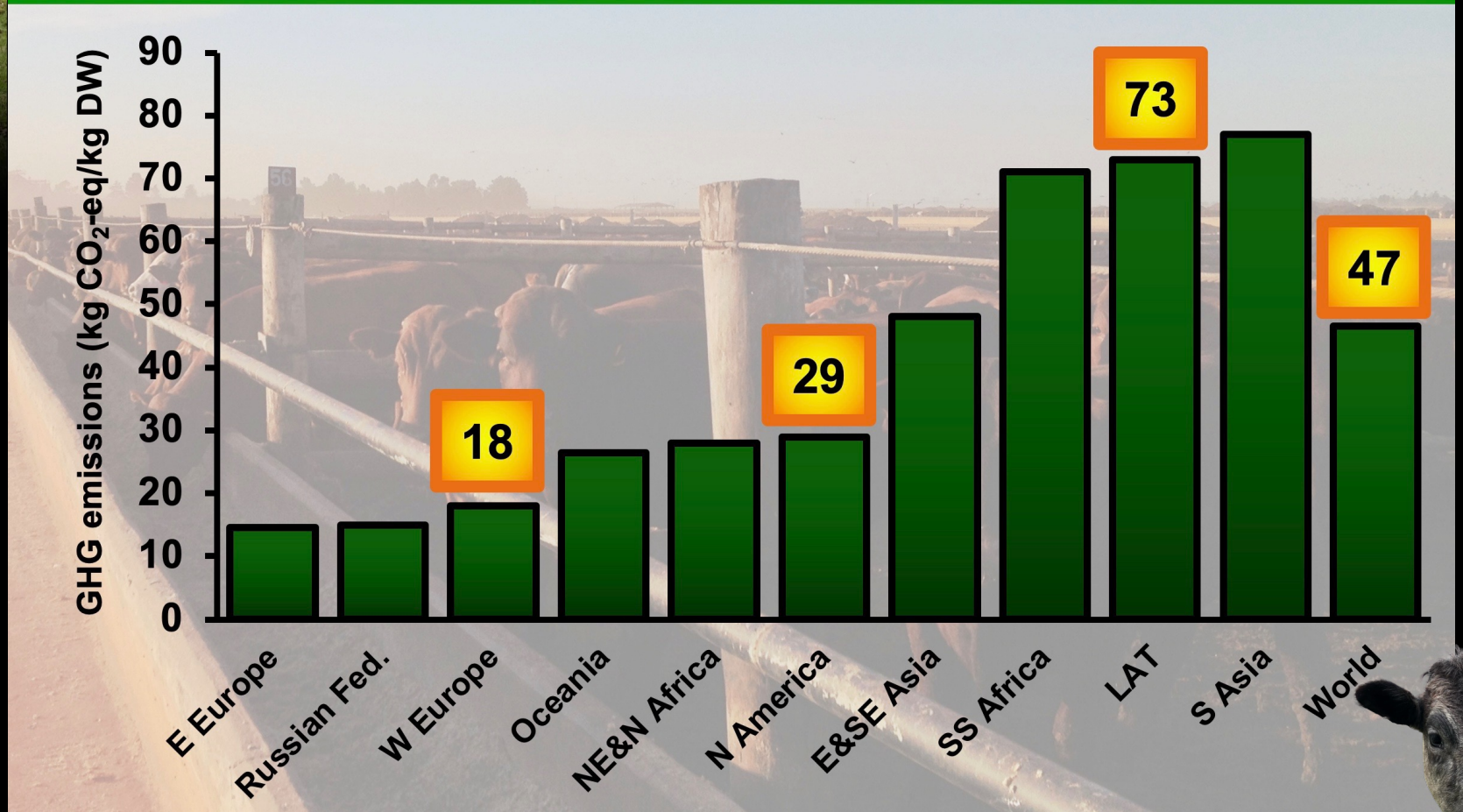


B

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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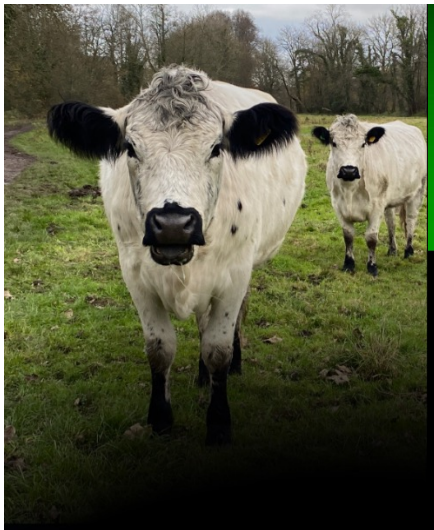
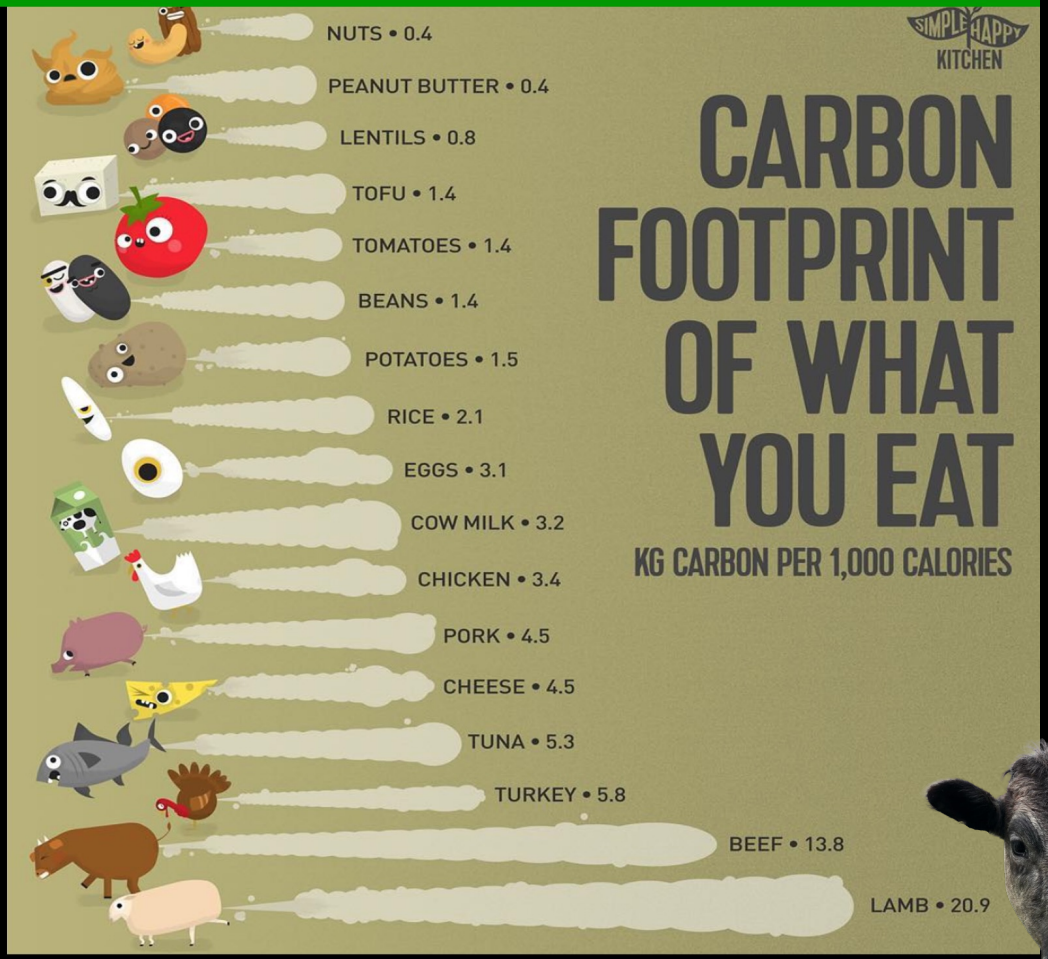


B

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 Jude L. Capper, 2023. Infographic from https://www.instagram.com/simple_happy_kitchen/

