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Sustainability and One Health: Where are the knowledge gaps?

Dr. Jude L. Capper

2nd September 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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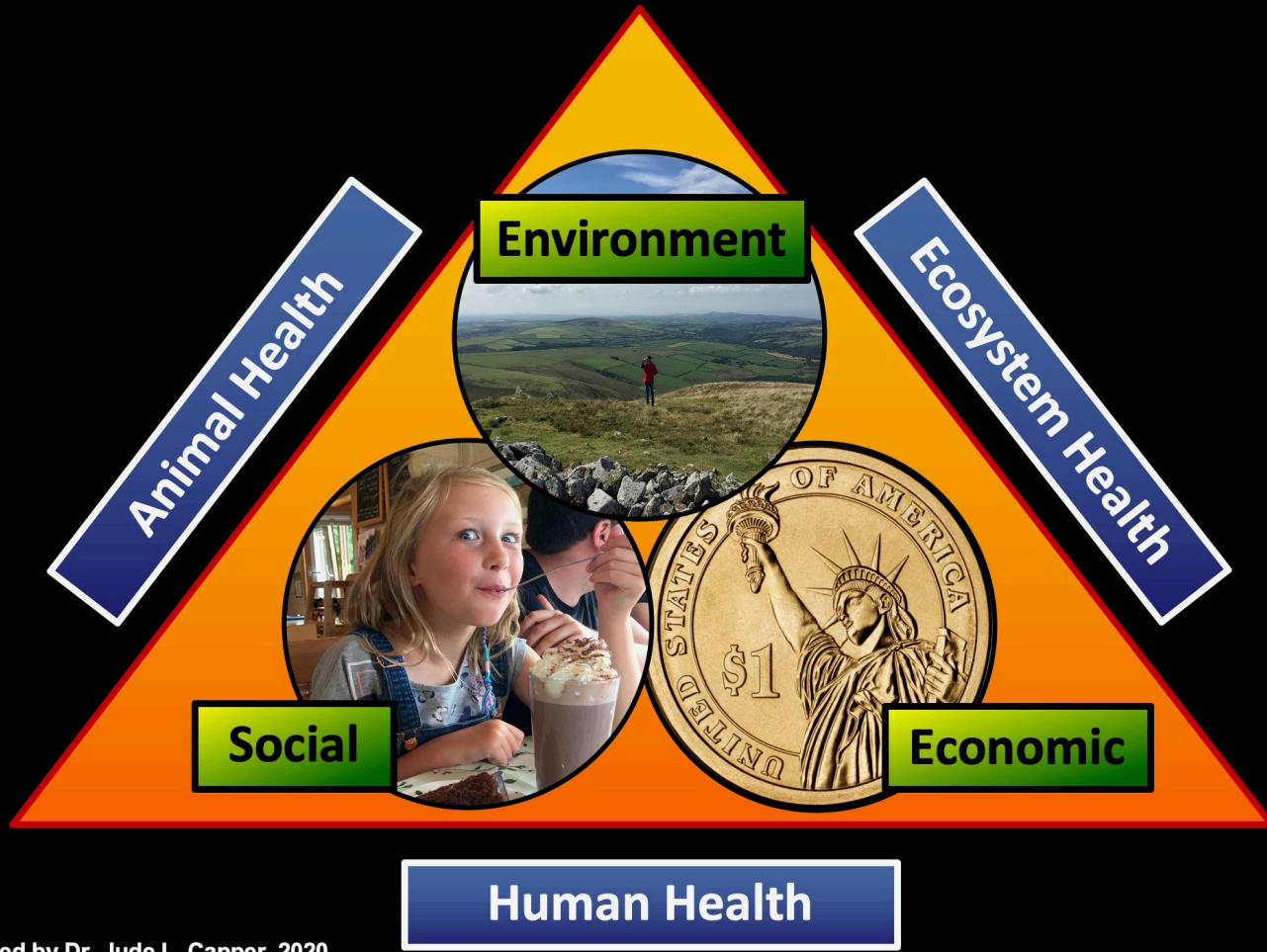
Source: Created and photos by Dr. Jude L. Capper, 2020

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Sustainability comprises three pillars, all under the umbrella of One Health



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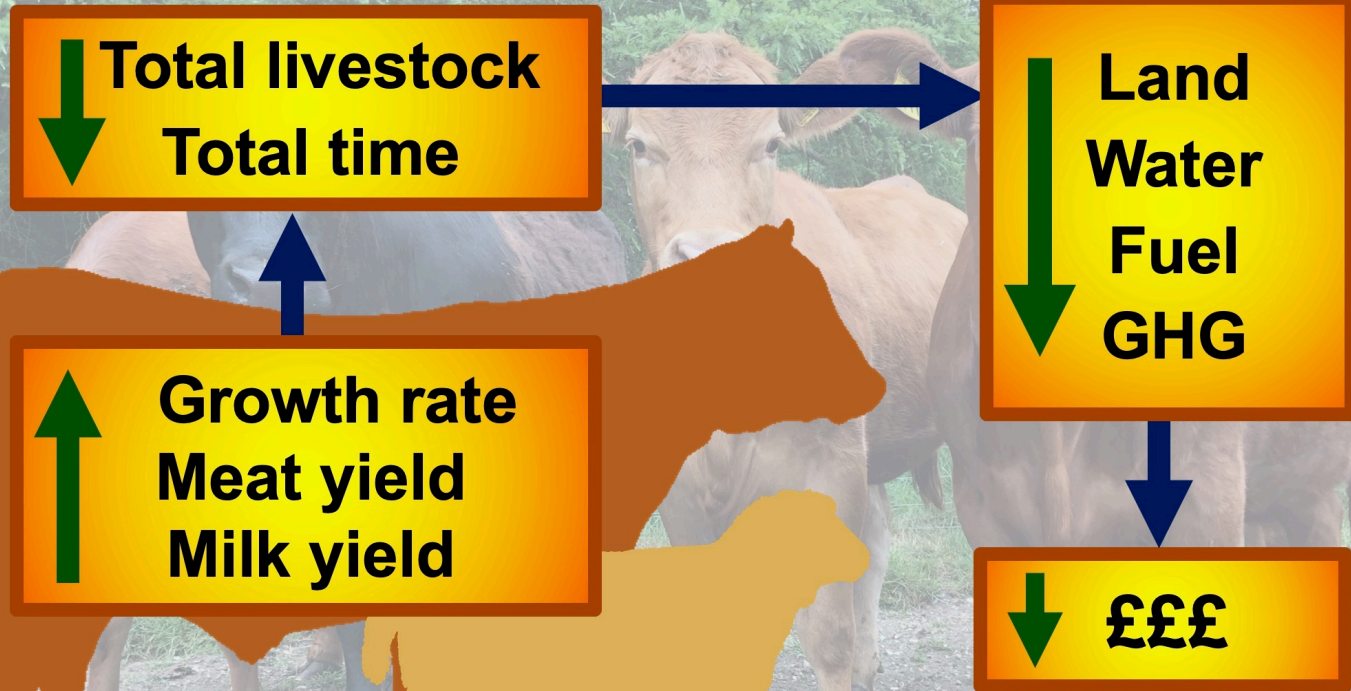
Source: Created by Dr. Jude L. Capper, 2020.

