

Q: How do we keep pet food sustainable?

A: By using rendered products

Charles Starkey

International Rendering Symposium

January 2024



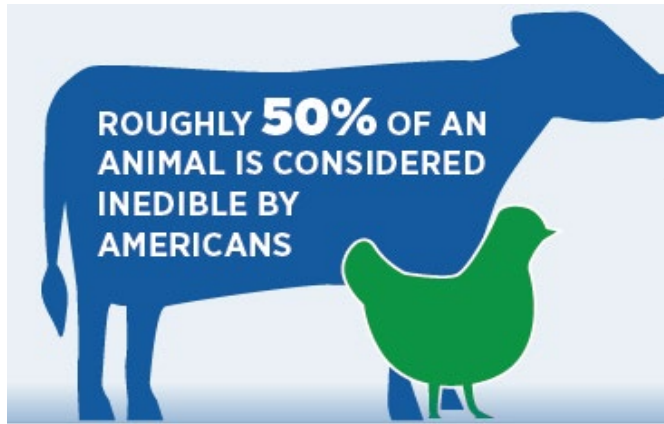
UN Definition - 1987

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Source: United Nation's World Commission on Environment and Development (the Brundtland Commission), 1987.



The Original Recyclers



RENDERING COMBATS CLIMATE CHANGE

Rendering protects the environment from high greenhouse gas emissions of other disposal methods. It reduces the environmental impacts of animal agriculture by sequestering 5 times more greenhouse gases than are produced.

This is equal to removing **18.5 million** cars off the road each year.

If all renderable products were sent to landfills, all available space would be gone in **4 years.**



Grocery Stores generate

Super Foods

1.92 BILLION POUNDS

of scraps, fat, bone, expired meat & used cooking oil annually

Renderers collect



4.4 BILLION POUNDS

of used cooking oil per year in the U.S. and Canada

RENDERING RECLAIMS AND PROTECTS

3.7 billion gallons of water that would otherwise be wasted are reclaimed during rendering, cleaned, and returned to rivers and streams. Rendering also improves water quality by reducing grease and oil that clog sewer and wastewater systems.



FEEDING THE FUTURE

Rendering helps grow the next generation of food by “recycling” unwanted meat into new and clean ingredients for animal food and fertilizer.



Rendering: IS RECYCLING

Avoid waste

Reduced landfills outputs

WHAT ARE THE PRODUCTS OF RENDERING?

Renderers collect:

56 BILLION POUNDS

of raw materials every year
in the U.S. and Canada



If all renderable product was sent to the landfill, all available space would be used in

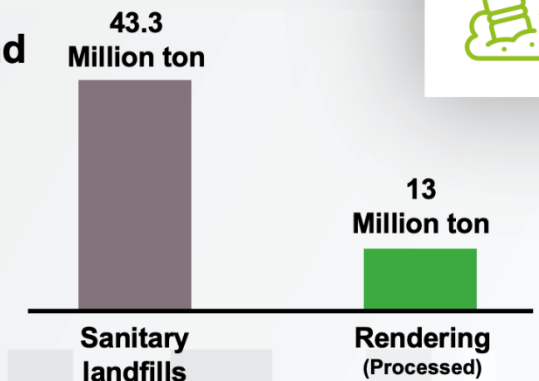
4 YEARS

<https://nara.org/wp-content/uploads/2019/12/Rendering-is-Recycling-Update.pdf>

ENVIRONMENTAL SUSTAINABILITY

Brazil currently has more than 3 thousand sanitary landfills spread all over the country

Without the renderers job, this number would increase by 30.7%, about 921 new sanitary landfills.



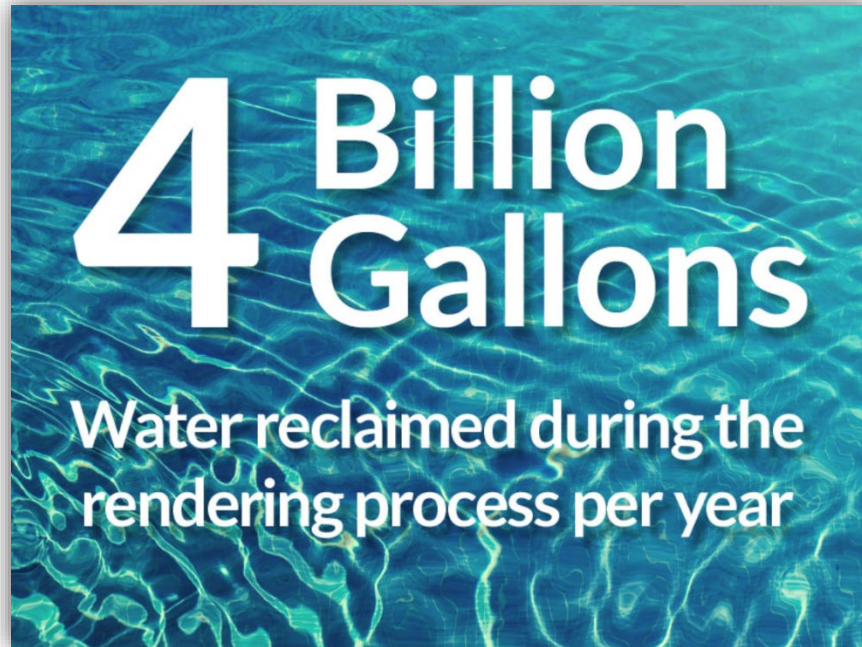
<https://abra.ind.br/conheca-o-setor/?lang=en>



