



**Appetite for
destruction -
are killing the
planet with our
dietary choices
- or is it more
complex?**

21st June 2023

Source: Jude L. Capper, 2023

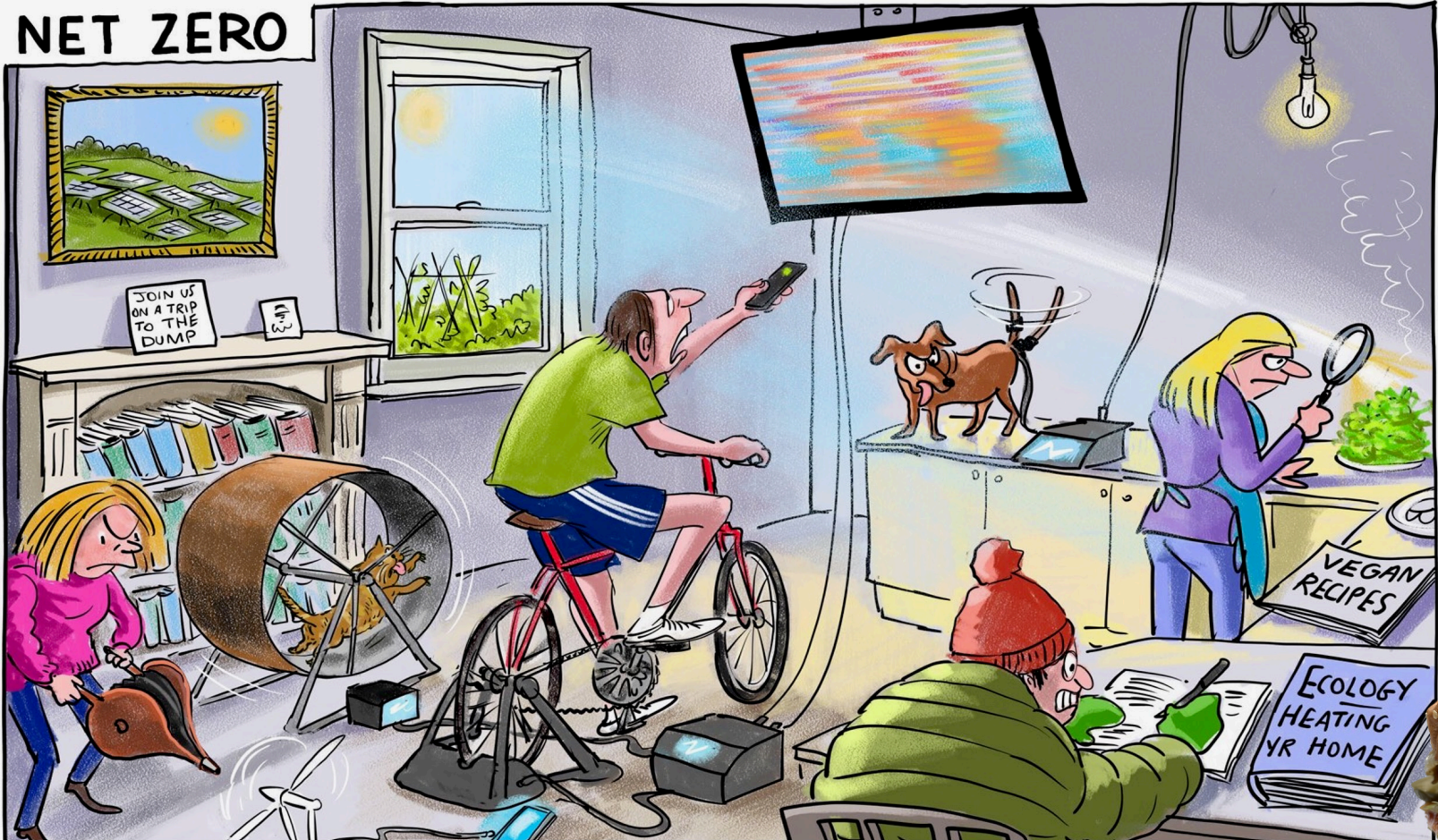


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Net Zero is a clear priority



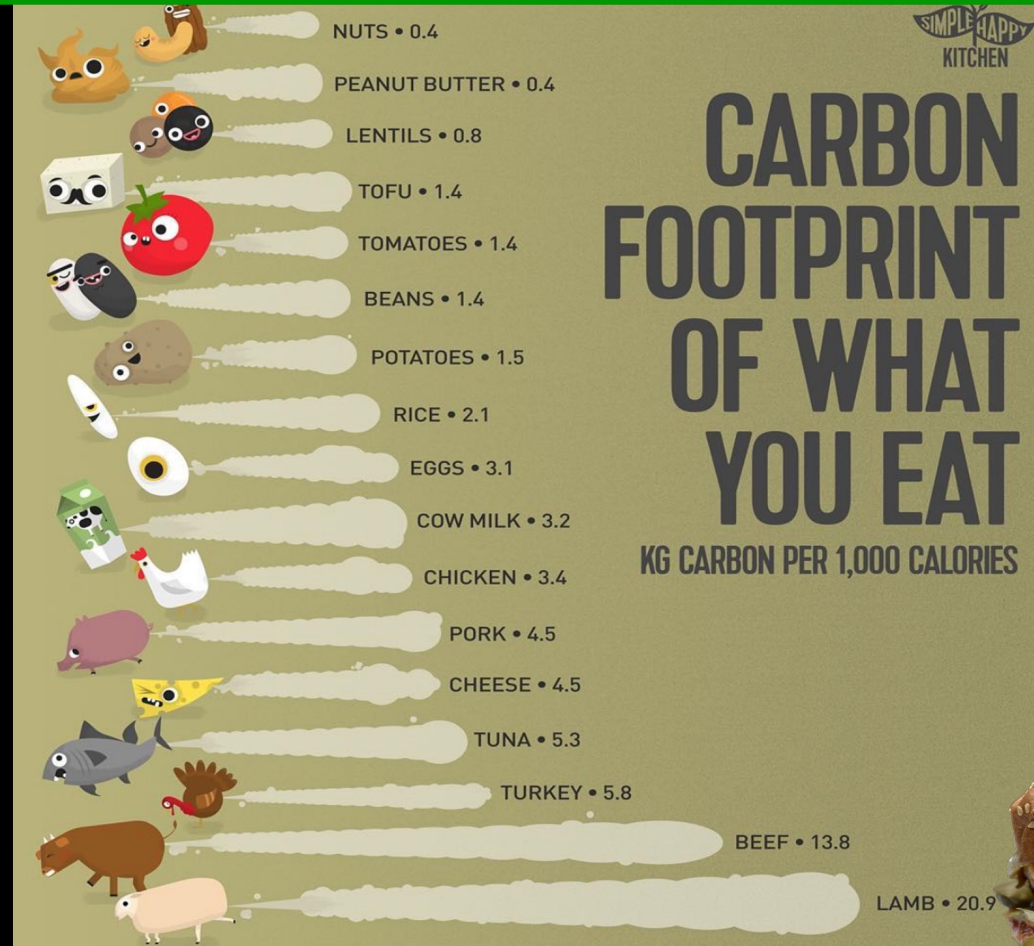
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Global averages are meaningless

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



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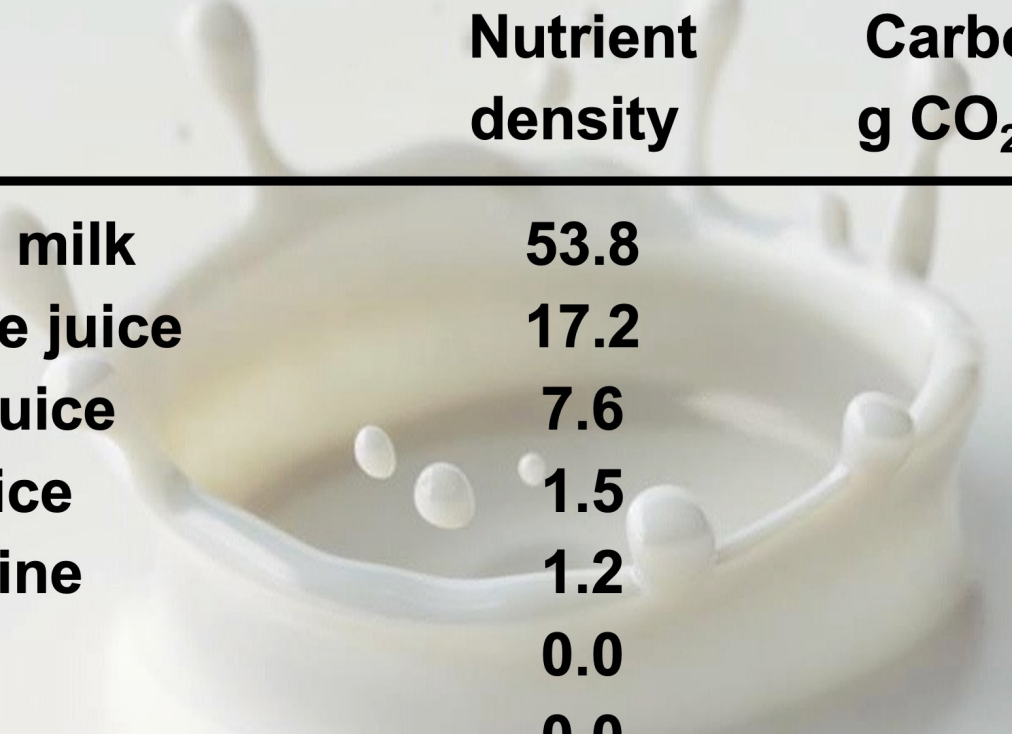


Source: Created by Jude L. Capper, 2023. Infographic from https://www.instagram.com/simple_happy_kitchen/