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B

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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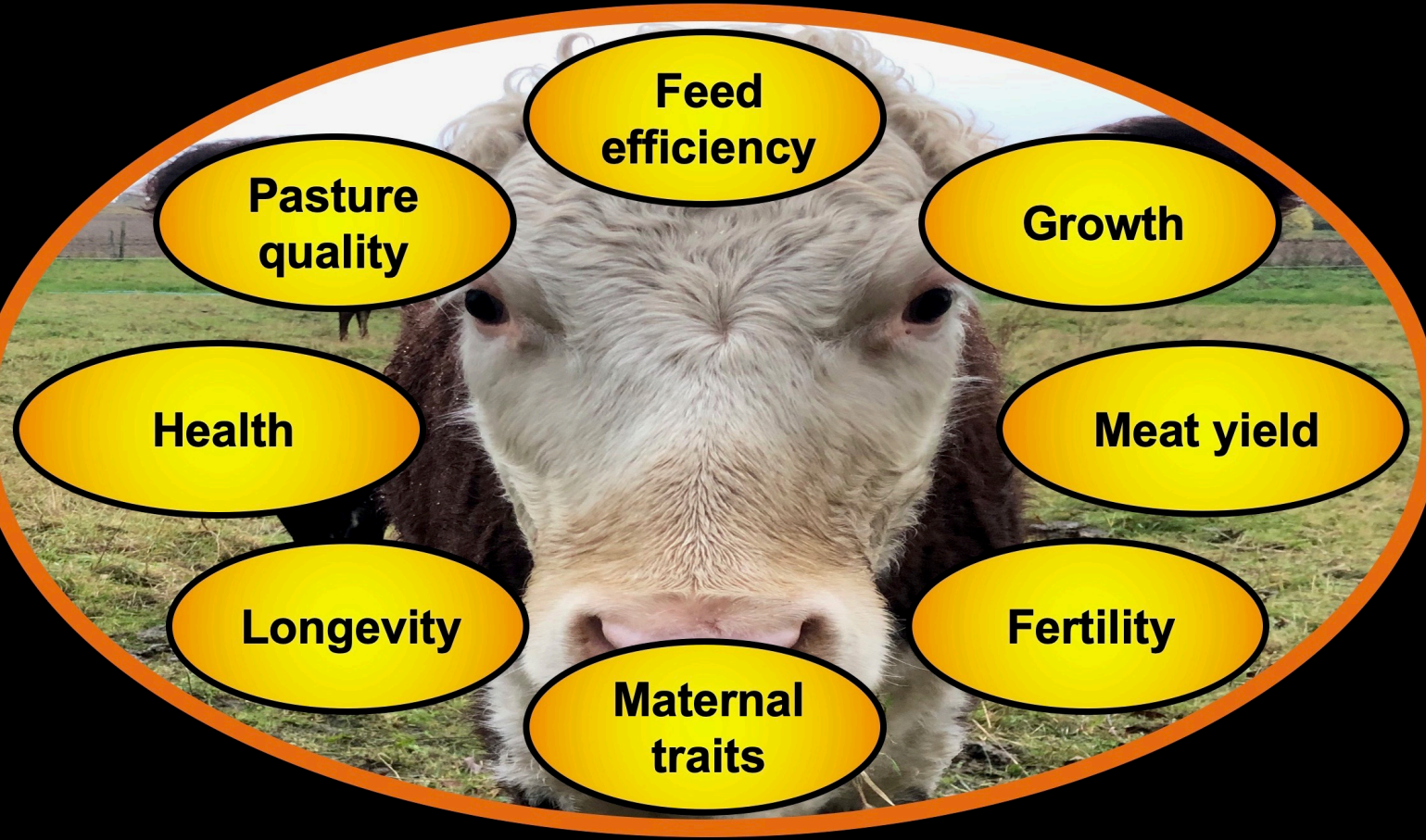


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B

Improving key performance indicators reduces environmental impacts



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



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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>

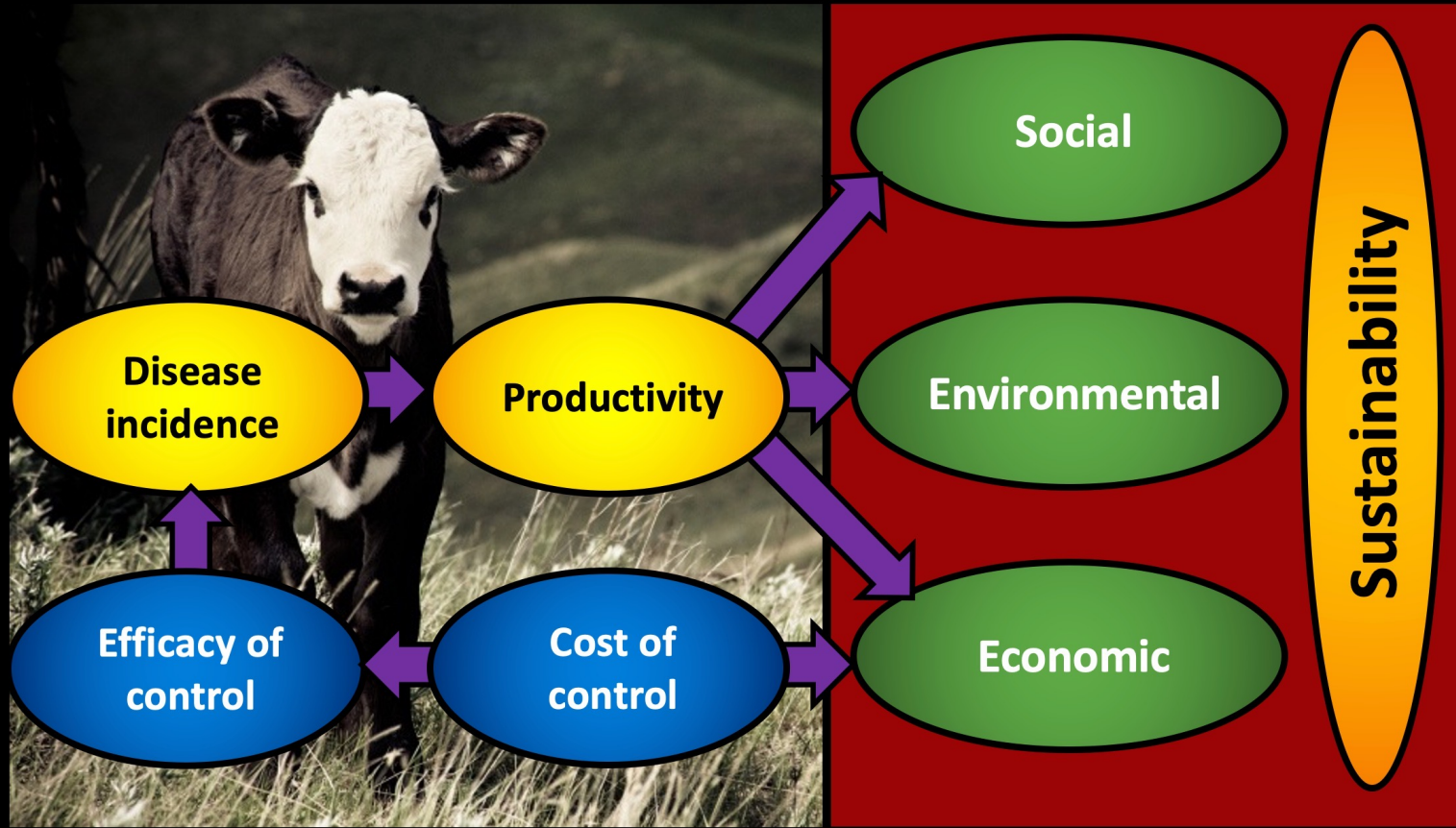
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More data is needed to quantify the impacts of disease on sustainability

