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Managing Fertility to Enhance Sustainability

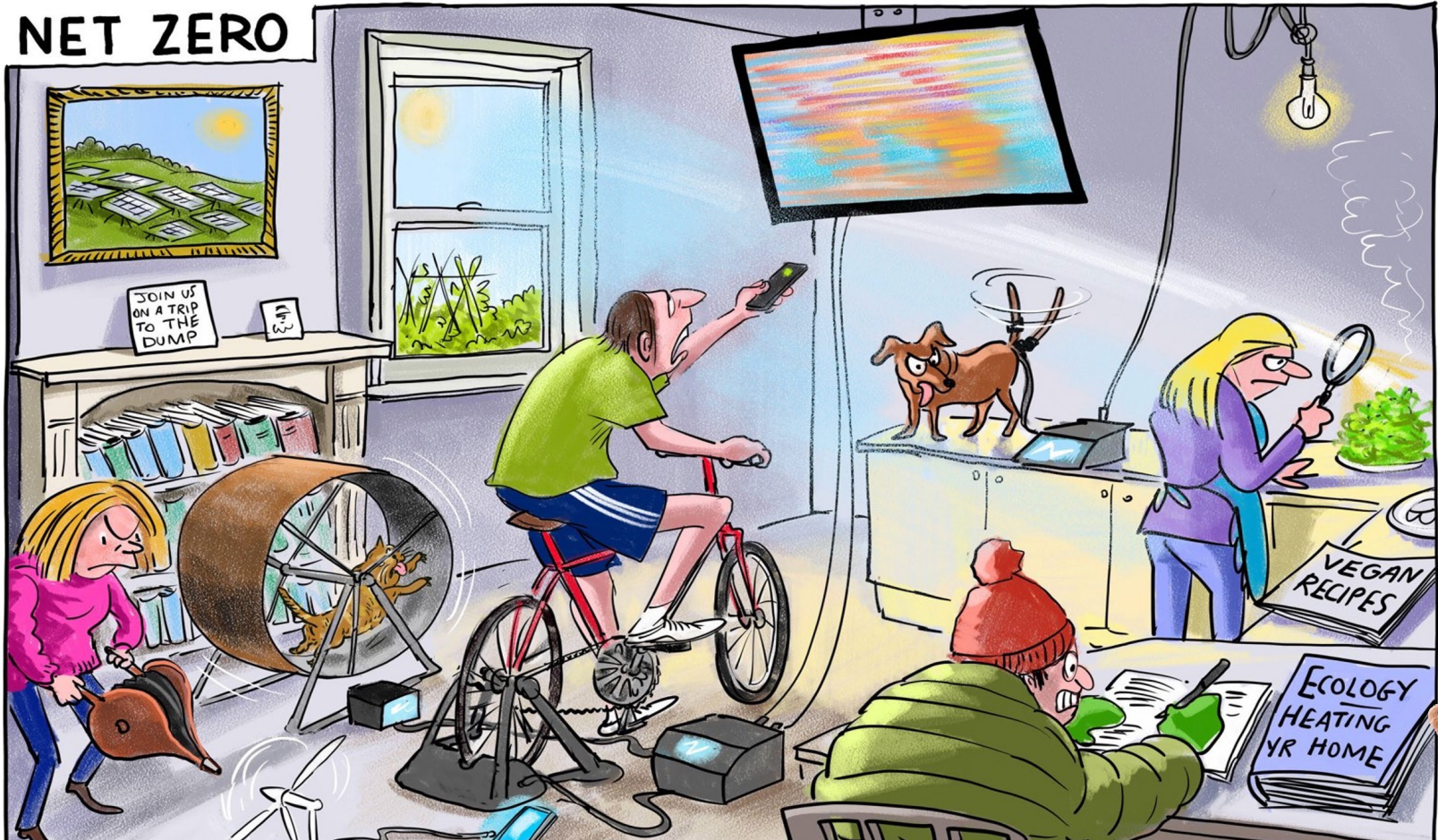
16th June 2022

Source: Dr. Jude L. Capper, 2022

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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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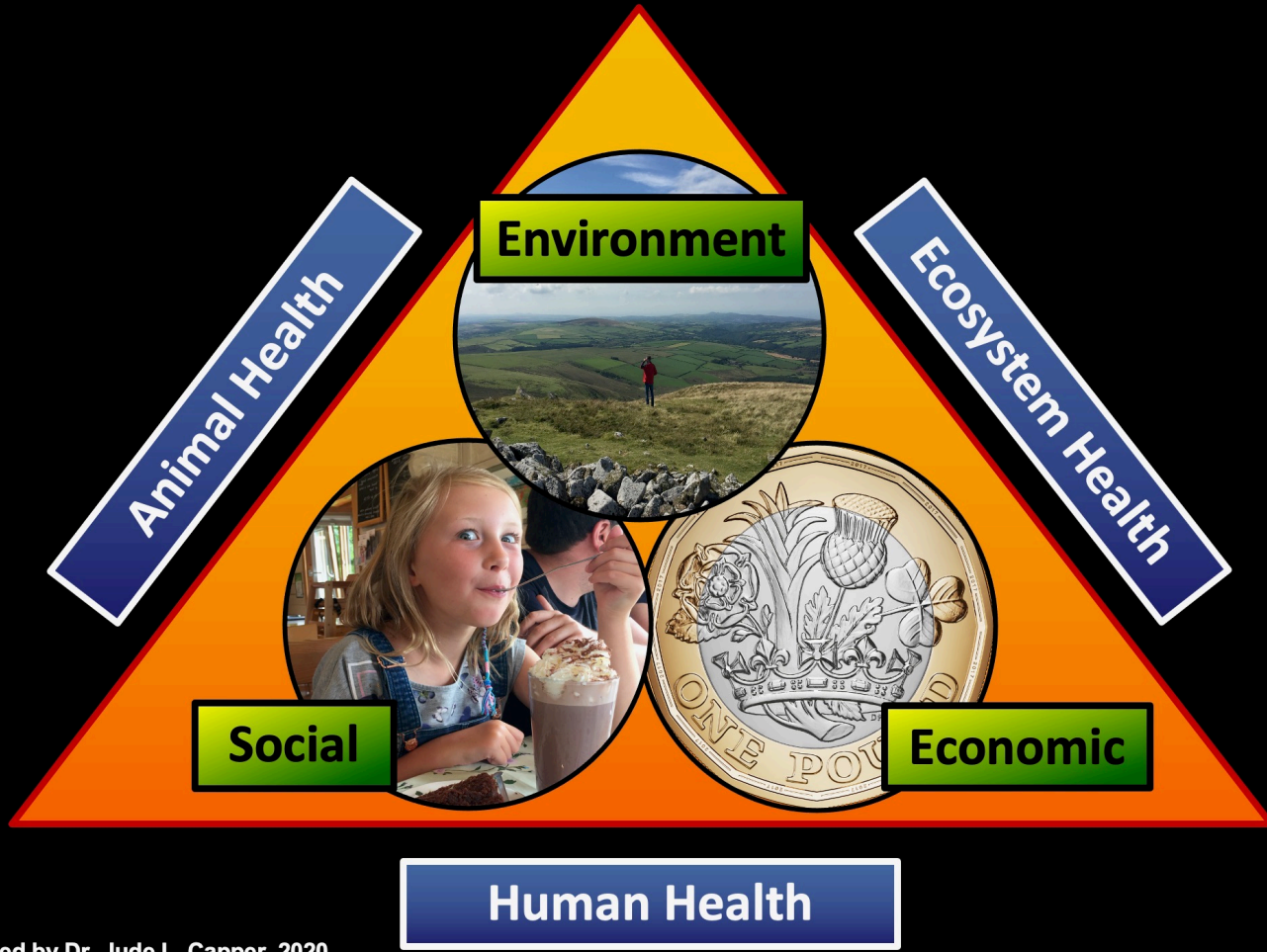