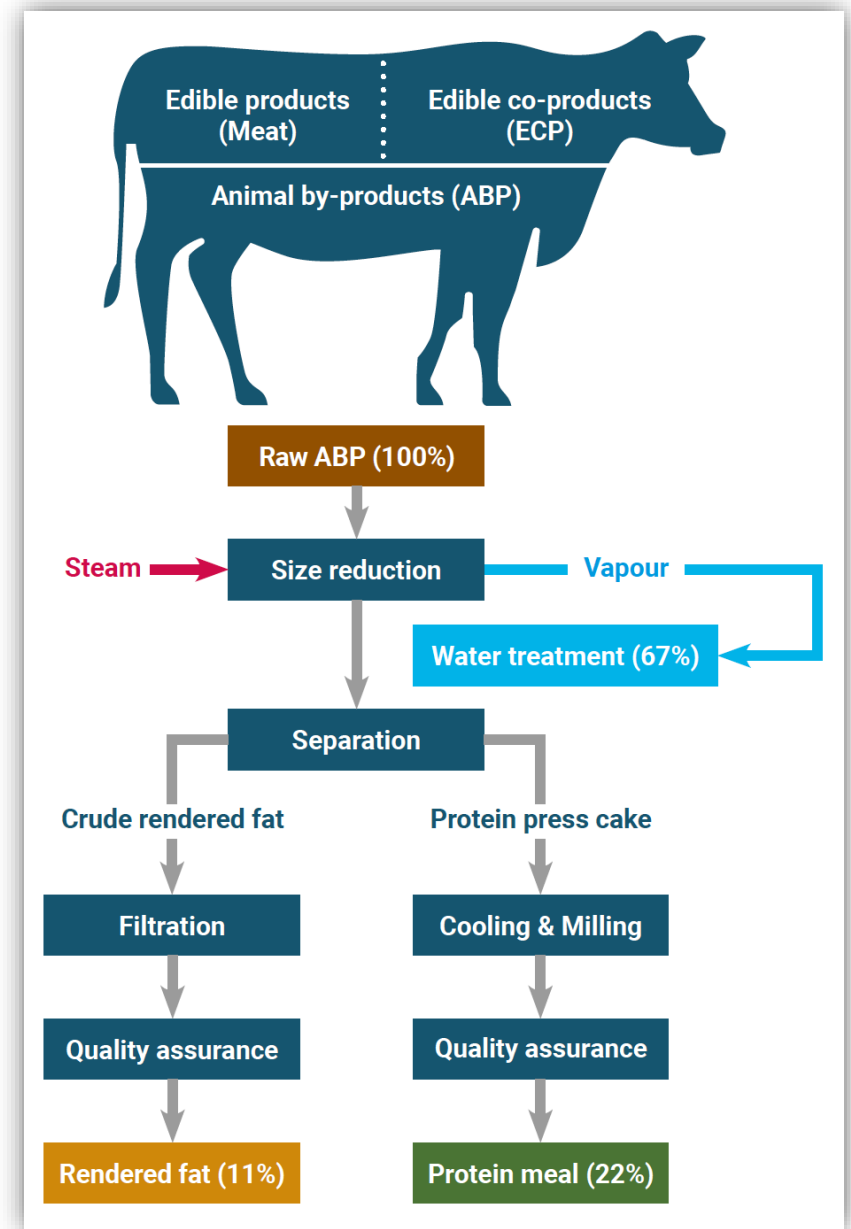
Rendered products: WATER RECOVERY

**Water: from 50% to 90% is water reclaimed,
and is treated before released**

Yearly in USA & Canada:



<https://nara.org/sustainability/water-recovery/>



<https://efpra.eu/wp-content/uploads/2022/05/EFRA-SUSTAINABILITY-CHARTER-V1a.pdf>

Rendered products: GHG EMISSIONS

Rendering reduces Greenhouse Gas Emissions (GHG)

- ✓ **Rendering reduces GHG emissions by 72% and fossil fuel use by 80%** (when compared to petroleum diesel)
- ✓ **An average rendering plant sequesters 5 times more greenhouse gas (GHG) emissions from the environment (such as carbon dioxide) than it emits. Some are even more efficient than that**
- ✓ **Rendering avoids at least 90% of the potential GHG emissions compared with industrial composting**



EU Renewable Energy Directive (RED)

Biofuel Production Pathway	Greenhouse Gas Emission Savings
Rape Seed Biodiesel	38%
Soybean Biodiesel	31%
Palm Oil Biodiesel	19%
Palm Oil Biodiesel with Methane Capture at Oil Mill	56%
Waste Vegetable or Animal Oil Biodiesel	83%



California Low Carbon Fuel Standard (LCFS) Carbon Intensity (CI) Scores (gCO₂e/MJ)

California Low Carbon Fuel Standard (LCFS) Carbon Intensity Scores (gCO ₂ e/MJ)			
Biodiesel Feedstock		Renewable Diesel Feedstock	
<u>North America</u>		<u>North America</u>	
Tallow	34.46	Tallow	36.29
Used Cooking Oil (UCO)	20.16	Used Cooking Oil (UCO)	20.84
Distillers Corn Oil	29.55	Distillers Corn Oil	32.80
Soy Oil	54.23	Soy Oil	55.22
Canola Oil	53.36	<u>Singapore</u>	
		Tallow	36.22
		UCO Global	21.25
		UCO Asian	16.89

Source: California Air Resources Board (CARB);
<https://ww2.arb.ca.gov/resources/documents/lcfs-pathway-certified-carbon-intensities>





Food Recovery Hierarchy

Most Preferred

Source Reduction
Reduce the volume of surplus food generated

Feed Hungry People
Donate extra food to food banks, soup kitchens and shelters

Feed Animals
Divert food scraps to animal food

Industrial Uses
Provide waste oils for rendering and fuel conversion and food scraps for digestion to recover energy

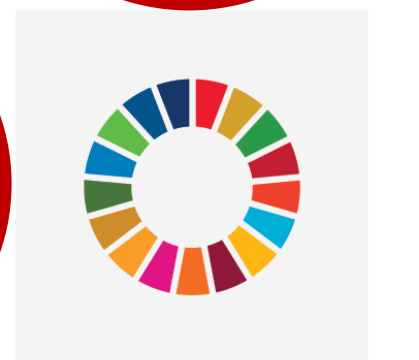
Composting
Create a nutrient-rich soil amendment

