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How do we improve cattle sustainability as we move towards 2050?

Dr. Jude L. Capper

12th March 2021

Source: Dr. Jude L. Capper, 2021

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s

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

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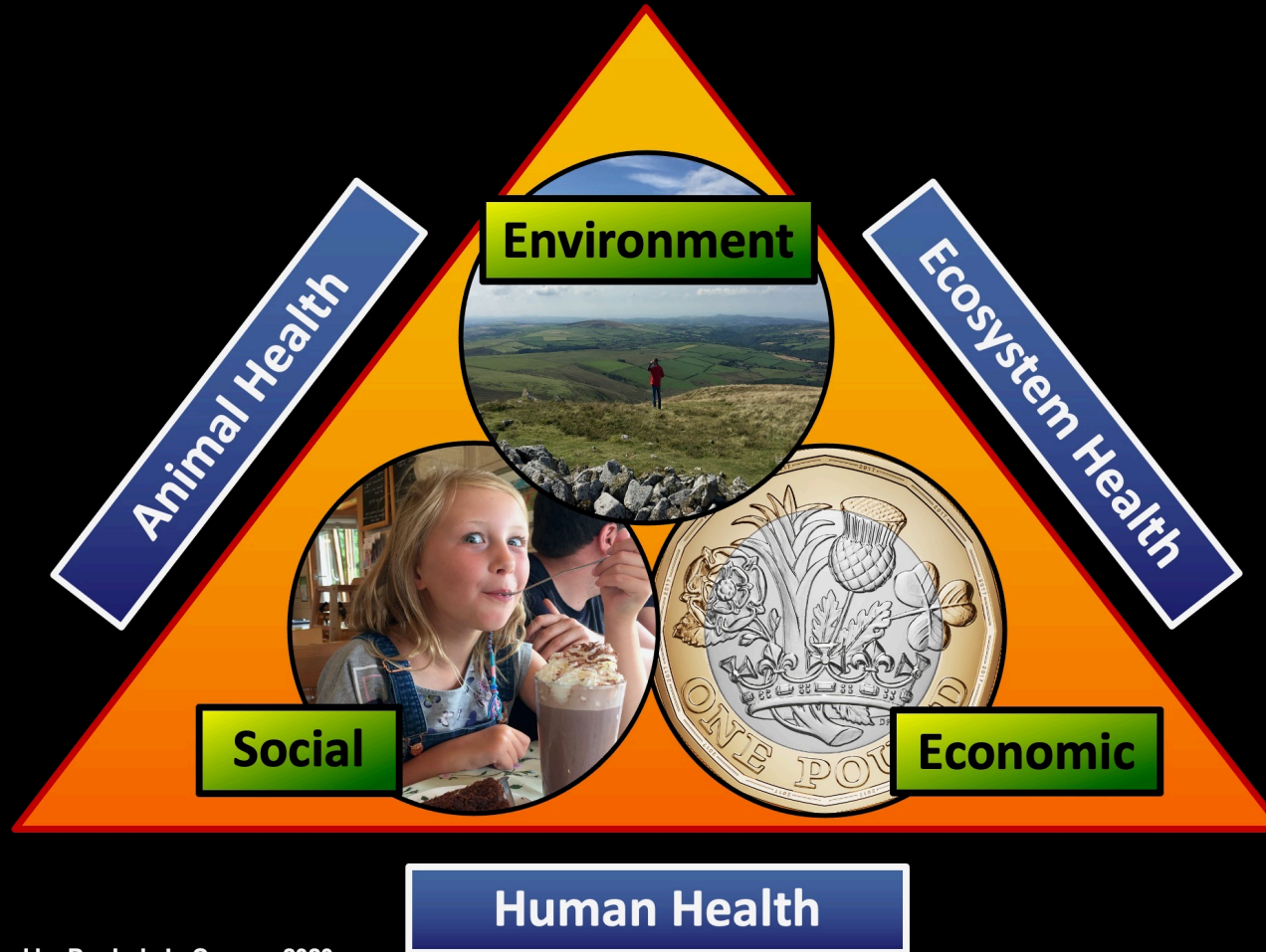


Source: Created and photos by Dr. Jude L. Capper, 2020

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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

The global livestock industry is under threat

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Source: Created by Dr. Jude L. Capper, 2011; Photos from: <http://www.goveg.com/environment-globalwarming.asp>
<http://culturemap.com/newsdetail/09-03-10-is-sex-in-the-shower-killing-our-water-supply-relax-beef-production-is-a-bigger-culprit/>;
http://animals.change.org/blog/view/save_the_animals_save_the_planet_blog_action_day_09_climate_change;
<http://www.peta.org/mc/ads/PAMpartsPETA300.jpg>