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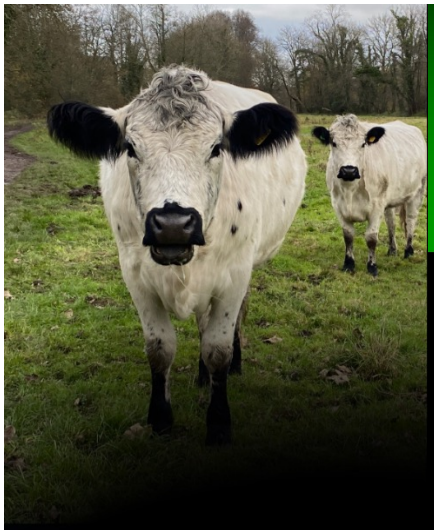
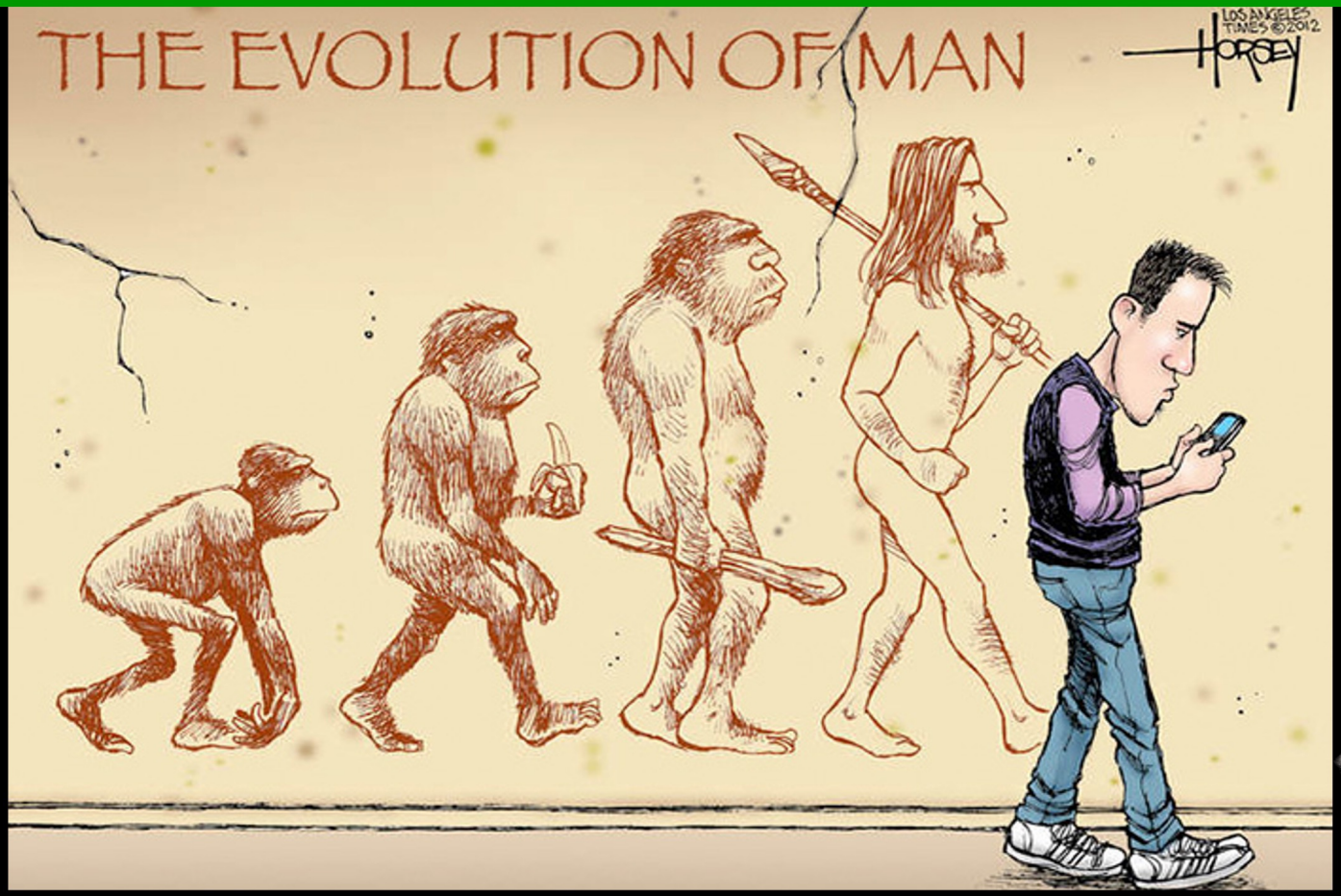


B

Climate science constantly evolves – new data and metrics will change food footprints



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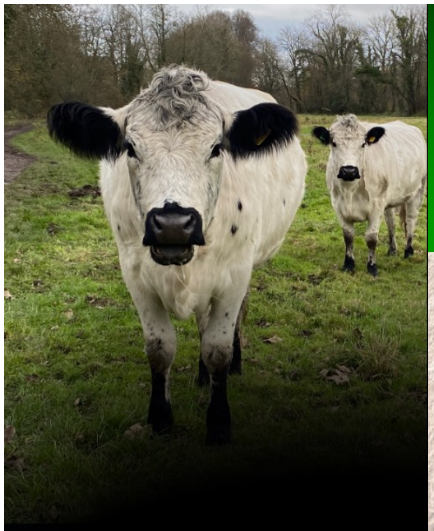
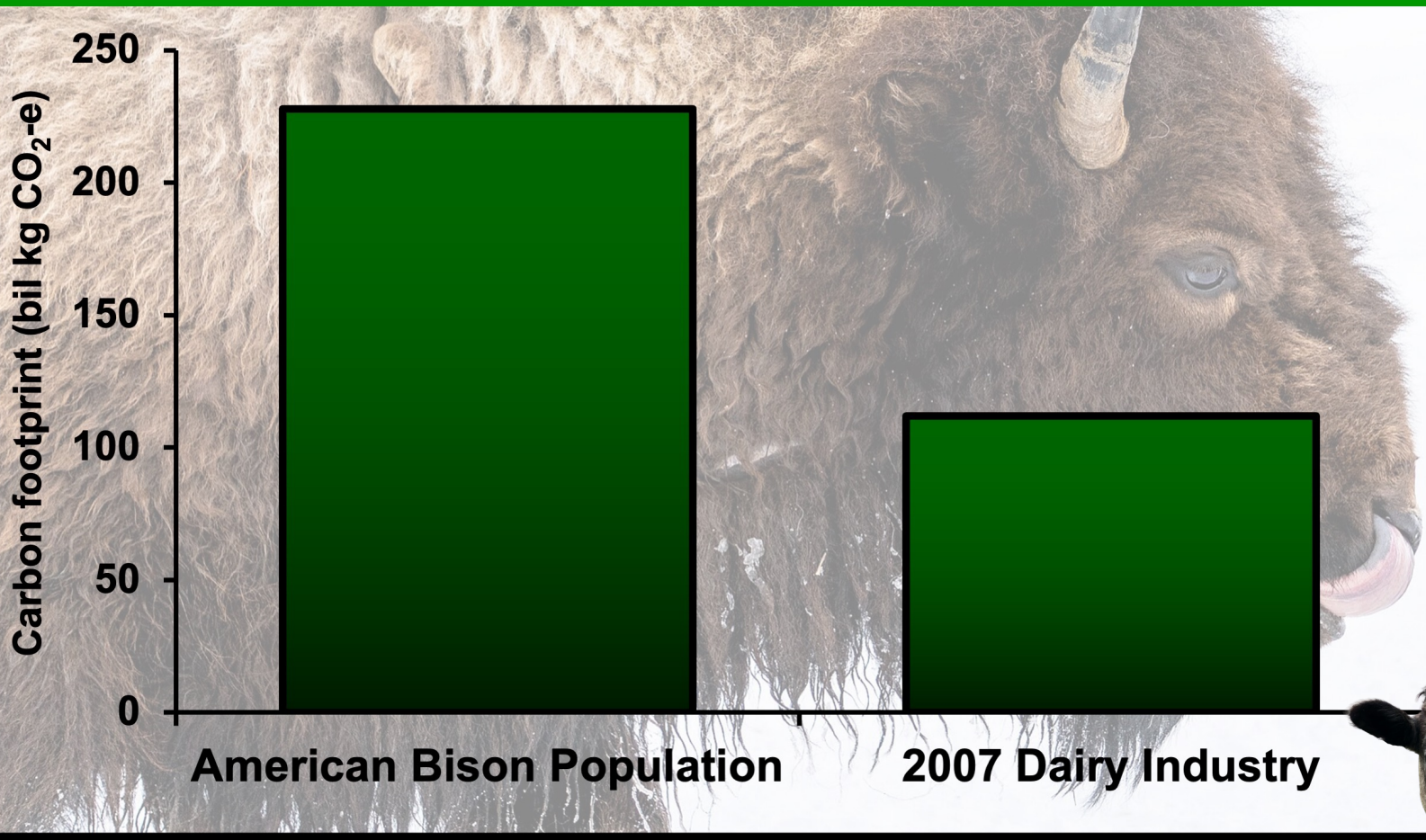
Source: Created by Jude L. Capper, 2024. Cartoon from: https://static.boredpanda.com/blog/wp-content/uploads/2016/02/funny-satirical-evolution-charles-darwin-day-251__700.jpg