D

Drinks vary in nutrient density and greenhouse gas emissions

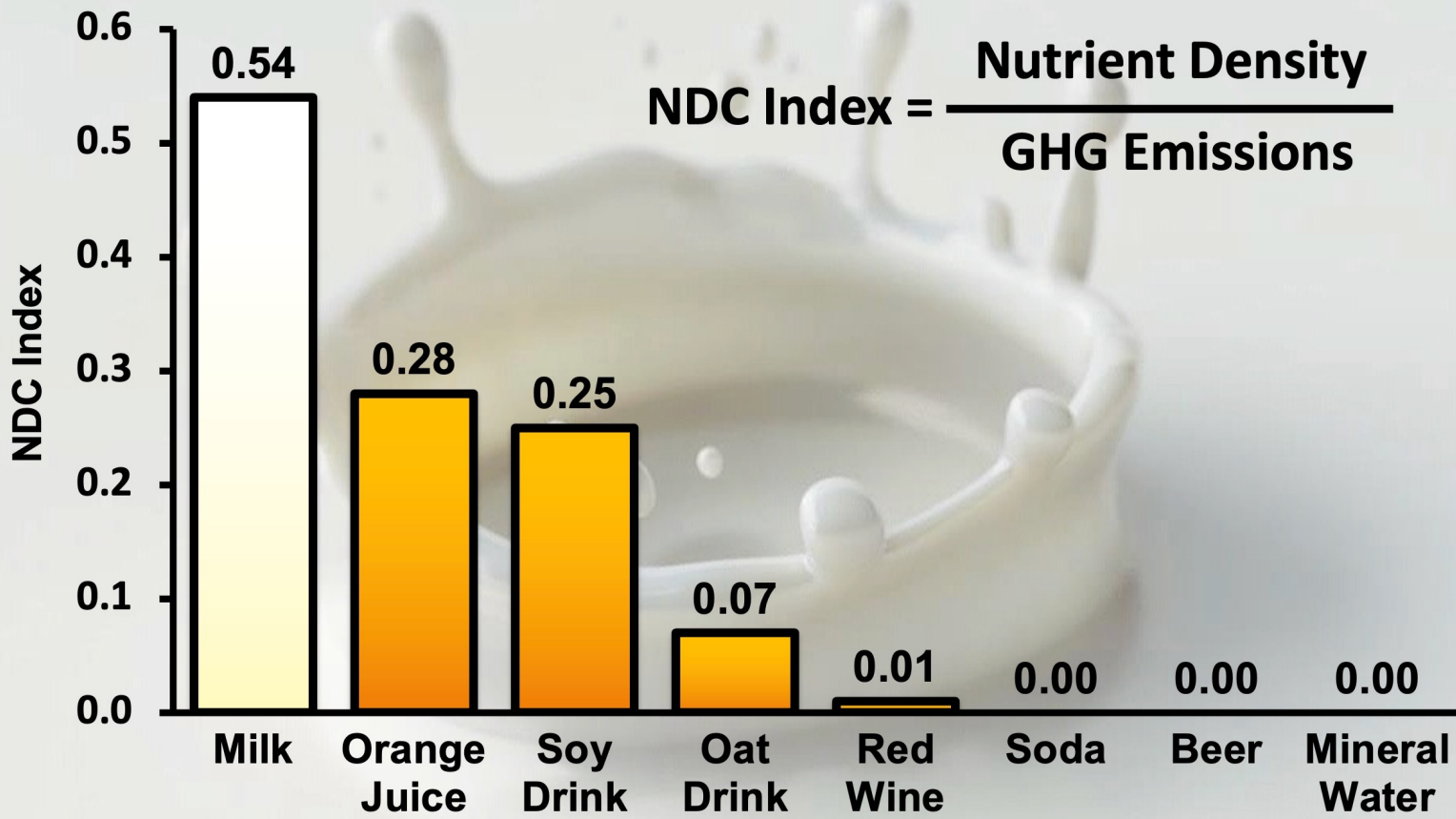


	Nutrient density	Carbon footprint g CO₂/100 g drink
Whole milk	53.8	99
Orange juice	17.2	61
Soya juice	7.6	30
Oat juice	1.5	21
Red wine	1.2	204
Soda	0.0	109
Beer	0.0	101
Water	0.0	10





D Nutrient density should be included when assessing carbon footprint



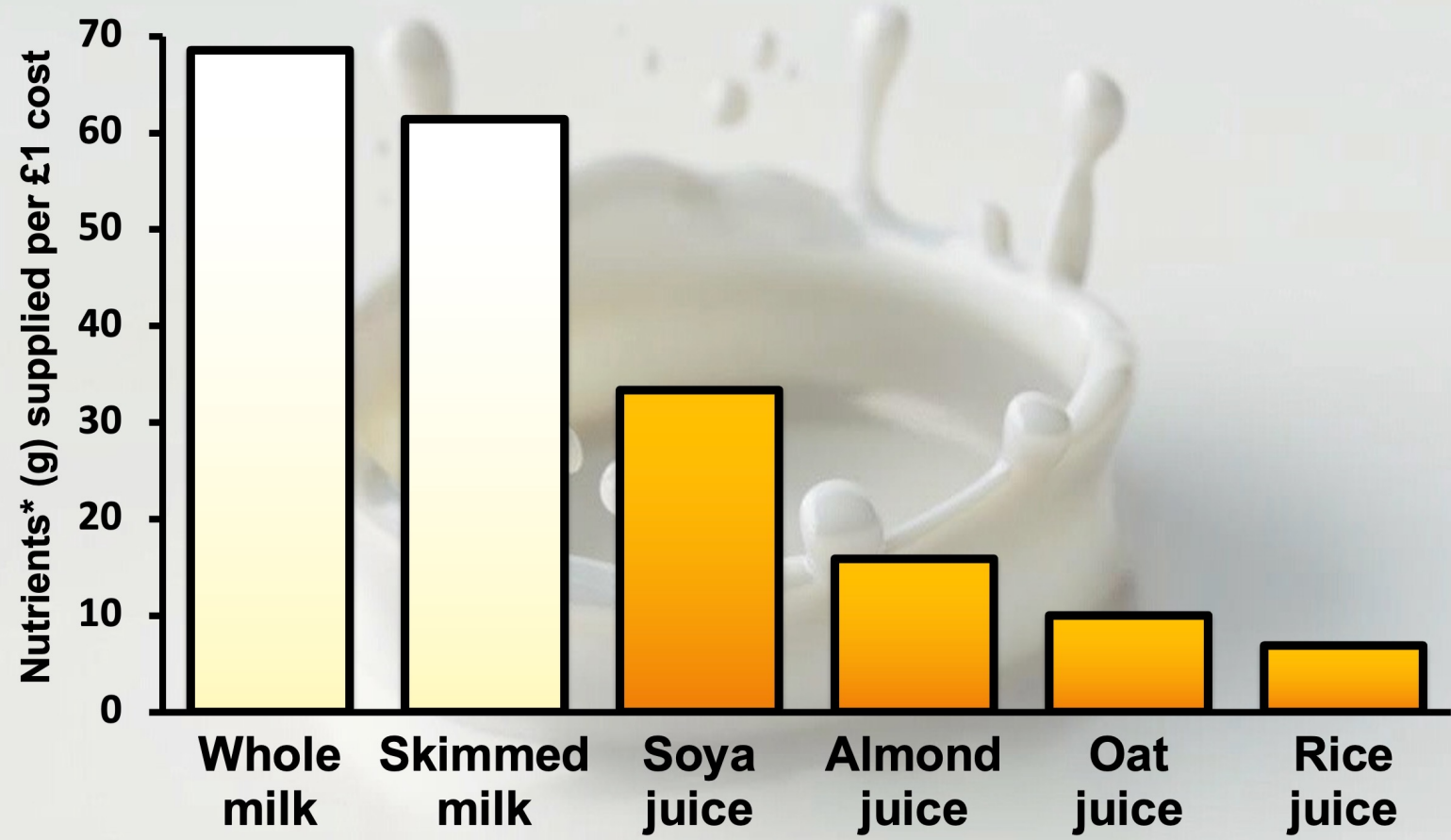
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A close-up photograph of a burger with a sesame seed bun, cheese, and other toppings.

Source: Created by Jude L. Capper, 2023. Data from: Smedman et al. (2010). <https://doi.org/10.3402/fnr.v54i0.5170>



