

**Dr. Jude Capper**

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# Food vs. feed – how do we maintain livestock industry sustainability?

**Dr. Jude L. Capper**

*13<sup>th</sup> May 2021*

Source: Dr. Jude L. Capper, 2021

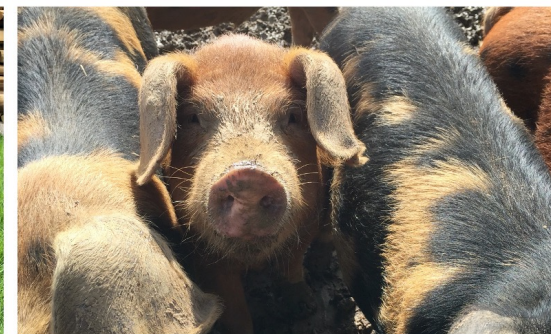
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s

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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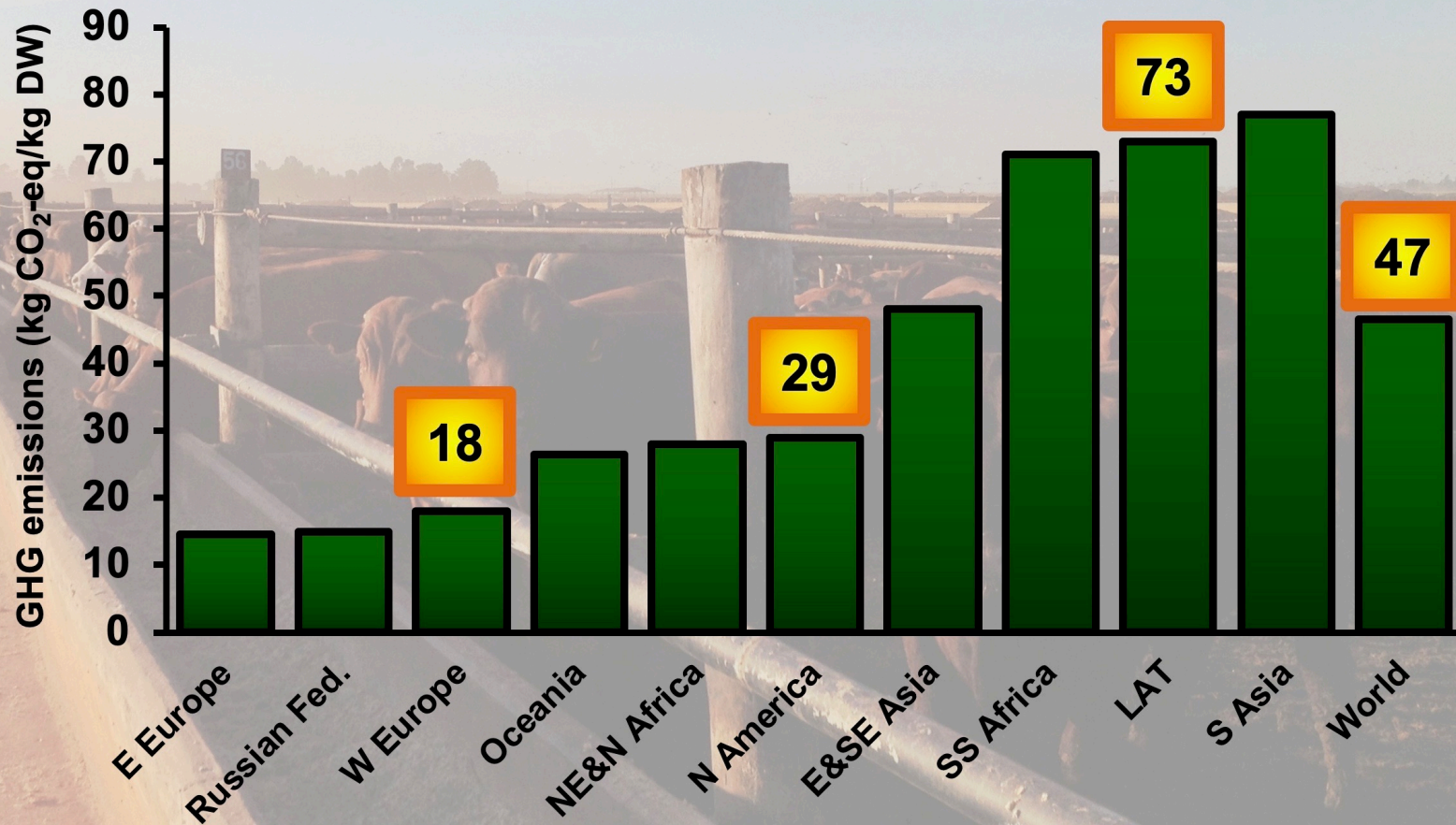


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B

## The carbon footprint of beef production varies across the globe



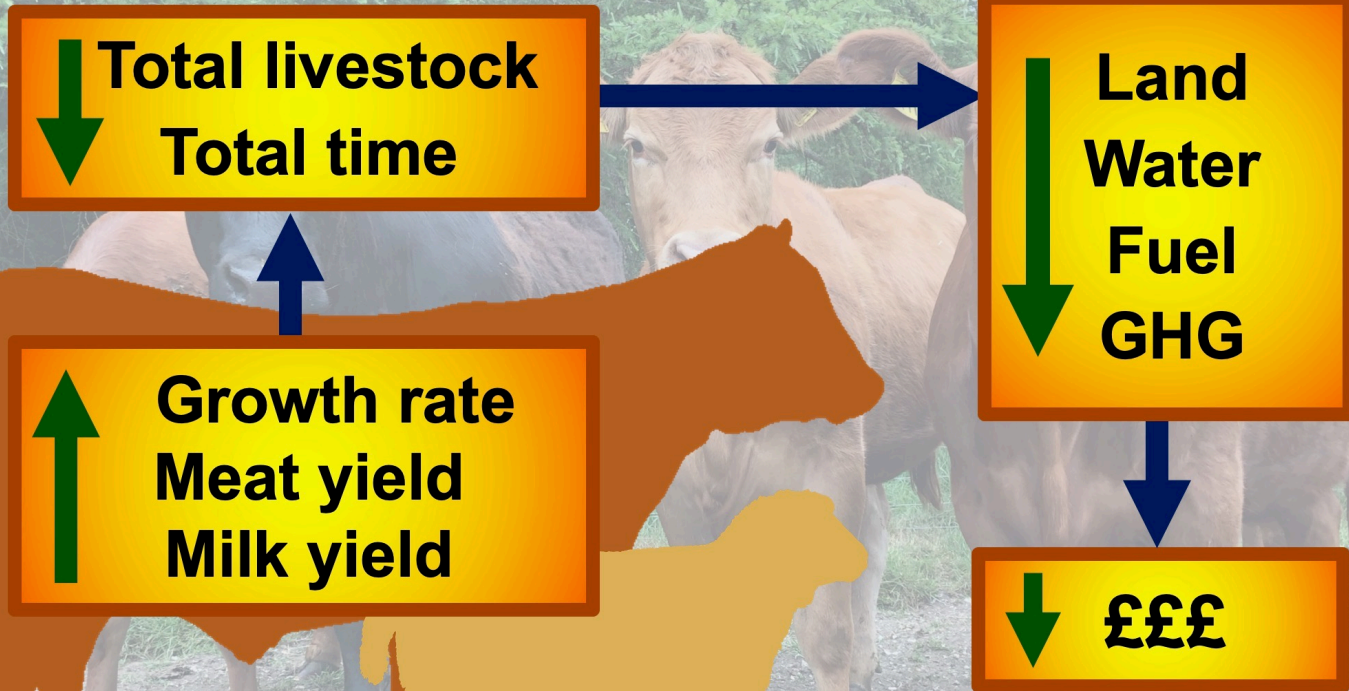
Source: Created by Dr. Jude L. Capper, 2020; data from Gerber et al. (2013) Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. FAO, Rome, Italy.

