Our **STORY**

Vet Sustain

Championing Sustainability In The Veterinary Profession

Vet Sustain is a not-for-profit community interest company on a mission to inspire and enable members of the veterinary profession to drive change for a more sustainable future. Vet Sustain produces tools, training, communication and advocacy centred around six Veterinary Sustainability Goals, to help veterinary professionals and teams to continually improve the health and wellbeing of animals, people and the environment through their day-to-day work.

Vet Sustain

Visit the Vet Sustain website

www.vetsustain.org

VetSalus

Wholesome food from healthy animals

VetSalus is a committed group of international veterinarians with expertise in all aspects of 'One Health', in particular animal health, welfare and sustainable agriculture which seeks to:

- Contribute to global food strategy.
- Develop relationships and networks, to build capacity and collaborate globally.

VetSalus connects international food producers with local veterinary expertise, to improve animal health, welfare and sustainability outcomes across the global food chain.

VetSalus

Visit the VetSalus website

www.vetsalus.com

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VetSalus

Vet Sustain

A veterinary approach to **sustainable** food and farming

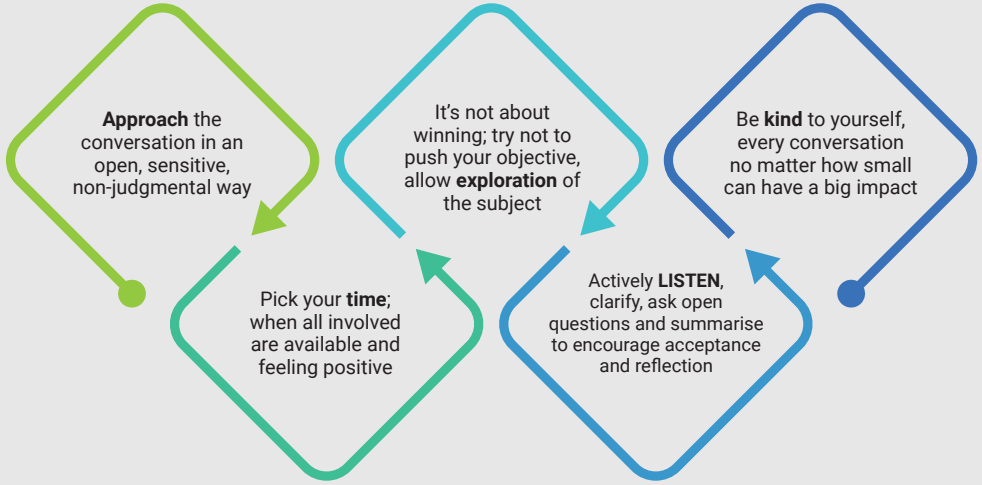
Farming is often cited as a major contributor to climate change through impacts on global warming and the environment.

As the global population increases past the 8 billion mark, the role of sustainable farming has never been so important.

Farm vets as trusted advisors and advocates are integral to supporting sustainable and regenerative farming practices. Through their wide-reaching influence, farm vets can offer solutions and lead conversations championing a 'less and better' philosophy.

But what are the facts? It can be difficult for vets to navigate the complexity and conflicting information regarding this subject. Here we outline some of the key considerations to inspire vets when approaching these conversations with farmers, and to act as a starting point towards encouraging a more regenerative mindset.

5 Top tips for starting the conversation



Define sustainability:

- Sustainable Development (SD) involves 'meeting the needs of the present, without compromising the ability of future generations to meet their own needs' (UN, 1987). In simple terms, SD protects the world's finite resources and ensures that there is enough, for all, forever. Sustainability encompasses many areas as outlined by the UN Sustainable Development Goals (SDGs), as shown in Figure 1. Veterinary professionals and the food and farming sectors can contribute to many of the SDGs. Vet Sustain has defined six Veterinary Sustainability Goals (VSGs) that highlight the key areas within which vets can have the greatest influence, as shown in Figure 2.

FIGURE 1

The **United Nations Sustainable Development Goals**, a call for action of 17 goals to enable a prosperous future for all.

FIGURE 2

Diverse and abundant wildlife

Conserve and enhance natural landscapes, habitats and biological diversity and abundance of wild terrestrial and aquatic plant and animal species.

A good life for animals

Safeguard and advocate for the health and welfare, in life and at the point of death, of animals under our care and those that are affected by human activity.

Net zero warming

Implement and promote decarbonisation through energy efficiency, the generation and use of renewable energy, mitigation of global warming and sequestration of carbon.