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Source: Created by Dr. Jude L. Capper, 2020. More information available at: <https://www.msd-animal-health-hub.co.uk/TimeToVaccinate>

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Impacts of disease on maintaining livestock production

Reduced milk/meat yield = need more animals

Increased mortality = need more animals

Failure to wean = need more animals

Failure to conceive = need more time

Reduced growth rates = need more time

Greater resource use
Higher economic cost

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Source: Created by Dr. Jude L. Capper, 2020. More information available at: <https://www.msd-animal-health-hub.co.uk/TimeToVaccinate>

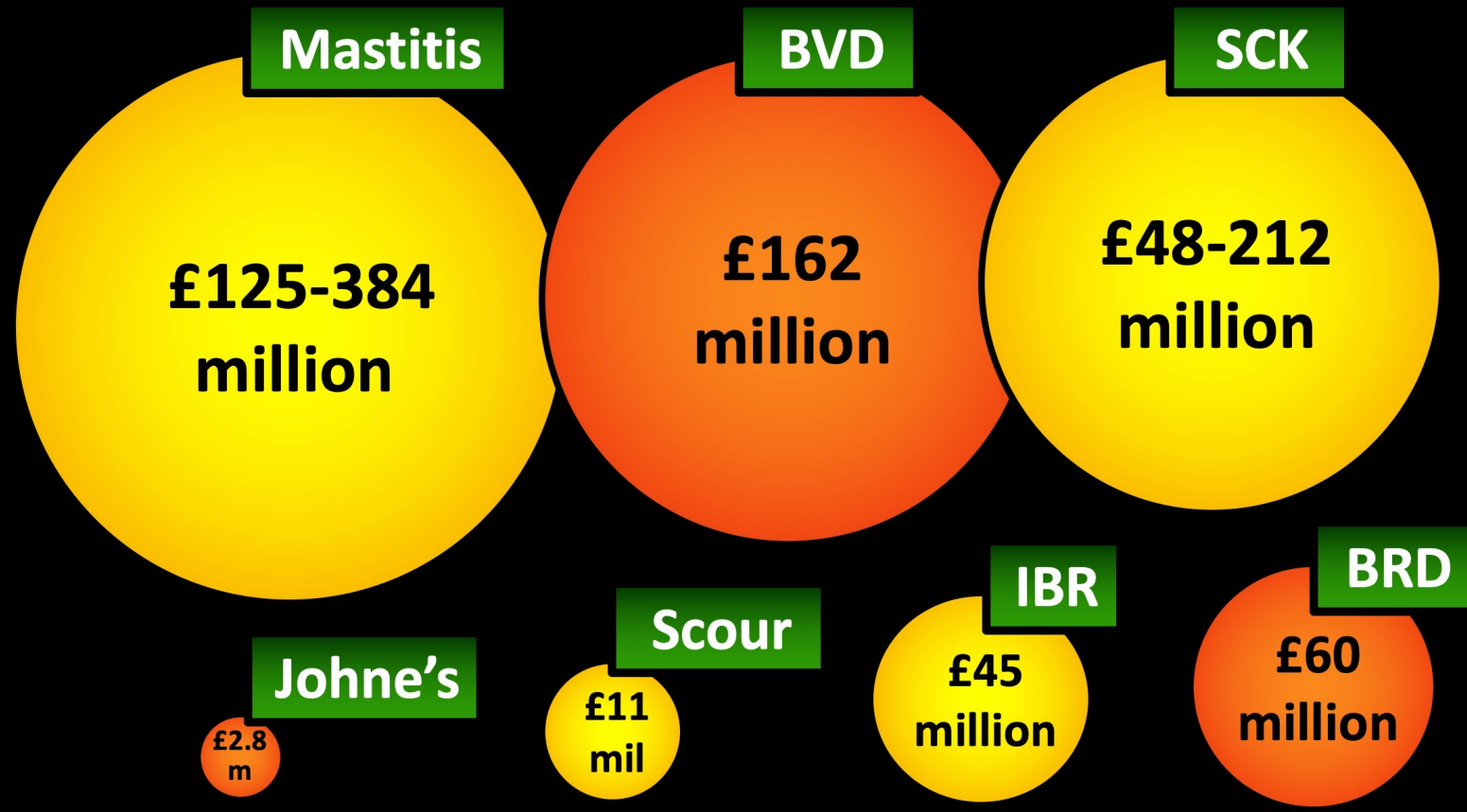


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Impacts of cattle disease on economic cost at the industry level