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B

# Improving animal productivity reduces the environmental impact of milk and meat



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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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D

# Improving key performance indicators reduces environmental impact and economic cost

- Nutrition**
- Reproduction**
- Lameness**
- Mastitis**
- Metabolic disease**
- Infectious disease**
- Dry period length**
- Age at first calving**
- Antibiotic residues**
- Feed wastage**
- Pasture management**



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

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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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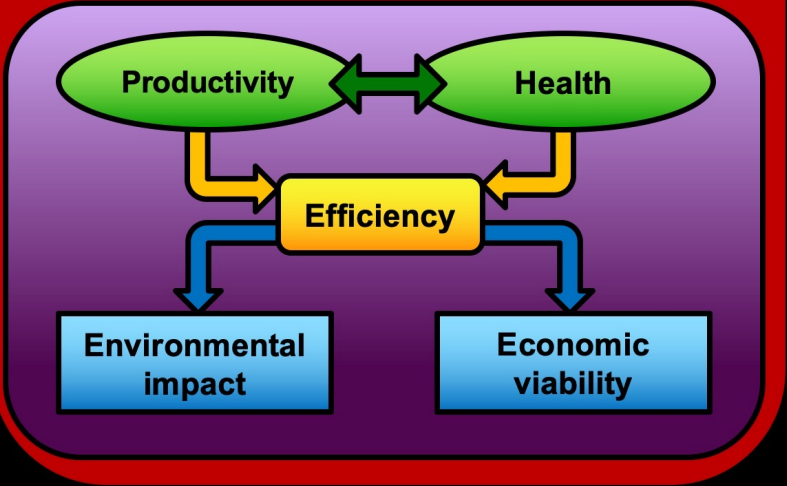
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# Social acceptability and consumer trust are vital for sustainable livestock production

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## Social Acceptability



## Sustainability



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

# All foods have an environmental impact



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

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B

# Market share for plant-based meat/dairy alternatives is growing

## Tesco sets 300% sales target for plant-based alternatives to meat

In UK first, supermarket's five-year commitment aims to offer more sustainable options



**A 300% sales target is impressive... yet the magnitude of the results depends on the (2018) baseline**

Source: Created by Dr. Jude L. Capper, 2020. Screenshot from: The Guardian (2020). <https://www.theguardian.com/business/2020/sep/29/tesco-sets-300-per-cent-sales-target-for-plant-based-alternatives-to-meat>

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Is the rise in plant-based food sales related to consumer demand?



**Lockdown preparations in local food hall indicate that dairy may be a priority for many panic-buyers**

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



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Do 402,206 Veganuary participants amount to more than a hill of beans?

**JOIN THE  
NEW YEAR'S  
REVOLUTION**



- Slightly greater than the population of Coventry
- If all participants were UK-based they would comprise <1% of the UK population
- Average of 2,095 per participating country
- 62% of participants already vegan, vegetarian or pescatarian

Source: Created by Dr. Jude L. Capper, 2020. Information from: <https://veganuary.com/veganuary-2020-official-survey-results/>

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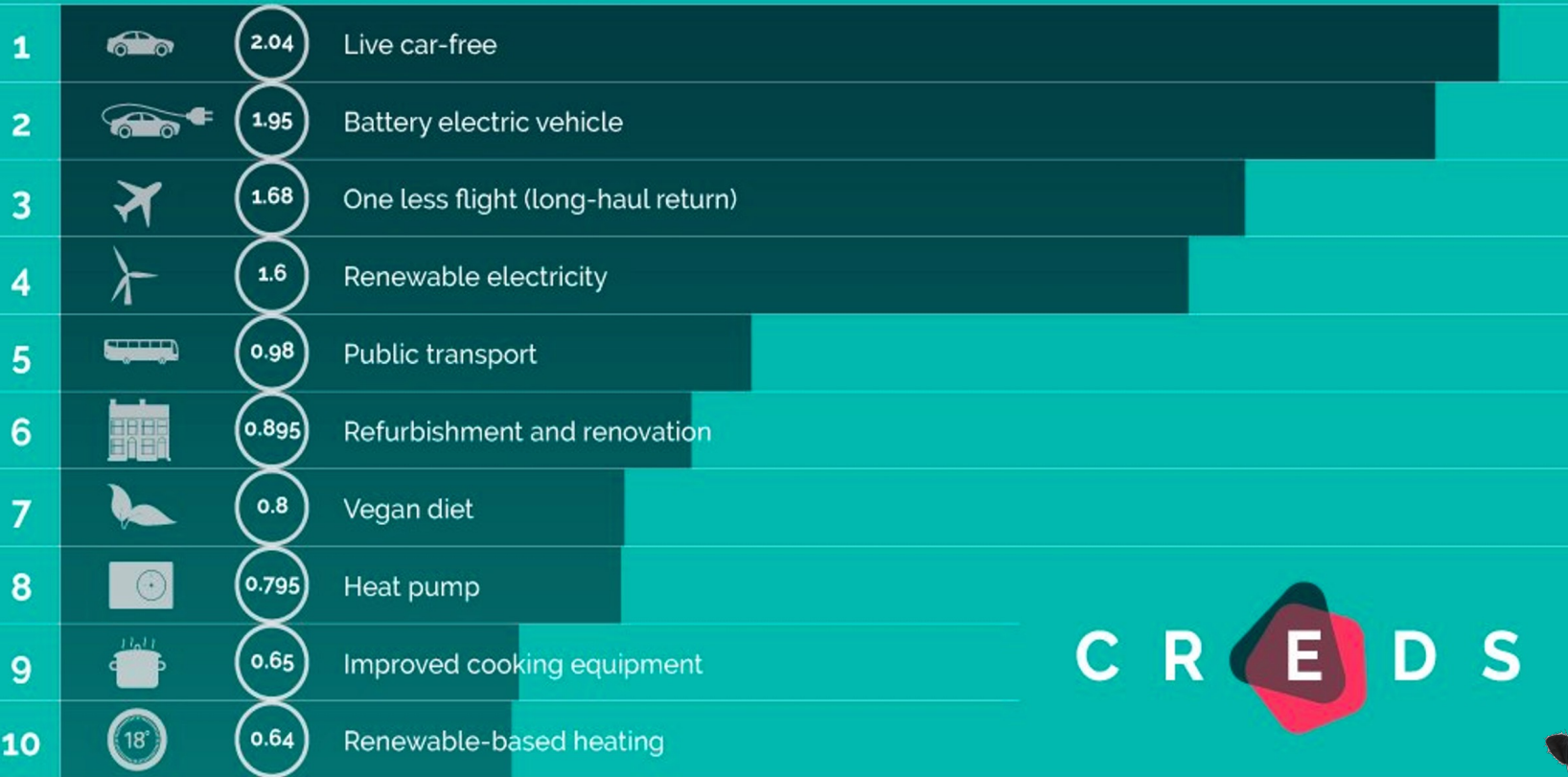
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CV