Health and happiness

Safeguard and enhance the physical and mental wellbeing of people and support a transition to livelihoods and lifestyles that are fit for the future.

A no-waste society

Minimise the usage and disposal of resources and materials, and support a transition to a circular economy.

Enough clean water for all

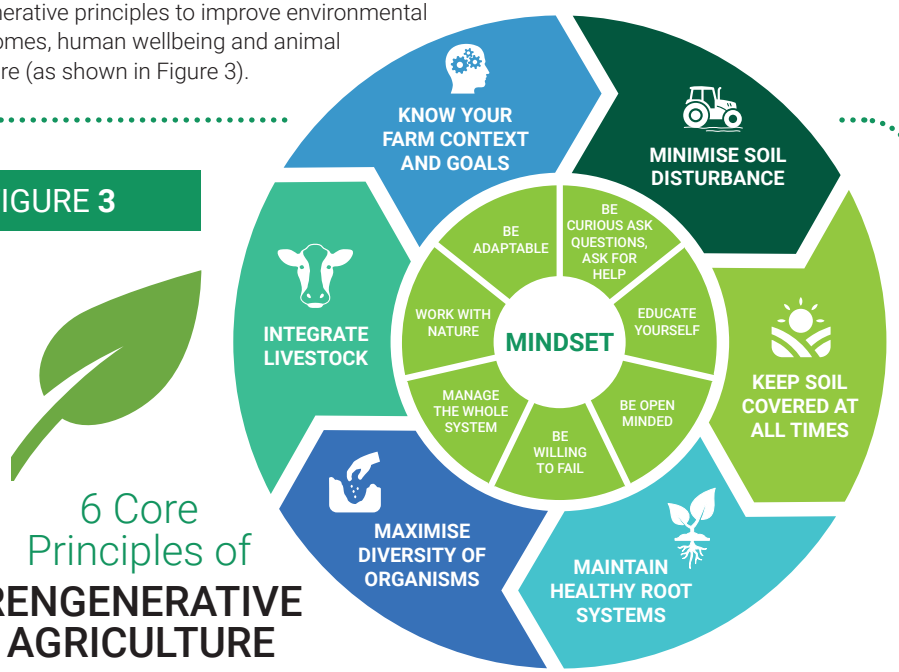
Uphold best practice in fresh water conservation and protection to mitigate water stress and prevent water pollution.

The **Vet Sustain Veterinary Sustainability Goals**, these 6 goals are well aligned with the UN SDGs and have been developed to enable and inspire veterinary professionals on their sustainability journey.

How can farming influence **sustainability?**

Farmers can play a vital role in sustainability; choosing an appropriate type of farming for their location/conditions, and employing regenerative principles to improve environmental outcomes, human wellbeing and animal welfare (as shown in Figure 3).

FIGURE 3



6 Core Principles of **RENGENERATIVE AGRICULTURE**

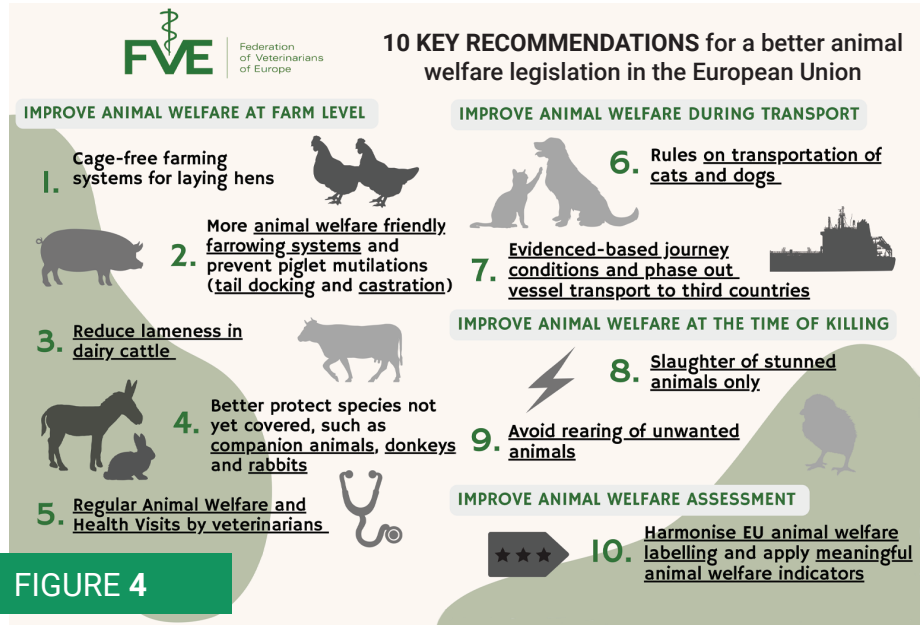
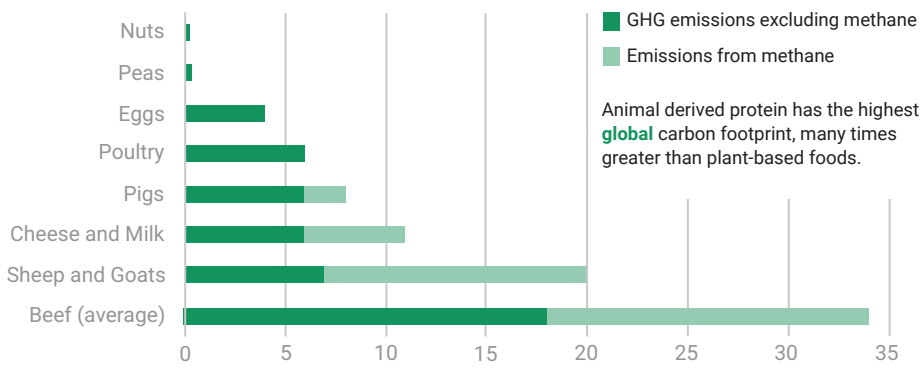