D

Historical bison population had GHG emissions twice that of the 2007 US dairy industry



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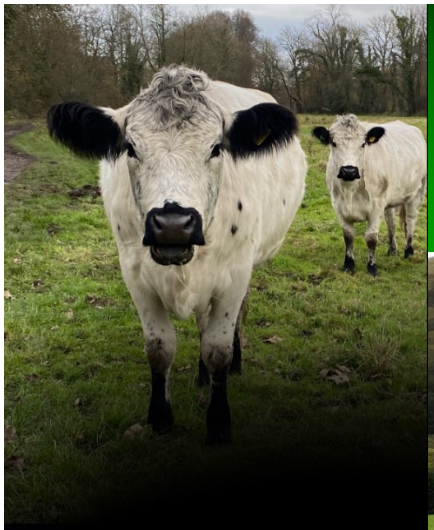
Source: Created by Jude L. Capper, 2023. Data from Capper (2011) https://doi.org/10.2527/af.2011-0009 based on the bison population in 1800. Photo from: Aleksomber, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0>, via Wikimedia Commons.



B

We need to be realistic about opportunities and limitations for reducing emissions

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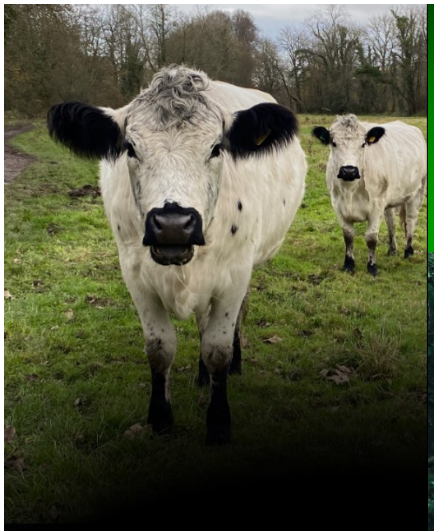
Source: Created by Jude L. Capper, 2024.



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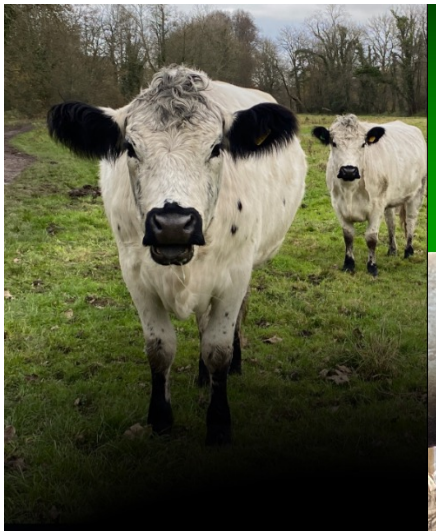

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We need to be realistic about opportunities and limitations for reducing emissions

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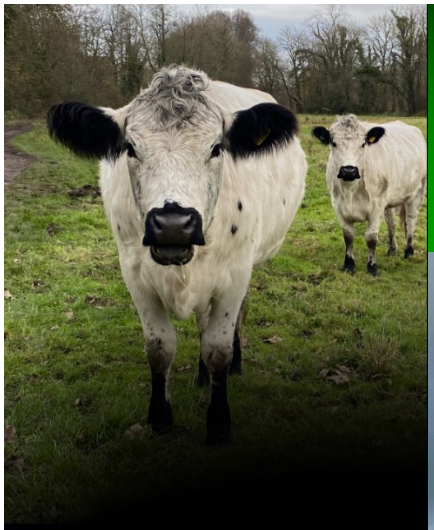

B

Huge variation in farm footprints – need to exemplify and learn from the best

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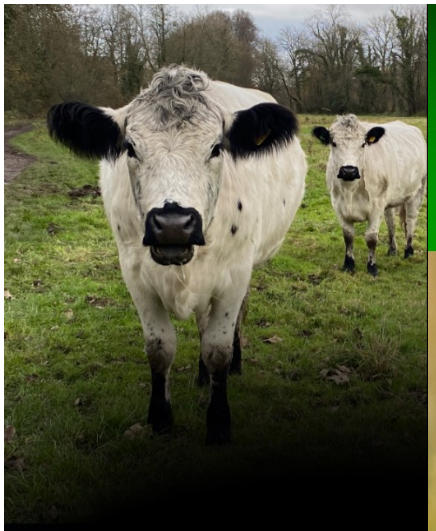
Source: Created by Jude L. Capper, 2024.



S

Feed efficiency is one of the principal issues used to denigrate animal agriculture

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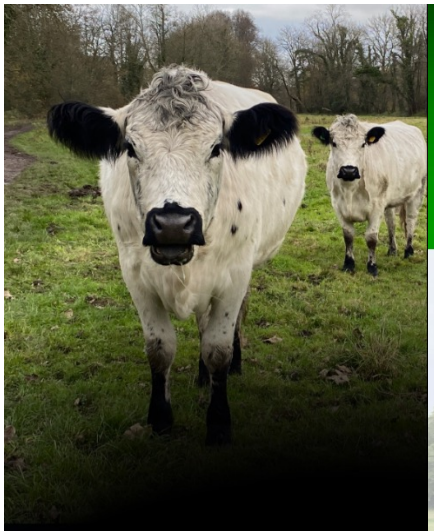
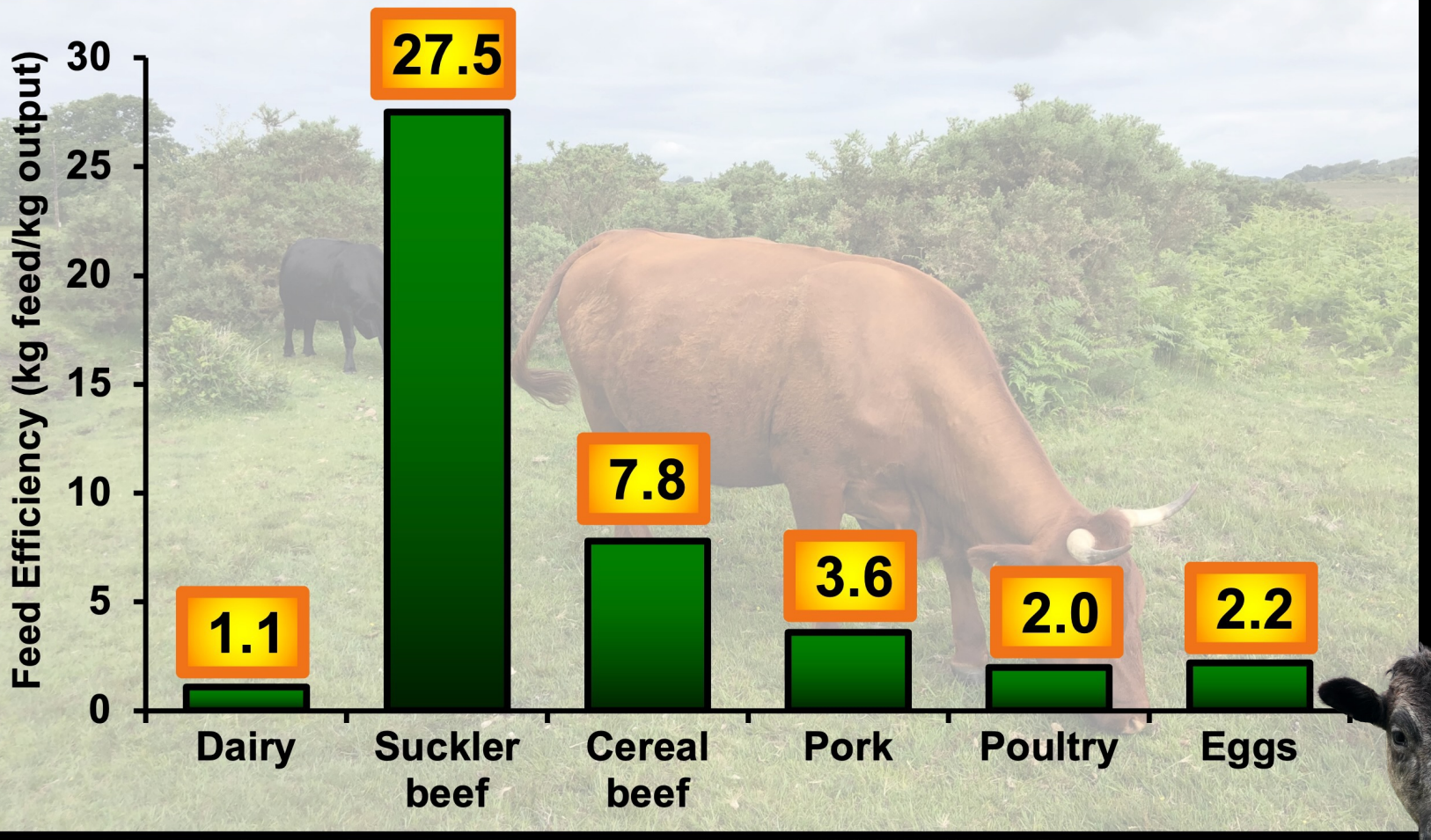
Source: Created by Jude L. Capper, 2023. Infographic from https://www.onegreenplanet.org/animalsandnature/eat-for-the-planet-meat-and-the-environment/