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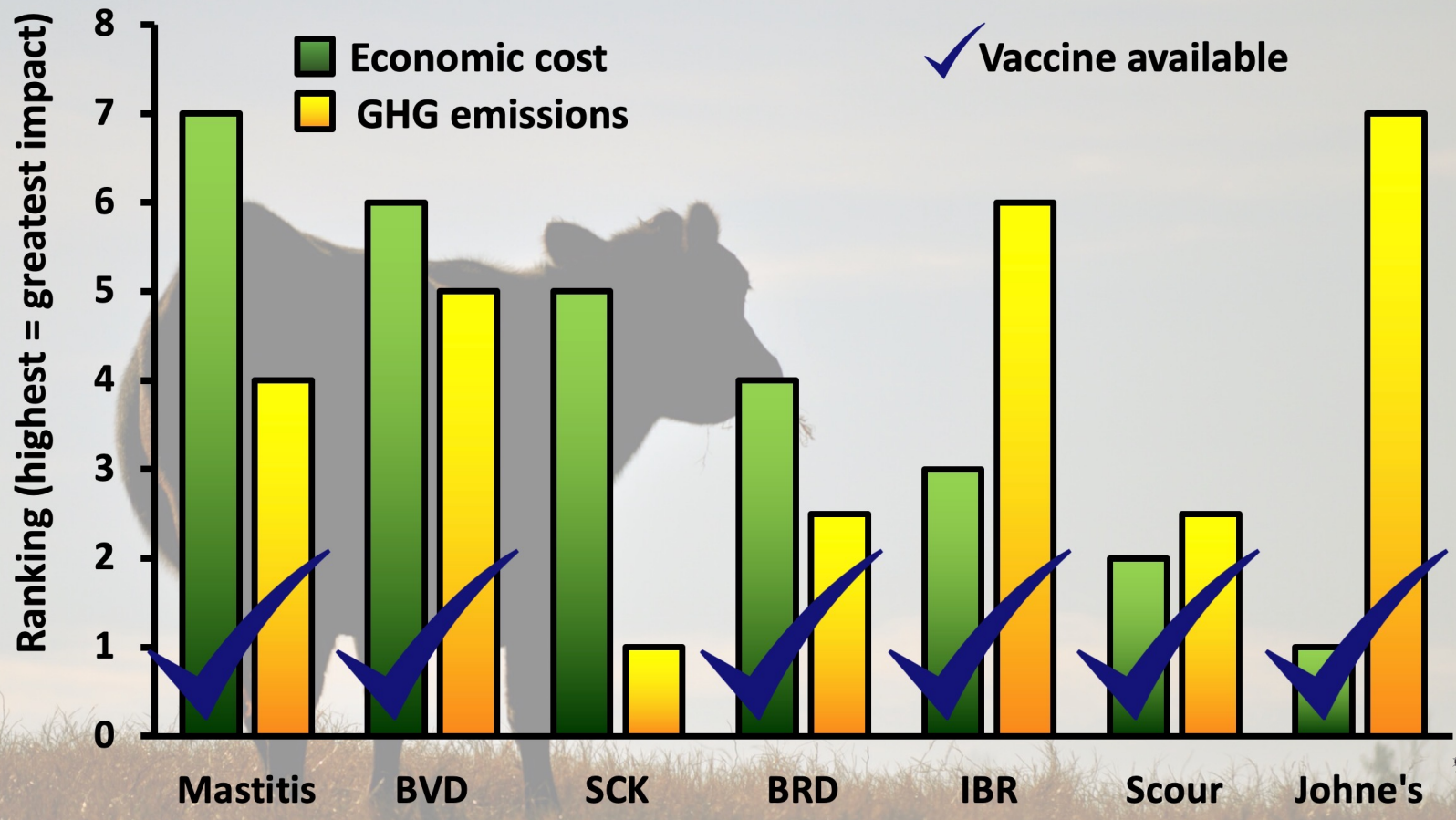


Source: Created by Dr. Jude L. Capper, 2020. More information available at: <https://www.msd-animal-health-hub.co.uk/TimeToVaccinate>



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Relative rankings of cattle diseases on economic cost and GHG emissions



Source: Created by Dr. Jude L. Capper, 2020. More information available at: <https://www.msd-animal-health-hub.co.uk/TimeToVaccinate>

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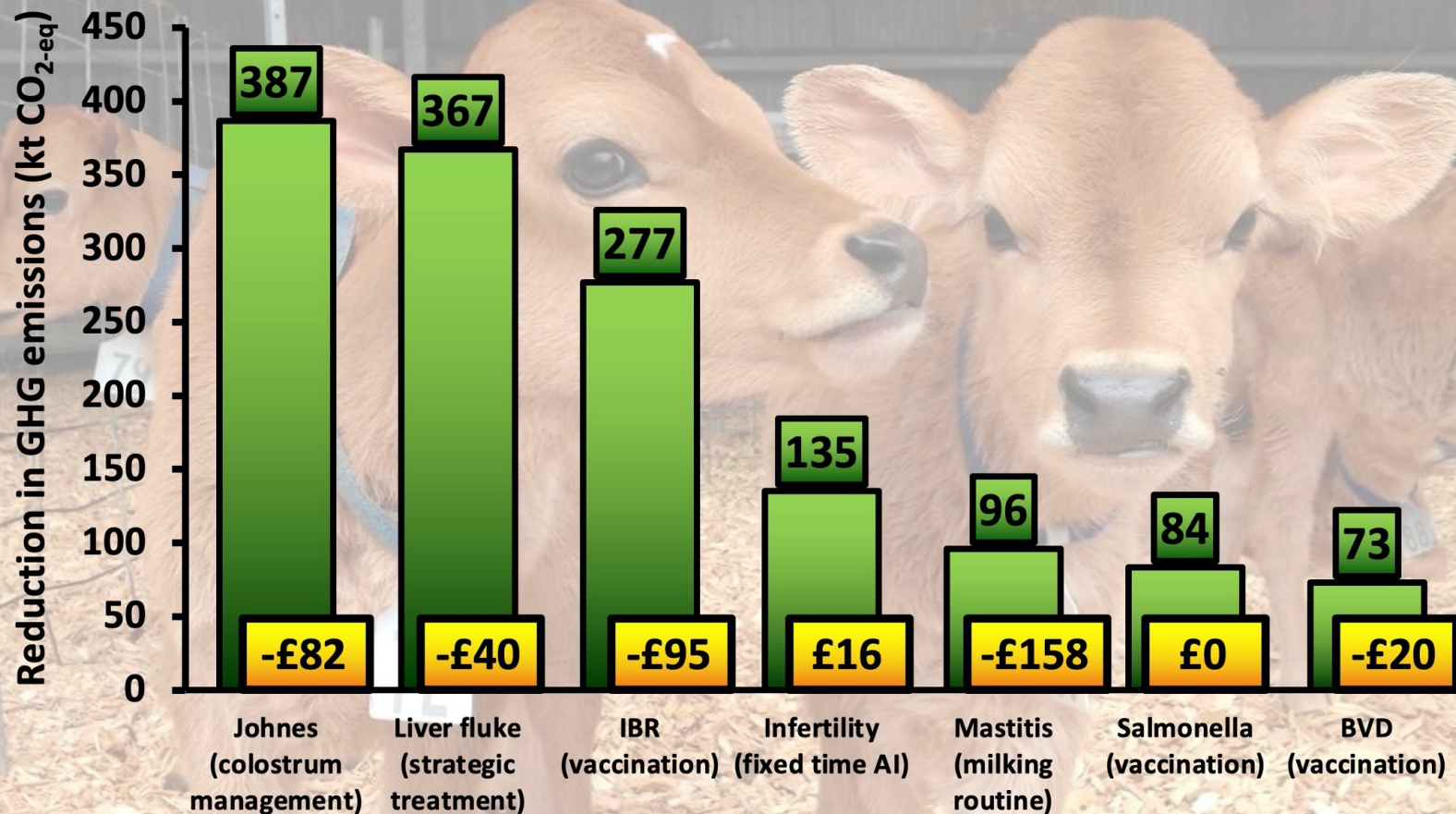


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Disease mitigation measures have varying impacts on GHG emissions and economic cost