Landfill/ Incineration
Last resort to disposal

Least Preferred



UN SUSTAINABLE DEVELOPMENT GOALS



livestock's long shadow

environmental issues and options



Repercussions



Source BBC.com

Repercussions



Source APnews.com



Repercussions



Source agriland.ie

Repercussions

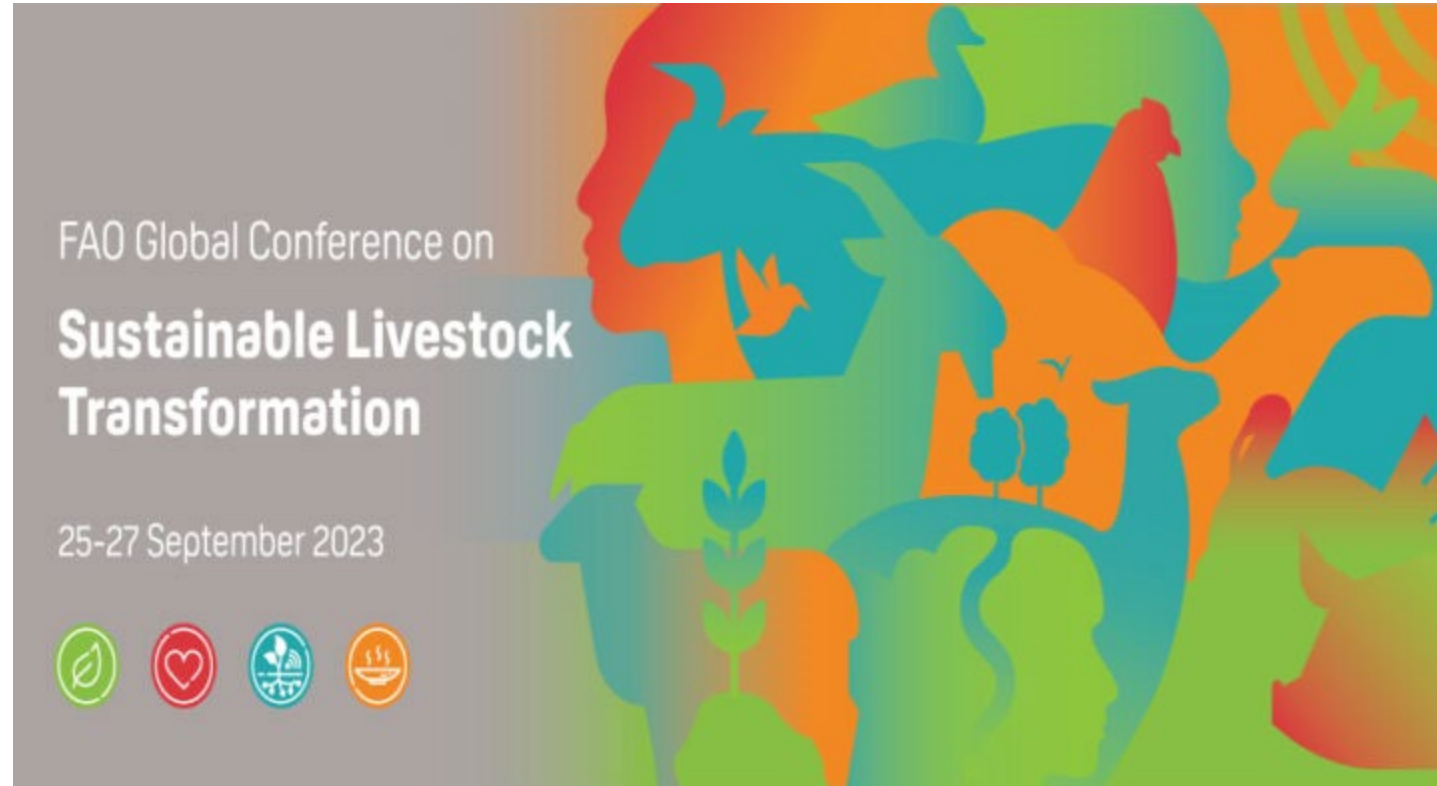


Source BBC.com

Source APnews.com

Source agriland.ie

Alternatives



ONE HEALTH

BY PROTECTING ANIMALS, WE PRESERVE OUR FUTURE

Animal and human sectors work together to protect health and ensure food safety and security

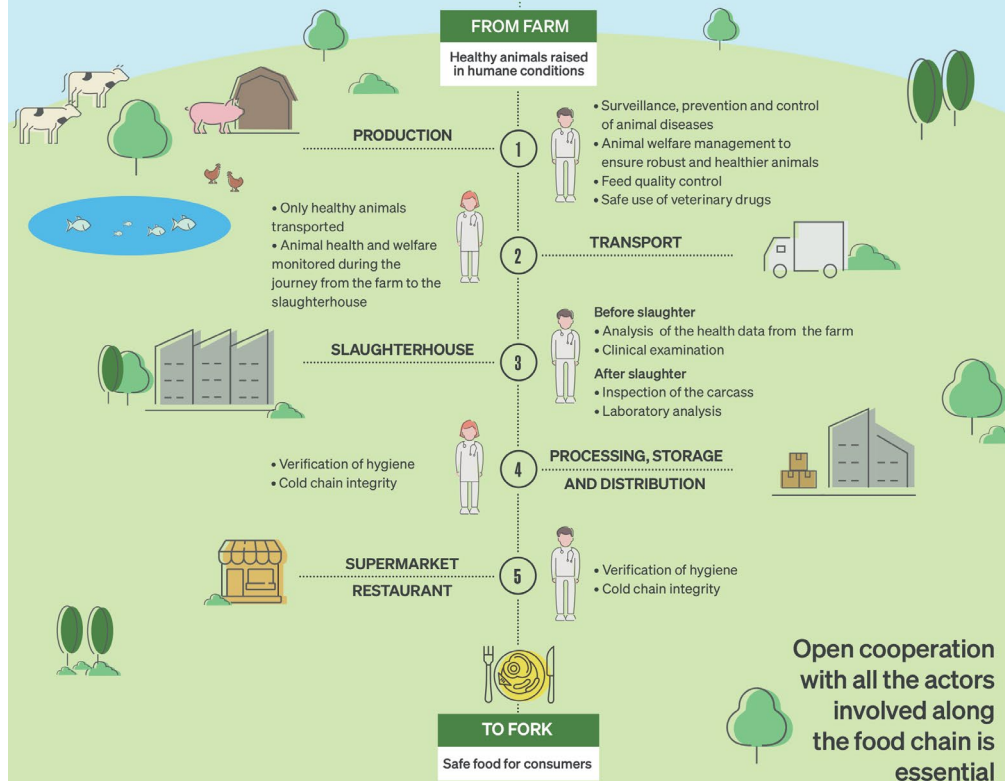
60% of human pathogens are of animal origin

5 new human diseases appear each year

20% of animal production losses are caused by diseases globally

With regards to animal health, veterinarians are key players of the 'One Health' approach