Feed efficiency ratios vary between systems and species



Source: Created by Jude L. Capper, 2023; data from Wilkinson (2011) https://doi.org/10.1017/S175173111100005X

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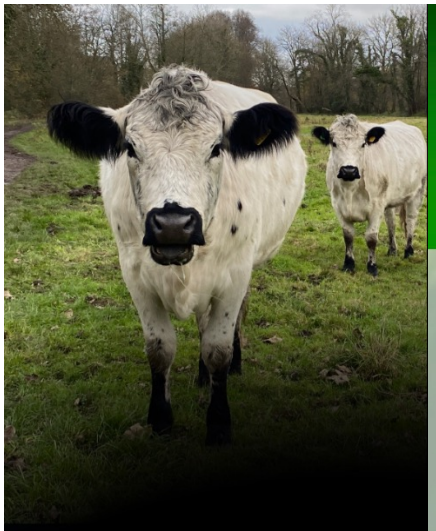
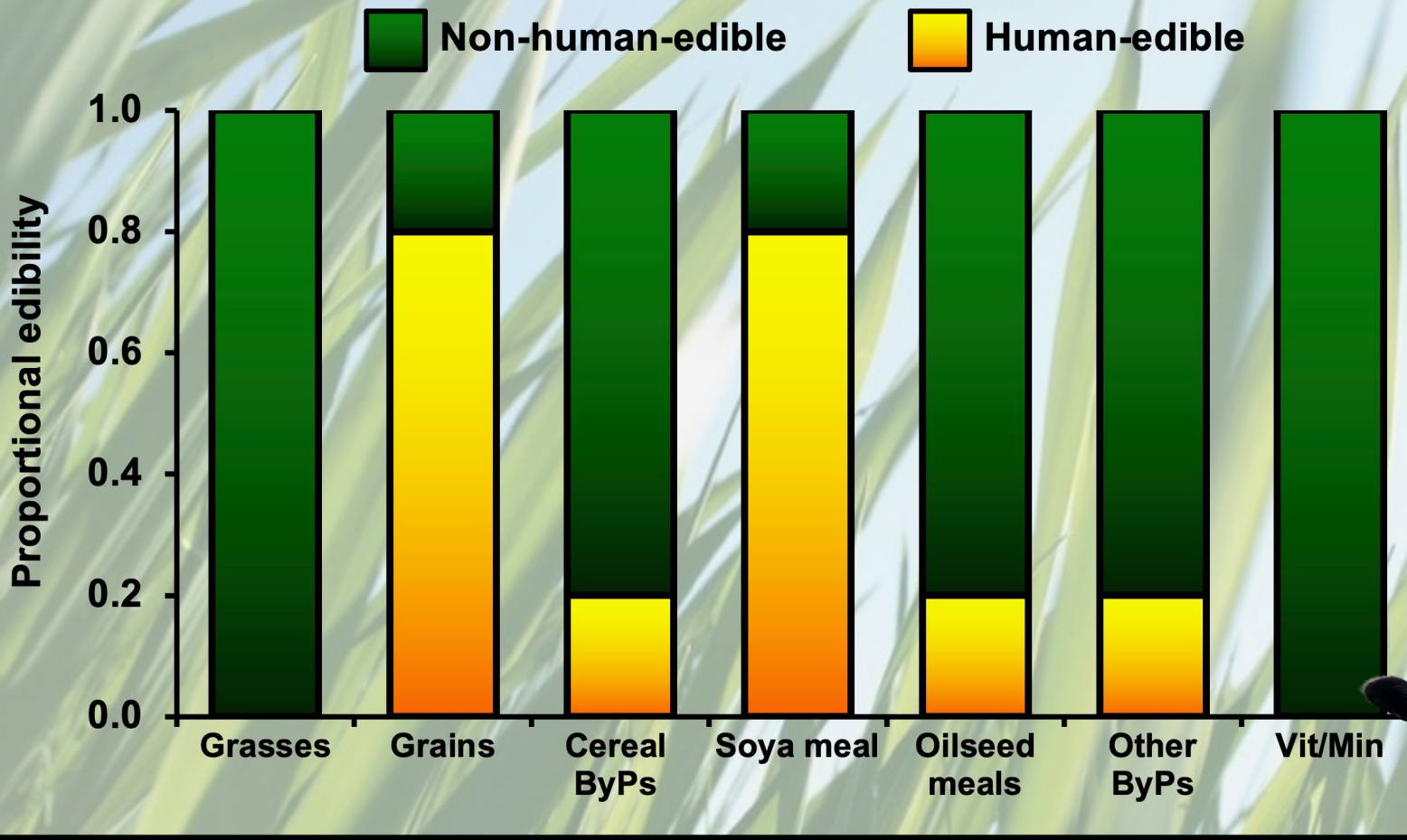


S

Feed efficiency metrics must consider competition for human-edible foods



Source: Created by Jude L. Capper, 2023; data from Wilkinson (2011) https://doi.org/10.1017/S175173111100005X