FIGURE 4

FIGURE 5

Global Greenhouse Gas Emissions per 100 grams of Protein

Emissions are measured in carbon dioxide-equivalents. This means non-CO_2 gases including methane, are weighted by the amount of warming they cause over a 100-year timescale (GWP100).



How may eating habits change in the future in response to **food insecurity, animal welfare, biodiversity and climate change?**

There is no doubt there will be some change. We must consider what these changes might look like and how we can best support farmers whilst upholding the highest standards of animal welfare. Greater intensification and technological advancement of animal agriculture may occur in some parts of the world, but this must not be to the detriment of environmental and animal welfare needs. We may see a move to eating less meat with greater focus on welfare and integrating farming with nature, or perhaps we will see an increased demand for plant-based diets or novel proteins. There is no single correct answer, with any global solution likely to be a blend of options; as veterinary professionals we can proactively work with our farmers to find individualised sustainable solutions and pursue positive outcomes for people, animals and the environment.

Animal Welfare

Promoting the highest standards of animal health and welfare is at the forefront of the veterinary profession, forming the backbone of the veterinary oath; **"... ABOVE ALL, my constant endeavour will be to ensure the health and welfare of animals committed to my care."**

Advancing the status, health and welfare of production animals is integral to sustainable food production. Increased production and efficiency to meet nutritional needs can reduce the land and resources required for food production but should not be traded for compromised welfare.

CHALLENGES

- Production animal welfare should not only be focused on the 'group', thereby forgetting the importance of championing welfare at the individual animal level.
- Breeding selection or farming methods to drive productivity at the expense of animal welfare are harmful.

SOLUTIONS

- Animal welfare indicators and the 5 Domains welfare assessment framework (nutrition, physical environment, health, behavioural interactions, mental state) are helpful in benchmarking and promoting production animal welfare.
- Sustainable agriculture recognises farmed animals as sentient beings. They deserve appropriate care, consideration and respect, and should experience both a good life (VSG Goal 2) and a humane death. Sustainable agriculture should not depend on prolonged or routine use of unnecessary pharmaceuticals. Breeding and management practices should encourage a move away from routine mutilations where possible.
- Veterinary professionals and representative bodies must advocate for practical changes and solutions to address the root causes of animal welfare problems such as implementation of the FVE's 10 key recommendations for better animal welfare (Figure 4).

Key facts on the role of agriculture in sustainable food production

Water

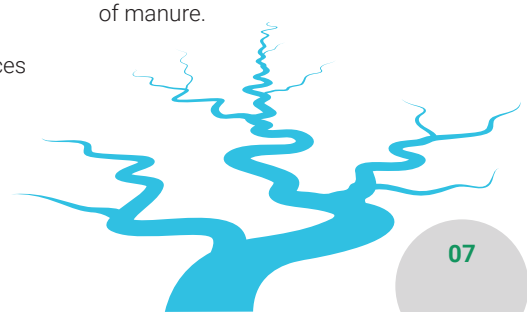
Access to fresh water is vital for human, animal and environmental health. However fresh water resources are under increasing pressure as we face climate change and an increasing global population. Water pollution is caused by human settlements, agriculture and industry.