D Dairy supplies more positive nutrients per £1 than plant-based alternatives

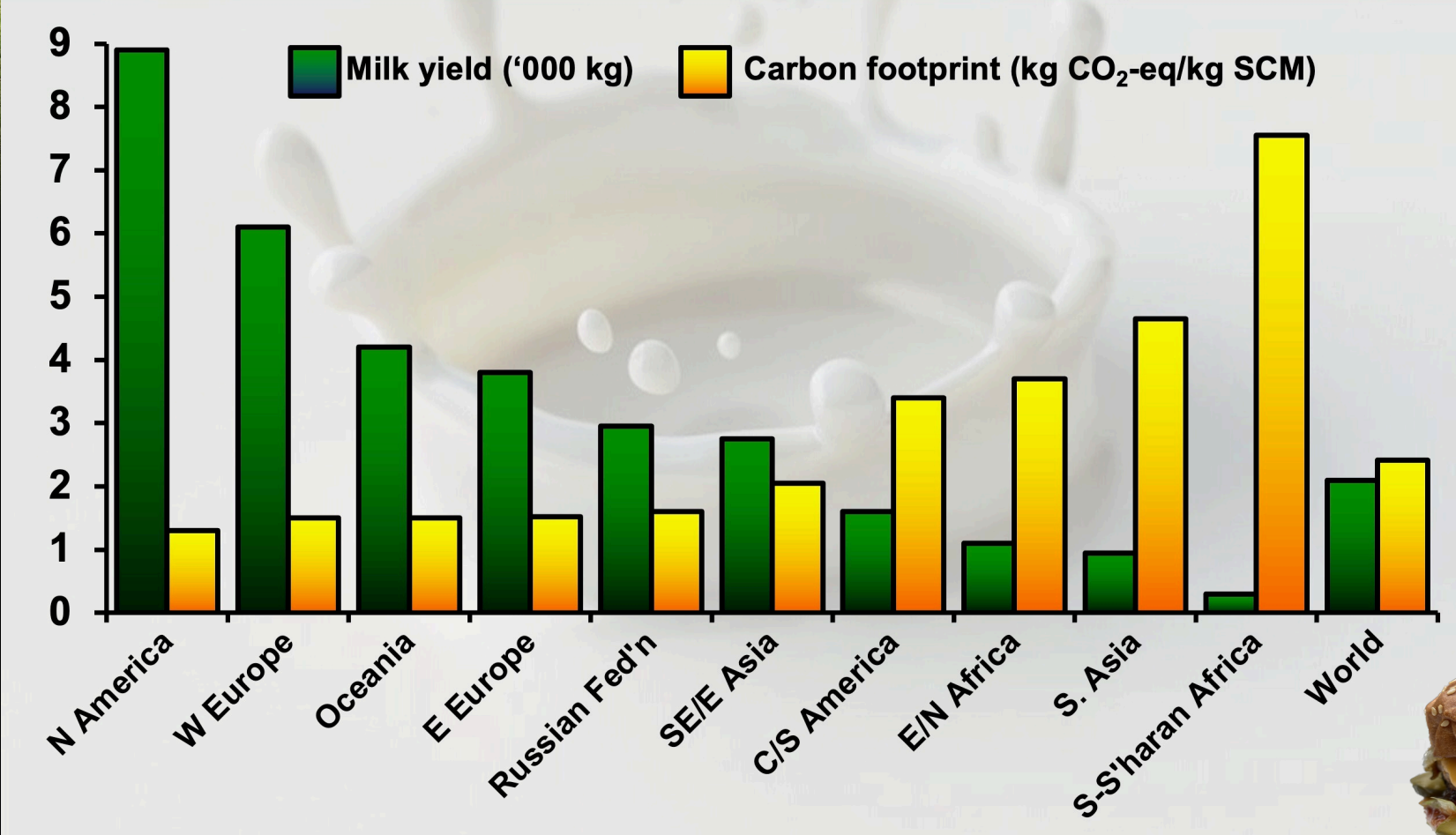


Source: Created by Jude L. Capper, 2023. Beverage cost and nutrition data derived from the Sainsburys shopping app as of 5/11/2019. *Positive nutrients comprise protein, unsaturated fat, fibre; does not include carbohydrates, saturated fats, salt.





A negative correlation exists between milk yield and carbon emissions



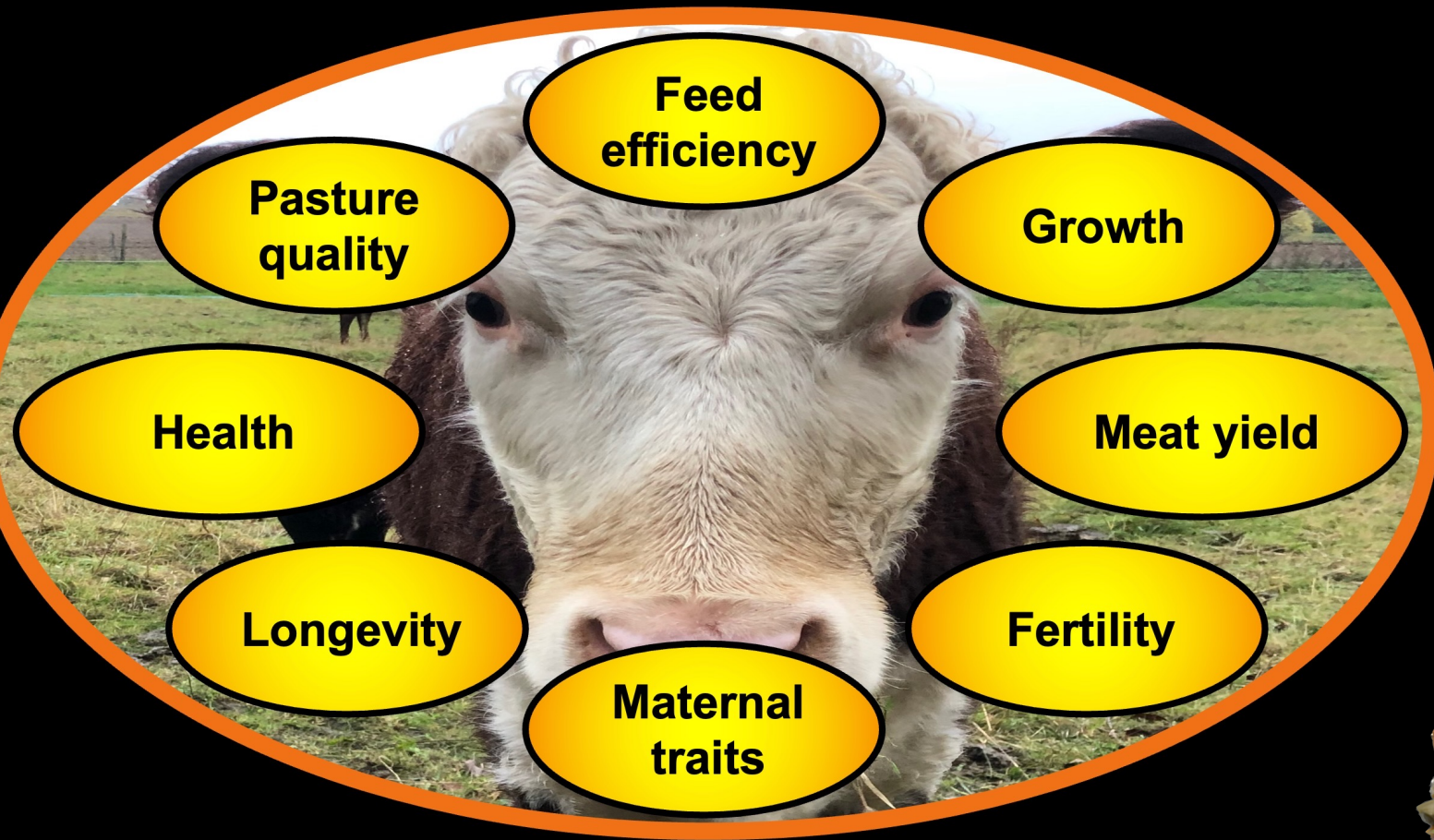
Source: Created by Jude L. Capper, 2023. Data from FAO (2010) Greenhouse Gas Emissions from the Dairy Sector. FAO, Rome, Italy.

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Improving key performance indicators reduces environmental impacts



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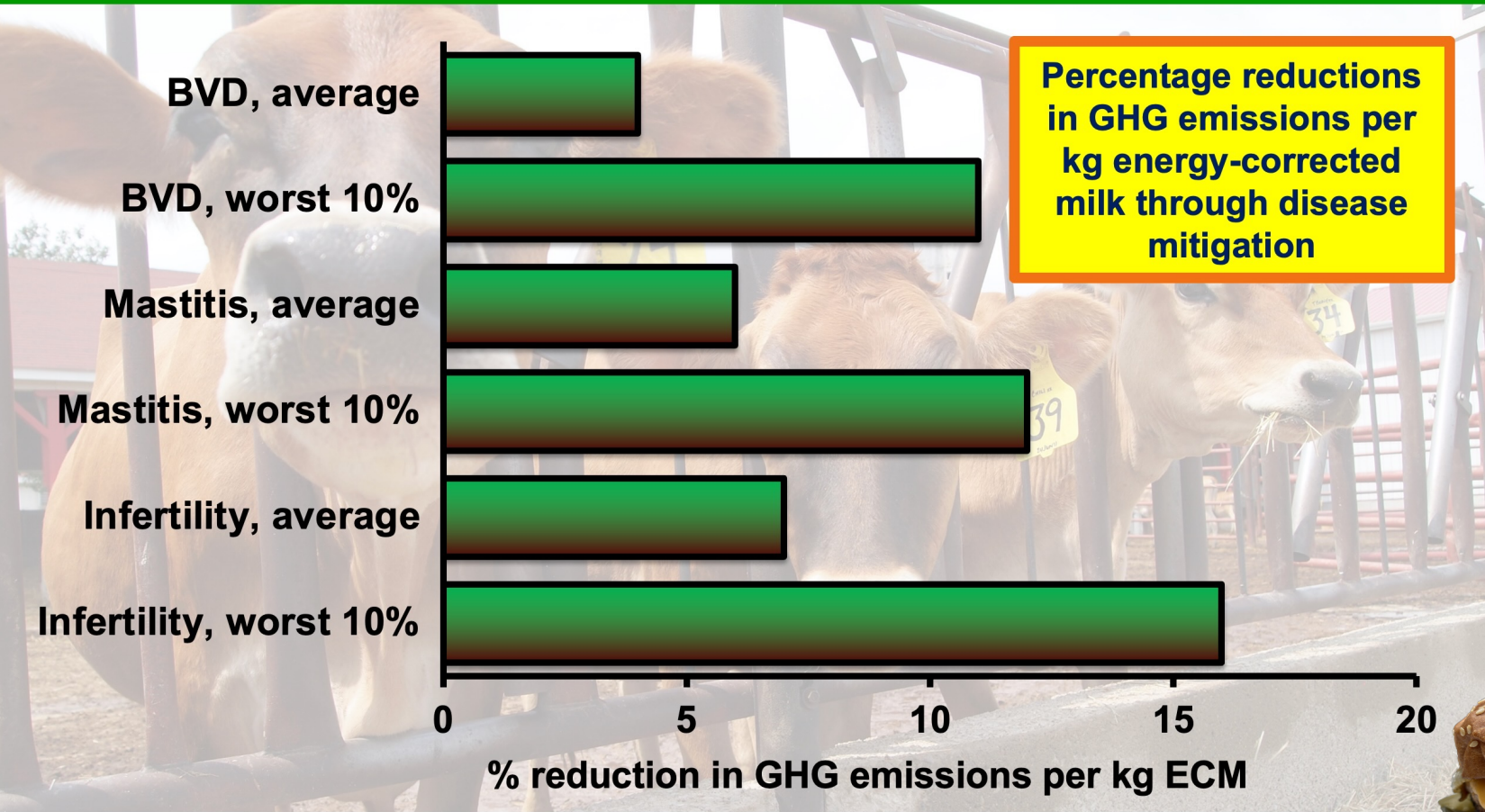