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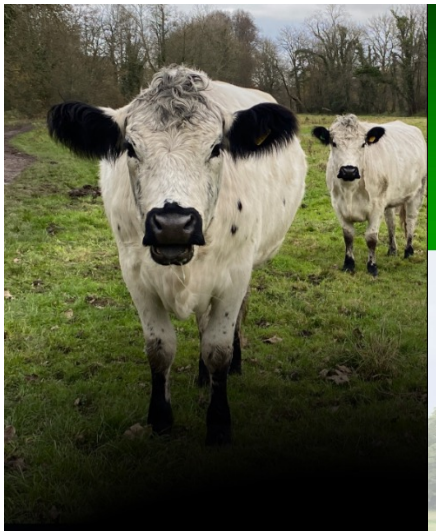
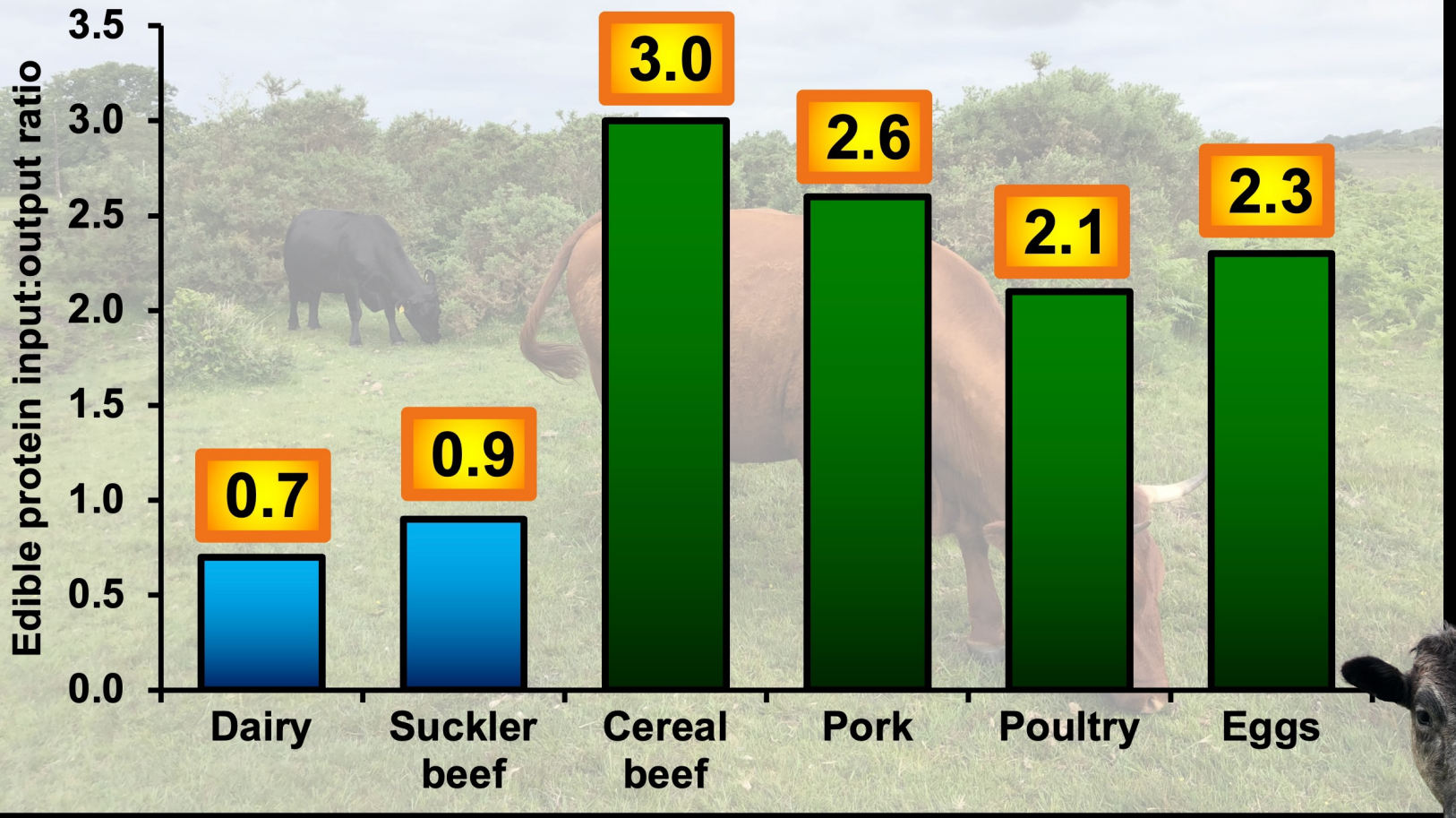


S

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



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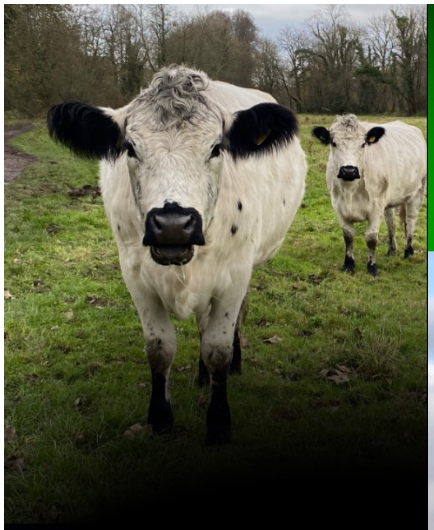

S

Can we grow human food crops everywhere?

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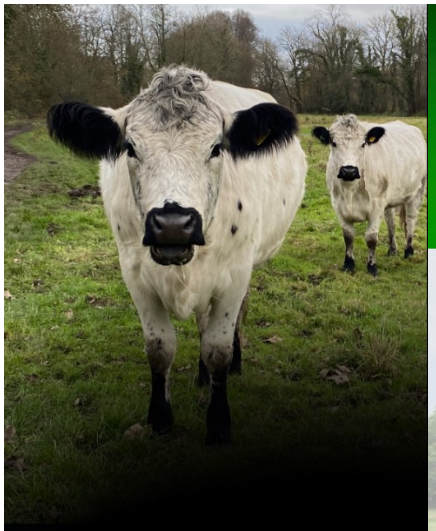
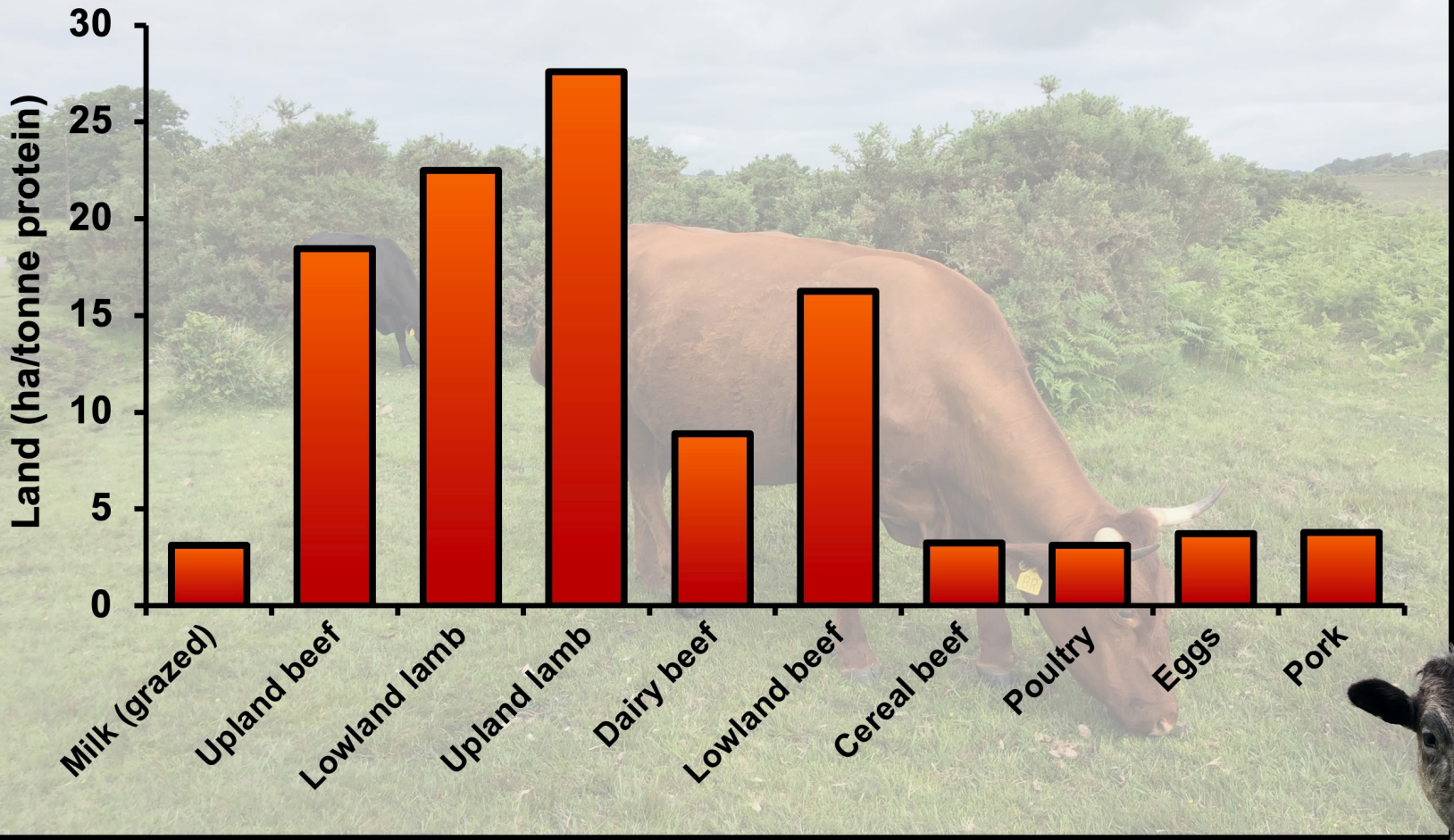
Source: Created by Jude L. Capper, 2023