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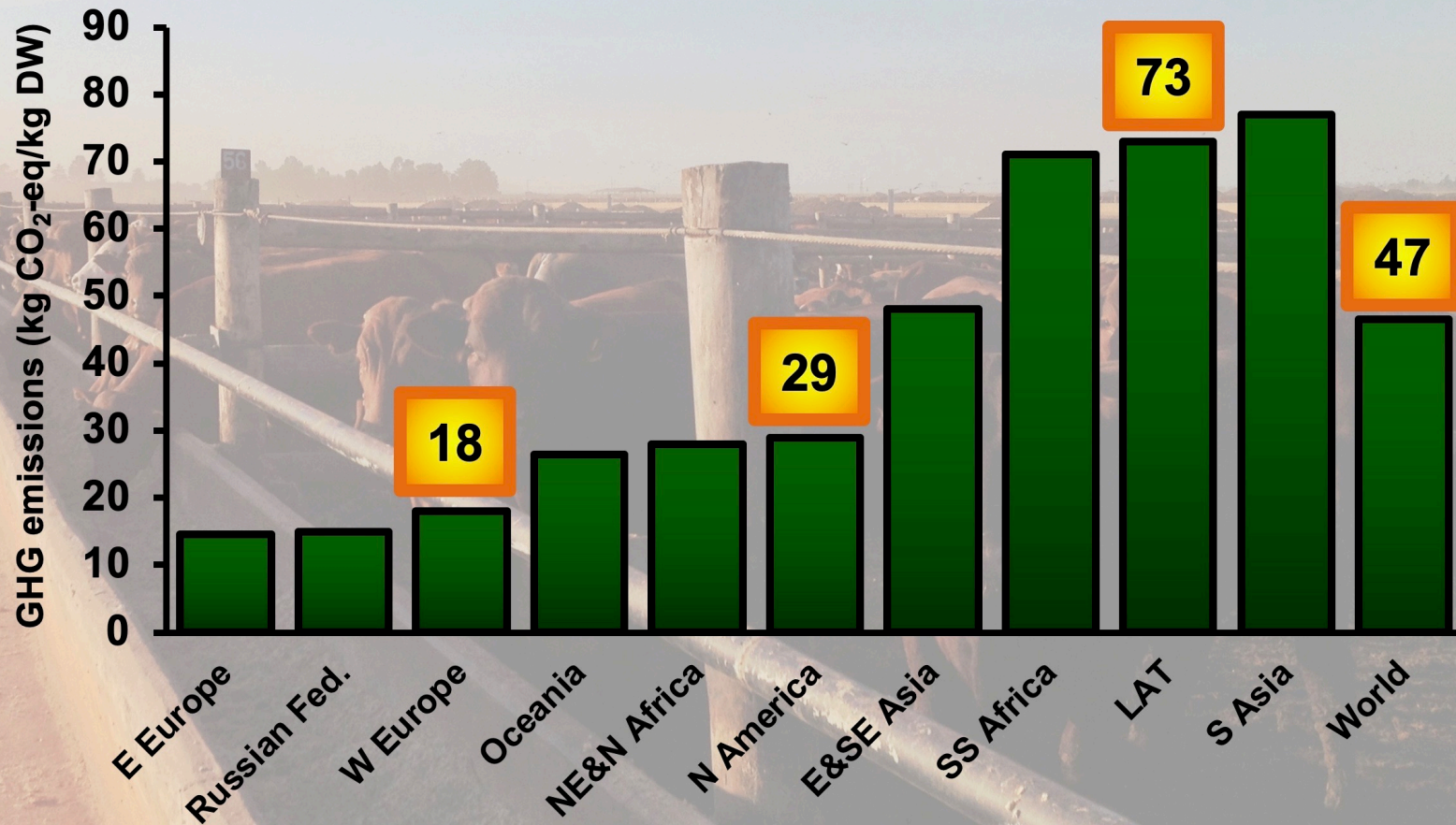


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B

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.



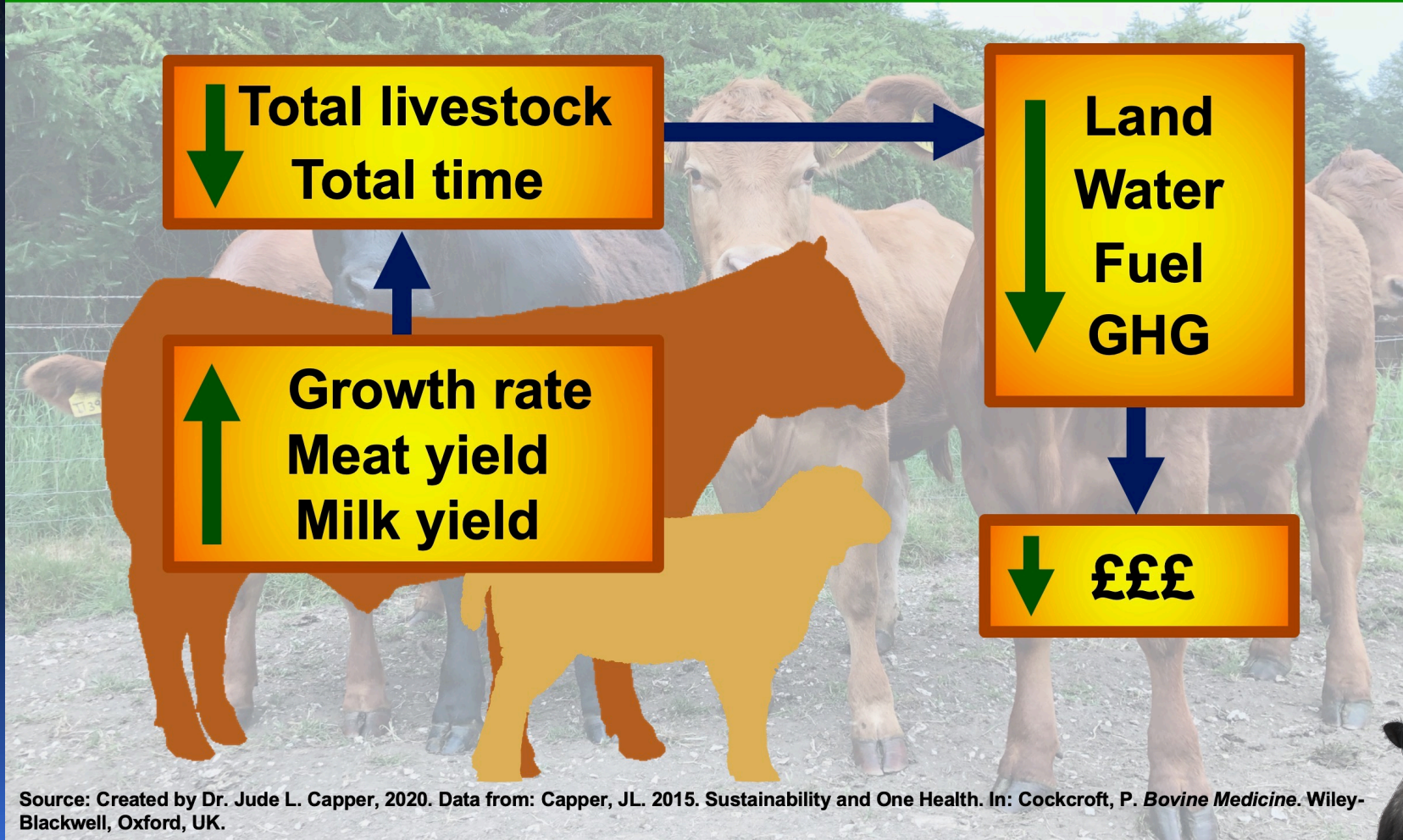
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B