Source: Created by Jude L. Capper, 2023






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



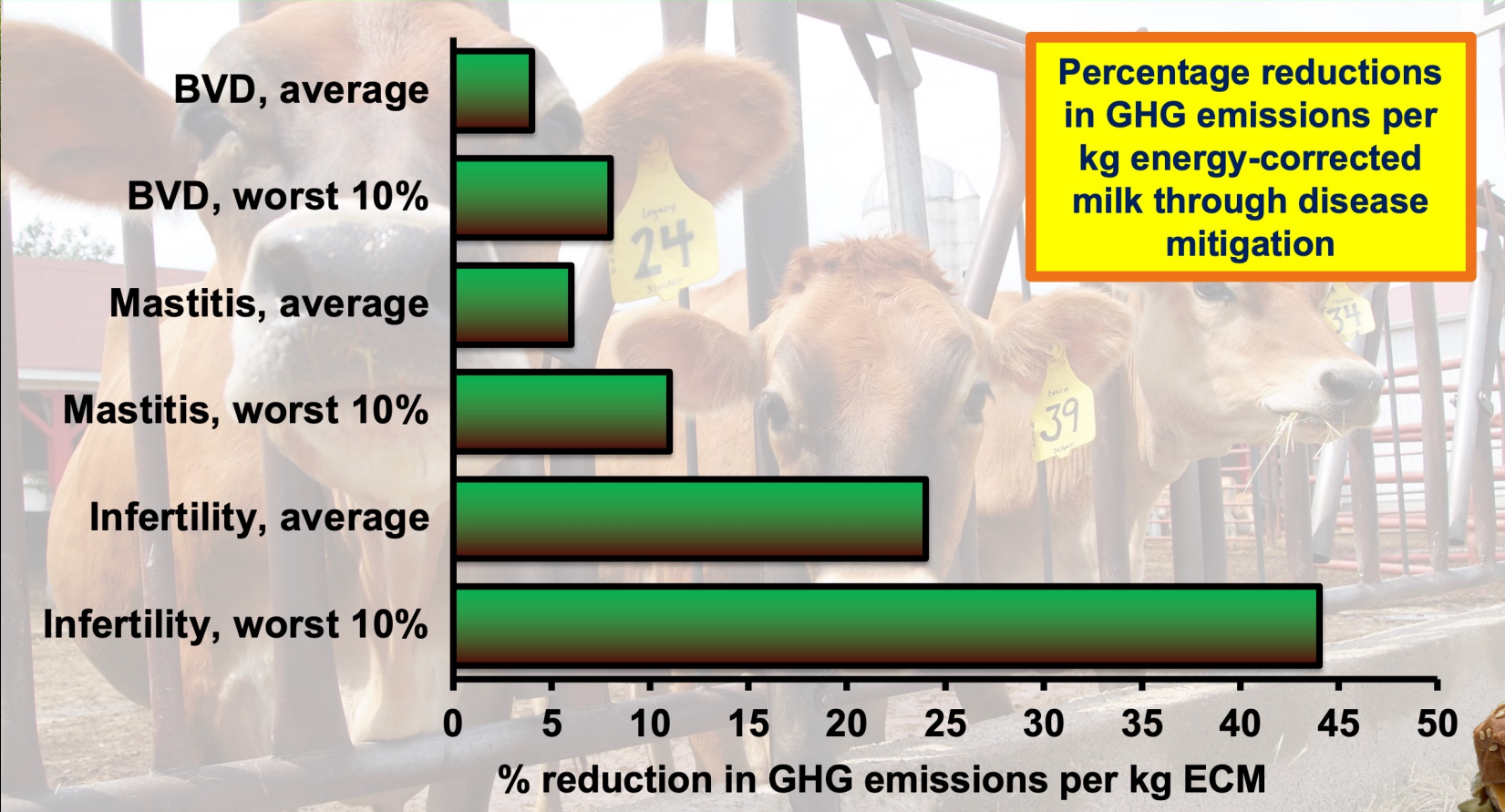
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Source: Created by Jude L. Capper, 2023. Data from: Statham et al. 2021. Dairy Cattle Health and Greenhouse Gas Emissions Pilot Study: Chile, Kenya and the UK.
Available from: <https://dairysustainabilityframework.org/wp-content/uploads/2020/10/Dairy-Cattle-Health-and-GHG-Emissions-Pilot-Study-Report.pdf>



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



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Source: Created by Jude L. Capper, 2023. 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>



HfA

“Real life” application – African swine fever

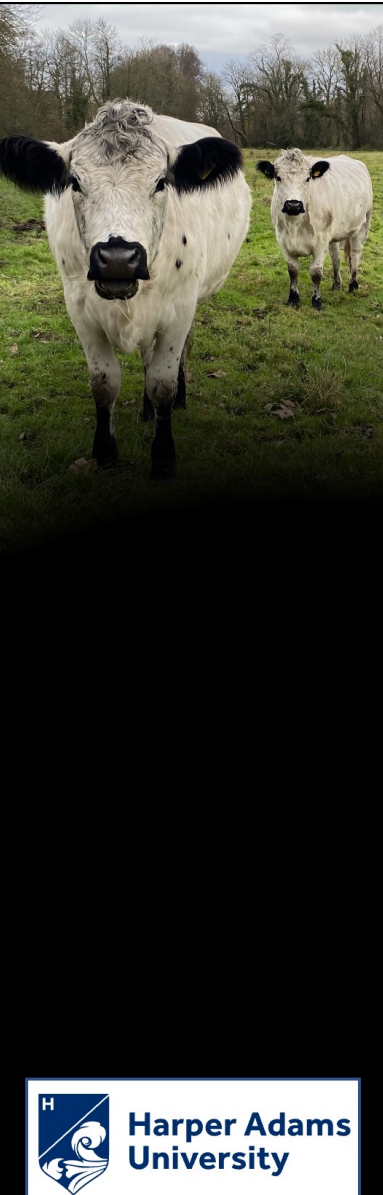
The recent African swine fever outbreak, in which 100-150 million pigs died, led to:

17-38% increase
in global pork
prices

Pigmeat losses
would have fed
550-824 million
people

Greenhouse
gases invested in
animals that died
or were culled
were equal to
annual emissions
of 16.7-25.1
million cars





D

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 Jude L. Capper, 2023. Data from FAOSTAT (2020) <http://www.fao.org/faostat/en/>

D

What about smallholders?

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Source: Created by Jude L. Capper, 2023. Photo attribution: Mullookkaan, CC BY-SA 3.0 <<https://creativecommons.org/licenses/by-sa/3.0/>>, via Wikimedia Commons

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How do we account for myriad livestock benefits in sustainability metrics?



Nutrition



Income



Fertiliser



Draught power



Cultural status



Education



Female emancipation



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Can we grow human food crops everywhere?



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Source: Created by Jude L. Capper, 2023.

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Can we grow human food crops everywhere?



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Source: Created by Jude L. Capper, 2023

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>60% of UK land is not suitable for growing arable crops



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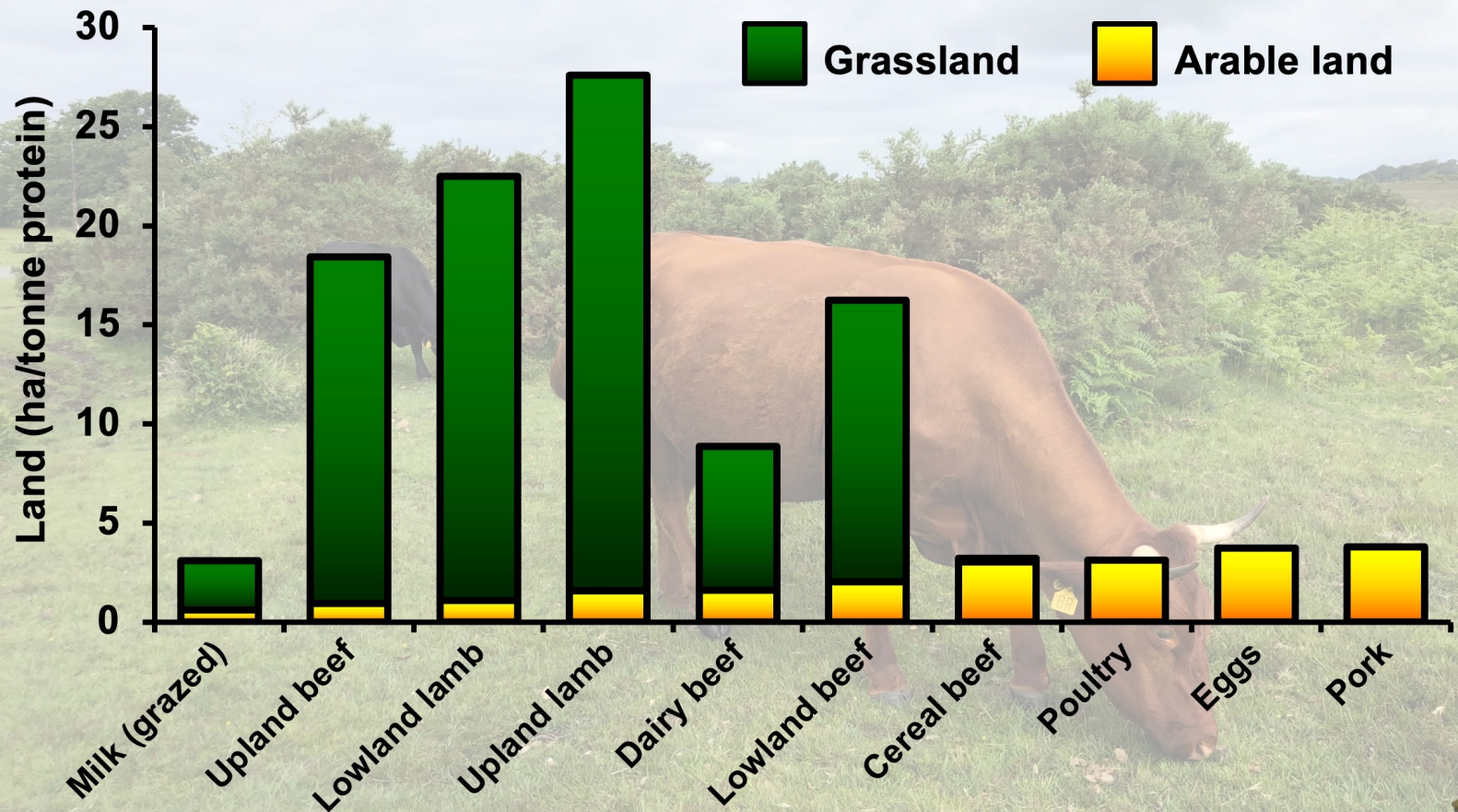