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S

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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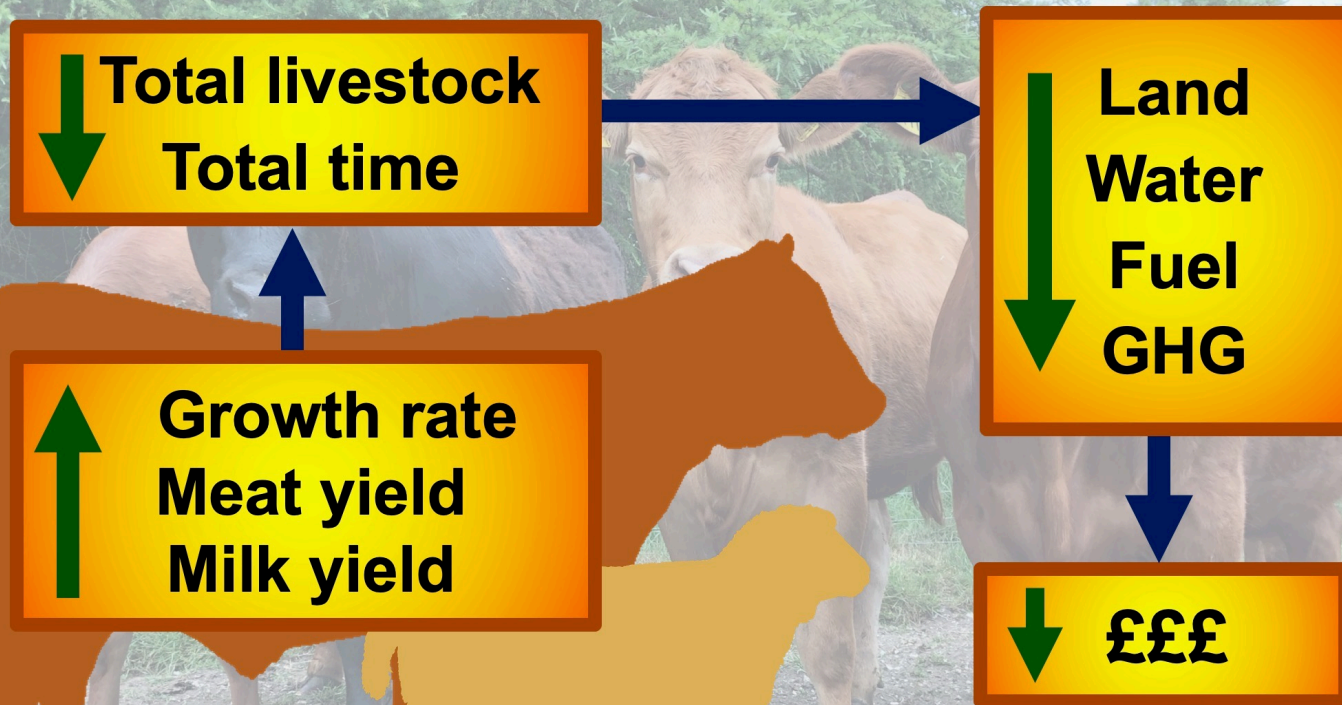
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B

Improving animal productivity reduces the environmental impact of milk and meat



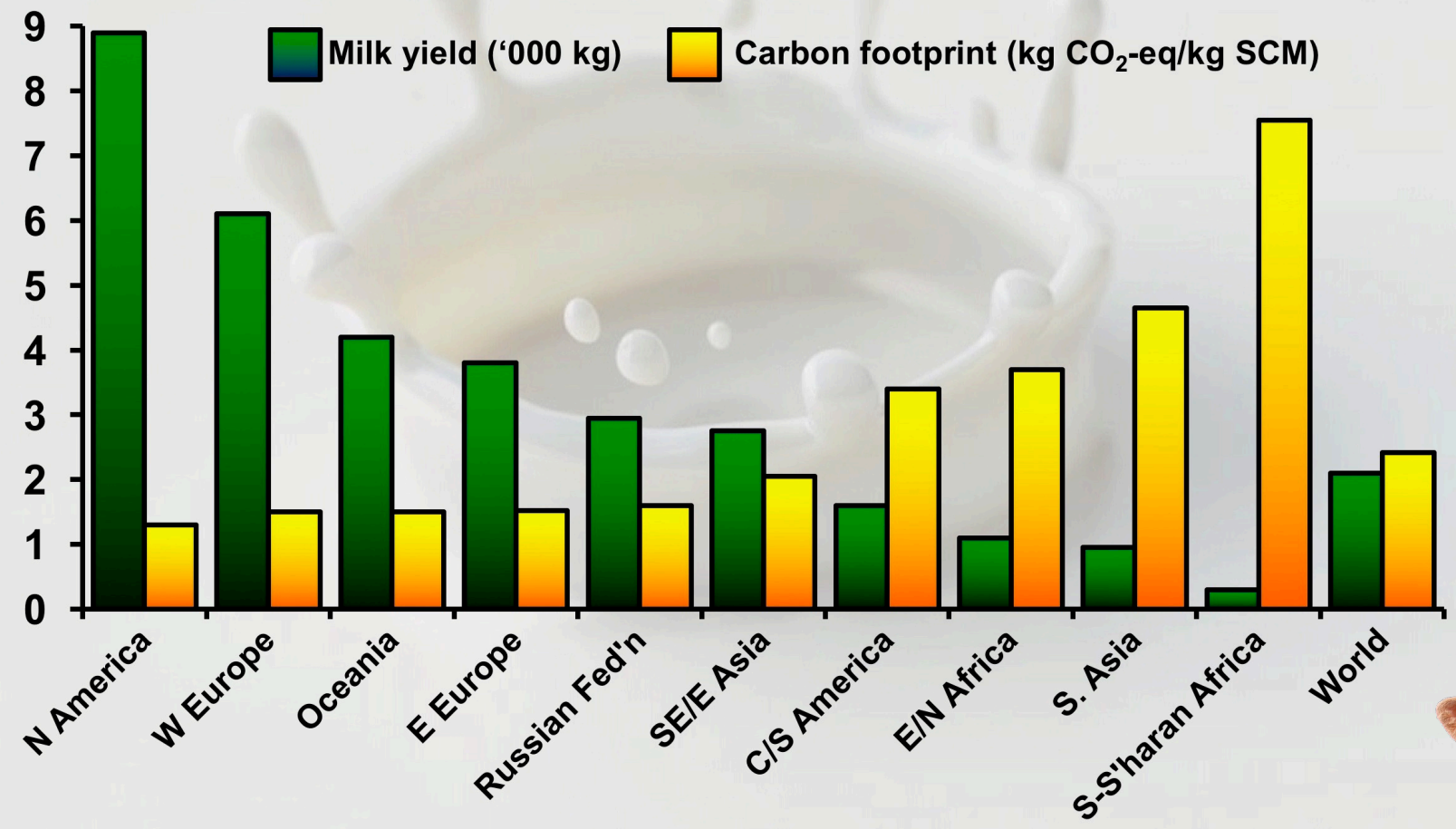
Source: Created by Dr. Jude L. Capper, 2020. Data from: Capper, JL. 2015. Sustainability and One Health. In: Cockcroft, P. *Bovine Medicine*. Wiley-Blackwell, Oxford, UK.