Improving animal productivity reduces the environmental impact of milk and meat



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



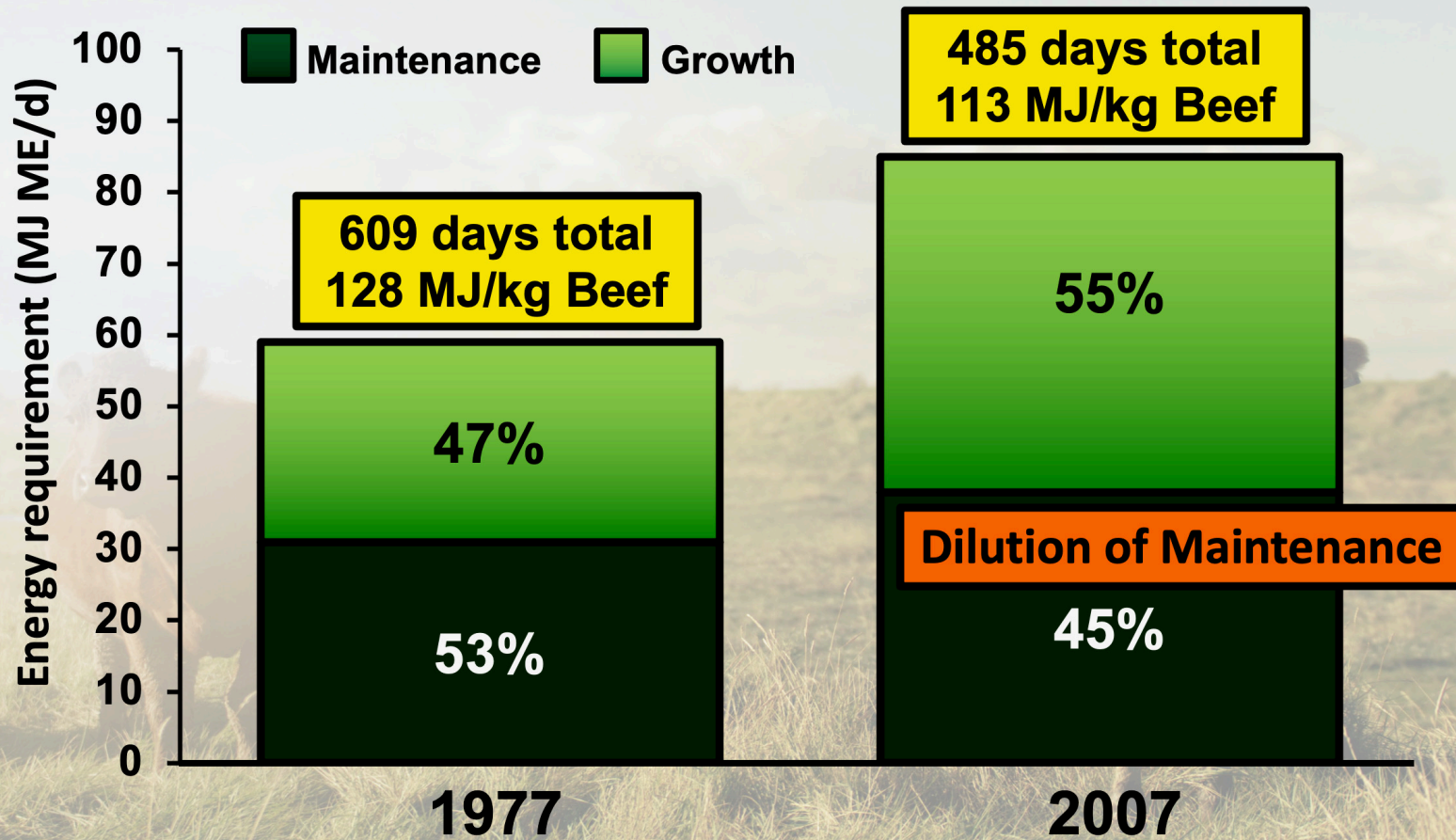


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Improving growth rate reduces energy use per kg of beef