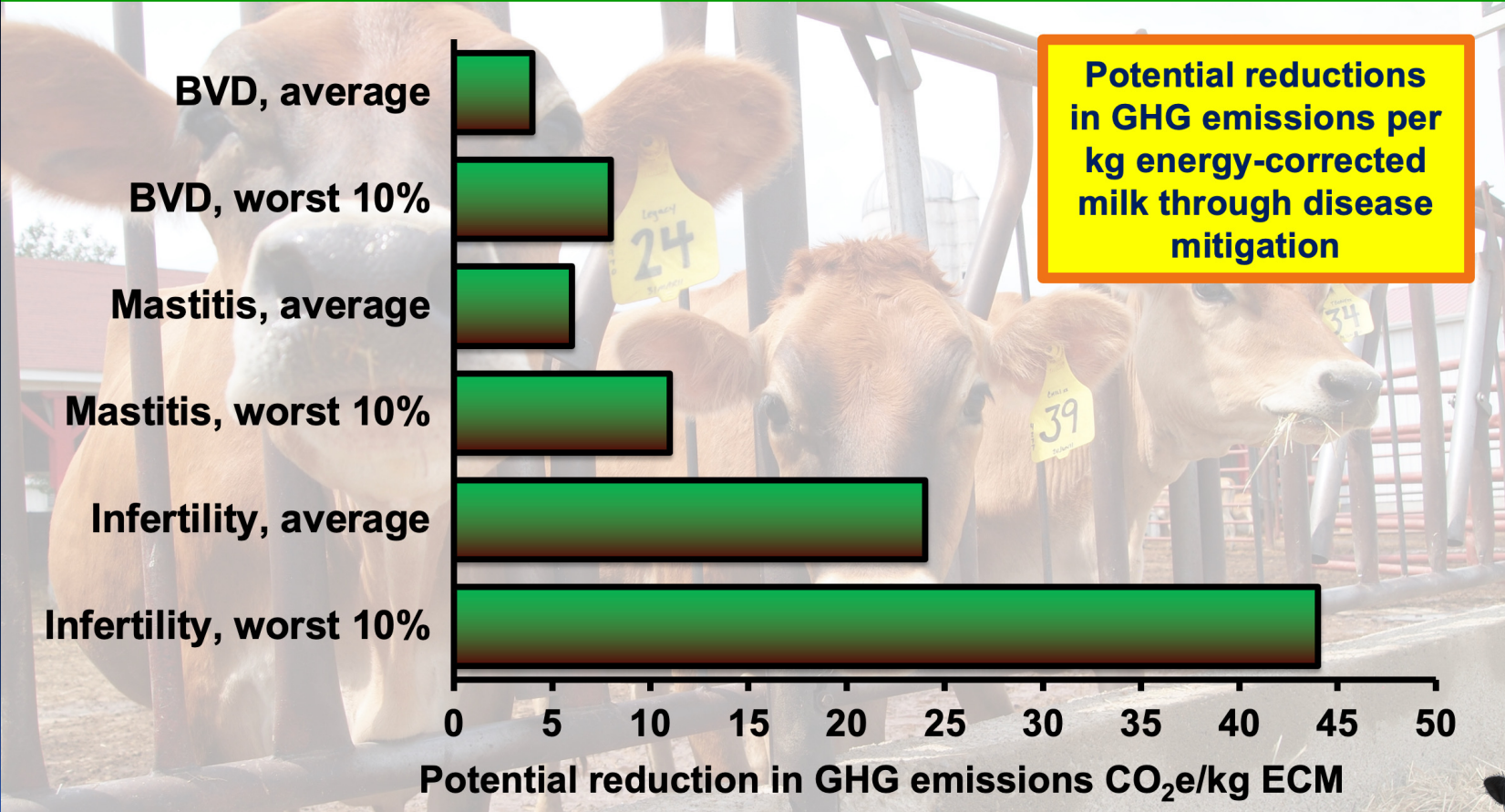
Source: Created by Dr. Jude L. Capper, 2020. Data from: ADAS (2015) Study to Model the Impact of Controlling Endemic Cattle Diseases and Conditions on National Cattle Productivity, Agricultural Performance and Greenhouse Gas Emissions. ADAS UK Ltd, Herts, UK.

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DS

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



Potential reductions in GHG emissions per kg energy-corrected milk through disease mitigation

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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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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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Consumers consider antibiotic use to be acceptable in sick livestock

“Should sick farm animals be treated with antibiotics if this is the most appropriate treatment?”

56% of EU consumers (77% of UK consumers) surveyed agreed or tended to agree that antibiotics should be used



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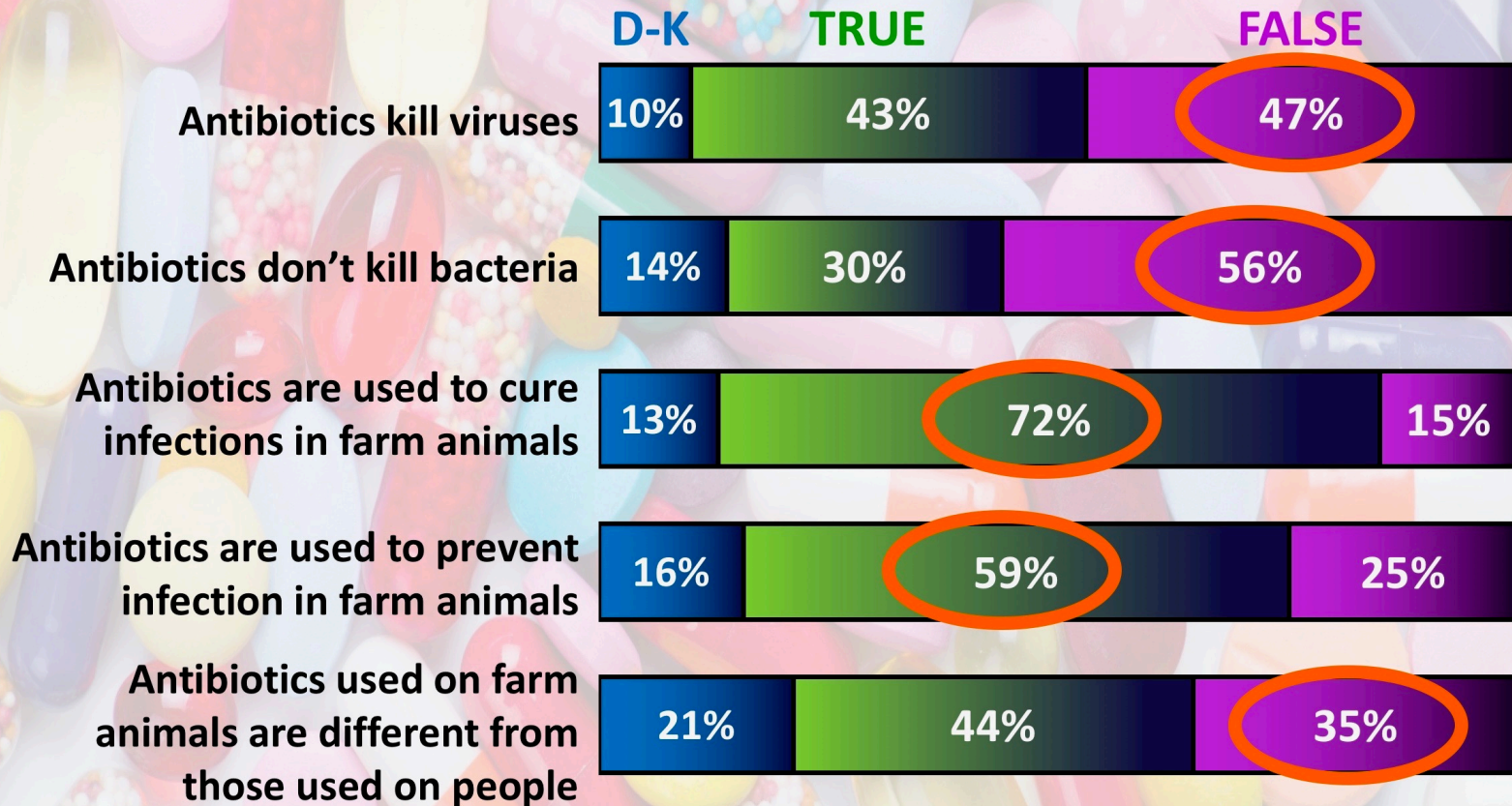
Source: Created by Dr. Jude L. Capper, 2020. Data from: Eurobarometer. 2018. Antimicrobial Resistance. Special Report 478. The European Commission, Brussels, Belgium.