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A negative correlation exists between milk yield and carbon emissions



Source: Created by Dr. Jude L. Capper, 2016; data from: FAO (2010) Greenhouse Gas Emissions from the Dairy Sector. FAO, Rome, Italy.

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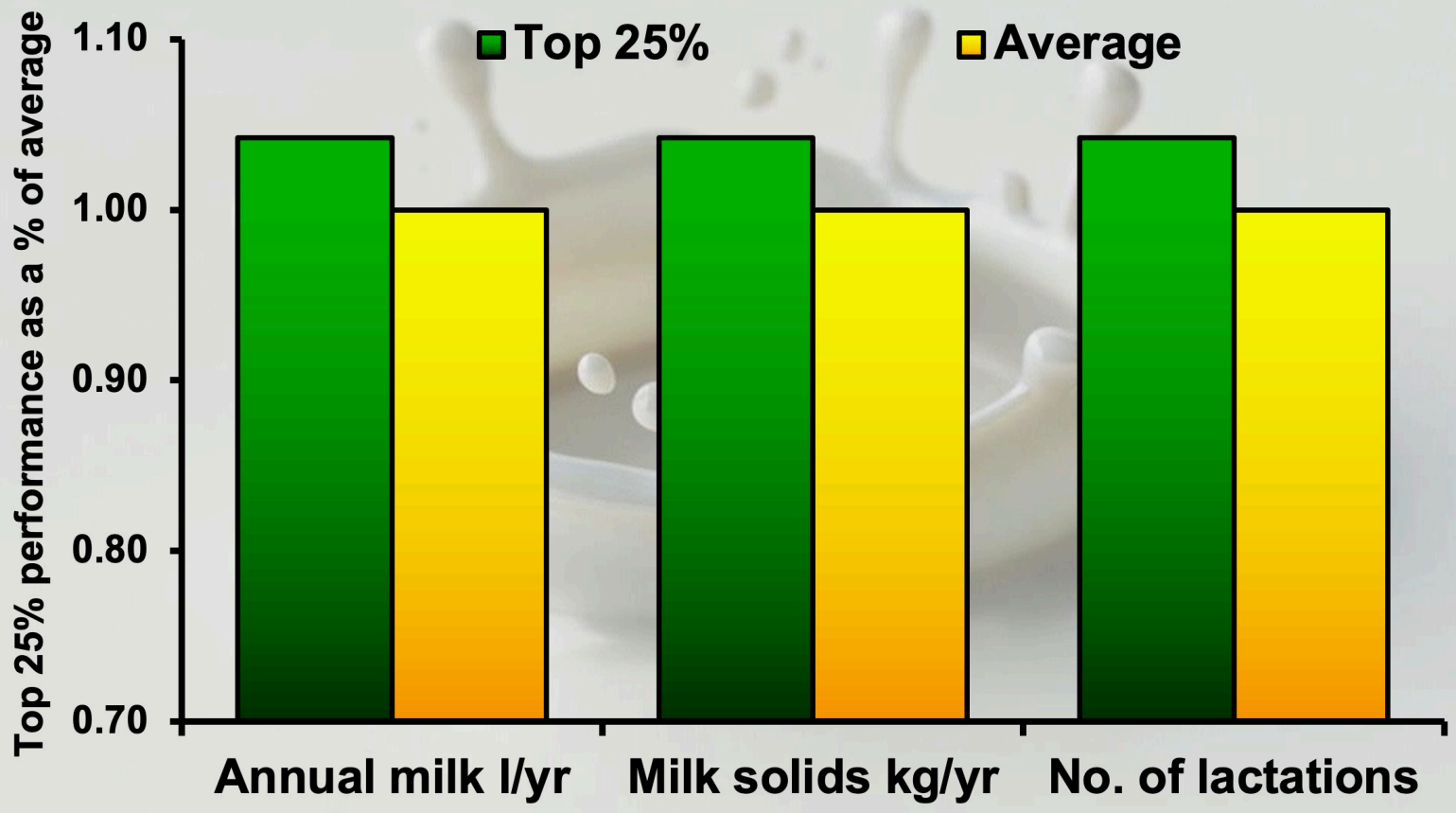


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DS

Top 25% of dairy farms have higher yields, higher milk solids and lower cow turnover



Source: Created by Dr. Jude L. Capper, 2021. Data from: AHDB (2020) Dairy performance results 2018/19.
https://projectblue.blob.core.windows.net/media/Default/Dairy/Publications/DairyPerformResults3265_200317_WEB.pdf

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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%)