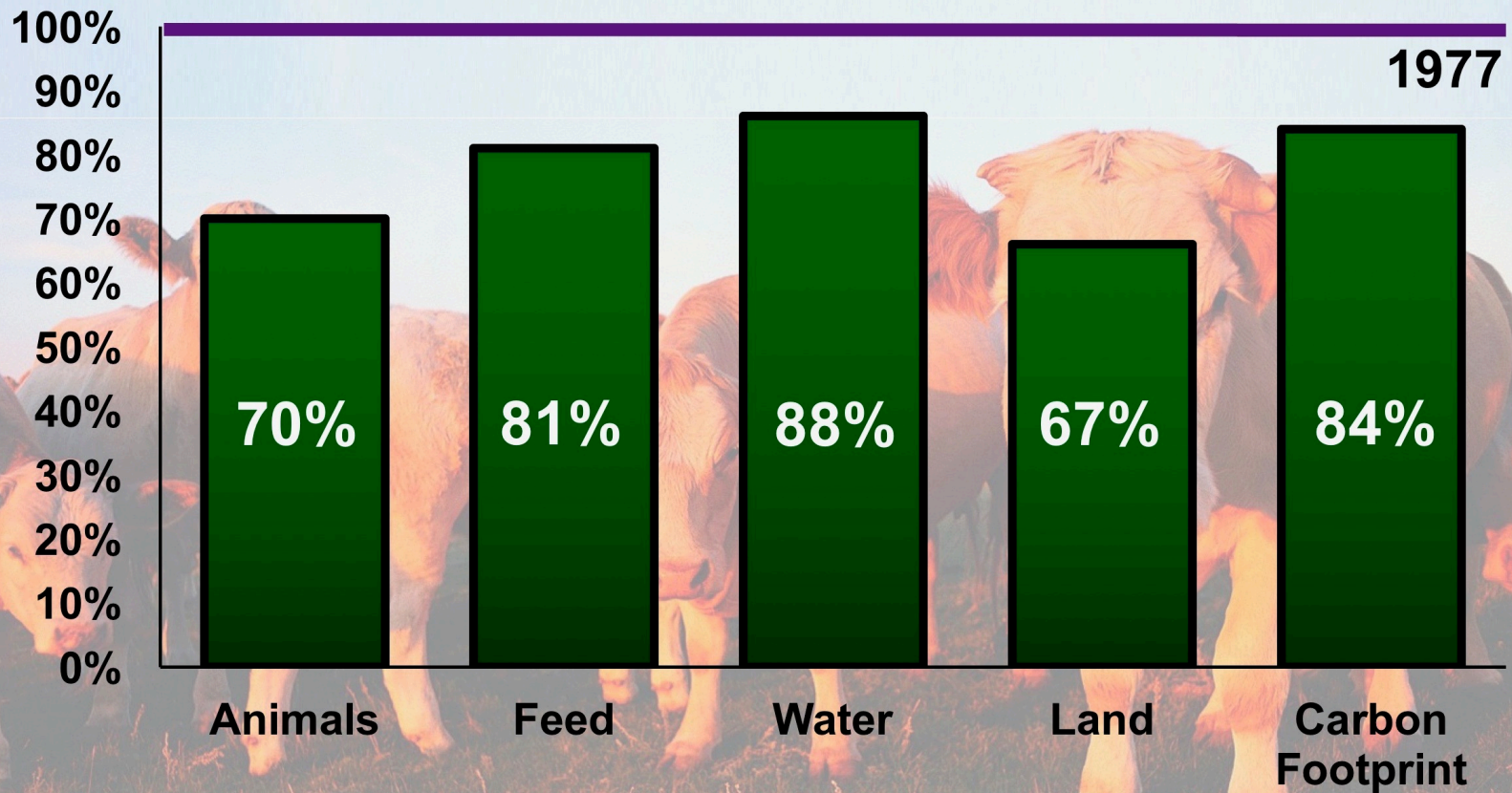


Source: Created as an example by Dr. Jude L. Capper, 2021; Based on nutrient requirements for feedlot-finished steers characteristic of 1977 and 2007 U.S. production systems. data from: Capper (2011) The environmental impact of U.S. beef production: 1977 compared with 2007. *J. Anim Sci.*



B

Environmental impact of U.S. beef production reduced by improved productivity



*All values expressed per lb of beef produced

Source: Created by Dr. Jude L. Capper, 2012; Data from: Capper, J. L. (2011). The environmental impact of U.S. beef production: 1977 compared with 2007. *J. Anim Sci*

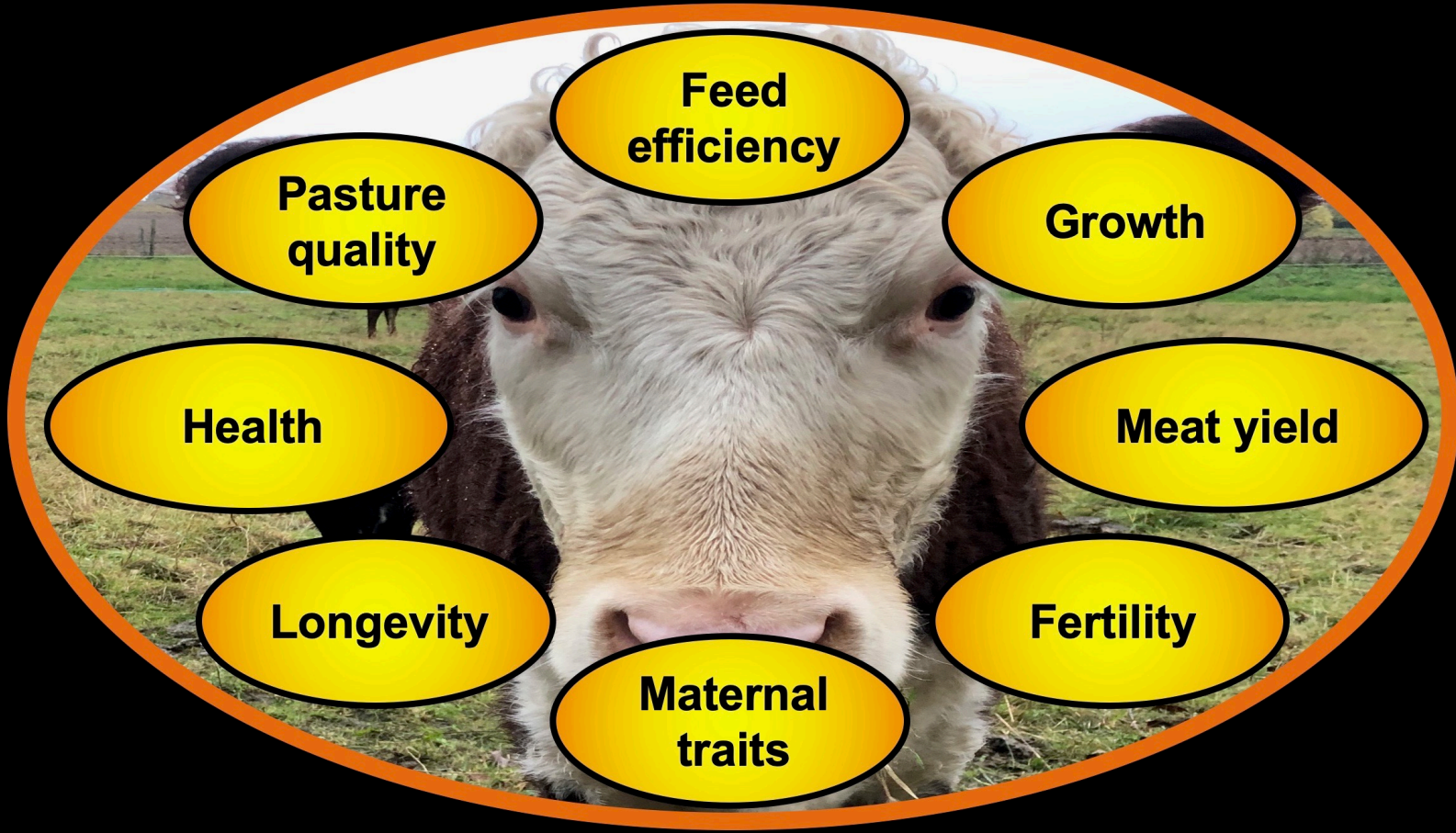
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Improving key performance indicators reduces environmental impacts



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



HfA

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

Lost: 20%

Harvested: 80%

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

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



B

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.