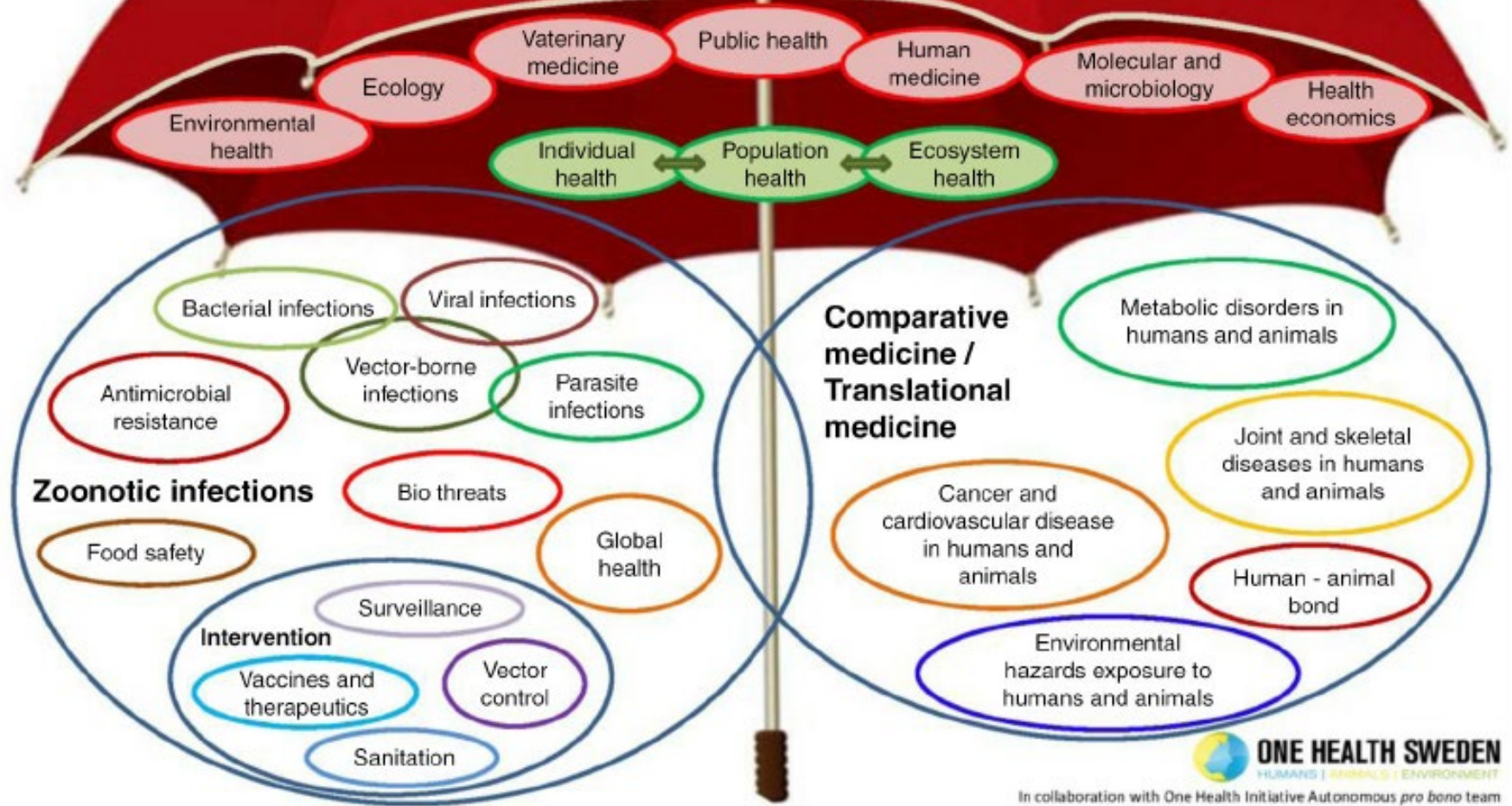
Early detection of diseases and infections at their animal source can prevent transmission to humans or introduction of pathogens into the food chain



THROUGHOUT THE FOOD CHAIN
Veterinarians are responsible for regulations on animal health, animal welfare, traceability, food safety and safe trade of animal products



One Health



What do you mean you
don't own any dogs?



So what do you even do?



Biofuels



California Environmental Protection Agency
Air Resources Board

California Environmental Protection Agency

Air Resources Board

Low Carbon Fuels

User Guide V...

LCFS Reporting

Credit Bank and Trans...

Release Date: A...

Last Updated: Ma...

Disclaimer: The California Air Resources Board (CARB) makes no warranty or representation as to the accuracy, completeness, or timeliness of the information in this User Guide, but makes no warranty or representation as to the accuracy, completeness, or timeliness of the information in this User Guide and/or to the products described in this User Guide. Please send your comments and feedback to the Board.