Source: Created by Jude L. Capper, 2023. Grazing land includes temporary grass on arable land (5% of total). Data from DEFRA. 2020. Farming statistics - provisional crop areas, yields and livestock populations at 1 June 2020 – United Kingdom. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/946161/structure-jun2020final-uk-22dec20.pdf



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Livestock systems vary widely in arable and grassland use



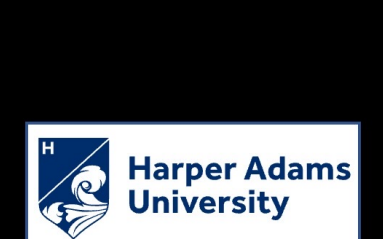
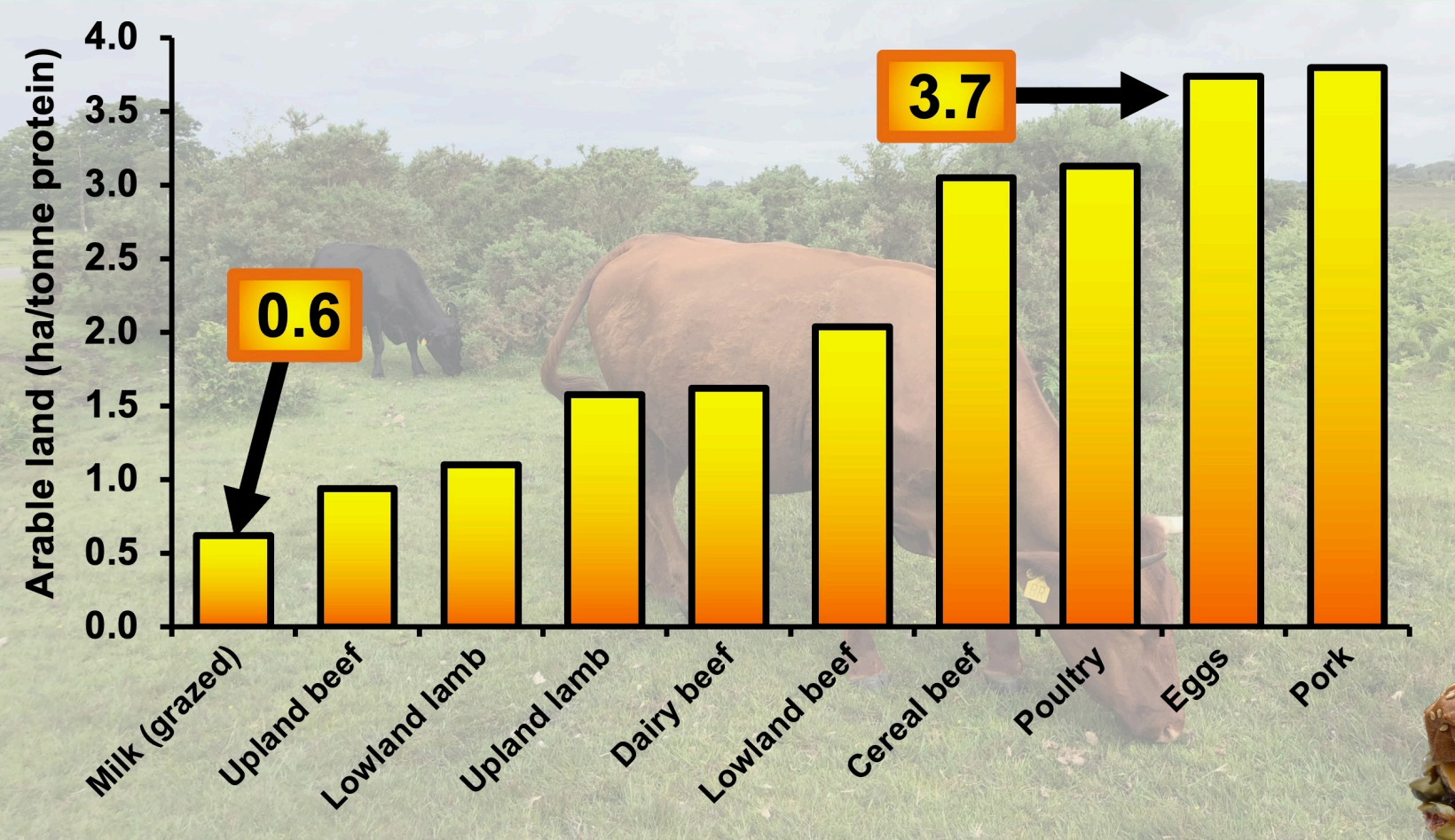
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Source: Created by Jude L. Capper, 2023; data from Wilkinson and Lee (2018) <https://doi.org/10.1017/S175173111700218X>

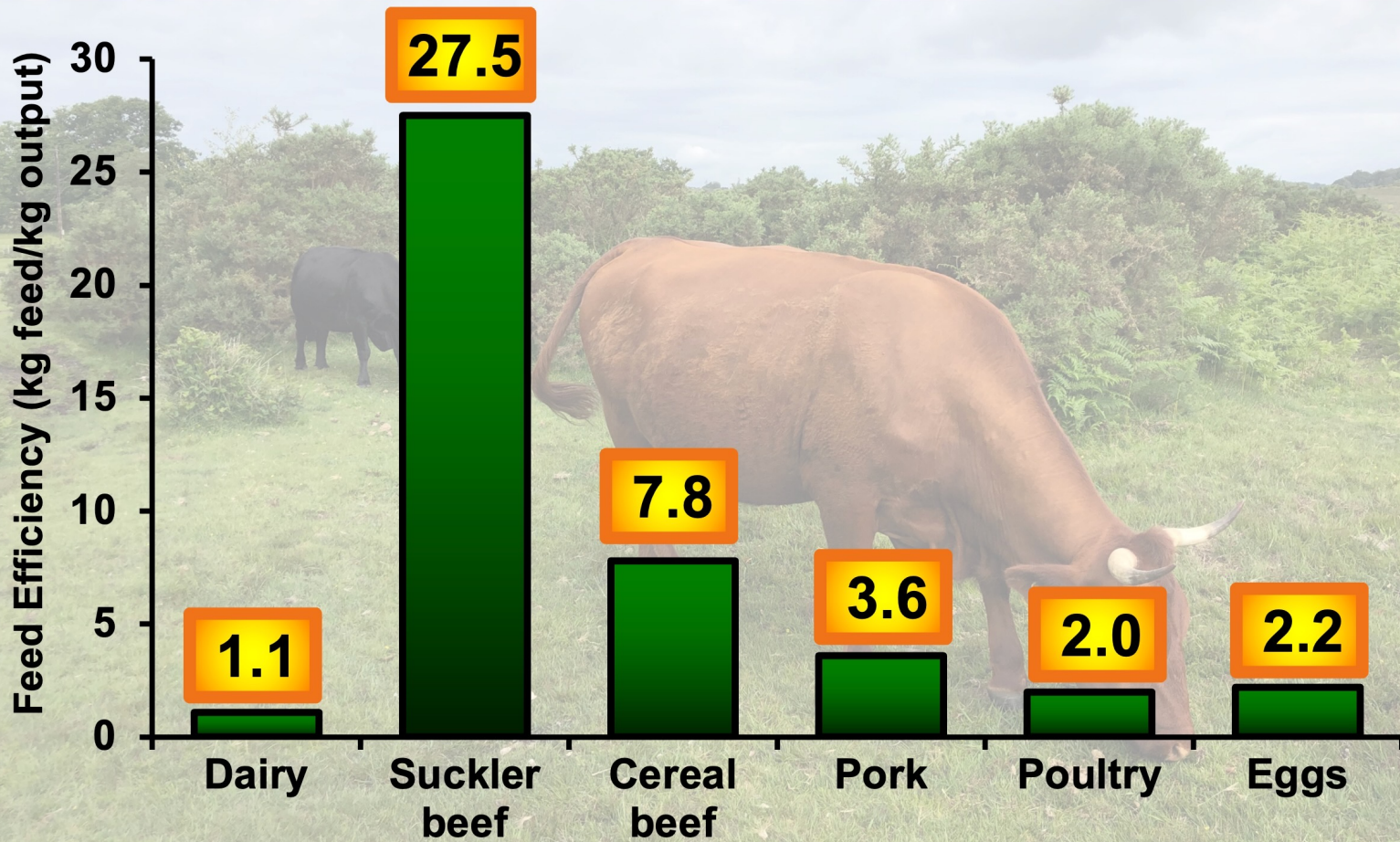


Livestock systems vary widely in arable land use



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Feed efficiency ratios vary between systems and species