S

Livestock systems vary widely in land use



Source: Created by Jude L. Capper, 2023; data from Wilkinson and Lee (2018) https://doi.org/10.1017/S175173111700218X

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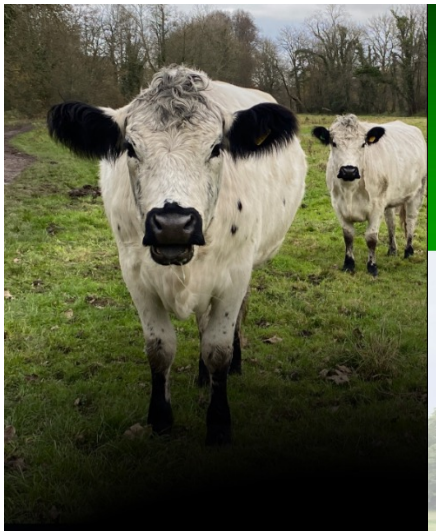
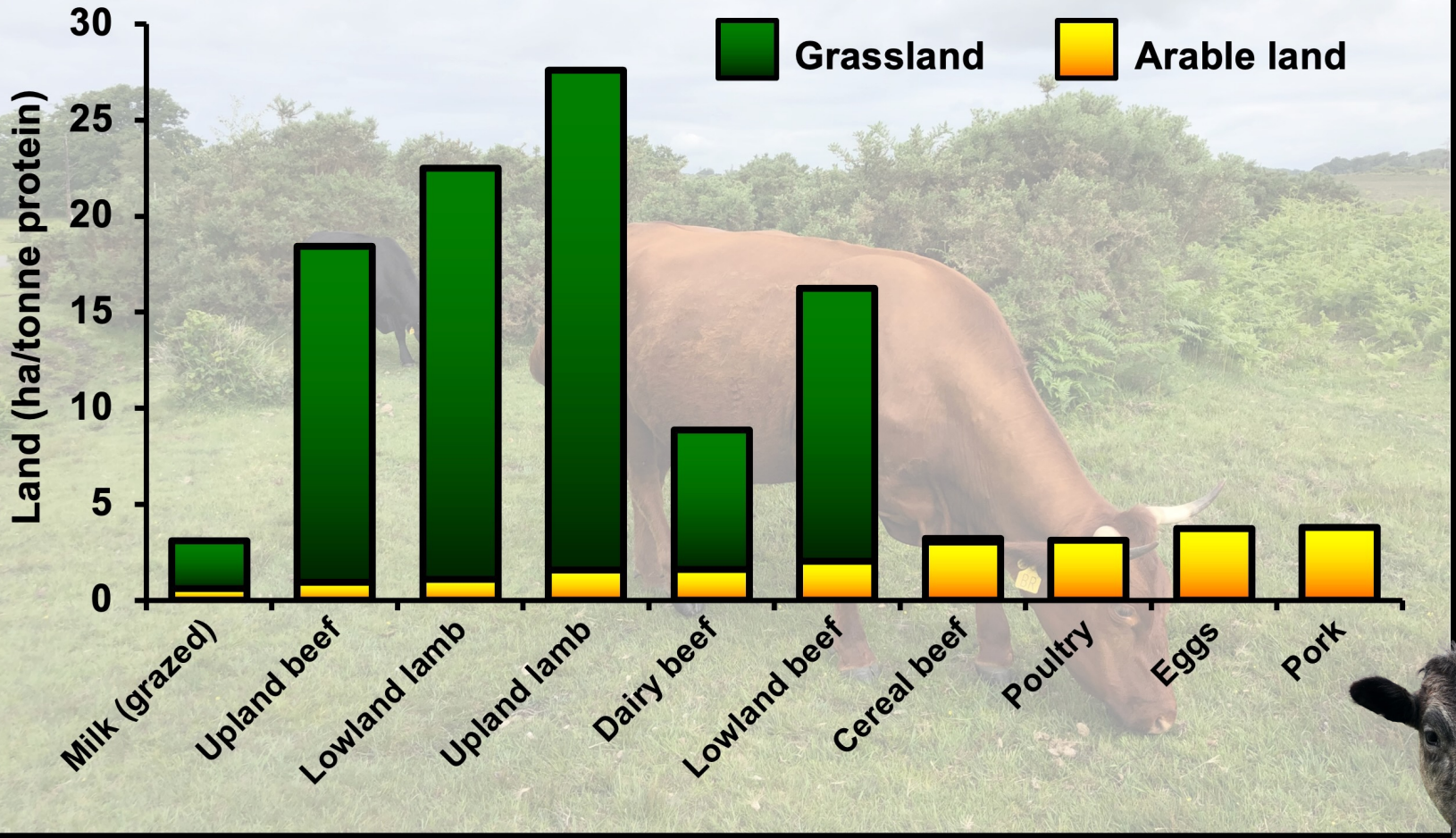


S

Livestock systems vary widely in arable and grassland use



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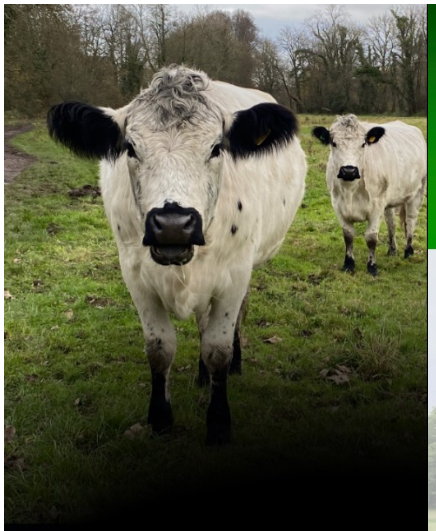
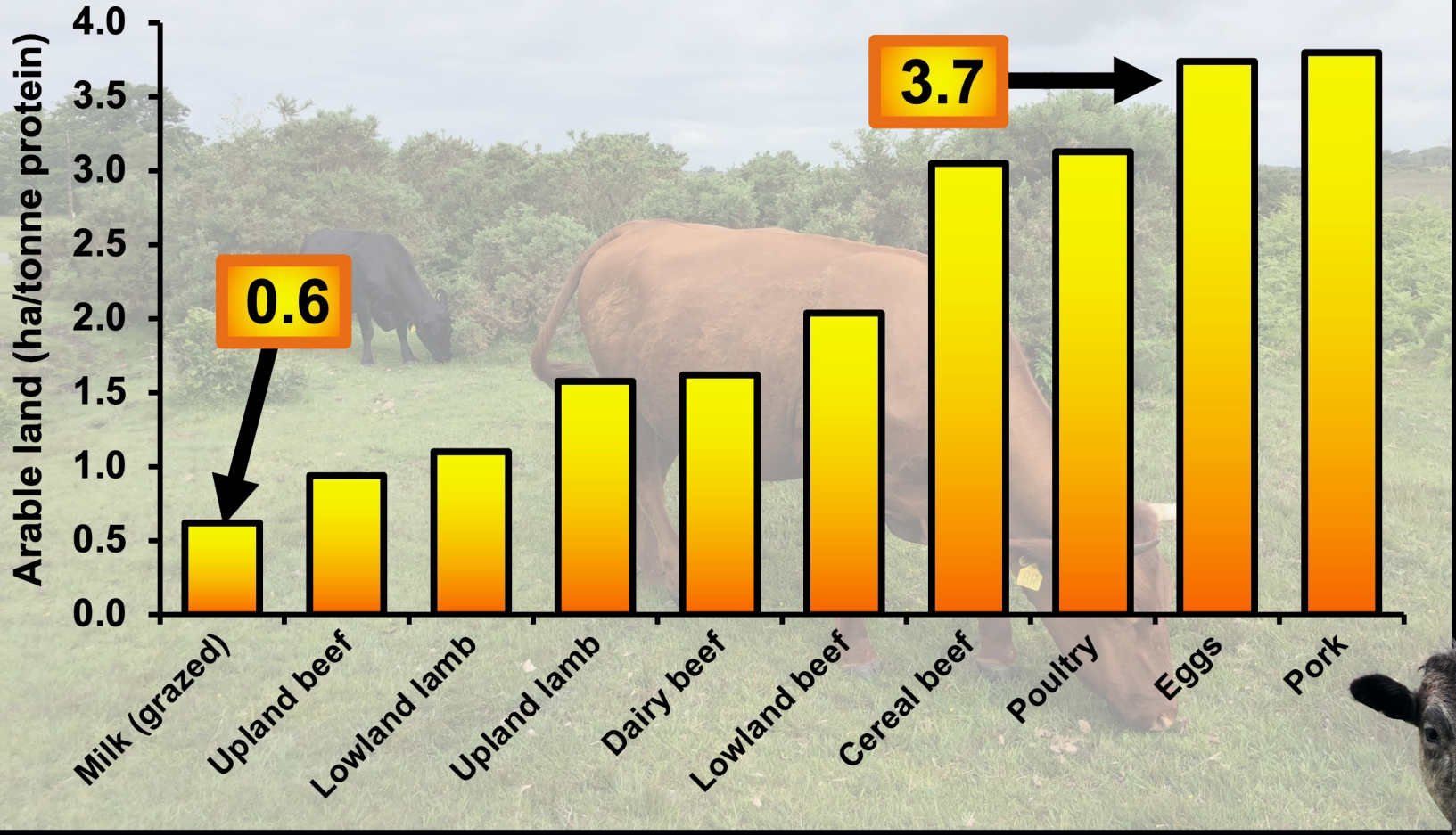