European Commission

EN English Search

Energy

Home > Topics > Renewable energy > Bioenergy > Biofuels

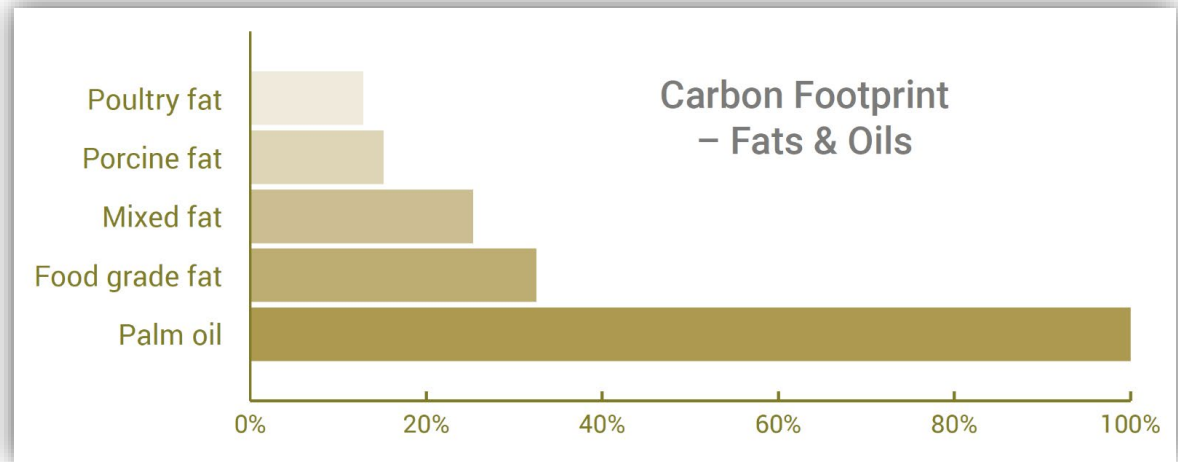
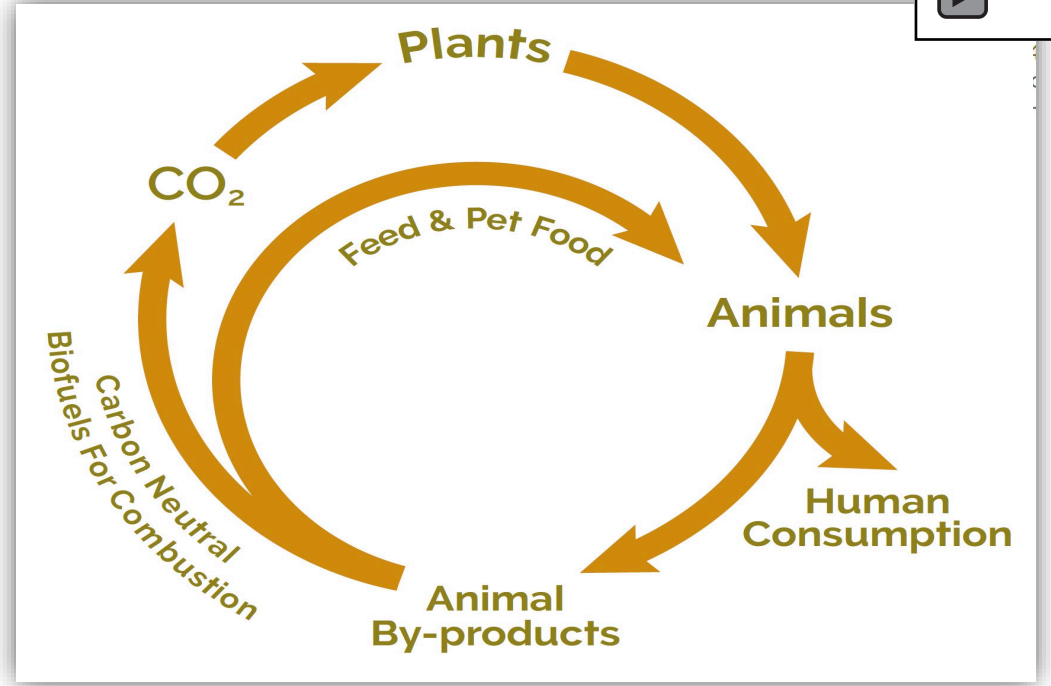
Biofuels

The EU is working on the transition towards advanced biofuels made from sustainable feedstock.

Biofuels are liquid or gaseous transport fuels, such as biodiesel and bioethanol, made from biomass. They serve as a renewable alternative to fossil fuels in the EU's transport sector, helping to reduce greenhouse gas emissions and improve the EU's security of supply.

By 2030, the EU aims to increase the share of renewable energy in transport to at least 14%, including a minimum share of 3.5% of advanced biofuels. EU countries are required to set out an obligation on fuel suppliers that ensures the achievement of this target.

Sustainability criteria



What does this mean?

U.S. Production & Use of Rendered Fat; Year to Date (YTD) 2021			
	YTD November 21 (Metric Tons)		
Product	Production	Consumption in Biofuel	Percent of Production
Poultry Fat	882,951	130,379	15%
Tallow	2,653,790	532,063	20%
White Grease	627,822	291,557	46%
Yellow Grease	922,058	1,368,416	148%
Other	208,567	35,675	17%
TOTAL	5,295,188	2,358,090	45%
* Does not include imports			

Source: Energy Information Agency, Monthly Biofuels Capacity and Feedstocks Update
 USDA, National Agricultural Statistics Service, Fats and Oils: Oilseed Crushings,
 Production, Consumption and Stocks



What does this mean?

U.S. Production & Use (bio-based diesel) of Rendered Fat in MT; (Annual 2022)

Product	Production	Imports	Total Supply	Consumption in Bio-based diesel	Percent of Production	Percent of TOTAL Supply
Poultry Fat	917,953	2,992	920,945	73,288	8%	8%
Tallow	2,834,157	554,064	3,388,221	794,616	28%	23%
White Grease	745,891	49,616	795,507	300,239	40%	38%
TOTAL*	4,498,001	606,672	5,104,673	1,168,142	26%	23%

Source:

USDA/National Agricultural Statistics Service

Energy Information Agency



What does this mean?

Animal protein use in pet foods	Metric ton	US Production metric tons
MBM	576,654	
Chicken Byproduct Meal	320,788	
Chicken Meal	174,515	
Poultry Byproduct Meal	172,386	
Lamb Meal	36,876	
Beef Meal	23,597	
Turkey Meal	15,947	
Turkey By Product Meal	13,944	
Meat Meal	7,864	
Pork Meal	3,574	
Bone Meal	190	
		4,026,828
Mammalian MBM	2,658,152	24%
Poultry Meal	1,368,676	51%
TOTAL	1,346,336	33%