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AMR

Consumers have a low level of knowledge and understanding of antibiotics



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Source: Created by Dr. Jude L. Capper, 2017. Data from: Etienne *et al.* 2016. EU Insights – Perceptions on the human health impact of antimicrobial resistance (AMR) and antibiotics use in animals across the EU. EFSA Supporting publication 2017:EN-1183. <http://www.efsa.europa.eu/publications>. Note that only 37% of consumers are aware that antibiotics are banned for use as growth promoters in the EU (Eurobarometer, 2016)

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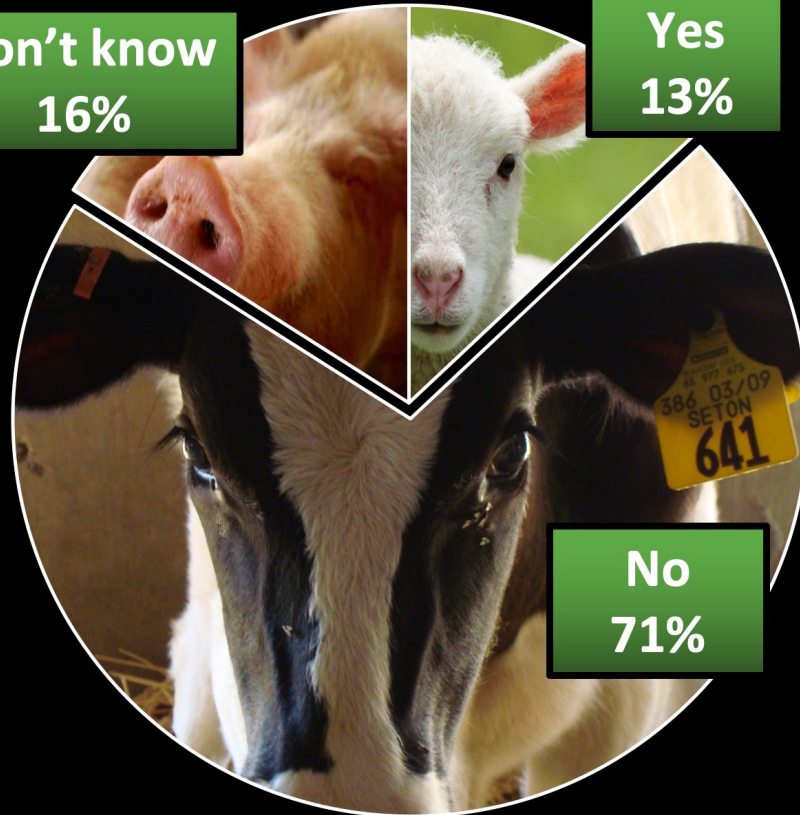


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Consumers do not consider enough is being done to reduce antibiotic use

Don't know
16%

Yes
13%



“Are sufficient actions undertaken to control or prevent overuse of antibiotics in farm animals?”

The majority (71%) of EU consumers surveyed considered that not enough was being done

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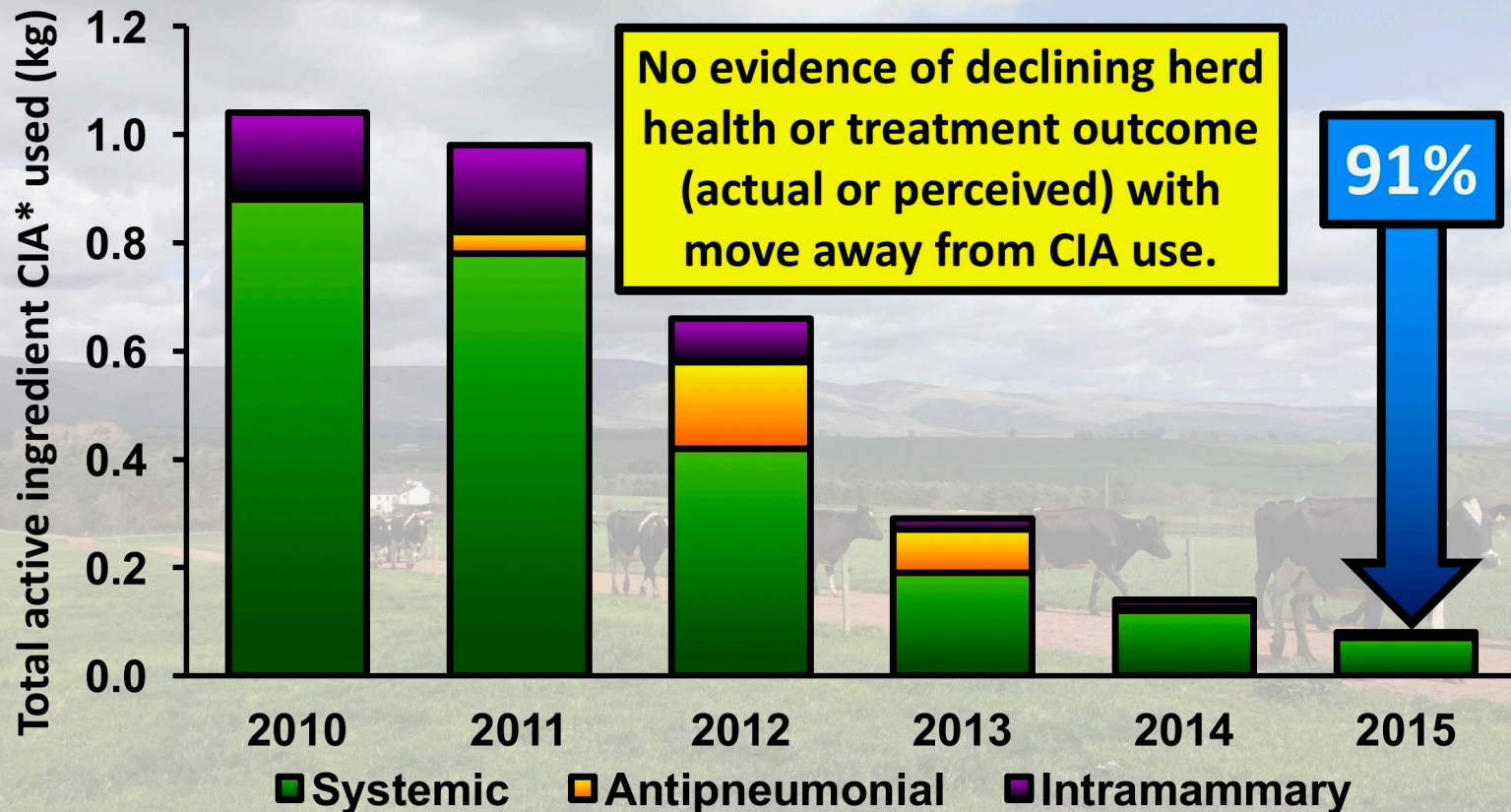
Source: Created by Dr. Jude L. Capper, 2019. Data from: Etienne et al. 2016. EU Insights – Perceptions on the human health impact of antimicrobial resistance (AMR) and antibiotics use in animals across the EU. EFSA Supporting publication 2017:EN-1183.