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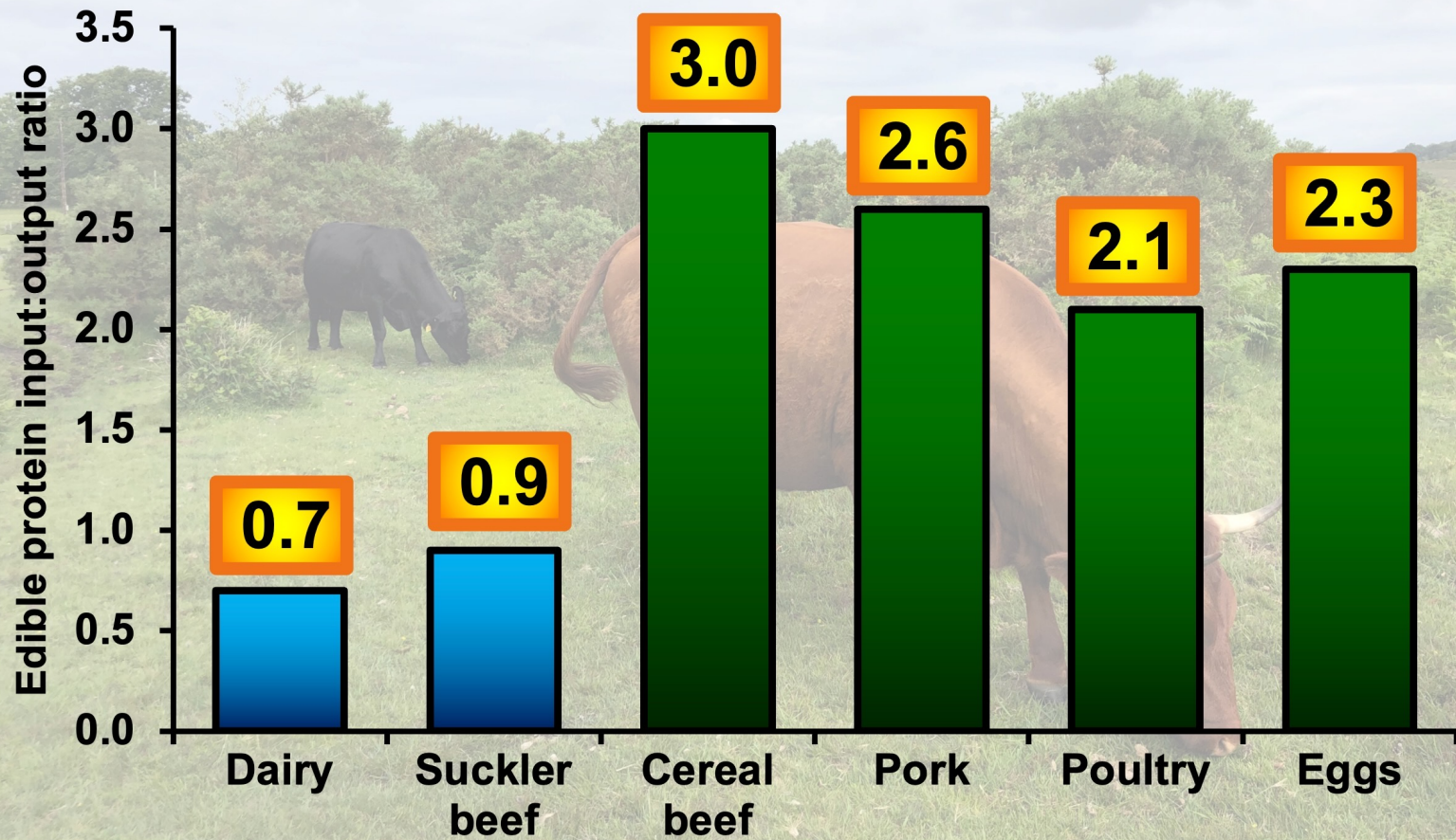
What do these industries have in common? They all provide by-products fed to animals



Source: Created by Jude L. Capper, 2023.

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



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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/>



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Dung beetles have myriad ecosystem benefits



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Source: Created by Jude L. Capper, 2023.

COM

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

**JOIN THE
NEW YEAR'S
REVOLUTION**



- 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



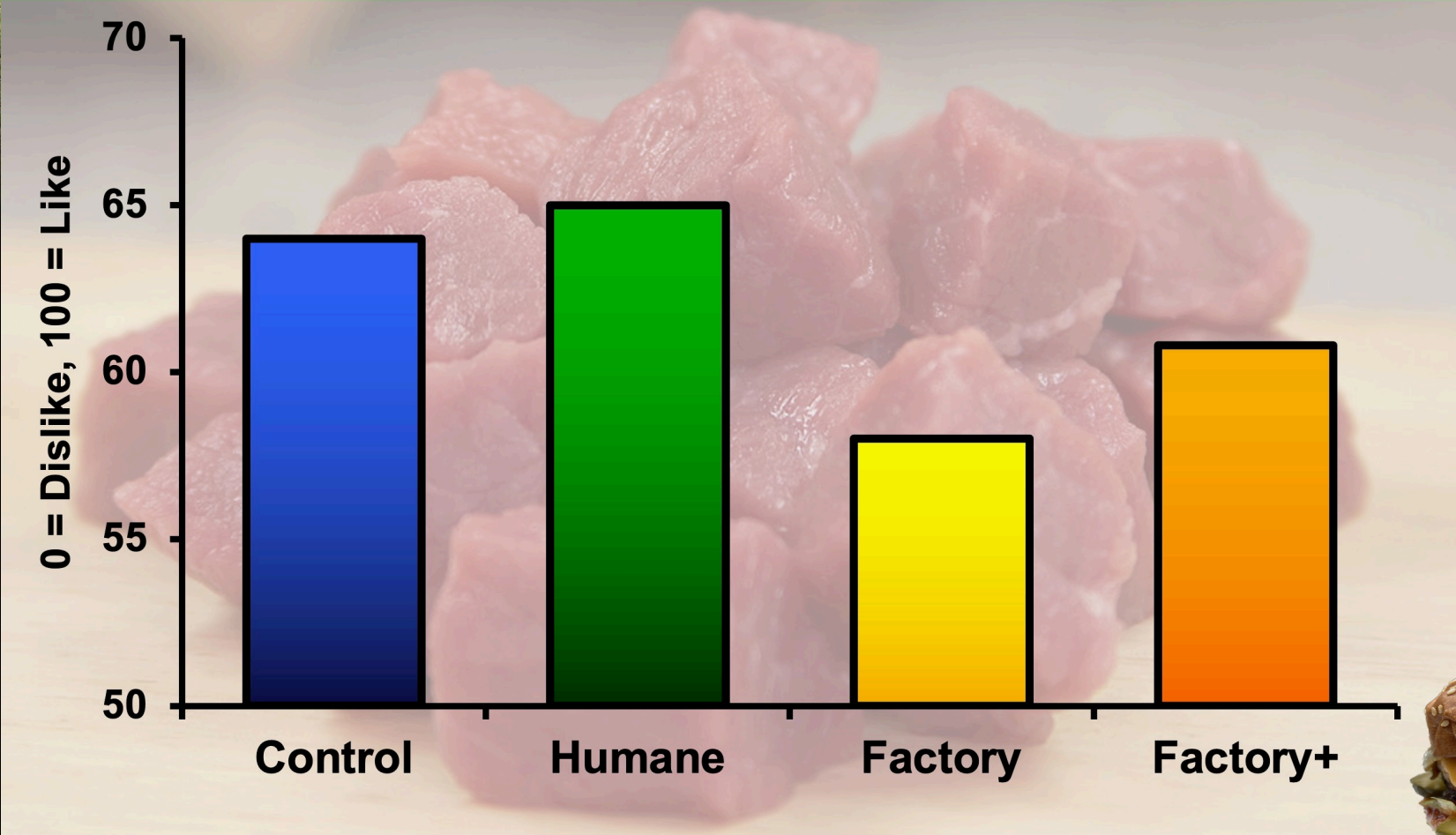
Source: Created by Jude L. Capper, 2023. Information from: <https://veganuary.com/blog/>

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Consumer perceptions influence the enjoyment and sensory qualities of food



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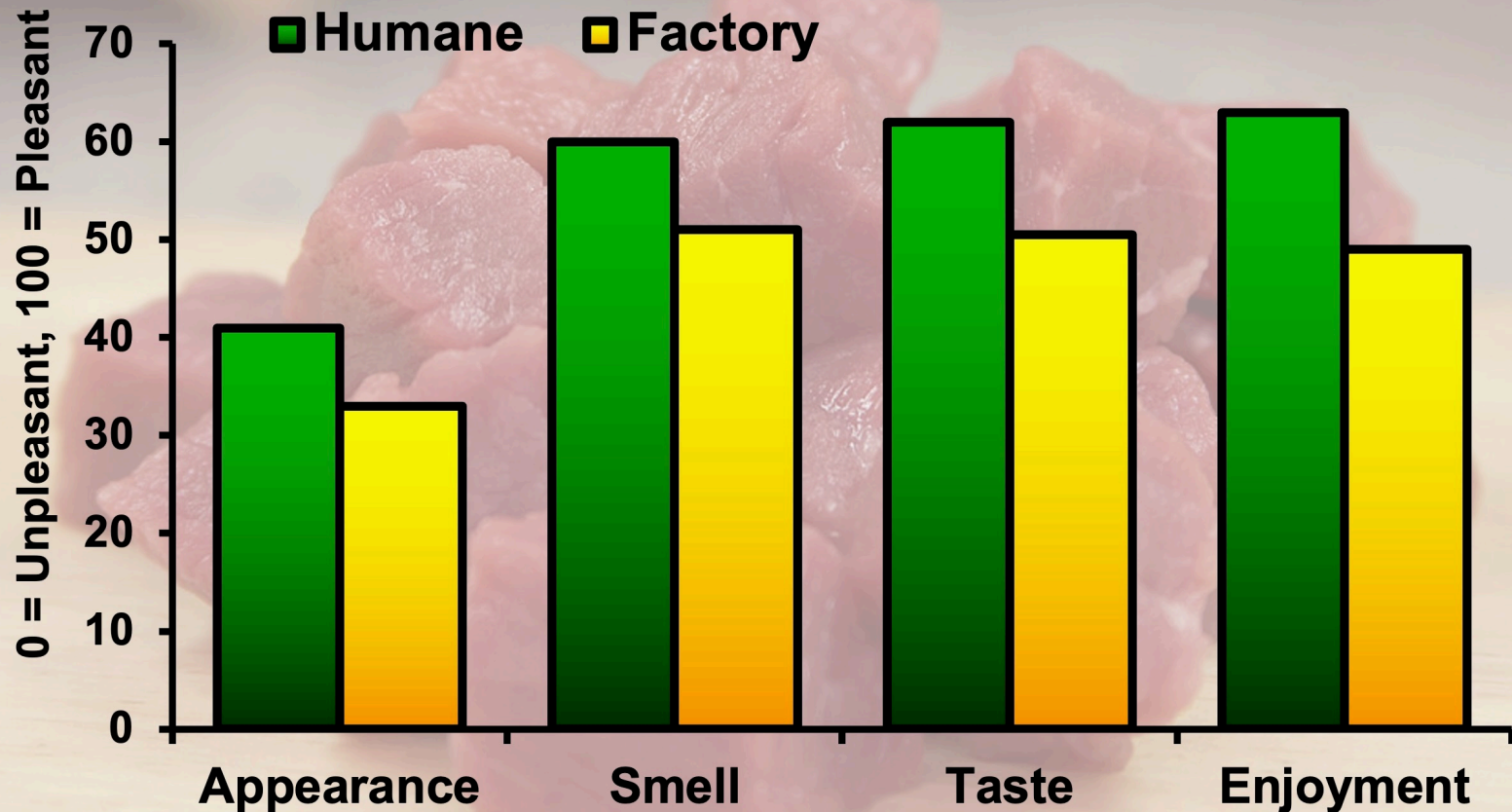
Source: Created by Jude L. Capper, 2023; data from Anderson and Barrett (2016) <https://doi.org/10.1371/journal.pone.0160424>.