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

## Top 10 options for reducing your carbon footprint



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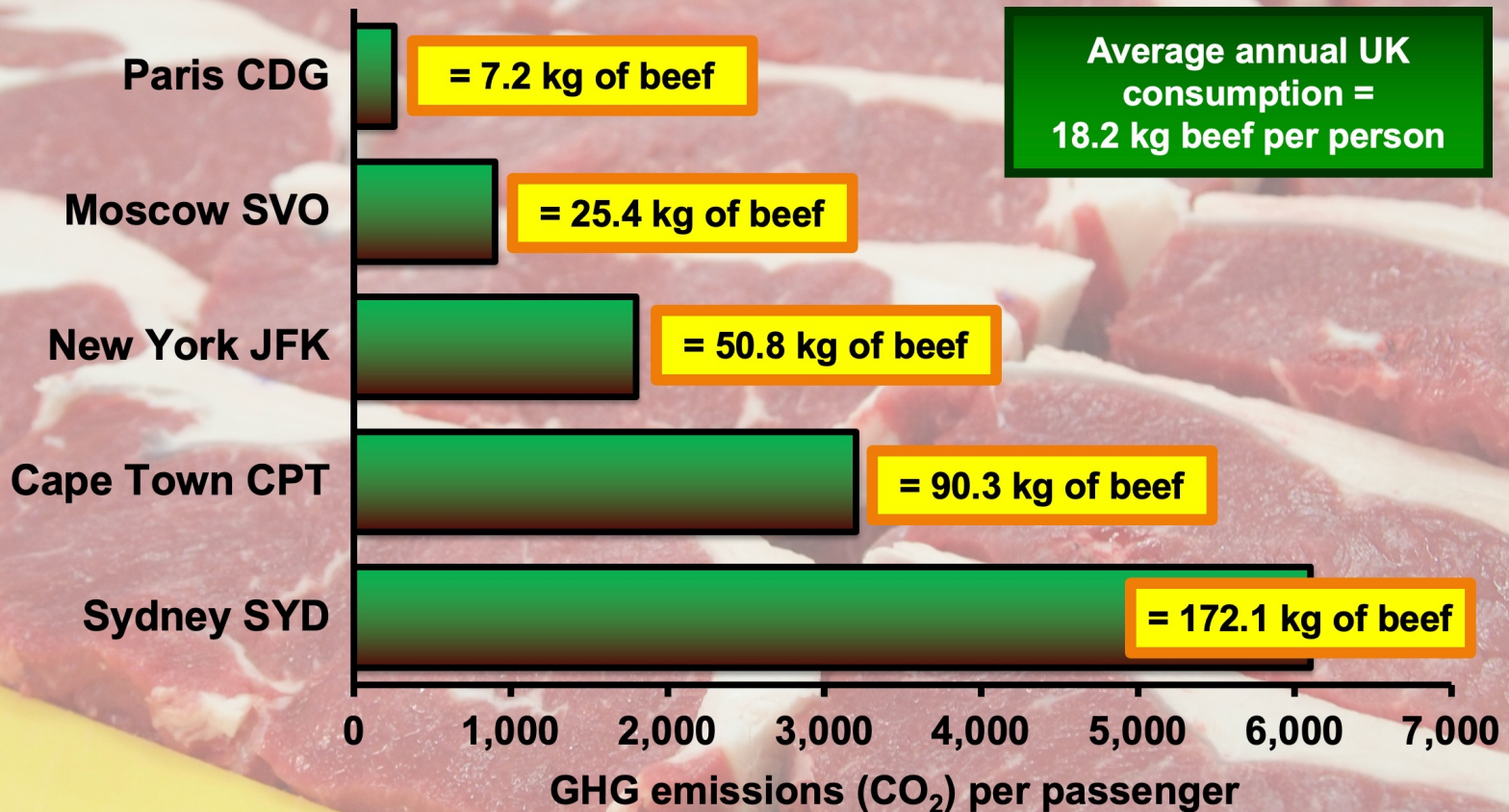
Commercial Farmers Group

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)



CV

# International flights emit considerable quantities of carbon compared to beef production



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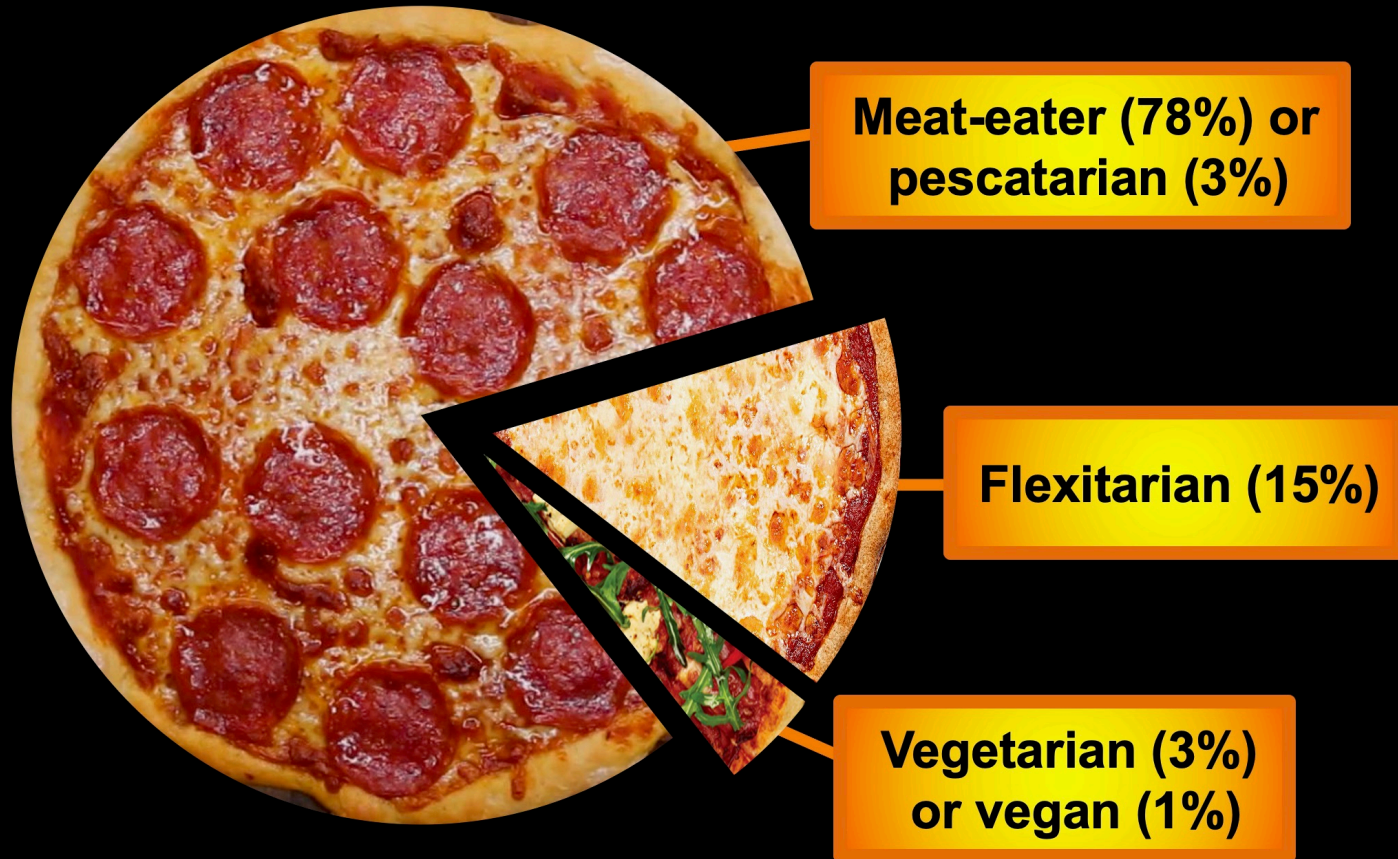
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Source: Created by Dr. Jude L. Capper, 2020. Calculations based on GHG emissions flight data from: [https://co2.myclimate.org/en/flight\\_calculators/new](https://co2.myclimate.org/en/flight_calculators/new), and on a carbon footprint per kg of boneless beef of 35.5 kg CO<sub>2</sub>-eq (under GWP100) from AHDB: [http://beefandlamb.ahdb.org.uk/wp-content/uploads/2013/05/p\\_cp\\_down\\_to\\_earth300112.pdf](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%