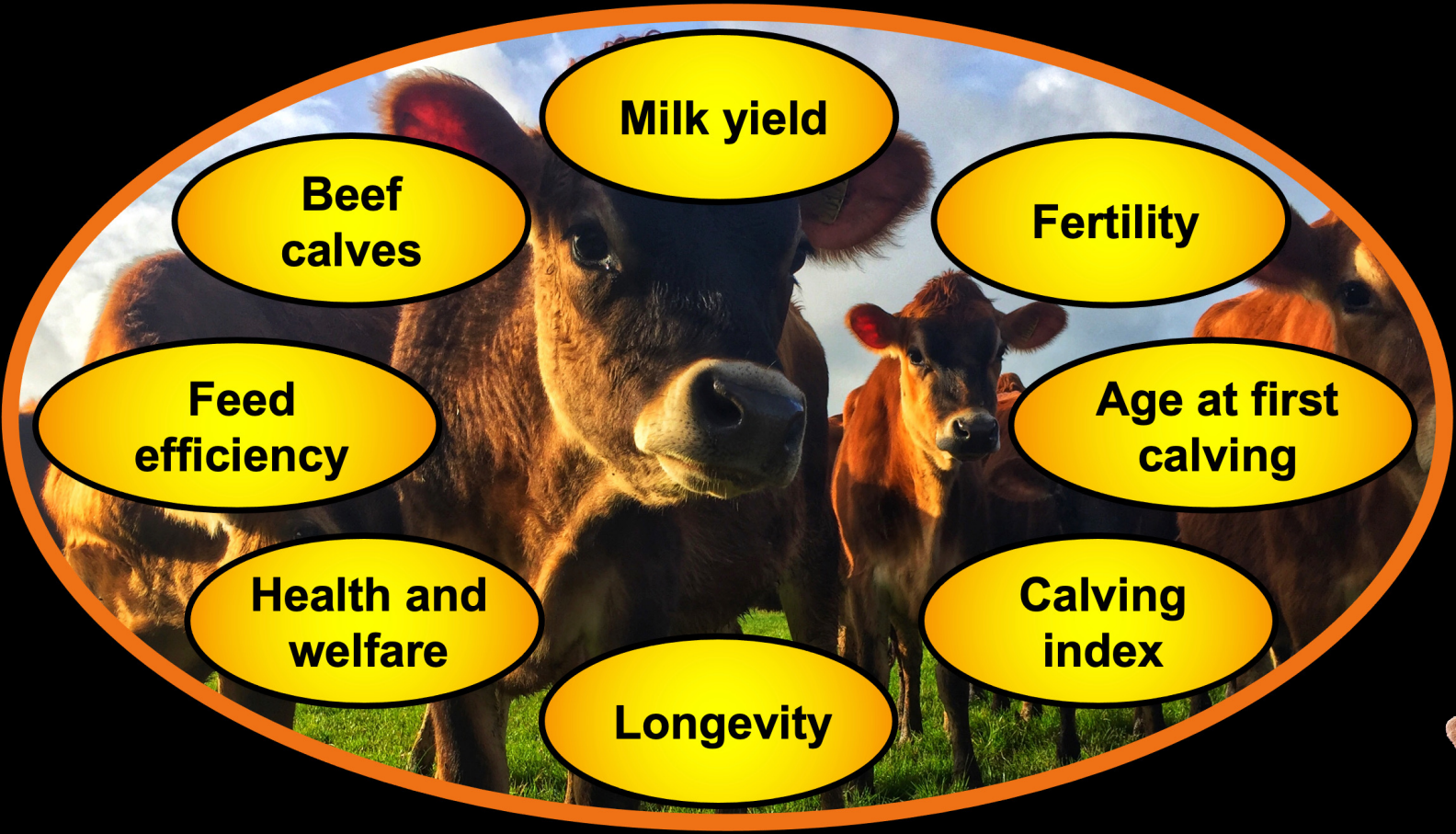
Source: Created by Dr. Jude L. Capper, 2020. Data from: FAOSTAT (2020) <http://www.fao.org/faostat/en/>

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D

Improving performance indicators reduces GHG emissions...but how do they compare?



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



AH

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



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



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

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What are the milk, meat and greenhouse gas implications of global dairy cow mortality?



Annual milk yield
4,500
kg

Milk lost if cow dies
8,537
kg

Meat lost if cow dies
430
kg CW

Extra GHG emissions
3,751
kg
CO₂e

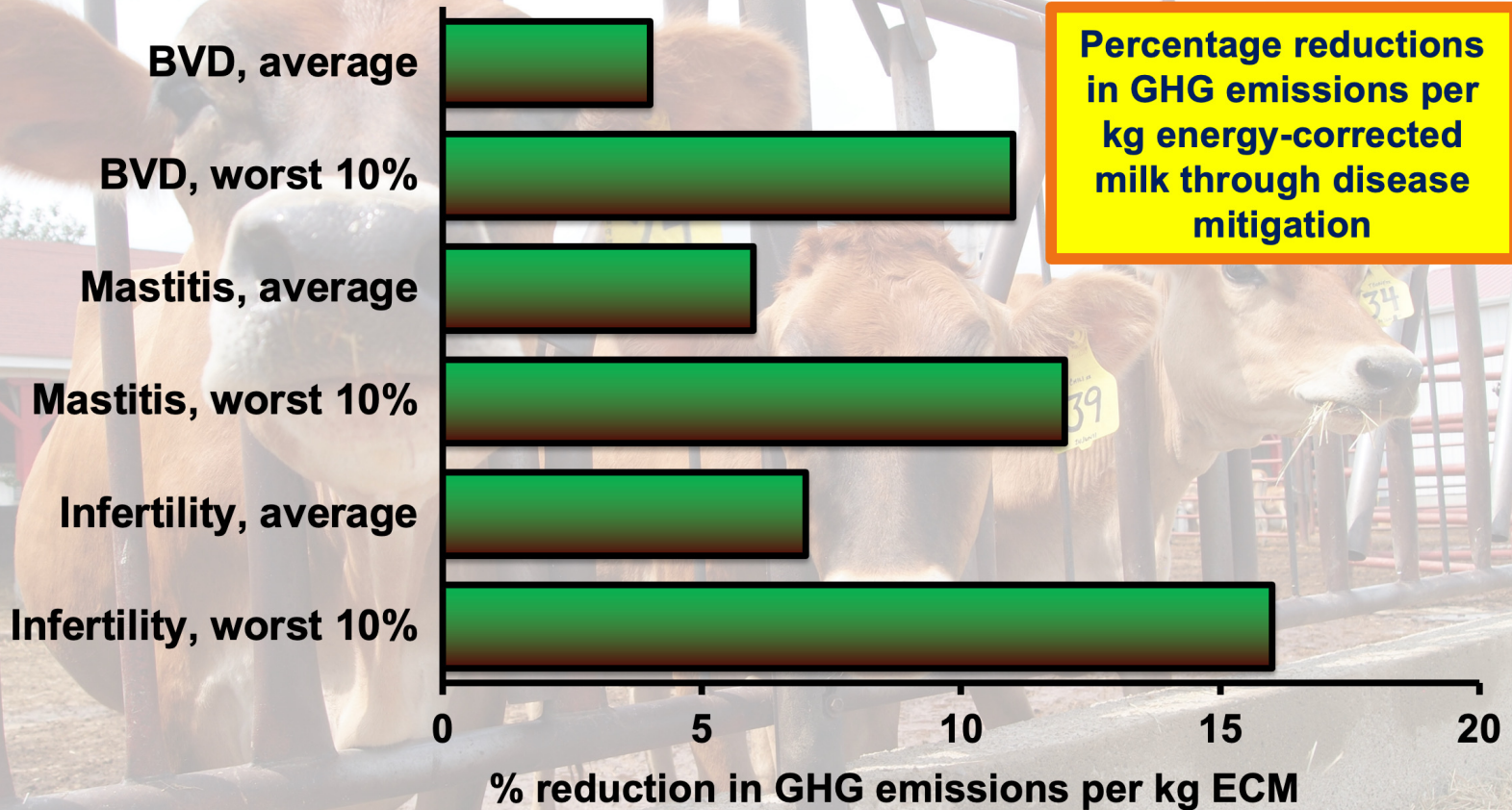
Source: Created by Dr. Jude L. Capper, 2021. Calculated as an example based on a 4,500 kg annual milk yield, 26 mo age at first calving, 14 mo calving interval, 248 kg carcass weight, 0.69 live calves born/yr, 0.50 calves reared for beef, and average of 1,731 kg CO₂e GHG emissions per heifer/yr.