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AMR

Case study: critically-important antibiotics* phased out successfully over time



Source: Created by Dr. Jude L. Capper, 2017. Data from: Tisdall et al. (2017) Achieving responsible medicines use at practice and farm level. *In-Practice*. Antimicrobial reduction achieved by Langford Farm Animal Practice between 2010 and 2015 despite 10% increase in dairy cattle numbers. 91% decrease in systemic use, 100% in intramammary use, 82% reduction overall. *Defined as third- and fourth-generation cephalosporins, fluoroquinolones and long-acting macrolides

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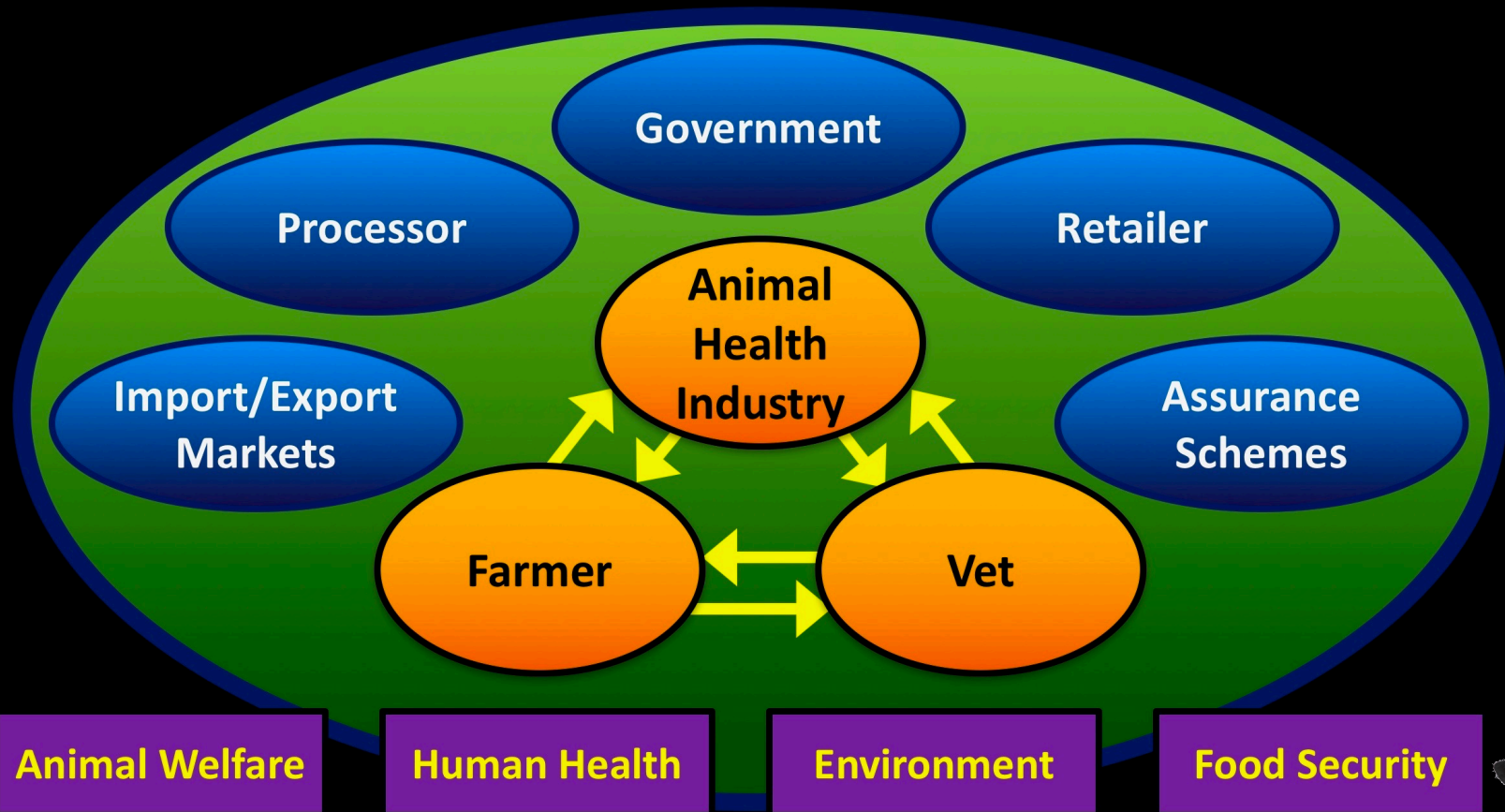


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AMR

The entire food supply chain is responsible for appropriate antibiotic use



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



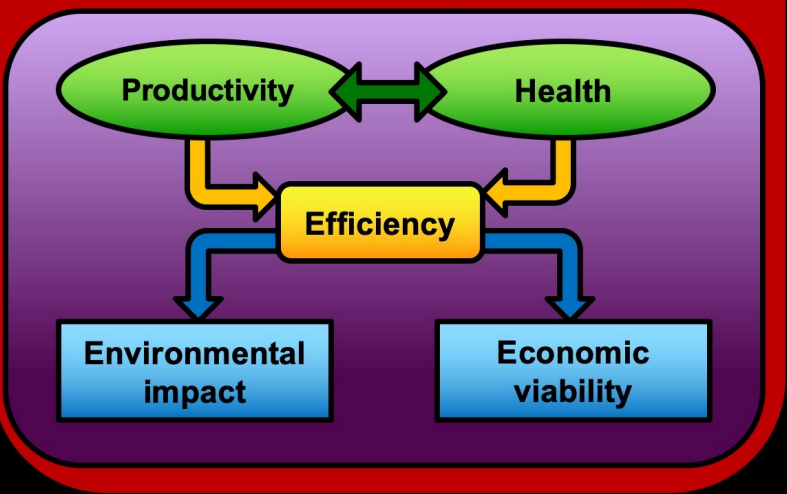
COM

Social acceptability and consumer trust are vital for sustainable livestock production