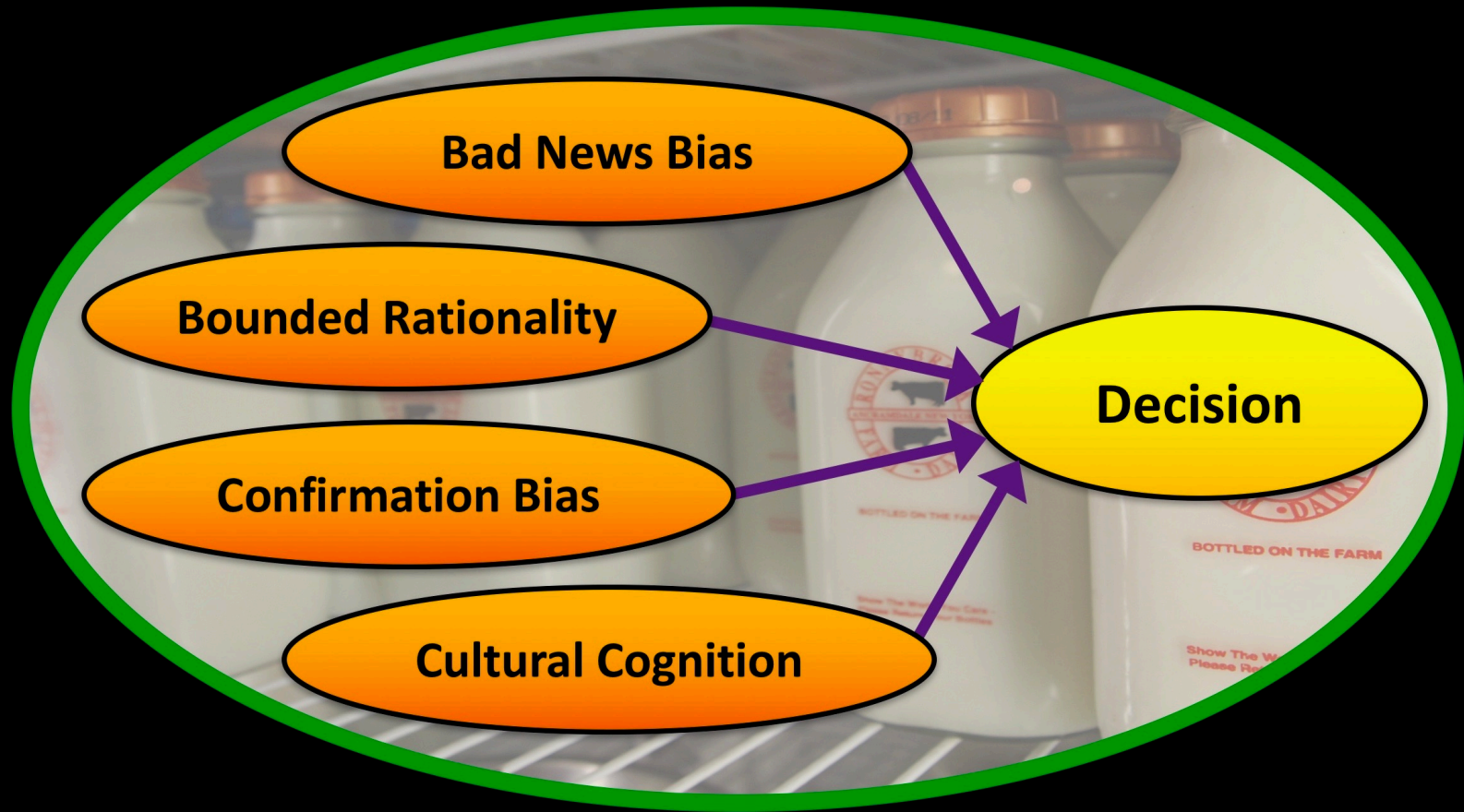
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Source: Created by Dr. Jude L. Capper, 2020. Information from: YouGov (2019) Is the future of food flexitarian?  
[https://yougov.co.uk/topics/resources/articles-reports/2019/03/18/future-food-flexitarian?](https://yougov.co.uk/topics/resources/articles-reports/2019/03/18/future-food-flexitarian)



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# Four major processes influence consumer decision-making



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Source: Created by Dr. Jude L. Capper, 2017. Information from: Capper and Yancey (2015). Communicating Animal Science to the General Public. *Animal Frontiers*.



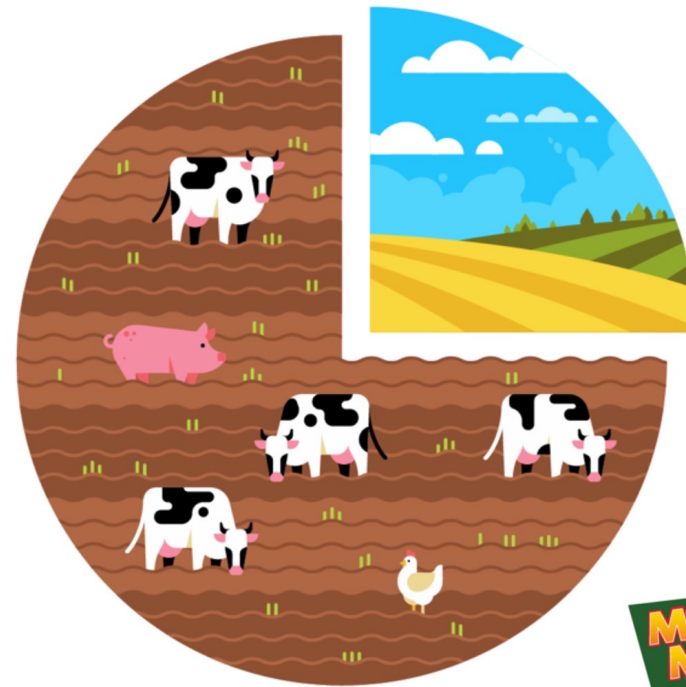


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Bad news bias – need five positive stories to cancel out each negative