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DS

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



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

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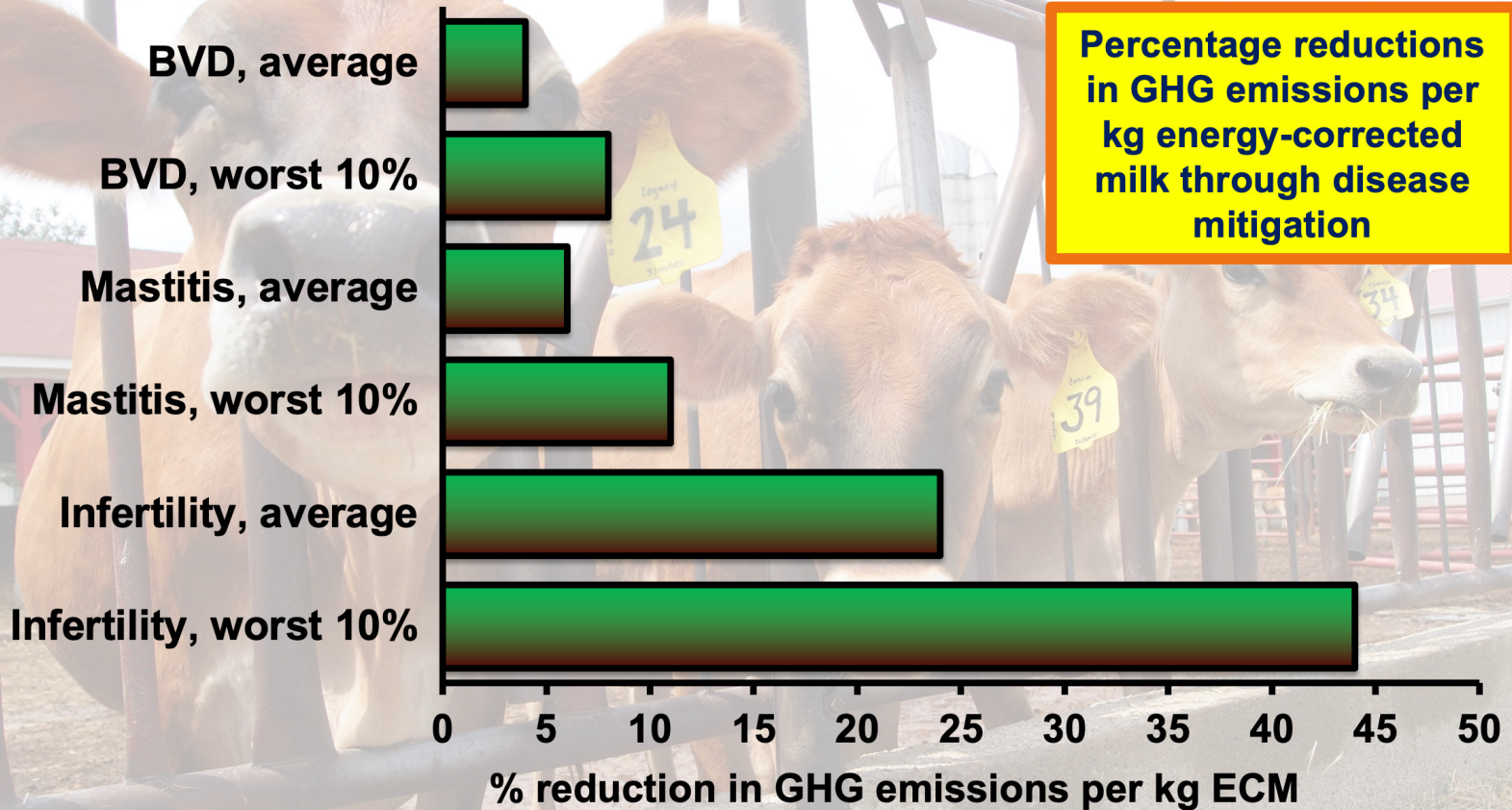


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GHG emissions could be cut significantly by mitigating dairy diseases - Kenya



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

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

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Source: Created by and photo from Dr. Jude L. Capper, 2021.

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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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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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Welfare, health and environmental concerns are paramount for people giving up dairy