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Consumer perceptions of agriculture influence meat quality/enjoyment parameters



COM

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

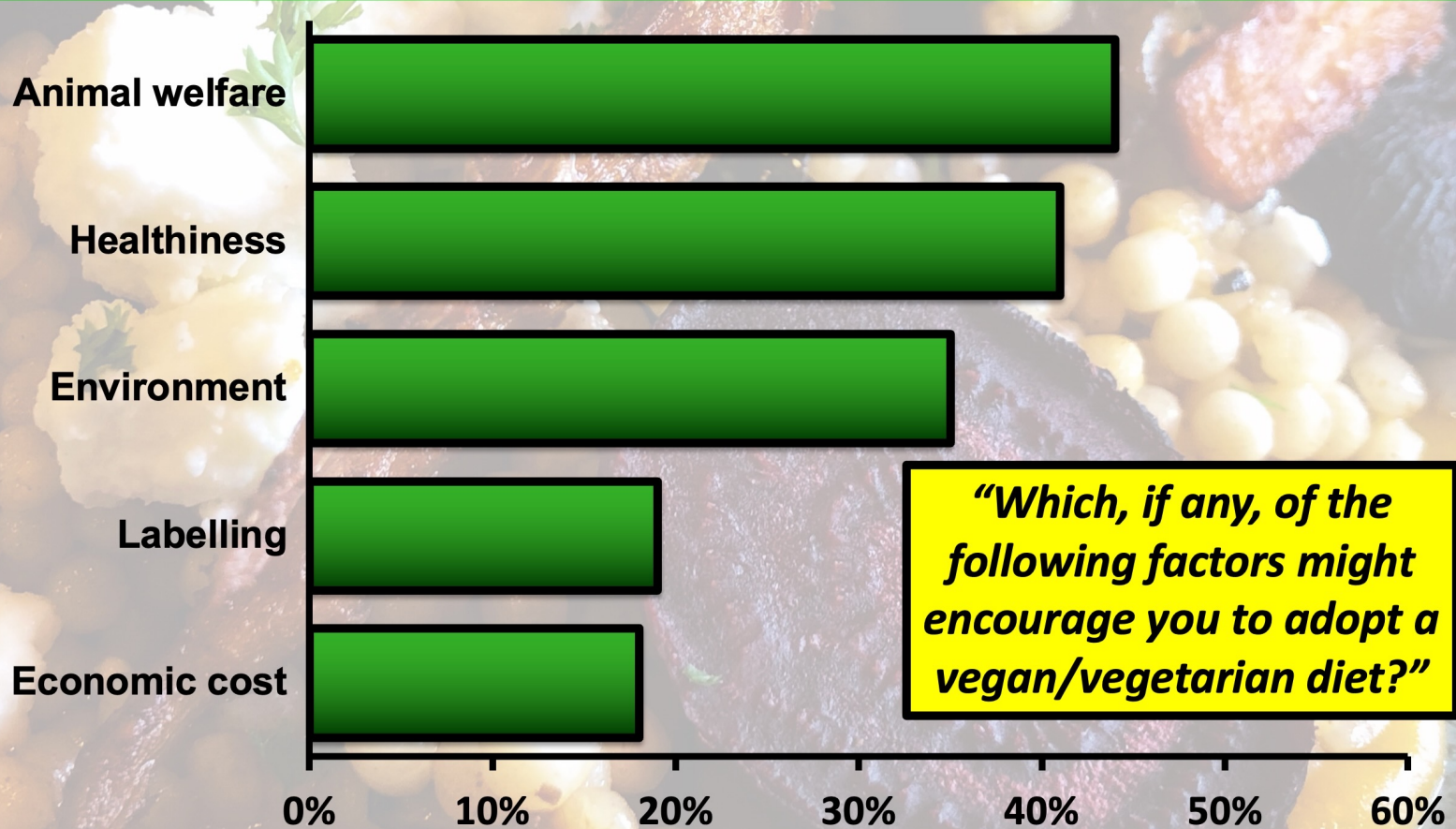
**No guilt
34%**

**Feel guilty
66%**



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Animal welfare, health and the environment are primary consumer concerns



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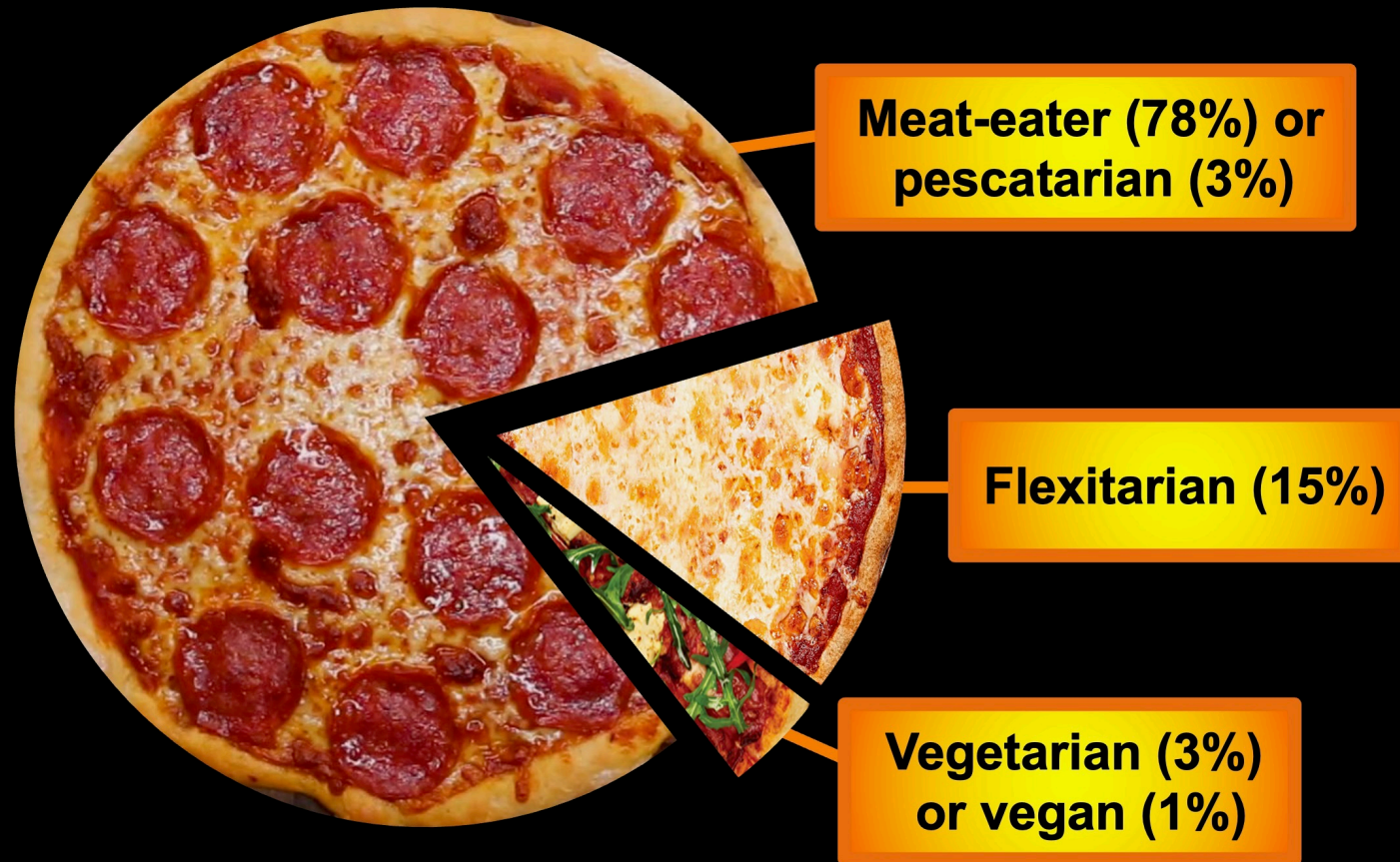


Source: Created by Jude L. Capper, 2023. Information from: YouGov (2019) Is the future of food flexitarian?
<https://yougov.co.uk/topics/resources/articles-reports/2019/03/18/future-food-flexitarian>