S

Livestock systems vary widely in arable land use



Source: Created by Jude L. Capper, 2023; data from Wilkinson and Lee (2018) https://doi.org/10.1017/S175173111700218X

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S

Removing cattle from pasture disadvantages ground-nesting birds

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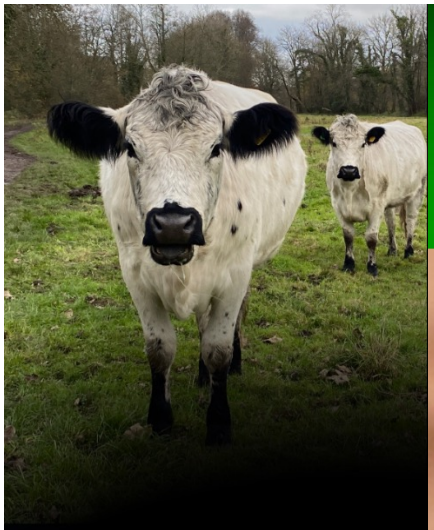
Source: Created by Jude L. Capper, 2023. Photo from Odd Falch https://www.pexels.com/photo/brown-bird-on-brown-grass-12084162/



S

Dung beetles have myriad ecosystem benefits

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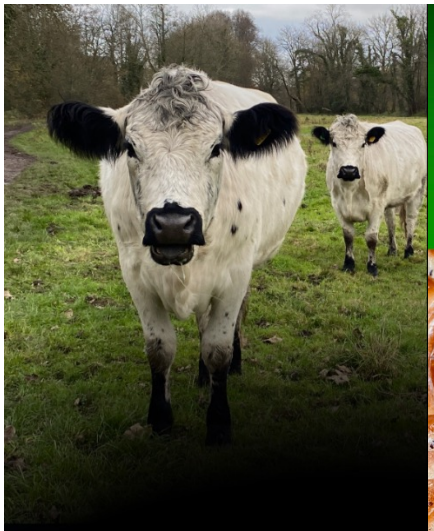
Source: Created by Jude L. Capper, 2023.



S

(Almost) all of our food comes from the soil








Source: Created by Jude L. Capper, 2023.

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COM

Do 706,965 Veganuary participants in 2023 amount to more than a hill of beans?

- Total is equal to 1.95x the population of Coventry
- If all participants were based in the UK they would comprise 1.05% of the population
- Average of 3,663 per participating country
- 60% of participants already vegan, vegetarian or pescatarian

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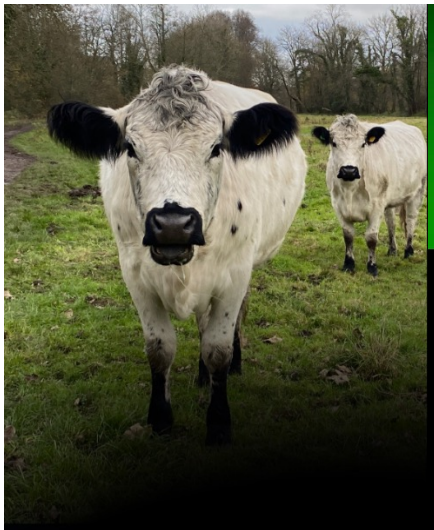
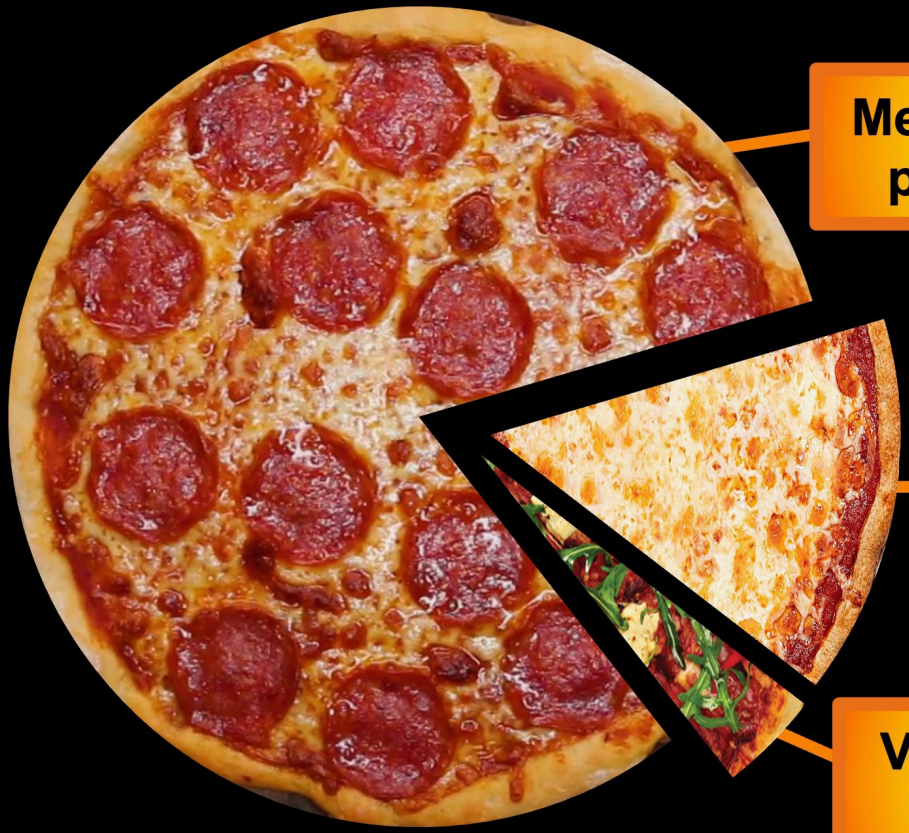
Source: Created by Jude L. Capper, 2023. Information from: https://veganuary.com/blog/



B

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 Jude L. Capper, 2023. 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%).