CHALLENGES

- Agriculture is responsible for 70% of water abstractions globally.
- Agriculture plays an important role in water pollution with impacts on aquatic ecosystems, human health and climate change. Common pollutants which may leach into waterways include:
  - Nutrients such as nitrogen and phosphates from excessive fertiliser application and manure runoff
  - Pesticides (herbicides, insecticides and fungicides)
  - Salts mobilised from soil on irrigated landscapes
  - Sediments from soil erosion
  - Organic matter from animal excreta, uneaten animal feed, mismanaged crop residues and animal processing industries
  - Zoonotic pathogens from animal faeces
  - Emerging pollutants such as drug residues (antibiotics, hormones, vaccines, growth promoters).

SOLUTIONS

- Minimising and optimising the quantity, composition and timing of pesticide and organic/inorganic fertilisers to crops.
- Focus on soil health to improve water infiltration and retention, reducing run-off.
- Use of buffer strips of vegetation along water courses and at farm margins, and creation of wetlands to decrease the concentration of pollutants entering waterways.
- Contour ploughing and avoidance of cultivation of steeply sloping land to reduce soil erosion.
- Correct use and disposal of fertiliser, pesticide and medicines in accordance with safety guidelines.
- Appropriate storage, treatment and re-use of manure.



Soil

95% of our food is produced directly or indirectly on our soils with soil health forming the basis of our food system.

Soil organic matter, produced from biological decomposition, is vital for soil structure, porosity, water infiltration, moisture holding capacity, diversity of soil organisms and plant nutrient availability.

CHALLENGES

- Poaching, overgrazing and overworking of soil for agriculture can lead to a reduction in soil fertility, damage to nutrient cycles and imbalances in the agro-ecosystem.
- Soil is a known carbon store; however tools for accurately assessing this are currently lacking.
- Research into the impact of grazing livestock on soil carbon sequestration has yielded conflicting results suggesting livestock grazing can lead to either loss or sequestration of soil carbon.

SOLUTIONS

- Employing the principles of regenerative farming (Figure 3) are vital for the maintenance of soil health.
- Grazing management is the critical factor in ensuring that livestock are a driver for good soil health. Planned rotational grazing of diverse pastures ensuring adequate rest periods, interspersed with short duration grazing impact, can be used to maximise photosynthesis and drive root exudate production, which feeds the soil biology.
- Integrating livestock into mixed/arable farms offers an opportunity to restore soil health with a minimum of artificial inputs.

Key facts on the role of agriculture in sustainable food production

Land Use/Biodiversity

Land is crucial for supporting natural habitats, ecosystems and agriculture as well as contributing to carbon sequestration.

Globally, **38% of the land surface is occupied by agriculture**, with1/3 devoted to cropland and 2/3 devoted to grassland pastures.

As the global population continues to grow, so does the pressure on the finite global land resources. The productivity of agro-ecosystems depends on selecting suitable land use for the appropriate biophysical and socio-economic conditions.

CHALLENGES

- Land conversion to agriculture is a major cause of biodiversity loss and land degradation.
- We are currently experiencing increasing biodiversity loss and accelerating extinction rates.
- Overgrazing, mono-culture crop production, and deforestation all lead to loss of natural habitats and biodiversity.
- The UK Net Zero strategy suggests that approximately 20% of current UK agricultural land is likely to be repurposed and diversified (peatland restoration, forest cover, bioenergy production) by 2050.

SOLUTIONS

- Environmental schemes under the UK Agricultural Transition Plan include the Sustainable Farming Incentive; Local Nature Recovery; and Landscape Recovery; supporting farmers to promote biodiversity, water quality and climate change mitigation.
- Agroecology, by integrating biodiversity, strengthens and harmonises the existing relationships between the land, nature, animals, and wildlife.
- Agroforestry can increase tree cover and habitat without loss of productive land.
- Minimising the use of imported feedstuffs for animal agriculture reduces the 'ghost acres' effect of British livestock globally.
- Responsible medicine use and integrated parasite management reduce impacts on invertebrates and other soil-dwelling and aquatic species.