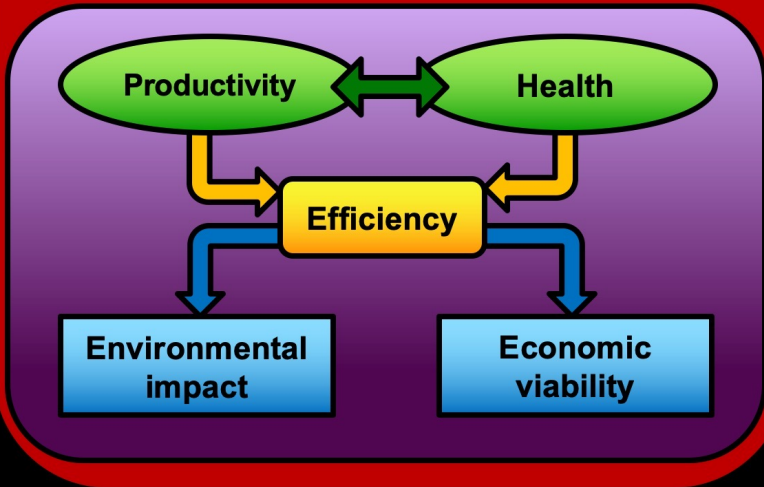
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Social acceptability and consumer trust are vital for sustainable livestock production

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Social Acceptability



Sustainability



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

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

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REVOLUTION**



- Slightly greater than the population of Lisbon
- If all participants were Portugal-based they would comprise <6% of the Portuguese 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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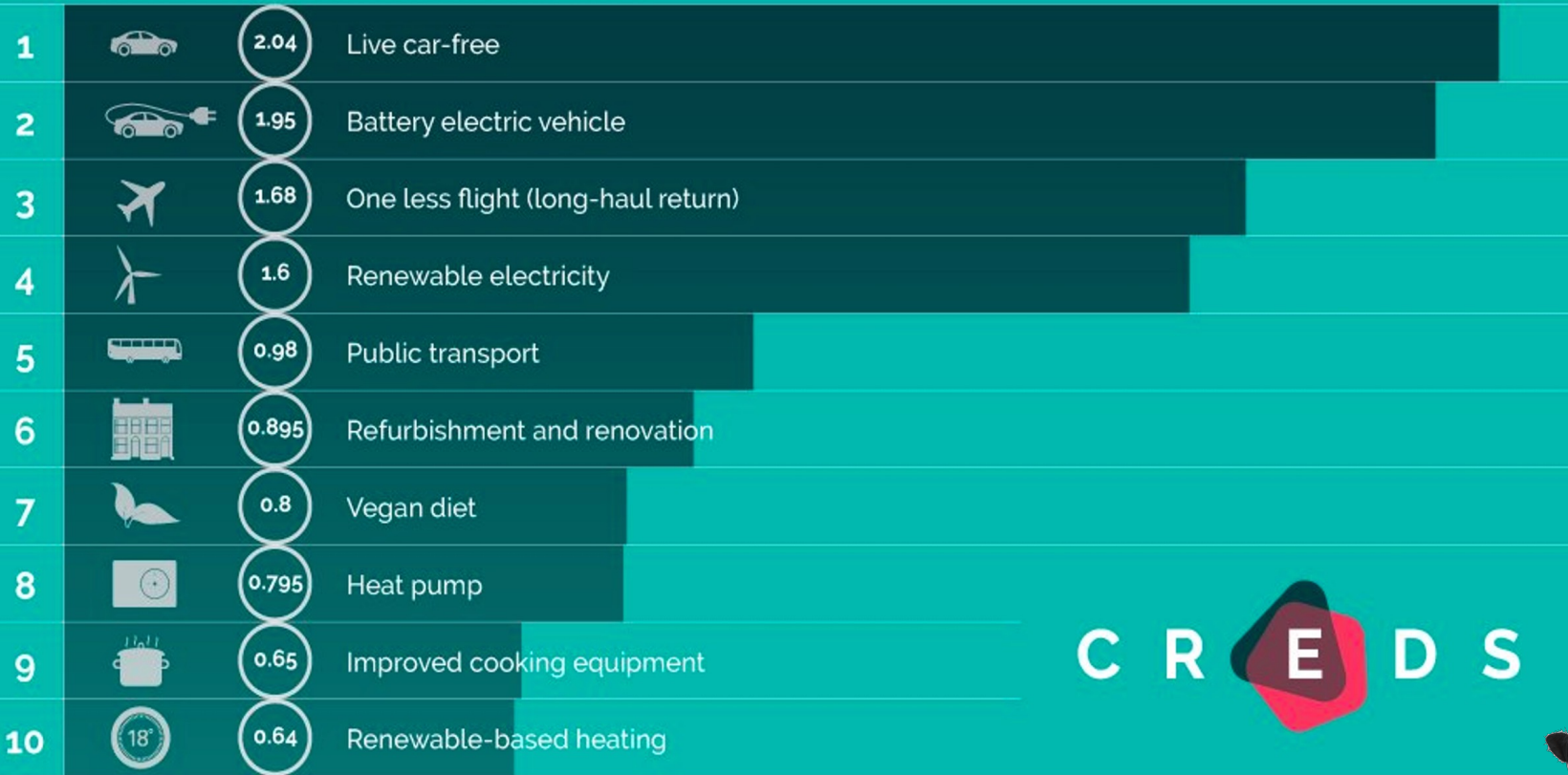
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CV