CV

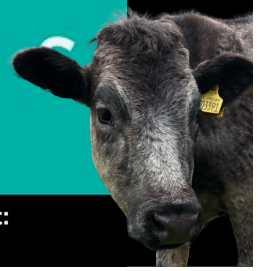
New CREDS report puts transport, energy and food choices into context

Top 10 options for reducing your carbon footprint

1	2.04	Live car-free
2	1.95	Battery electric vehicle
3	1.68	One less flight (long-haul return)
4	1.6	Renewable electricity
5	0.98	Public transport
6	0.895	Refurbishment and renovation
7	0.8	Vegan diet
8	0.795	Heat pump
9	0.65	Improved cooking equipment
10	0.64	Renewable-based heating

C R E D S

Source: Created by Jude L. Capper, 2023. Infographic adapted from Centre for Research into Energy Demand Solutions (2020). Available at: https://twitter.com/CREDS_UK/status/1262984570175176704?s=20



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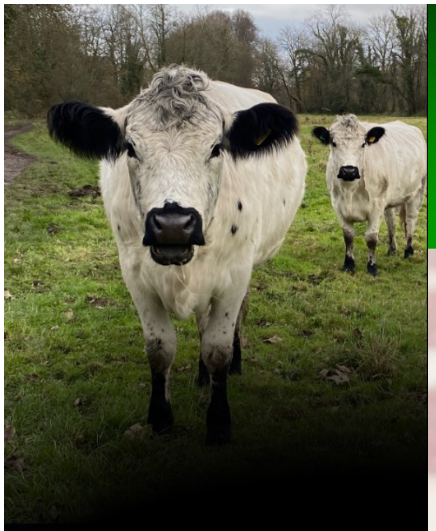
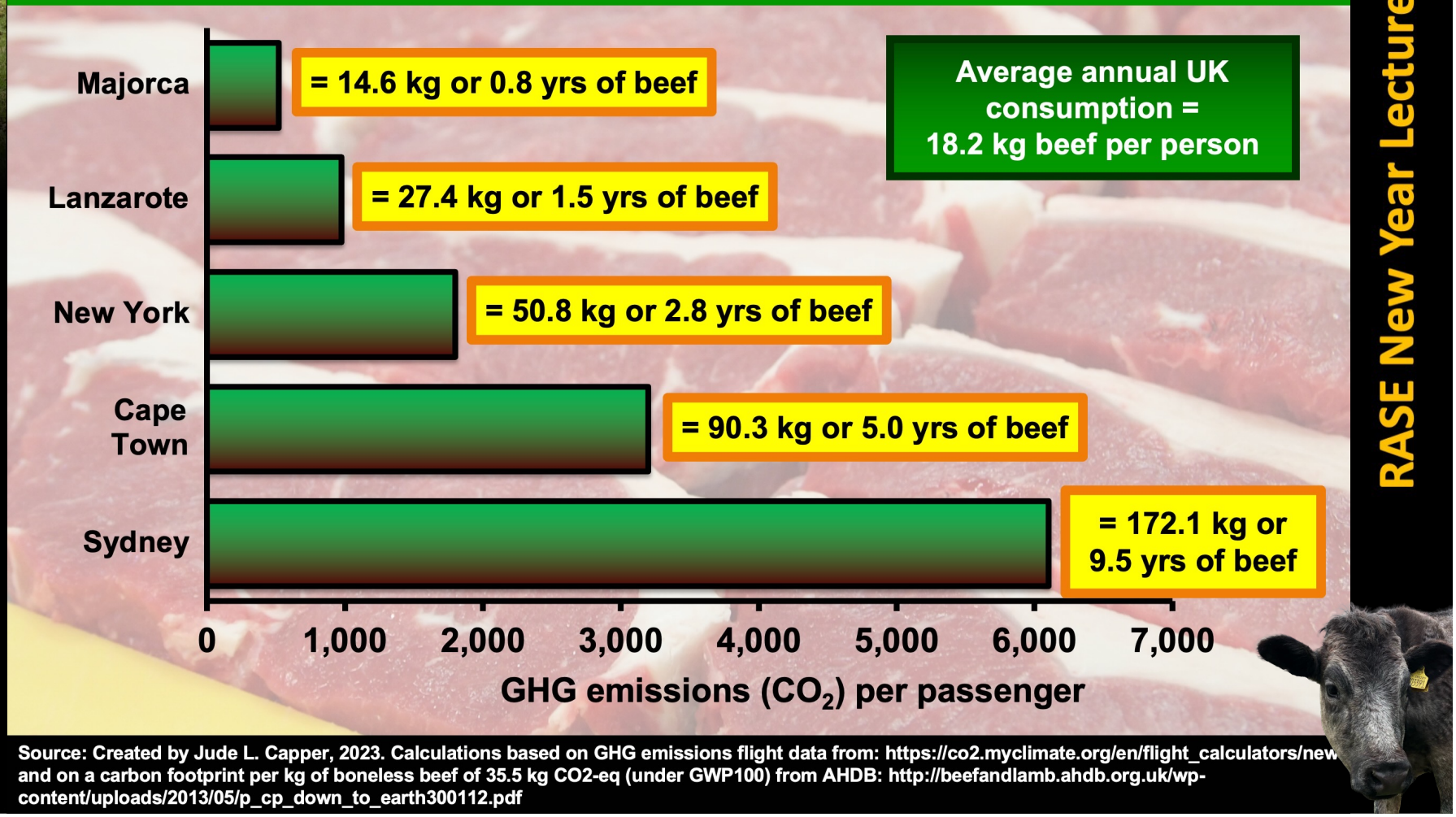


CV

International flights emit considerable quantities of carbon compared to beef production



Source: Created by Jude L. Capper, 2023. 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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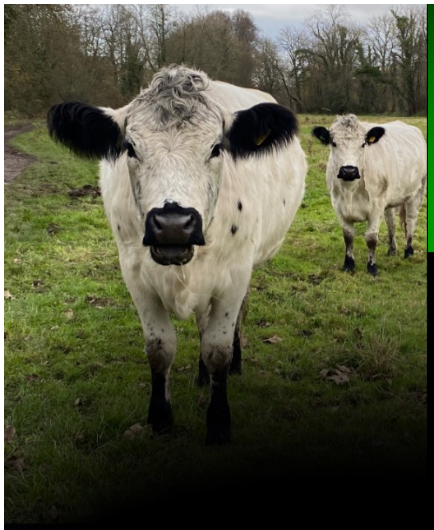

B

Conclusions

Every food and farming system has an environmental impact

Global data do not represent British farms

Cattle do not compete with humans for feed *vs*. food

Cattle provide crucial ecosystem, landscape and food services

All food choices are equally valid - the majority of consumers still enjoy meat within their diet

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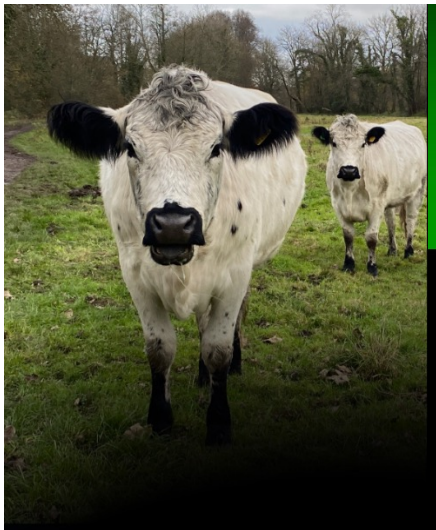
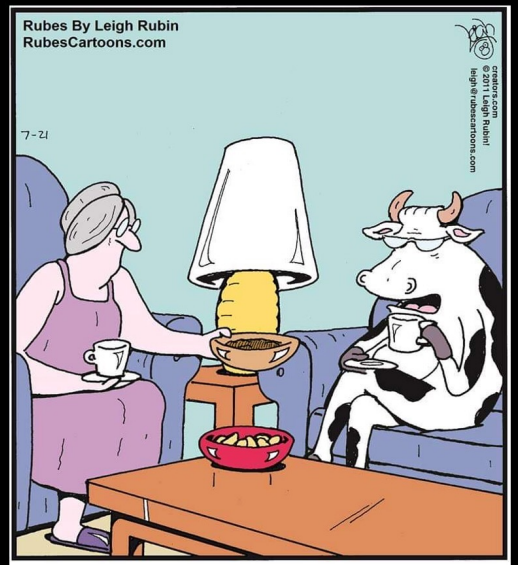
Source: Created by Jude L. Capper, 2024.



B

Thank you!

JCapper@Harper-Adams.ac.uk



"No more bean dip for me, dear. I'm trying to reduce my carbon footprint."

Questions?

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Source: Created by Dr. Jude L. Capper, 2021. Cartoon from: http://RubesCartoons.com