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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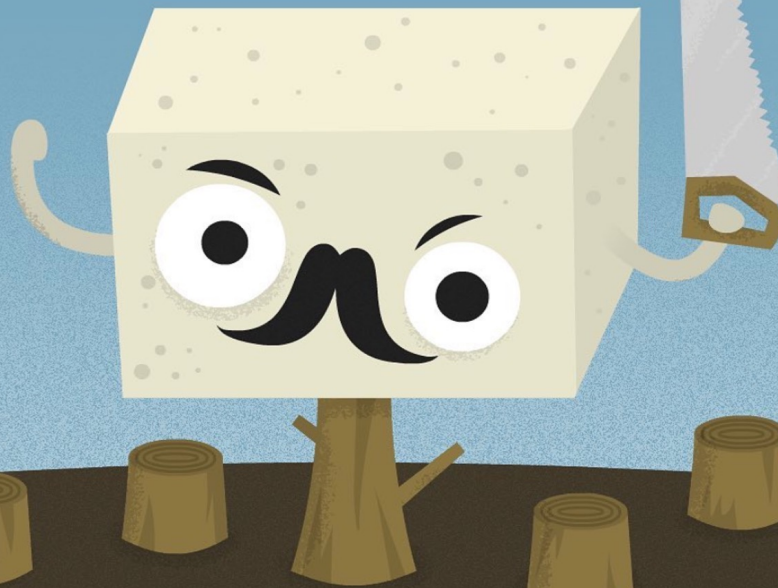
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# Soya has become a pantomime villain

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BUT... VEGANS ARE DESTROYING THE RAIN FORESTS TO MAKE TOFU!



**No.** 80% of land cleared in the Amazon region is used as pastureland for animals raised for food rather than for growing soybeans. 80% of the soybeans grown worldwide are used to feed animals raised for food.



simple\_happy\_kitchen • Follow ...



simple\_happy\_kitchen "The Amazon is burning at record rates—and deforestation is to blame (National Geographic) ---

Many trees in the Amazon are cleared to plant soy or make way for lucrative cattle pastures. Burning is commonly used to clear trees quickly."



"The Amazon is burning because the world eats so much meat (CNN) --- The vast majority of the fires have been set by loggers and ranchers to clear land for cattle. The practice is on the rise, encouraged by Jair Bolsonaro, Brazil's populist pro-business president, who is backed by the country's so-called beef caucus."



"Every meat eater on the planet is



4,002 likes

AUGUST 23, 2019

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

Infographic from:

[https://www.instagram.com/simple\\_happy\\_kitchen](https://www.instagram.com/simple_happy_kitchen)

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S

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



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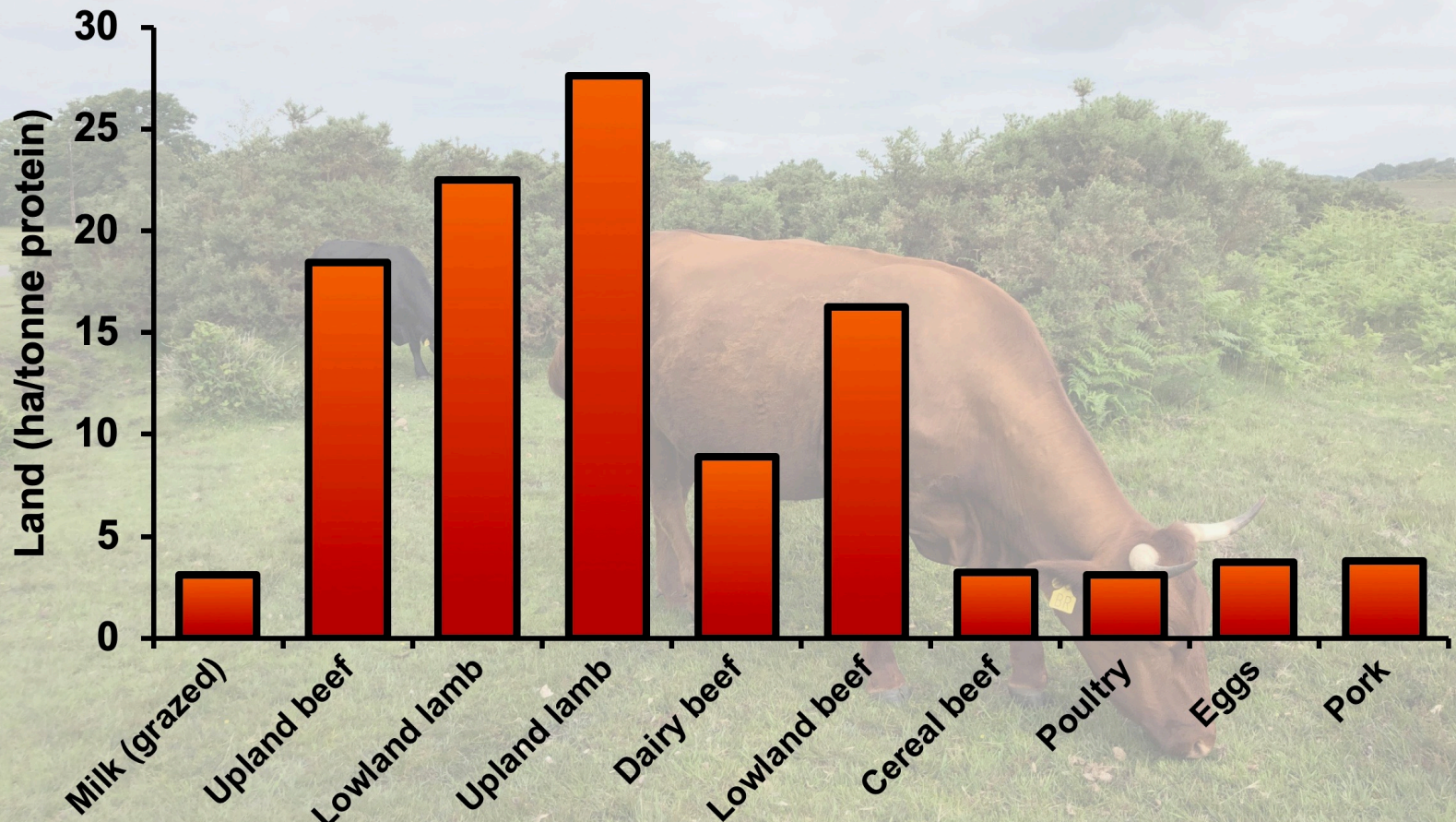
Source: Created by Dr. Jude L. Capper, 2020. Grazing land includes temporary grass on arable land (6% of total), land used for outdoor pigs or non-agricultural purposes not shown (1.7% of total). Data from DEFRA. 2019. Farming statistics - provisional crop areas, yields and livestock populations at 1 June 2019 – United Kingdom.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/837834/structure-jun2019prov-UK-10oct19.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/837834/structure-jun2019prov-UK-10oct19.pdf)