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

Top 10 options for reducing your carbon footprint



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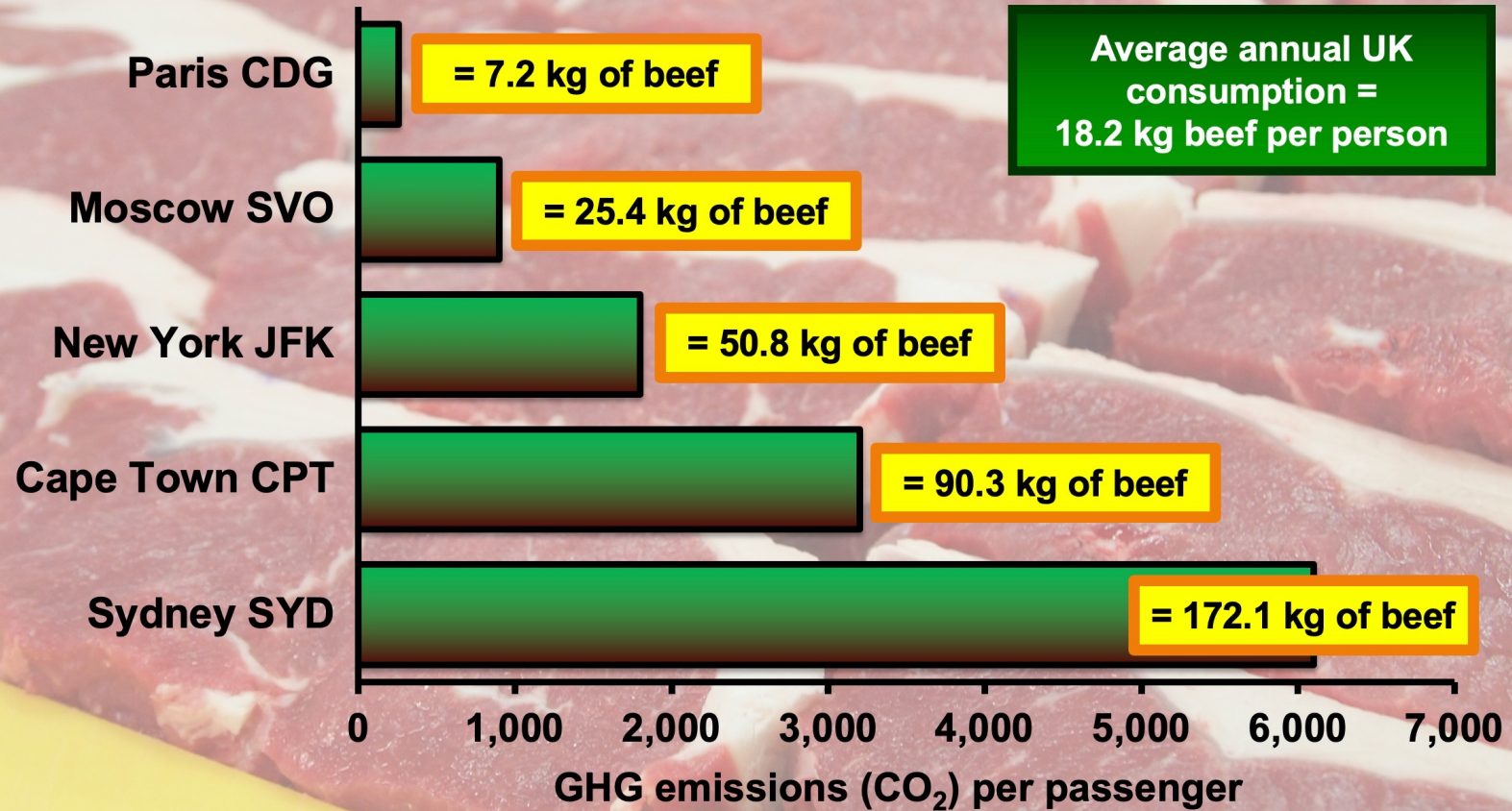
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Source: Created by Dr. Jude L. Capper, 2020. . Infographic adapted from Centre for Research into Energy Demand Solutions (2020). Available at: https://twitter.com/CREDS_UK/status/1262984570175176704?s=20



CV

International flights emit considerable quantities of carbon compared to beef production