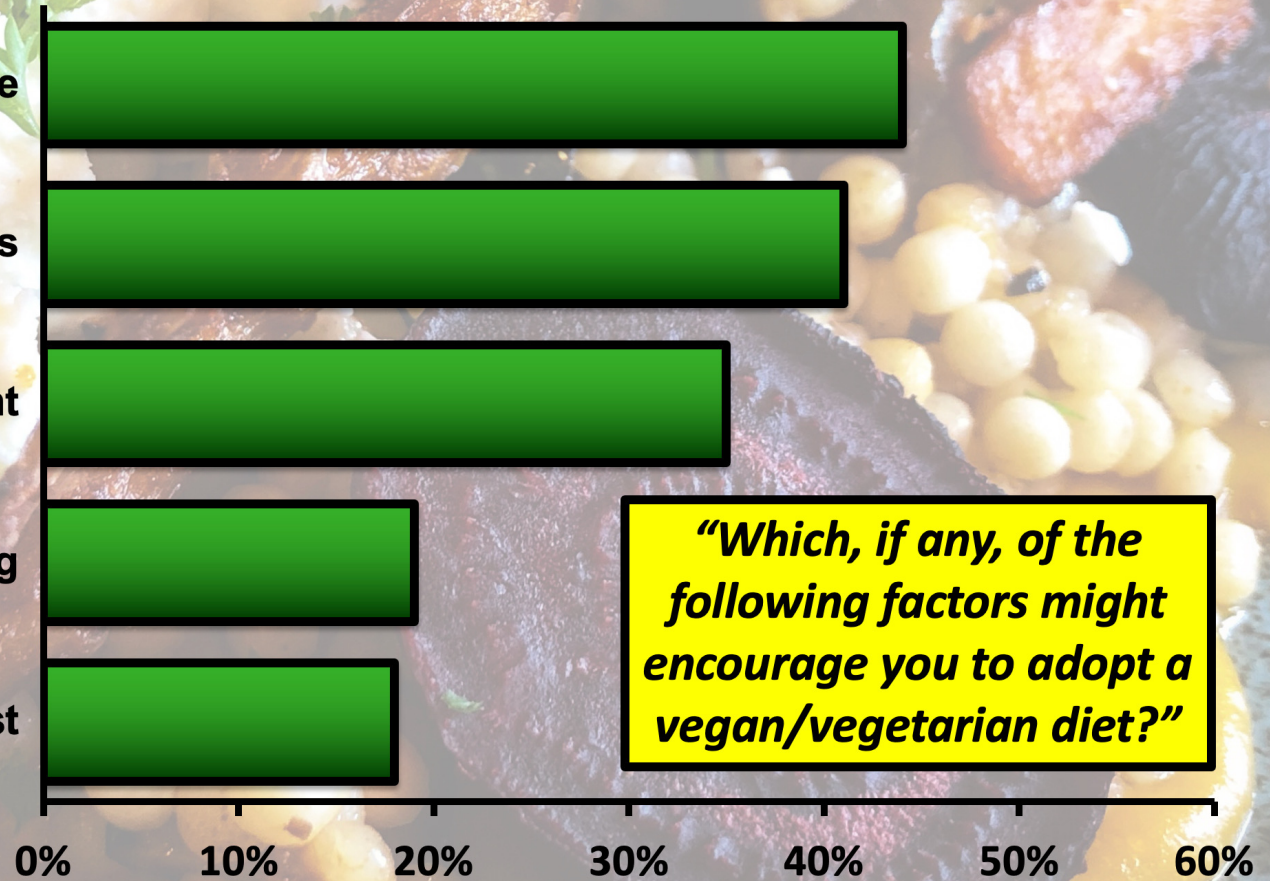
Animal welfare

Healthiness

Environment

Labelling

Economic cost



Source: Created by Dr. Jude L. Capper, 2021. 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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Has choosing dairy become a controversial issue?

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“The dairy industry is more cruel and horrible than the meat industry... dairy is truly a pleasure and I really feel guilty.”

Victoria Coren Mitchell

Source: Created by Dr. Jude L. Capper, 2019.
Screenshot from Apple Podcasts app, photo from:
<https://www.radiotimes.com/>



OFF MENU



0:02

- 1:16:25

Ep 17: Victoria Coren Mitchell
Off Menu with Ed Gamble and James A

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DS

Bad news bias – we need five positive news items to overcome each negative article

MailOnline

Viewers' outrage over harrowing scenes of day-old calves being lined up and shot DEAD just because they're male

- Three Jersey calves were filmed being killed on the Channel 4 programme featuring farmer Jimmy Doherty
- Nearly 60 people complained about the graphic scenes aired at 9.30pm on Tuesday

By PAUL REVOIR FOR MAILONLINE

PUBLISHED: 23:29, 30 May 2012 | UPDATED: 10:55, 31 May 2012



1.1k
View comments

Harrowing scenes of newly-born dairy calves being lined up and shot dead simply because they are male have left television viewers sickened.

The images of three Jersey calves being killed were filmed to highlight the grim reality of the dairy industry.

When talking to consumers, it's impossible to justify killing male dairy calves on the basis of economic cost.

Source: Created by Dr. Jude L. Capper, 2019. Article from: <http://www.dailymail.co.uk/news/article-2152402/Viewers-outrage-harrowing-scenes-day-old-calves-shot.html>

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Showing that we are making industry-wide positive changes will improve consumer trust

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Source: Created by Dr. Jude L. Capper, 2019. Screenshot from Instagram.



ciwf • Follow
United Kingdom



ciwf Is there such thing as too cute? We think we might have found it... 😊🐄

In case you've missed it, we also wanted to share some good news. In the UK @morrison's are making moves to stop male dairy calves being killed at birth, and to stop them being exported from the UK too. Instead they will be making sure that they are raised in the UK in higher welfare conditions. We believe that once born all farm animals should be able to have a life worth living, so steps like these are really important and help to reduce suffering.



439 likes

1 DAY AGO



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Science and technology are often frightening concepts when applied to food

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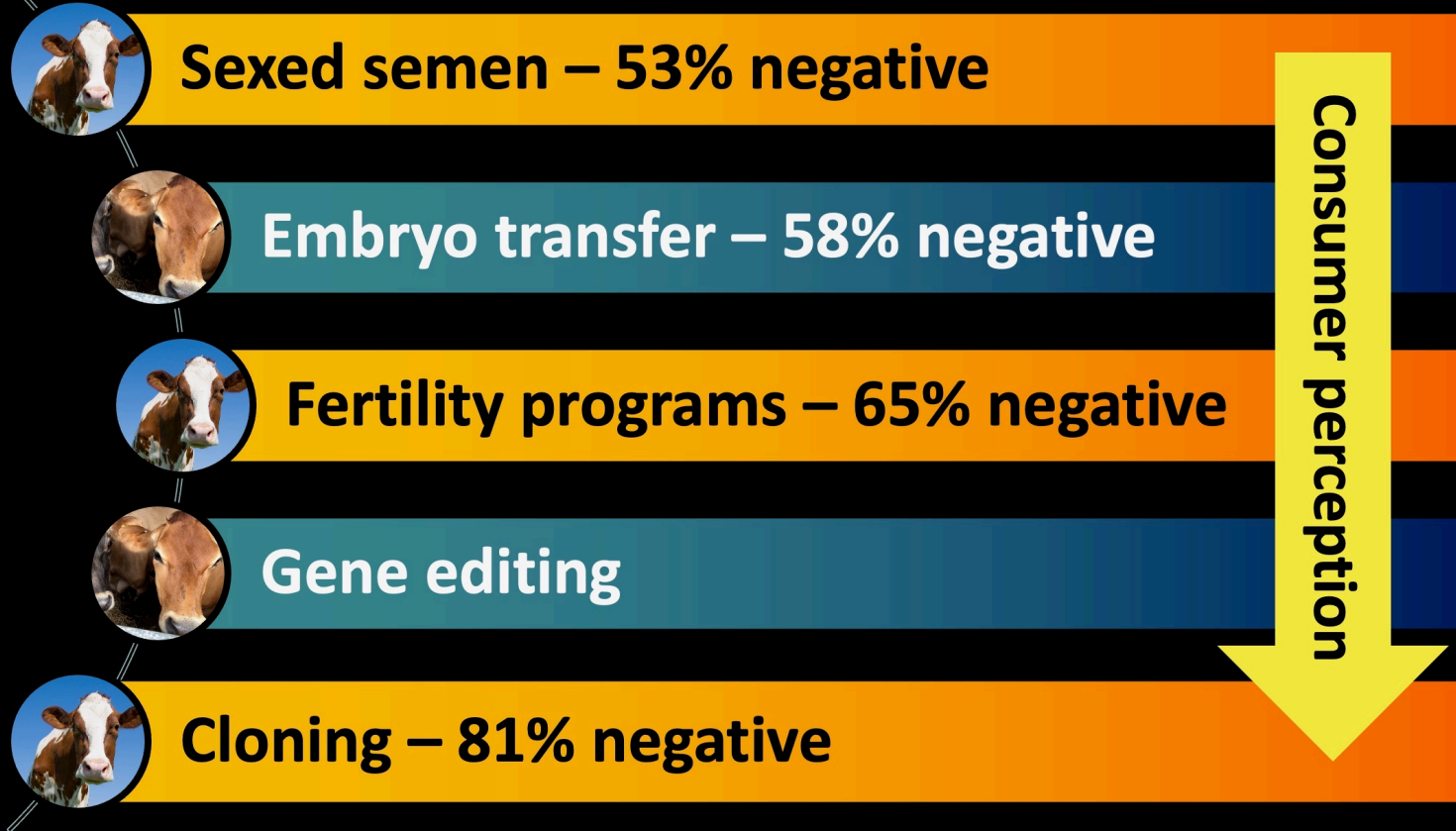
Source: Created by Dr. Jude L. Capper, 2022. Original art "The Farm" by Alexis Rockman.