s

# 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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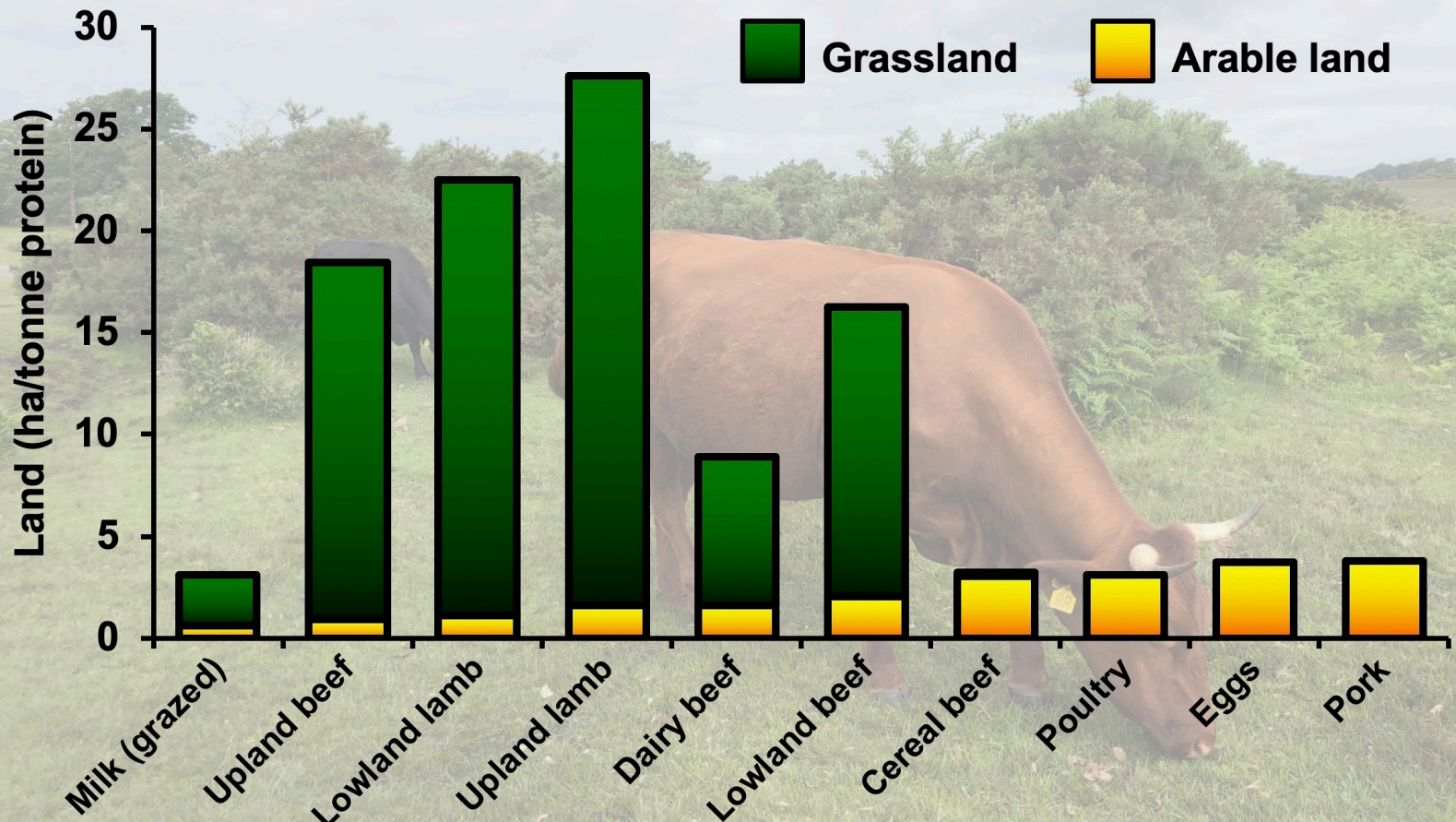


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# Livestock systems vary widely in arable and grassland use



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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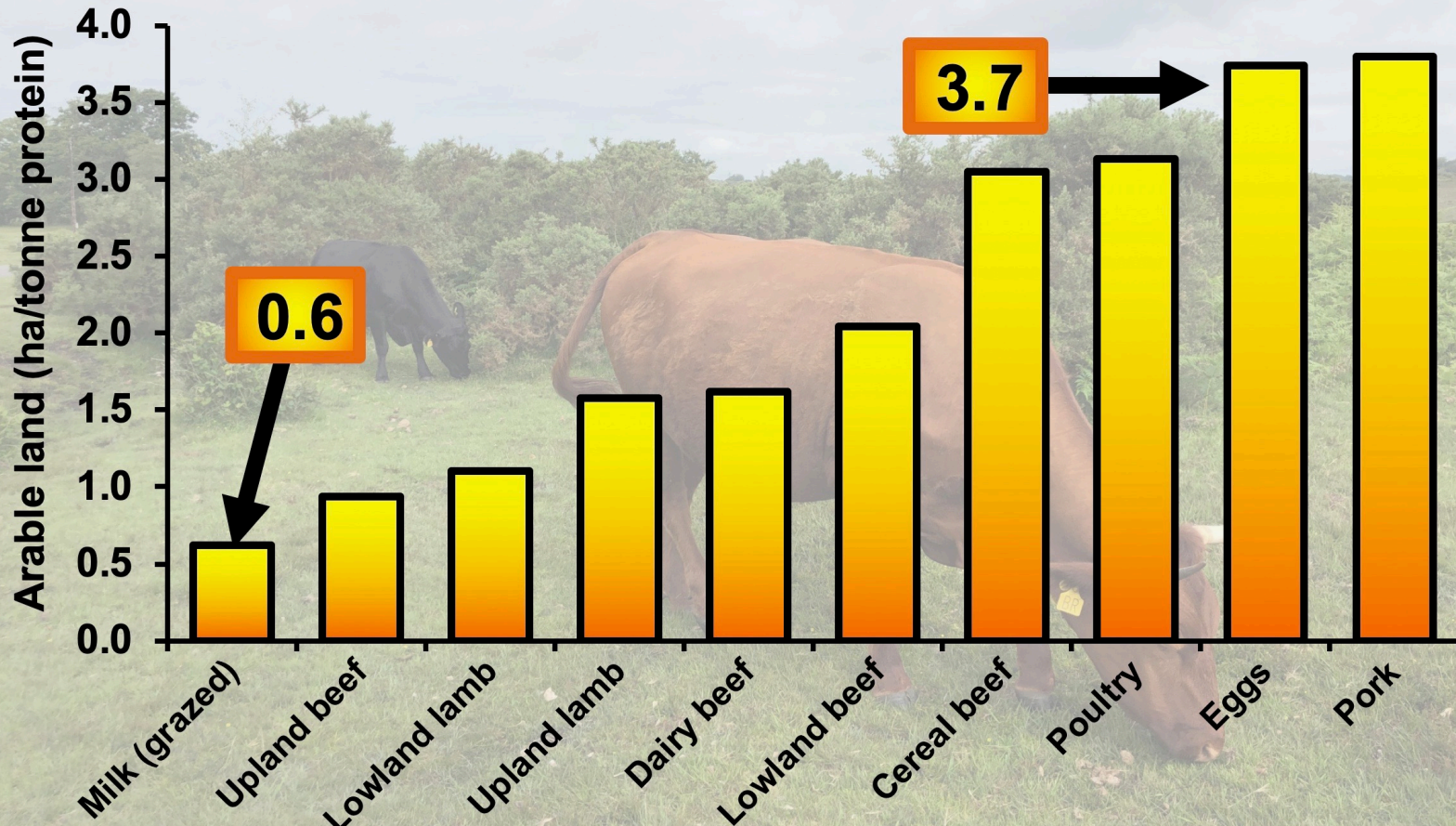


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# Livestock systems vary widely in arable land use