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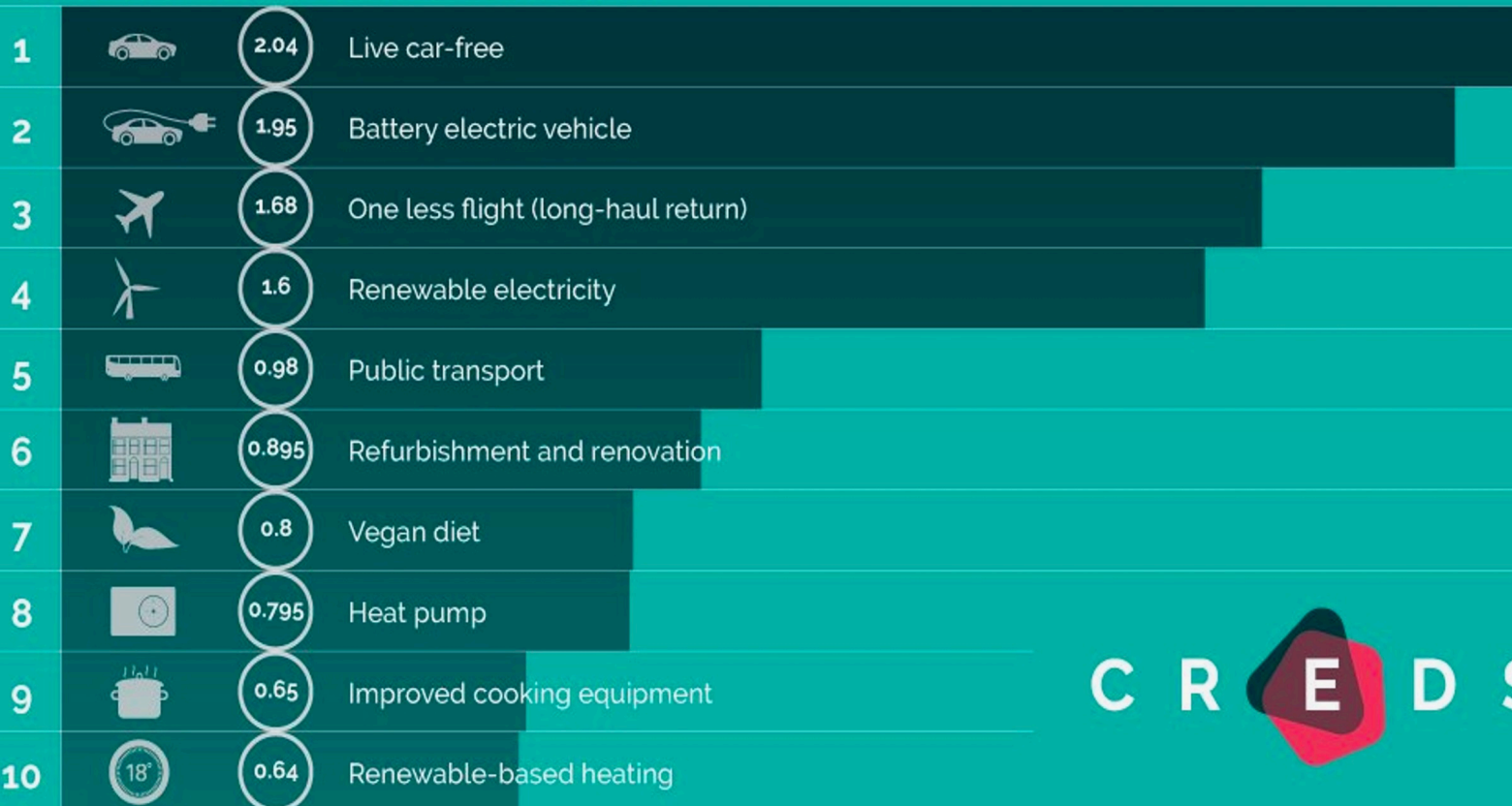
The future probably isn't vegan, but it may be flexitarian?



CV

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

Top 10 options for reducing your carbon footprint



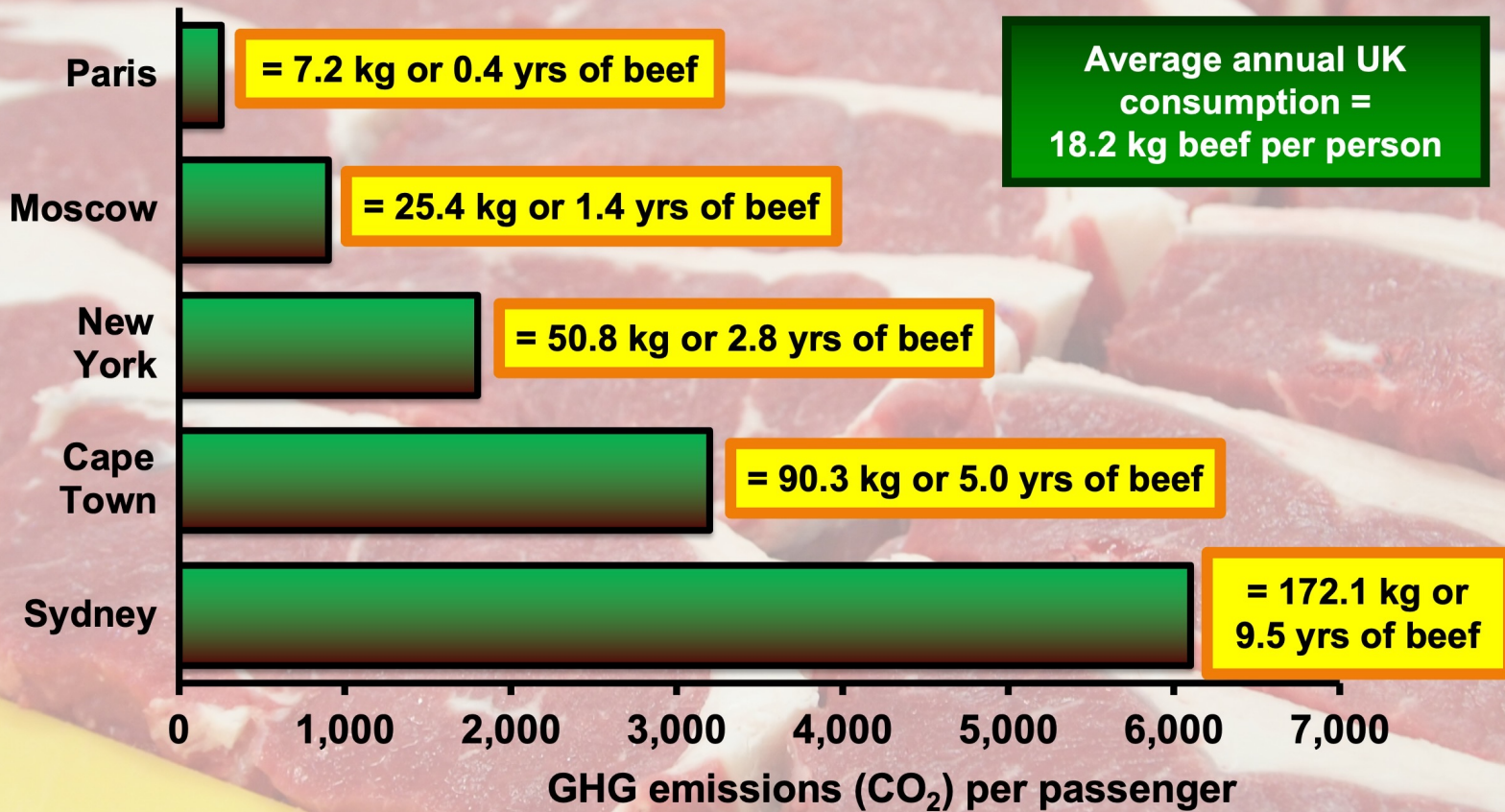
Source: Created by Jude L. Capper, 2023. Infographic adapted from Centre for Research into Energy Demand Solutions (2020). Available at: https://twitter.com/CREDS_UK/status/1262984570175176704?s=20

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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/ne 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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Globally, 33% of food is wasted



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Source: Created by Jude L. Capper, 2023. Data from FAO (2013) "Food Wastage Footprint – Impacts on Natural Resources". FAO, Rome, Italy.

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Is local food going to save the world?



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Source: Created by Jude L. Capper, 2023. Quote from: <http://www.polyfacefarms.com/taste.aspx>

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Is local food going to save the world?

**We do not ship
anything anywhere.
We encourage folks
to find their local
producers and
patronize them.**



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Is local food going to save the world?

**What patrons are saying about our farm:
*“I drive to Polyface 150 miles one way in order to get clean meat for my family.” V.K.***



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“Food miles” are considerably greater for eggs shipped across the country

Grocery store egg truck travels **2,405 mi** at **5.4 mpg** (TX to VA)

Car for poultry farm eggs travels **300 mi** at **22.6 mpg**

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Source: Created by Jude L. Capper, 2023. Data from: Capper (2011) <https://doi.org/10.2527/af.2011-0009>

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Vehicle productivity is key to assessing food transportation emissions

A tractor trailer carries **23,400** dozen eggs

A car carries **one** dozen eggs



Source: Created by Jude L. Capper, 2023. Data from: Capper (2011) <https://doi.org/10.2527/af.2011-0009>



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The obvious answer isn't always the right answer

Buying poultry farm eggs emits **55x** more CO₂ than buying grocery store eggs

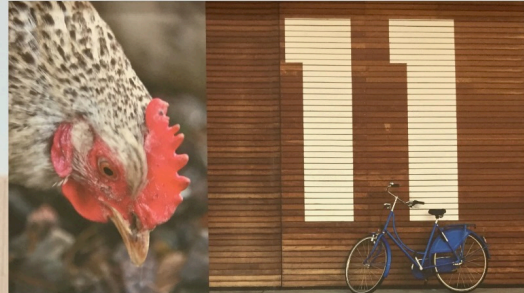
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Source: Created by Jude L. Capper, 2023. Data from: Capper (2011) <https://doi.org/10.2527/af.2011-0009>

COM

We need transparency not bucolic imagery



TRACED FROM FARM TO KITCHEN



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

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We need transparency not bucolic imagery

HERBS & SPICES
FRESH USING
Original **LESS**
Recipe **STUFF**
BRITISH
FARMS 
HEALTHY REDUCING
OPTIONS CARBON



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

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Thank you!



@Bovidiva

<http://bovidiva.com/presentationlinks>

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Questions?



Source: Created by and photo from Jude L. Capper, 2023. Cartoon from: <http://RubesCartoons.com>