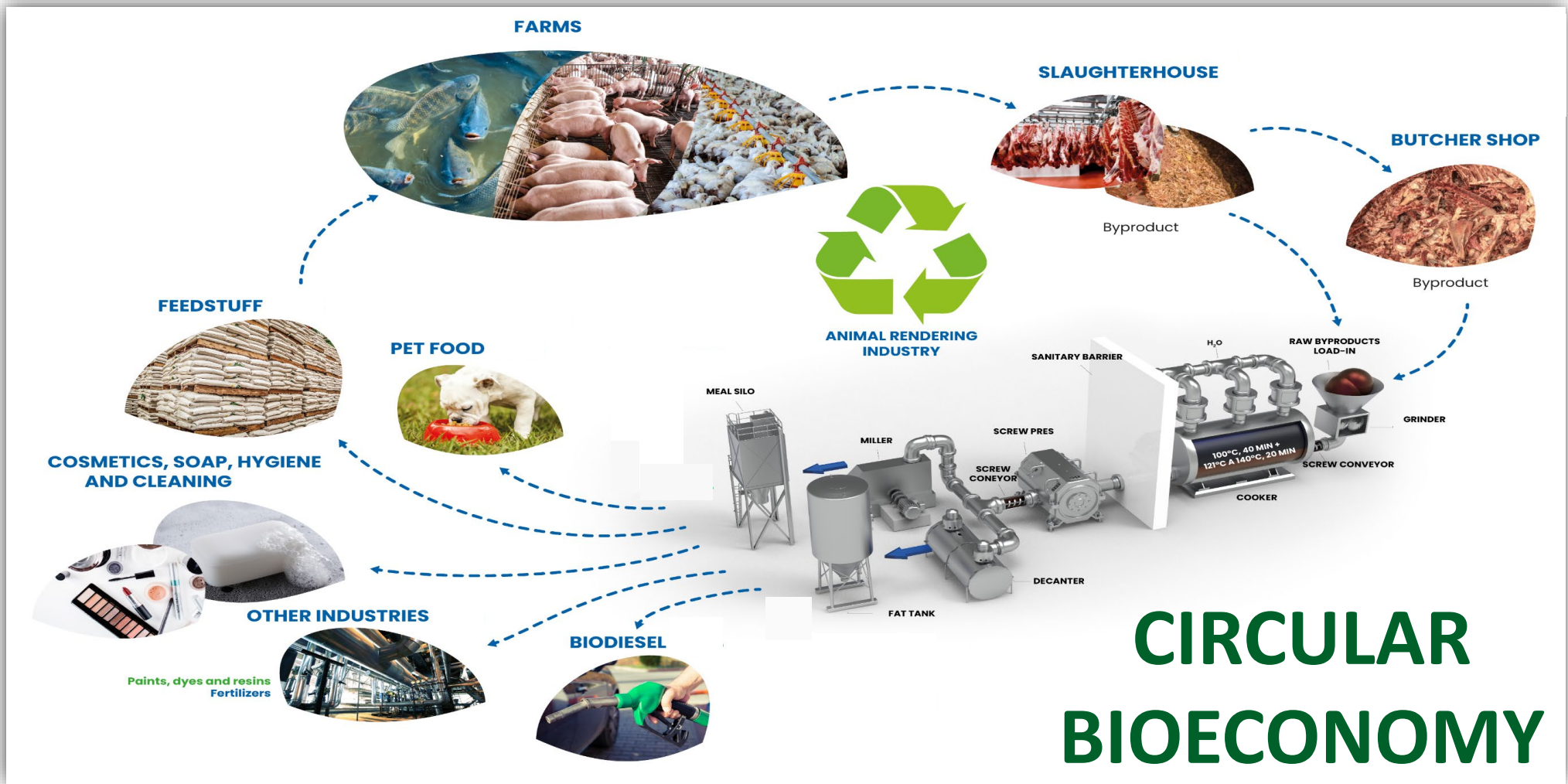


What does this mean?

Animal fat use in pet foods	Metric ton	US Production MT	% of production
Beef Fat	120,162	2,770,781	4%
Animal Fat	89,038		
Chicken Fat	39,715	1,025,563	5%
Poultry Fat	11,870		
Pork Fat	1,076	736,798	0.146%
TOTAL	261,860	4,819,064	5%



Sustainability



CIRCULAR BIOECONOMY

Sustainability

RESPONSIBLY SOURCED

Made With **Global Animal Partnership**
Certified Chicken

- ✓ No Cages, Crates, Or Crowding
- ✓ No Antibiotics Ever
- ✓ Enriched Environment With Natural Light
- ✓ Animals Treated Properly And Respectfully



Alternatives



Sustaining relationships through science

PET FOOD ALLIANCE

The **Pet Food Alliance (PFA)** is a joint project facilitated through Colorado State University and the Fats and Protein Research Foundation (FPRF) to bring together members of the rendering, pet food, laboratory, academia, and technology industries to collaborate and develop solutions for industry-wide challenges and explore mutually beneficial opportunities.



Research Funding, *utilizing research and data to...*

- Economic sustainability
- Increasing markets
- Improvements in quality
- Supportive safety information



Fats and Proteins Research Foundation



New Concepts

- Protein alternatives
- Product shift
- Food waste
- Sustainability data



A photograph of a large, cooked piece of meat, possibly a lamb shank, resting on a wooden cutting board. To the left of the meat is a small white bowl containing a colorful salad of green and purple leafy vegetables. The background is a light-colored, slightly blurred surface.

Americans only eat 50% of an animal. Rendering reclaims the meat that is left over and transforms it into nutritious pet food and countless other products- Recycling 99% of this unwanted food.

#SUSTAINABLE

DID YOU KNOW?

Rendering avoids more than **90%** of potential greenhouse gas emissions compared with industrial composting. It also sequesters **5 times** the amount of greenhouse gas emissions as it emits.

nationalrenderers.org

A stylized graphic of a globe showing the continents in white against a dark blue background, positioned at the bottom of the card.

IF ALL RENDERABLE PRODUCTS WERE SENT TO THE LANDFILL, ALL AVAILABLE SPACE WOULD BE USED IN **4 YEARS.**



A photograph of a large, dark pile of organic waste, including leaves, twigs, and other debris, piled high in a landfill. The background is a clear, light sky.

www.nationalrenderers.org

DID YOU KNOW?

Rendered material makes wonderful Natural Fertilizer

NATIONALRENDERERS.ORG

A photograph of a field of tulips in bloom, with several red and orange flowers in the foreground and a soft-focus background of green leaves and more flowers.

New research

- **Animal co-products (ACP) can be processed into restructured pet treats by using hydrocolloids as functional ingredients**
 - Challen and Moorhouse, 2011
- **Hydrocolloids are high molecular weight polymers used to improve the rheological and textural properties of food products**
 - McArdle and Hamill, 2011
- **Selection of adequate type of hydrocolloid is crucial to attaining desired quality, sensorial acceptability, stability, and shelf life**
 - McArdle and Hamill, 2011



The Process

Chicken liver and heart Chicken carcass frames

Chicken paws

Raw product



Mixtures



Final product



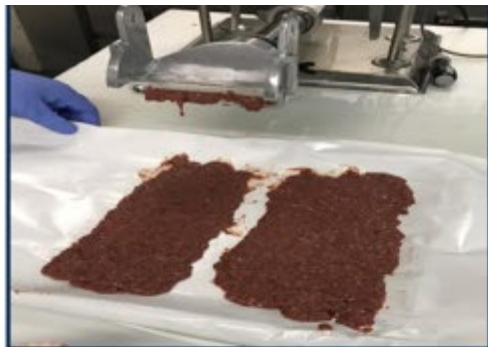
The Process



BL:BH mixture



BL:BH mixture with ALGIN



Extruded raw product



Cutting raw product



Forming raw BL:BH treats



Measuring color on raw BL:BH treats



Dehydrated BL:BH treats



Measuring color on cooked BL:BH treats

Product Flexibility and collaboration



Food Waste



<https://mill.com/news/announcing-mill-press-release>



New research demonstrating benefits of rendered products on sustainability in pet formulas