Emissions

Methane and carbon dioxide (CO_2) are greenhouse gases (GHG) produced by agriculture. Methane has a greater global warming potential (GWP) than CO_2 (28 and 82 times more over 100-years and 20-years respectively). However, it is a relatively short-lived GHG, degrading in the atmosphere within 12 years compared to CO_2 which remains for centuries, making comparison difficult.

CHALLENGES

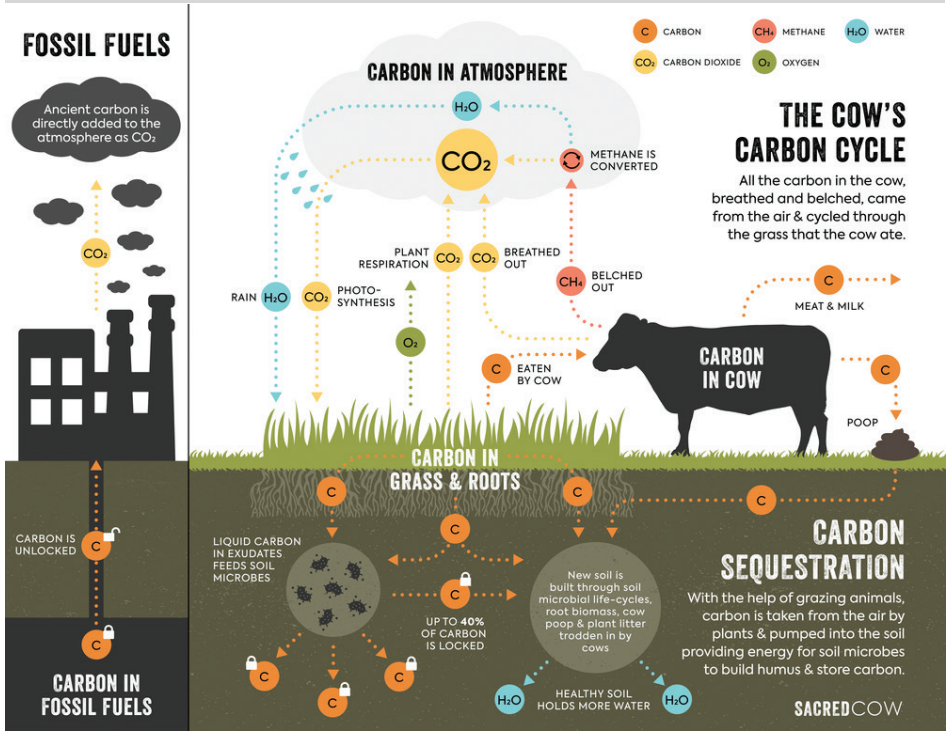
- Metrics used to quantify the impact of GHG usually focus on the GWP over 100 years (GWP100) which may overestimate the warming effects of short-lived methane.
- Any source of methane that is increasing has a rapid and large immediate warming effect on the climate due to the potency and high GWP of methane.
- Per gram of protein, ruminant meat has the highest average **global** carbon footprint, many times greater than plant-based foods (Figure 5). However carbon footprint varies greatly depending on location and production system used.
- Comparing the carbon footprint of different foodstuffs is complex due to their varying nutritional composition and health benefits (e.g. a beef burger has a very different protein and amino acid profile to a plant-based burger).

SOLUTIONS

- The GWP* metric accounts for the short-lived effect of methane, more accurately representing the environmental impact of ruminants and highlighting the benefits of improving animal health and welfare.
- Ruminant methane from forage digestion is a natural part of the biogenic carbon cycle, in contrast to methane and CO_2 released from the use of fossil fuels (Figure 6). Ruminants can convert human-inedible plant matter, by-products and waste to meat and milk.
- Global GHG emission averages can mislead and do not represent the impact of local agriculture e.g. the carbon footprint of UK milk production is < half the global average.
- A decline of any methane source at a rate of >3% per decade will reduce global temperatures. Therefore a gradual reduction of total global livestock numbers alongside improved health, welfare, lifespan and productivity are important.
- Dietary management, and methane inhibitors such as 3-nitrooxypropanol (3-NOP) may be useful whilst maintaining dry matter intake, production and body weight.

FIGURE **6**

The biogenic carbon cycle associated with ruminants versus carbon cycling of fossil fuel production



- Direct carbon emissions from cattle in systems not relying on fossil fuel-dependent feed inputs are biogenic
  - Methane from ruminant enteric fermentation is not adding new carbon to the atmosphere
- Many cattle systems utilise feedstuffs and equipment dependent on fossils fuels and their emissions therefore include non-biogenic carbon