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Negative consumer perceptions increase in tandem with technological artifice



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Source: Created by Dr. Jude L. Capper, 2022. Data from survey of 1,646 German consumers published in Pieper et al. (2016). *J. Dairy Sci.*
<https://doi.org/10.3168/jds.2015-10169>

D

Sexed semen sustainability benefits



Rate of genetic gain



Reduced dystocia



Improved calf welfare



Greater cross-breeding opportunities



Reduced GHG emissions from beef cattle



Heiferette production systems?



Improved profitability – given adequate fertility

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Source: Created by Dr. Jude L. Capper, 2022. Data from: Balzani et al. (2021) doi: 10.3389/fvets.2020.623128; Holden and Butler (2018) doi:10.1017/S1751731118000721

D

Sexed semen – dairy economic viability 1



Modelling sexed semen and crossbreeding on German dairy farms



Profit improved by €0-568 per cow per year, with an average of €79.42



Greatest benefit on farms with low stocking densities or high replacement rates

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Source: Created by Dr. Jude L. Capper, 2022. Data from: Pahmeyer and Britz (2020) <https://doi.org/10.3168/jds.2019-17354>

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D

Sexed semen – dairy economic viability 2



Modelling sexed semen, beef semen, genomic testing and crossbreeding, on Swedish dairy farms



Greatest economic returns achieved from combining all four strategies (€58 per cow per year)



Greatest gains made by using sexed semen in 90% of heifers, plus 45% of first-parity cows

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Source: Created by Dr. Jude L. Capper, 2022. Data from: Clasen et al. (2021) <https://doi.org/10.3168/jds.2020-20028>

D

Sexed semen – beef environmental responsibility 1



Modelling effects of sexed semen and moving from 50:50 to 78:22 dairy:suckler beef in Ireland



Economic value of dairy beef to the industry improved by 60.4%



GHG emissions per tonne beef reduced by 24.6% assuming dairy herd expands to maintain supply

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Source: Created by Dr. Jude L. Capper, 2022. Data from: Holden and Butler (2018) doi:10.1017/S1751731118000721

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D

Sexed semen – beef environmental responsibility 2



Modelling effects of using sexed semen on medium and large Scottish dairy farms



Farm gross margin increased by ~1.0%, cost-effectiveness = -€15 - €7/tonne CO₂e



GHG emissions per tonne milk reduced by 9.5-11.6% assuming dairy beef replaces sucklers

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Source: Created by Dr. Jude L. Capper, 2022. Data from: Eory et al. (2014) German Journal of Agricultural Economics, 63:133-142.

B

GHG benefits of dairy-beef now recognized – sucklers will need to demonstrate benefits

Annual requirements of one suckler cow:

- 3,954 kg feed DM
- 20,047 litres water
- 2,459 kg CO₂

Need to justify these impacts vs. beef from dairy.

Source: Created by Dr. Jude L. Capper, 2021. Calculation based on feed and water requirements of one Angus cow weighing 544 kg producing 7.8 kg of milk per day, with calf weaned at 207 days of age.



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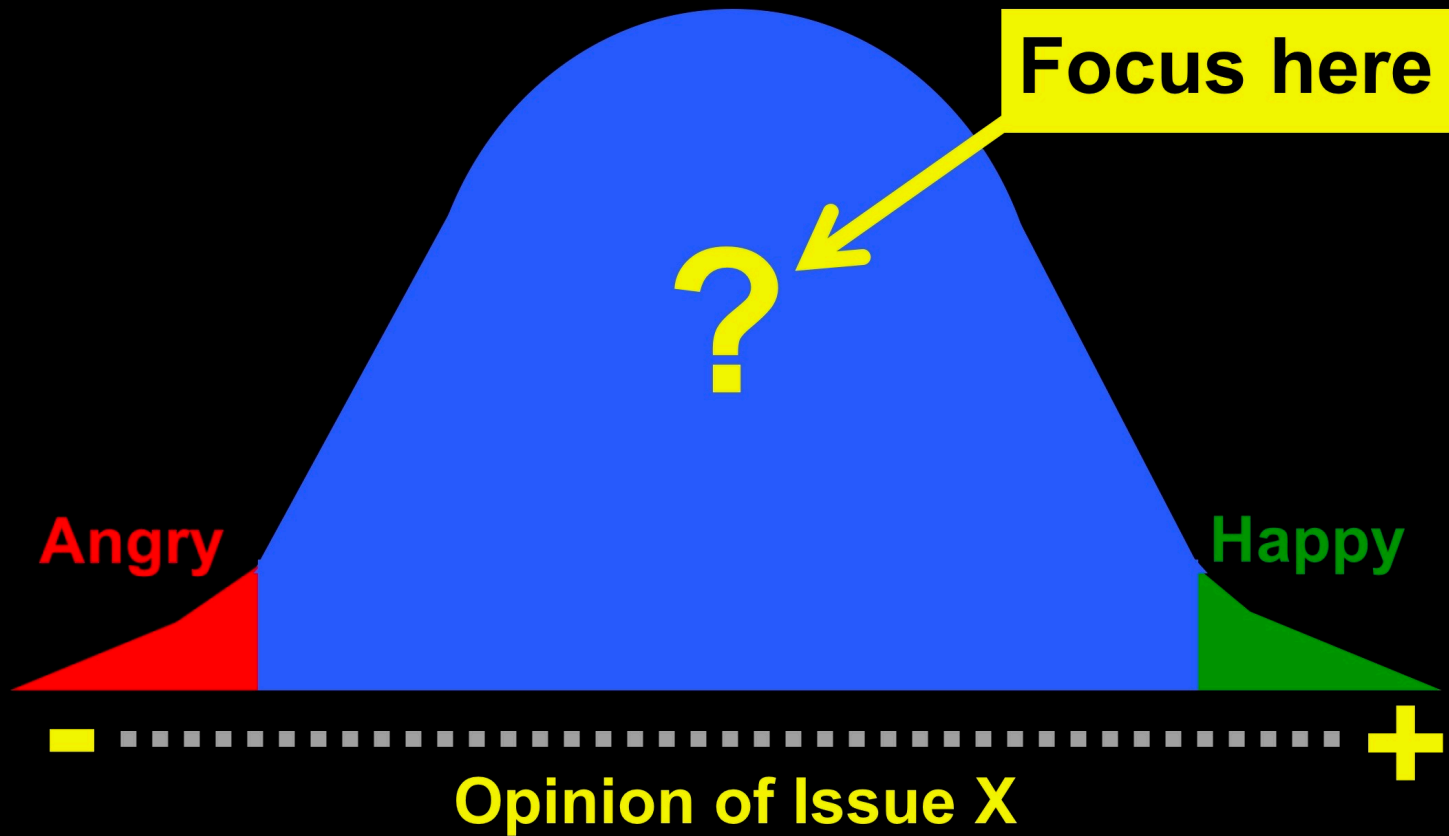
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We need to communicate with consumers who don't yet have fixed opinions of agriculture