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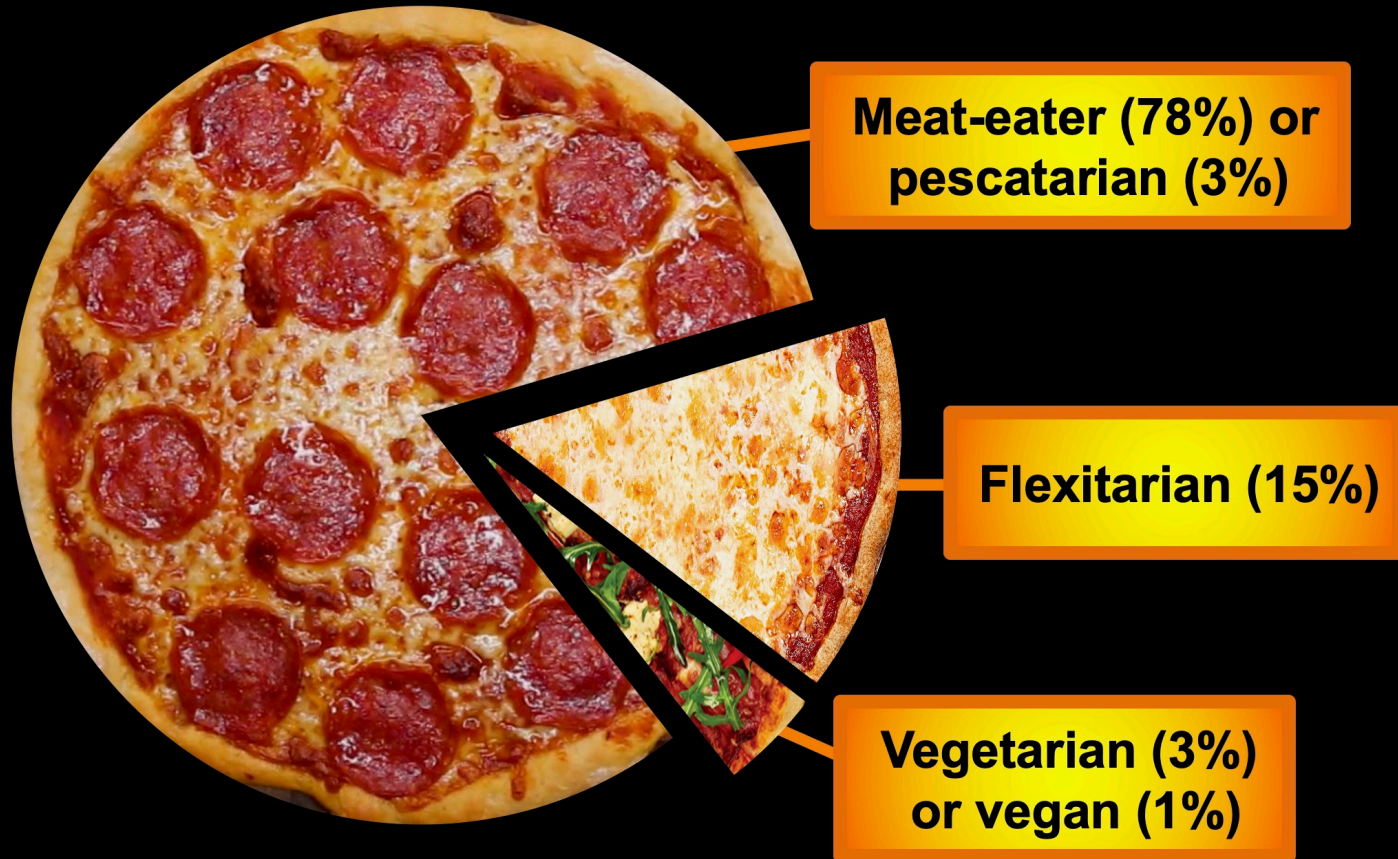


Source: Created by Dr. Jude L. Capper, 2020. Calculations based on GHG emissions flight data from: https://co2.myclimate.org/en/flight_calculators/new, and on a carbon footprint per kg of boneless beef of 35.5 kg CO₂-eq (under GWP100) from AHDB: http://beefandlamb.ahdb.org.uk/wp-content/uploads/2013/05/p_cp_down_to_earth300112.pdf



B

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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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%

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>

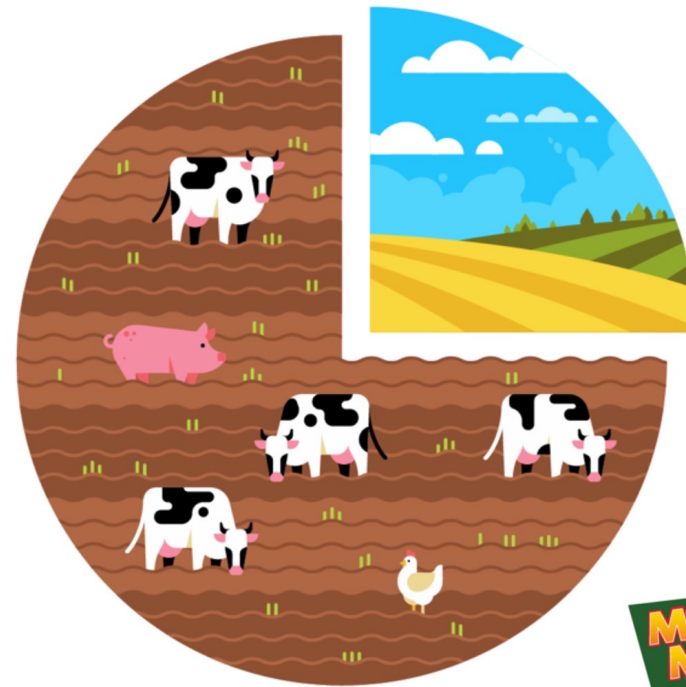


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Bad news bias – need five positive stories to cancel out each negative

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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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 non-agricultural purposes not shown (1.7% of total). Data from DEFRA. 2019. Farming statistics - provisional crop areas, yields and livestock populations 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