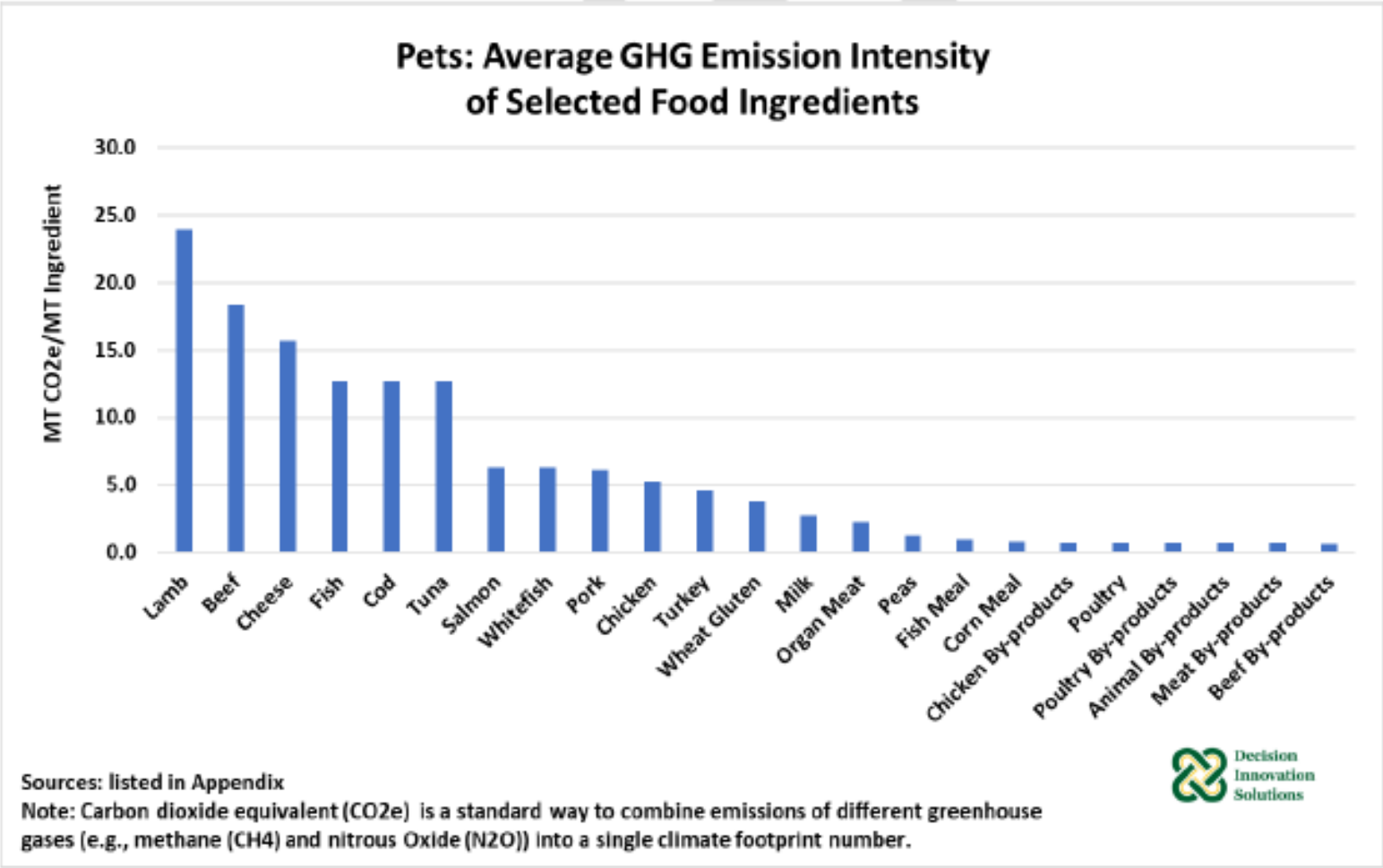


Figure 2. Pets: Average GHG Emission Intensity of Selected Food Ingredients



New research demonstrating benefits of rendered products on sustainability in pet formulas