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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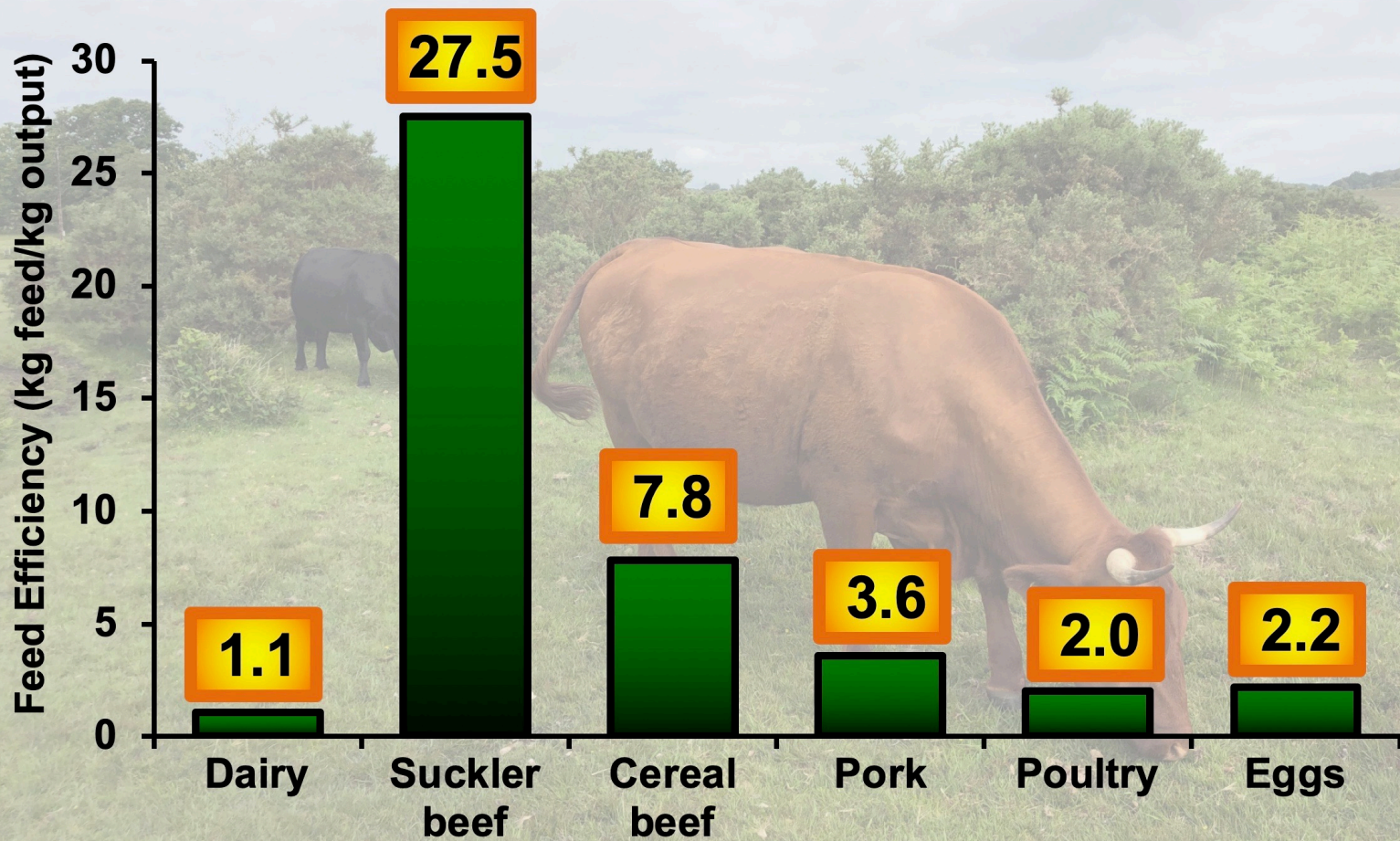


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# Feed efficiency ratios vary between systems and species



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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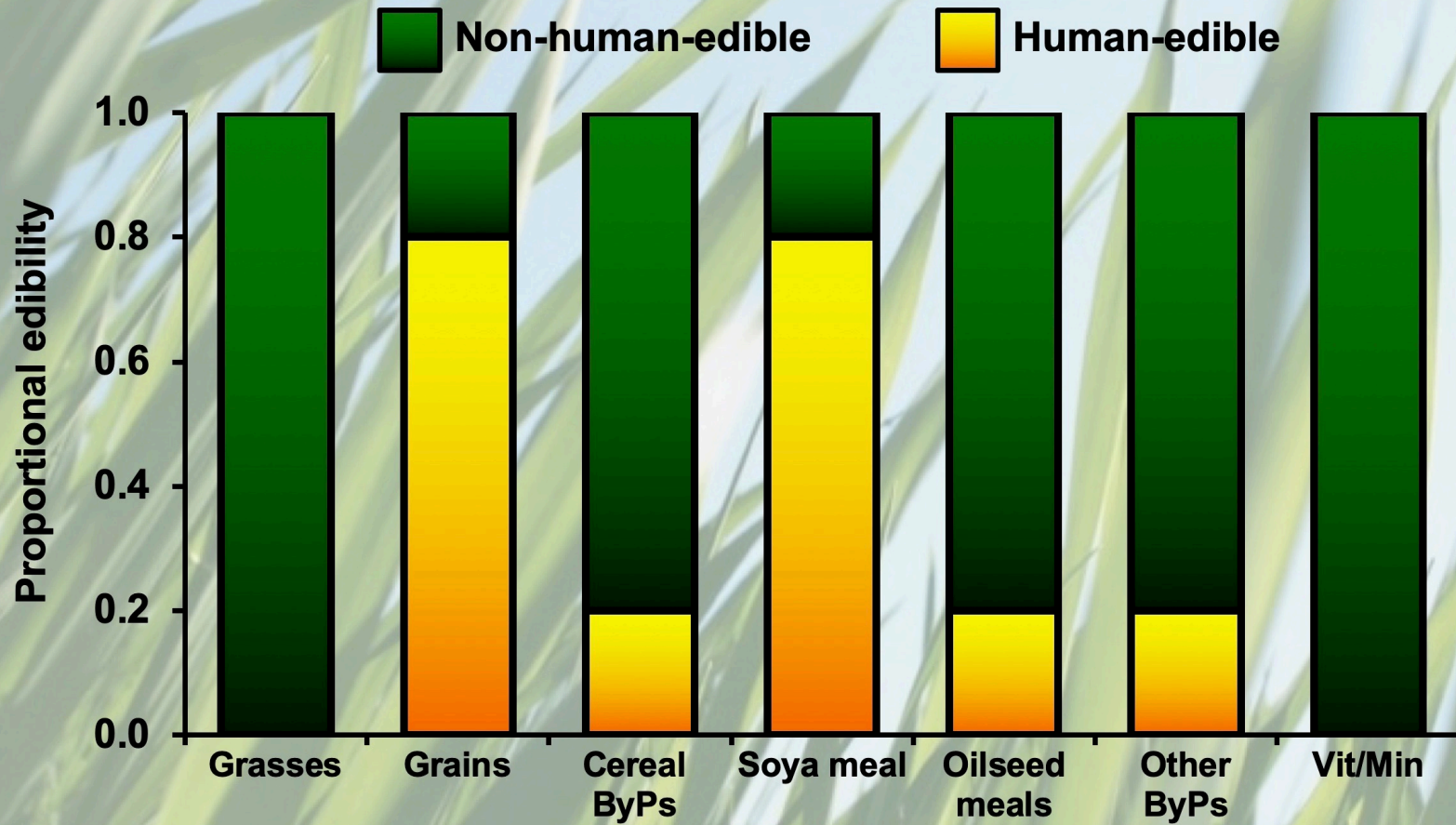
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# Feed efficiency metrics must consider competition for human-edible foods