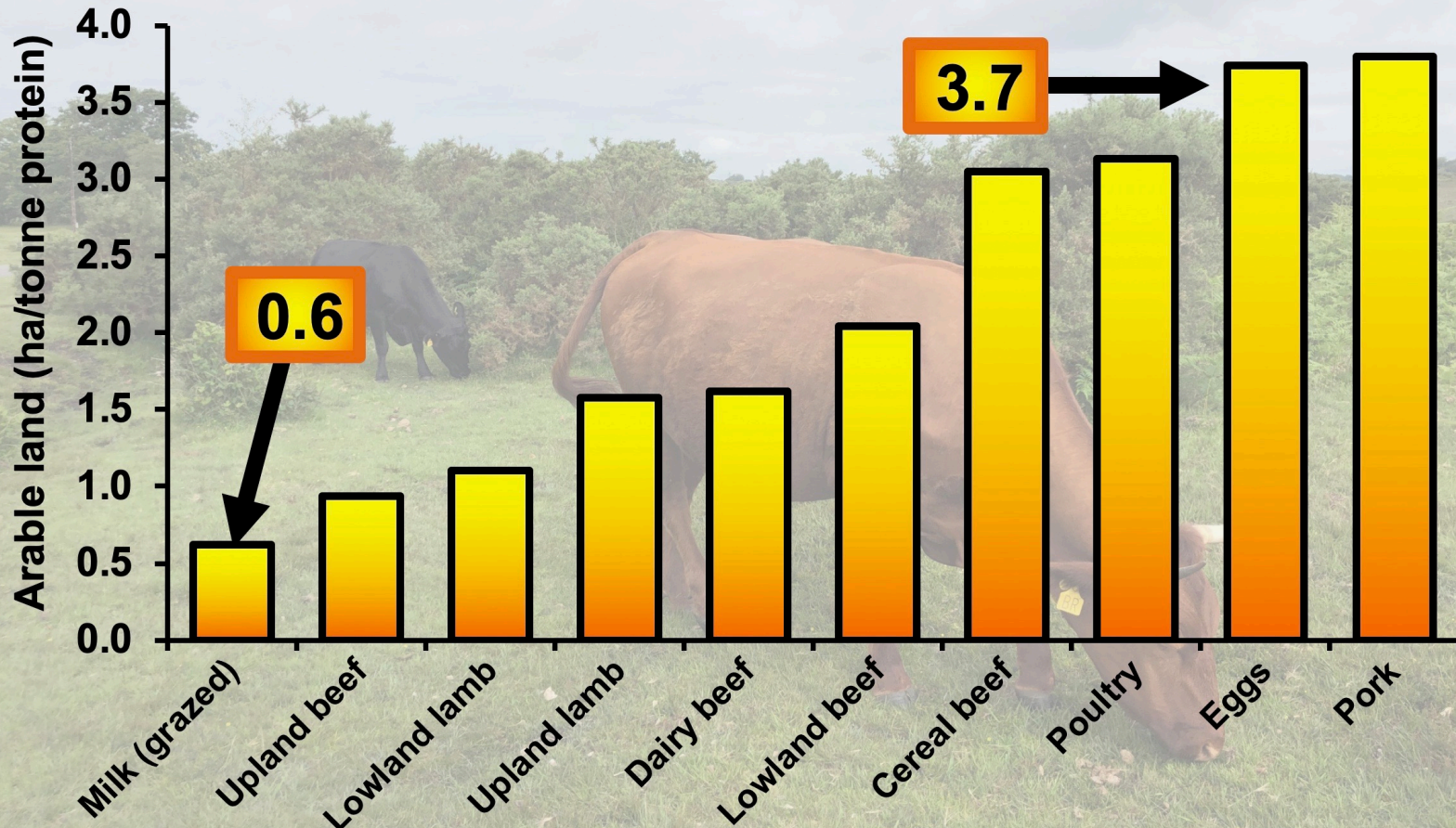


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5

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.



S

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



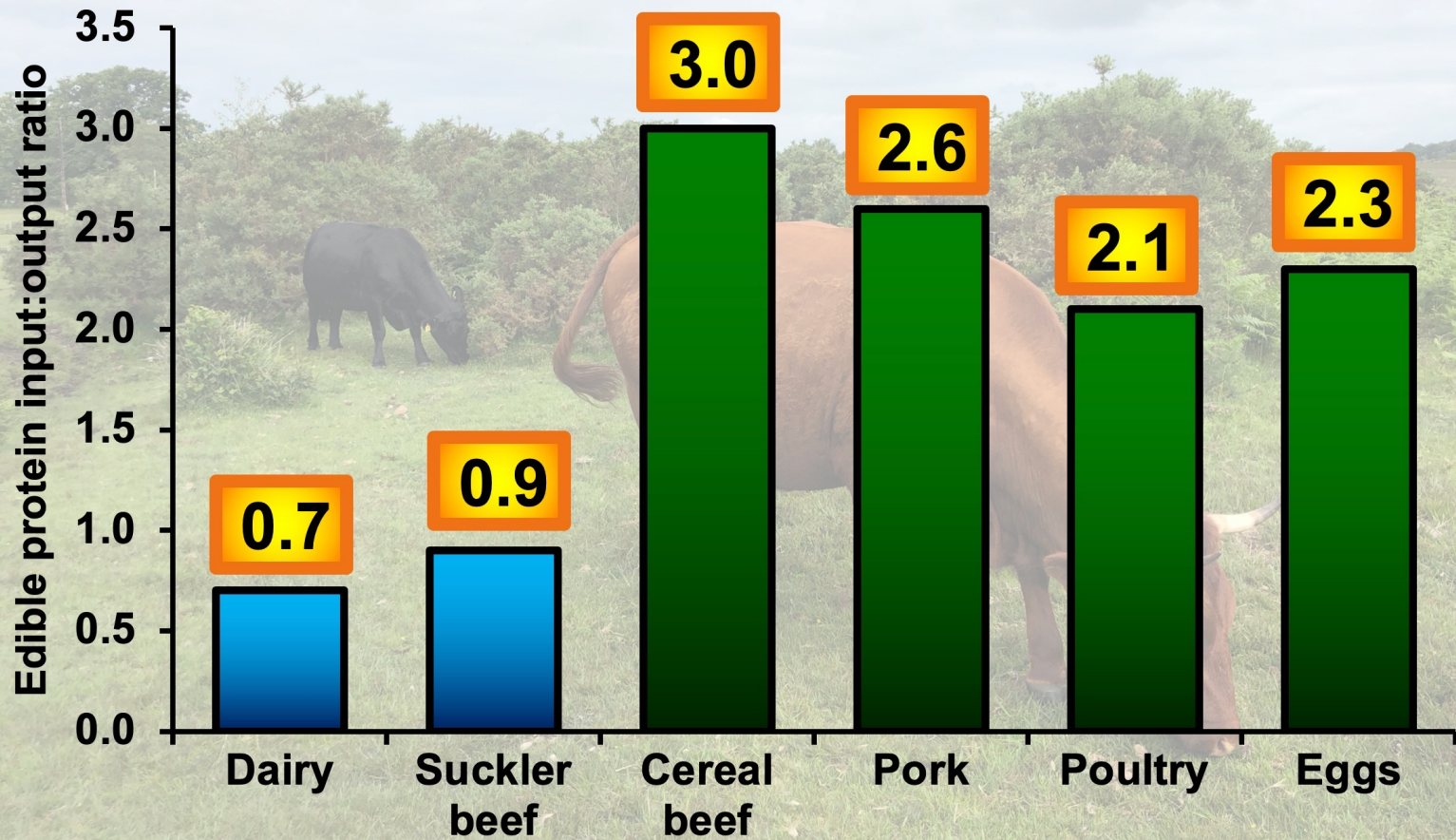
Source: Created by Dr. Jude L. Capper, 2013

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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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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, 2020. Cartoon from: <http://RubesCartoons.com>

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