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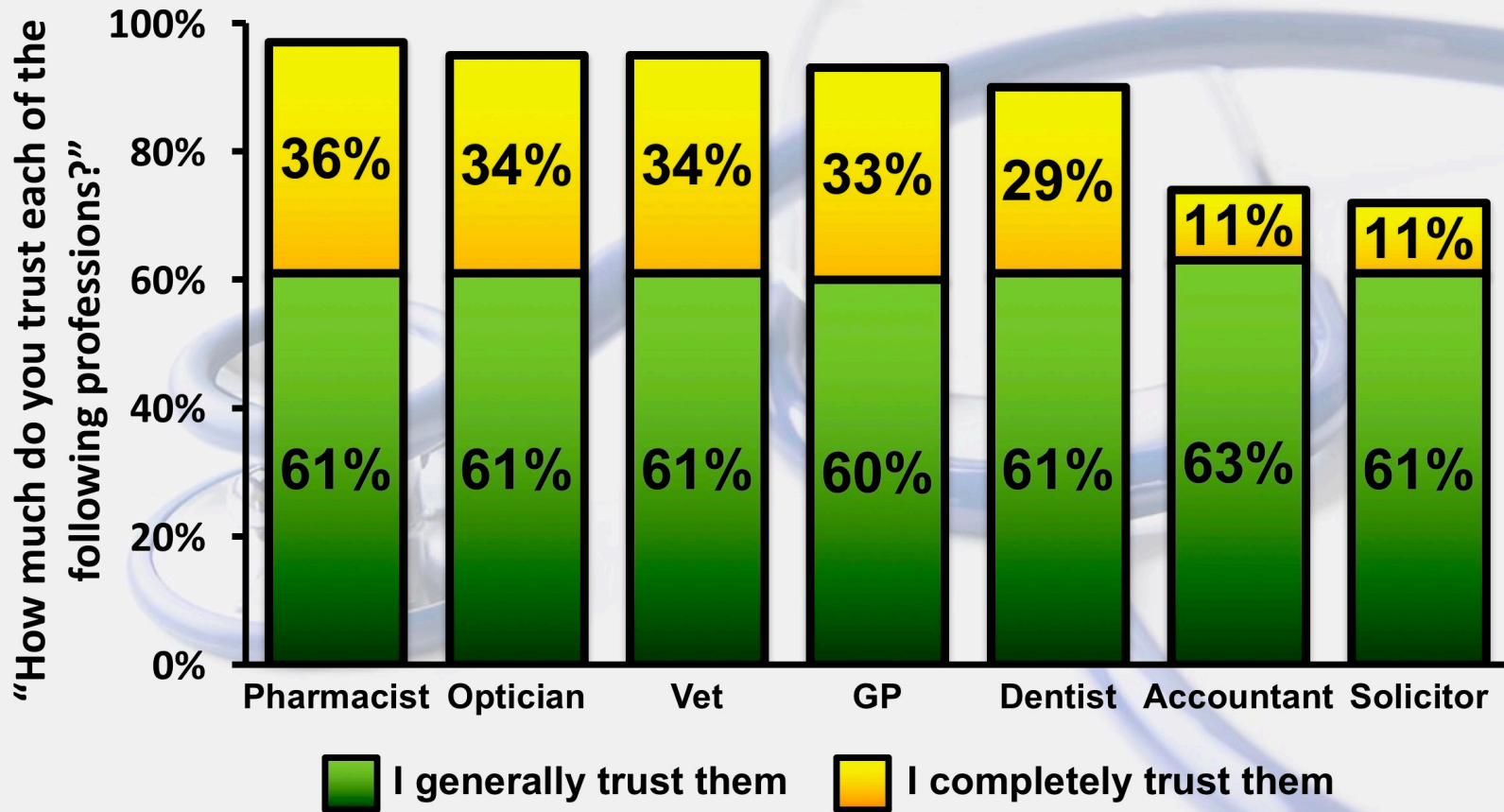
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Source: Created by Dr. Jude L. Capper, 2017

COM

Consumer trust in the veterinary profession is extremely high



Source: Created by Dr. Jude L. Capper, 2017. Data from: Vet Futures (2015) [https://www.vetfutures.org.uk/download/surveys-filebase/Public trust in the professions.pdf](https://www.vetfutures.org.uk/download/surveys-filebase/Public%20trust%20in%20the%20professions.pdf)

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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*.

B

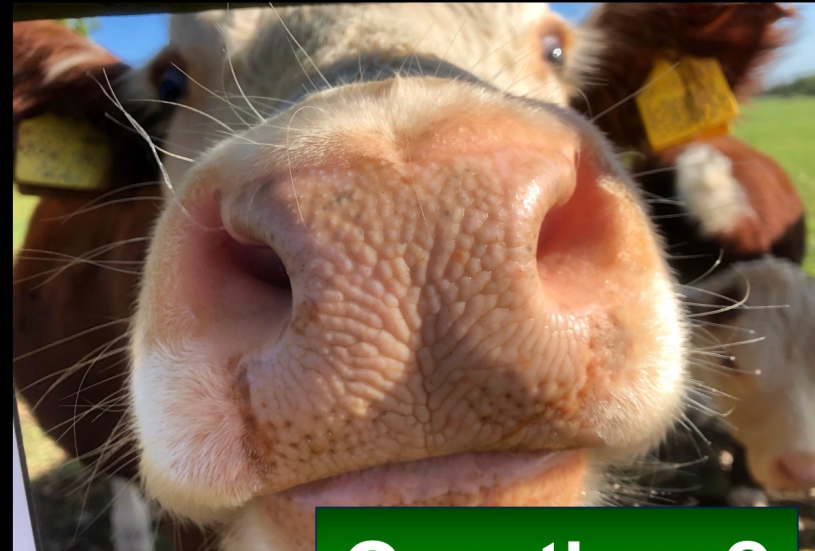
Thank you!

jude@livestocksustainability.com

<http://bovidiva.com/presentationlinks>

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Questions?



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Source: Created by Dr. Jude L. Capper, 2022. Cartoon from: <http://snipurl.com/methanecartoon>