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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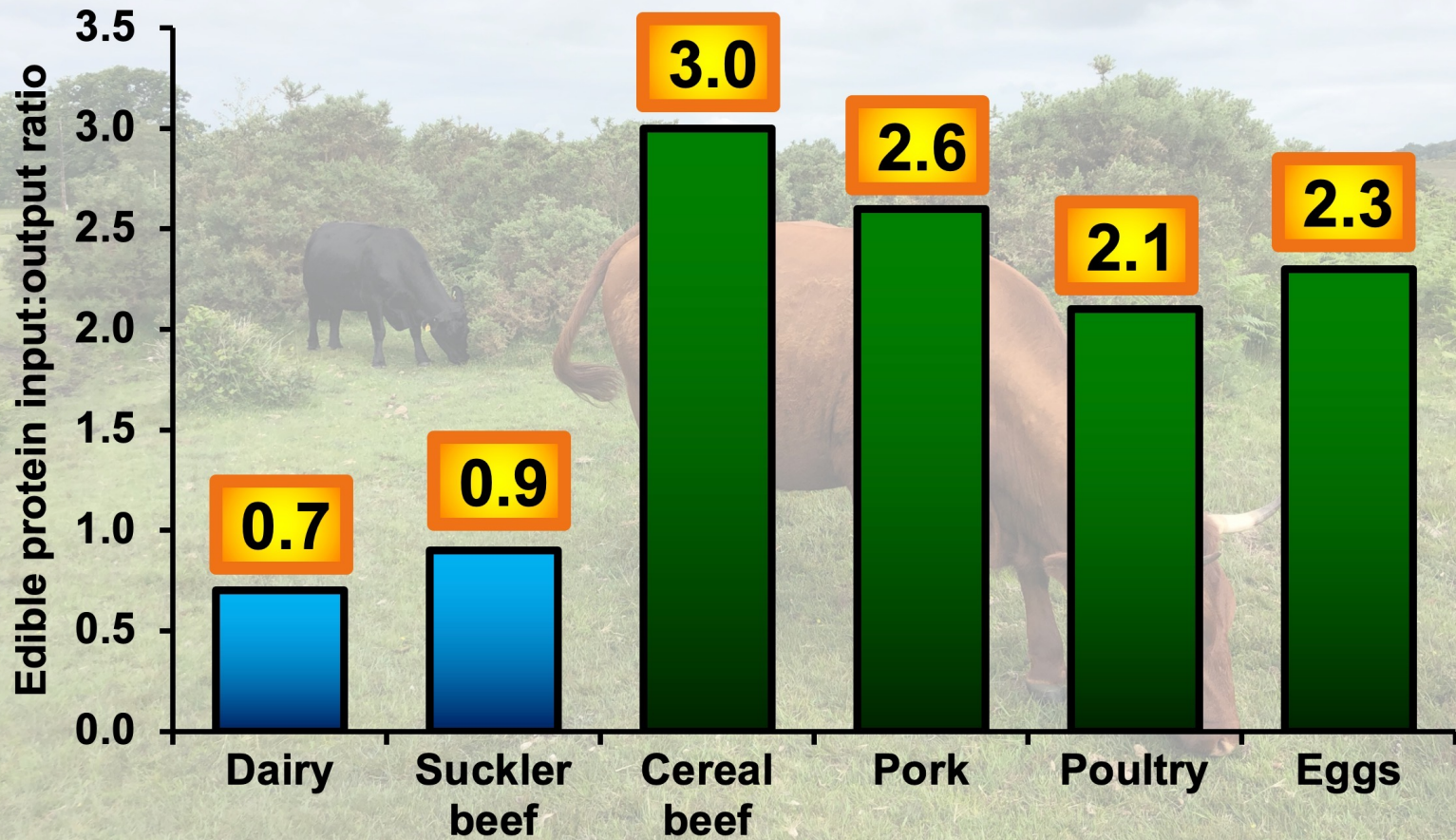


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# Grazing cattle systems produce more human-edible protein than they consume



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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Bounded rationality - we don't have time to research, so need quick, simple explanations

Based on the average UK diet

30%

of our protein intake comes from red meat...

...which is vital for our body's growth, maintenance and muscle recovery!



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Source: Created by Dr. Jude L. Capper, 2020. Infographic from HCC (2020): <https://meatpromotion.wales/en/news-industry-info/download>



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# Confirmation bias – tapping into consumers' inherent beliefs to improve trust

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**Consumers may interpret bottle-feeding a calf as caring or cruel, depending on pre-conceived ideas**

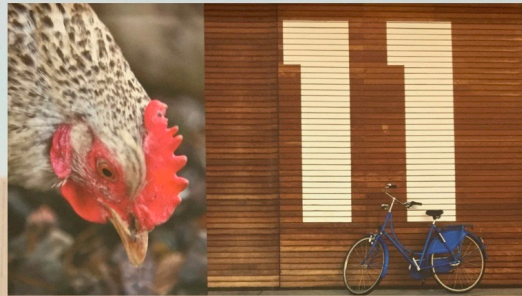
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Source: Created by Dr. Jude L. Capper, 2020.



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We need transparency not bucolic imagery



TRACED FROM FARM TO KITCHEN

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

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Cultural cognition – we trust people with whom we share values and wish to emulate

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England rugby player credited <3 week recovery from broken leg to drinking 2 pints of milk per day

Source: Created by Dr. Jude L. Capper, 2019. Screenshot from: <http://www.telegraph.co.uk/rugby-union/2017/02/02/england-prop-joe-marler-reveals-secret-behind-hisremarkable/>

The Telegraph

HOME | NEWS

## Sport | Rugby Union

Rugby Union | Fixtures | Results | Tables | Lions | Aviva Premiership | Brian Moore

Home > Sport > Rugby Union

### England prop Joe Marler reveals the secret behind his remarkable recovery in time for Six Nations



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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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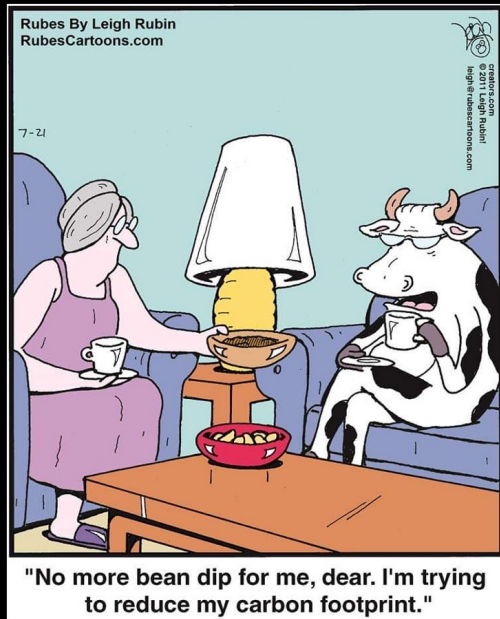
# Thank you!

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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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