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Social Acceptability



Sustainability



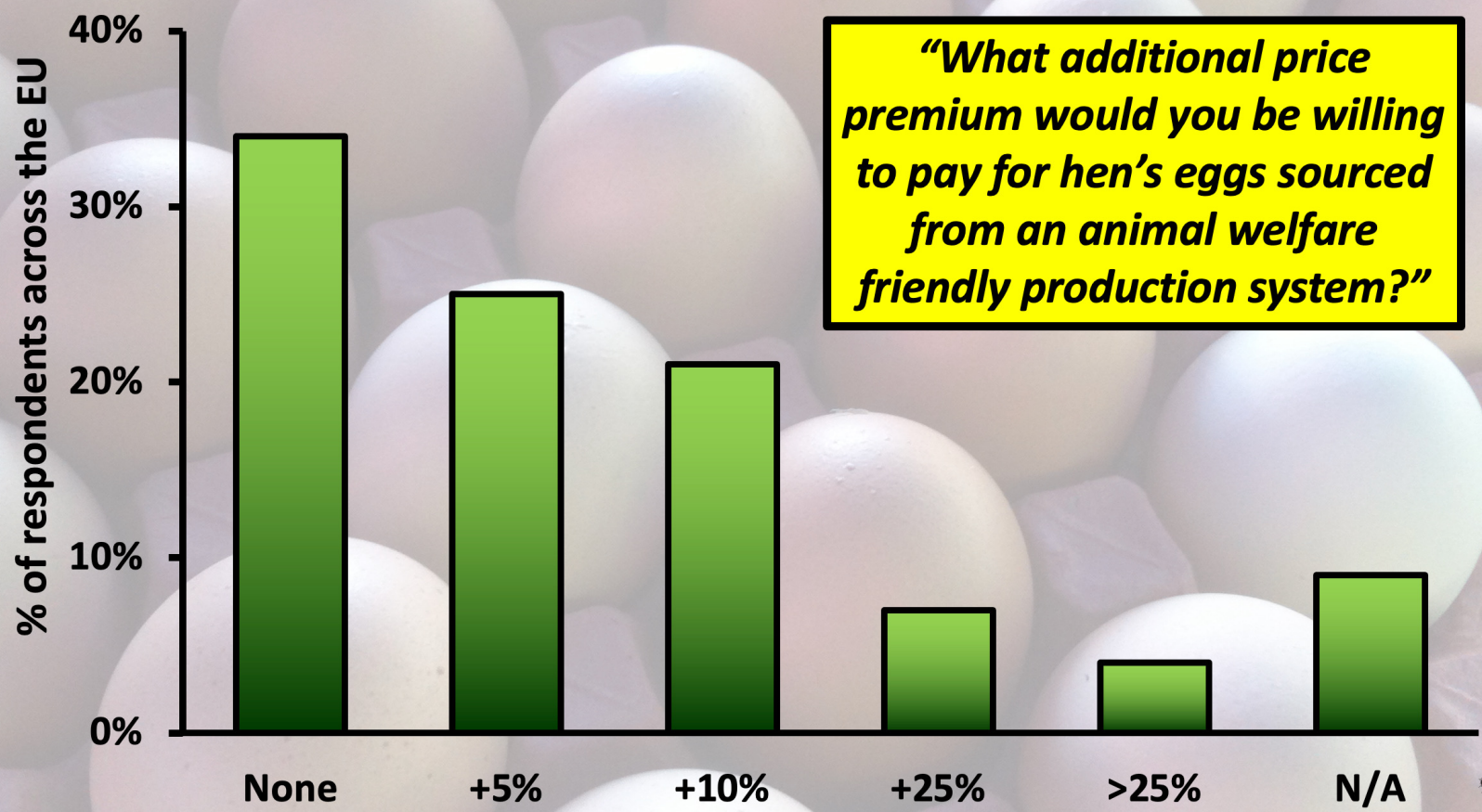
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Source: Created by Dr. Jude L. Capper, 2020.

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94% of EU respondents said it was important to protect welfare...but few will pay for it



“What additional price premium would you be willing to pay for hen’s eggs sourced from an animal welfare friendly production system?”

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Source: Created by Dr. Jude L. Capper, 2021. Data from Eurobarometer (2016) Special Eurobarometer 442. Attitudes of Europeans Towards Animal Welfare. Available from: <https://europa.eu/eurobarometer/surveys/detail/2096>

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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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How can we improve?



Take a whole-herd, holistic approach



Use on-farm medicines responsibly



Use vaccination where appropriate



Record and benchmark health data



Record performance and economic impacts



Communicate dedication to livestock health

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Source: Created by Dr. Jude L. Capper, 2020. More information available at: <https://www.msd-animal-health-hub.co.uk/TimeToVaccinate>

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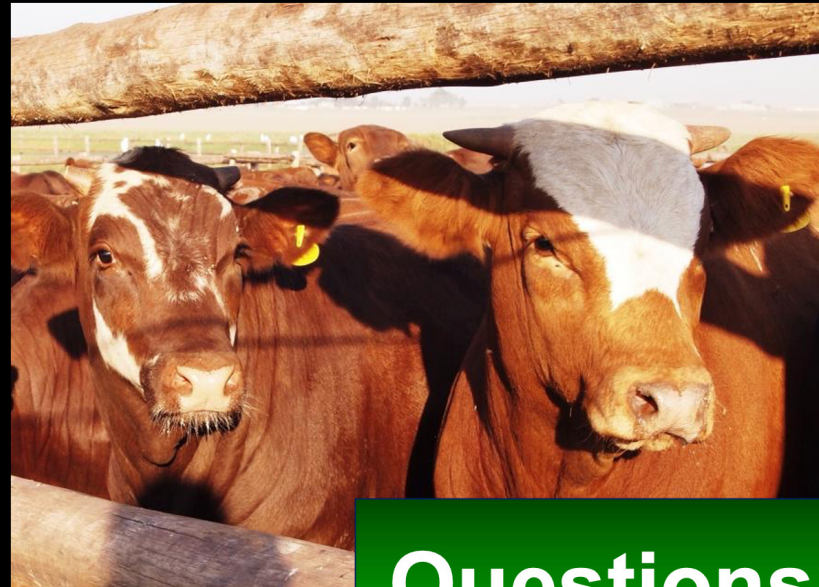


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Thank you!

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Questions?



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

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