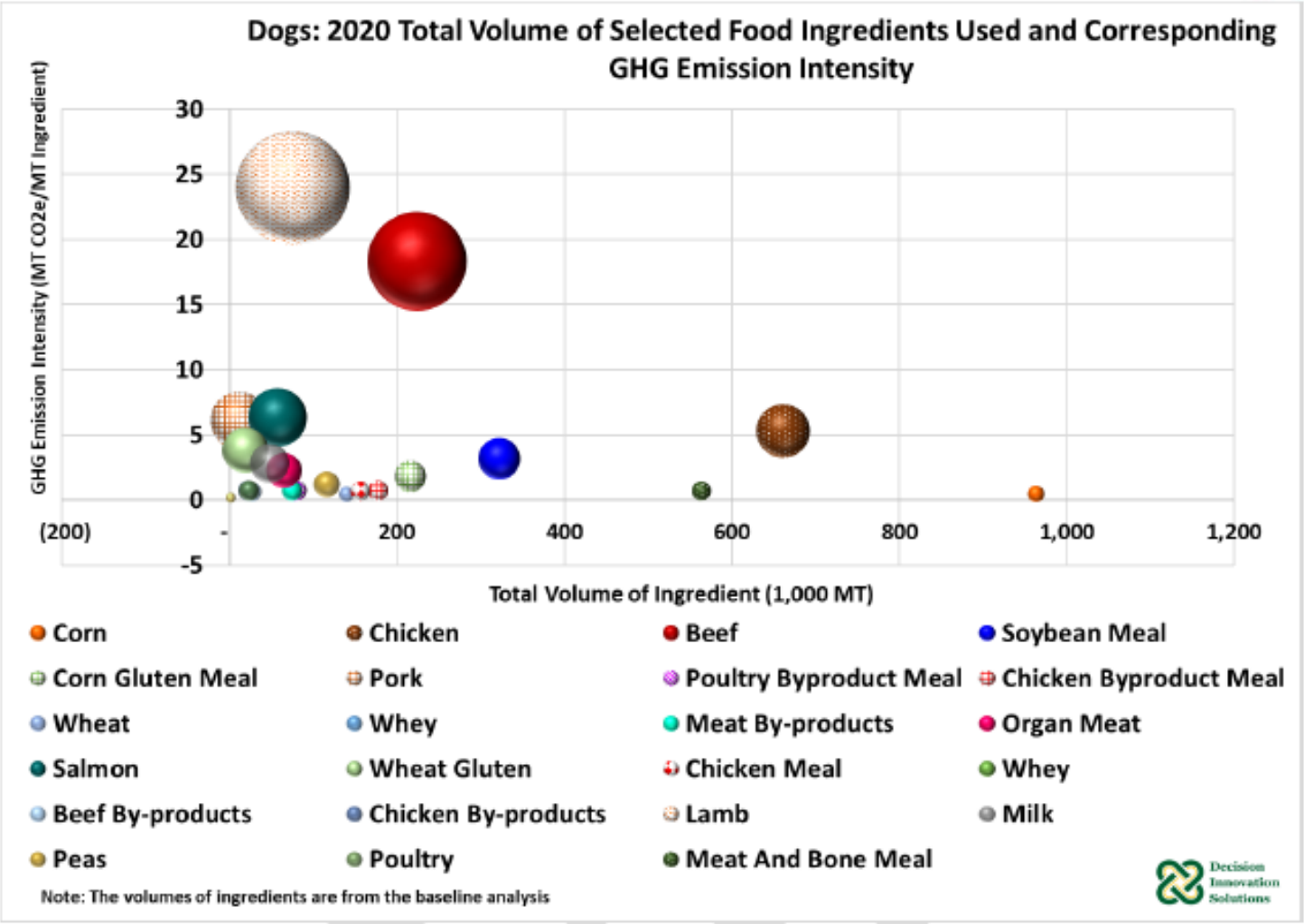


Figure 20. Dogs: 2020 Total Volume of Selected Feed Ingredients Used and Corresponding GHG Emission Intensity



New research demonstrating benefits of rendered products on sustainability in pet formulas

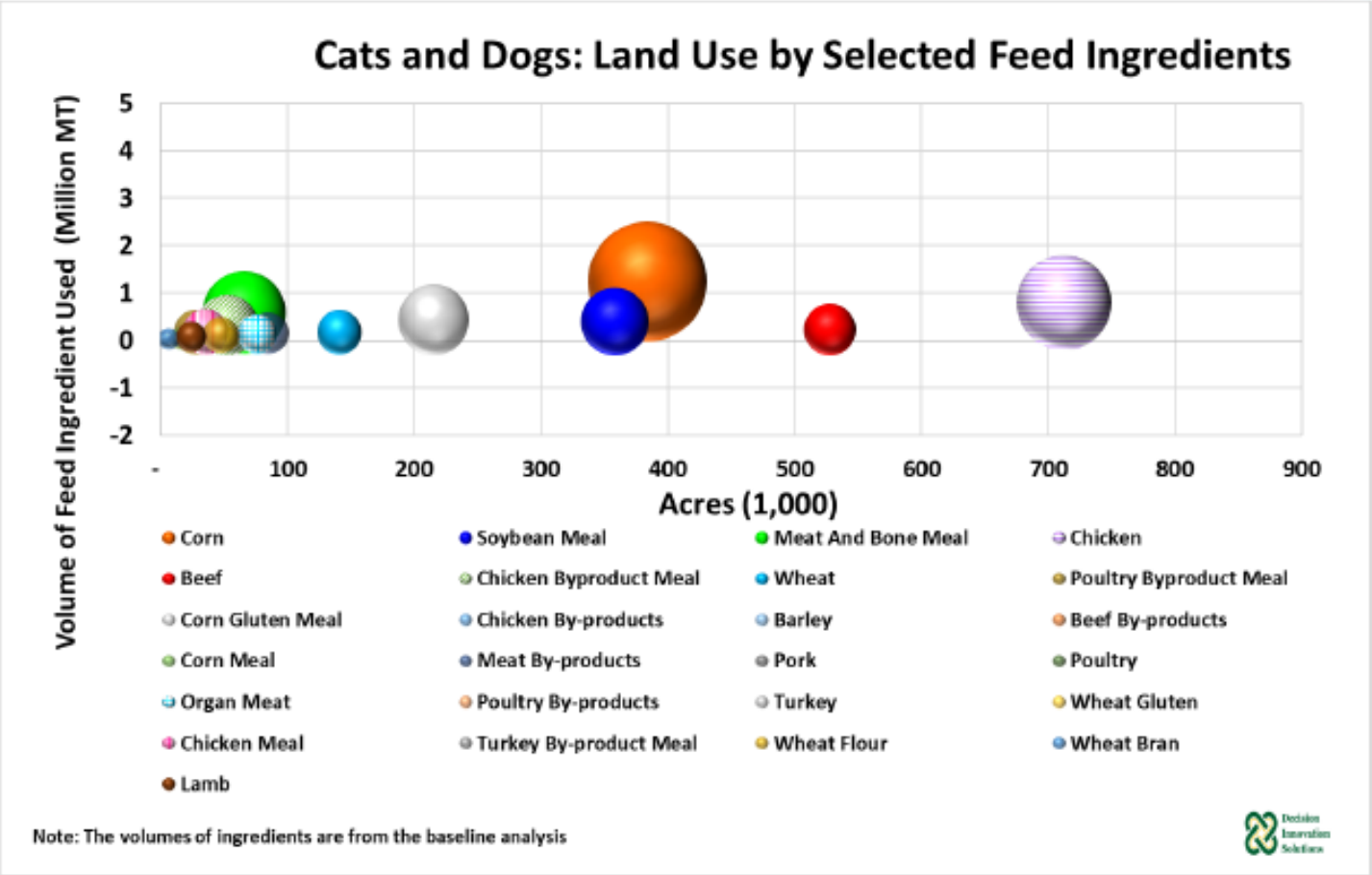


Figure 22. Cats and Dogs: Land Use by Selected Feed Ingredients



New research demonstrating benefits of rendered products on sustainability in pet formulas

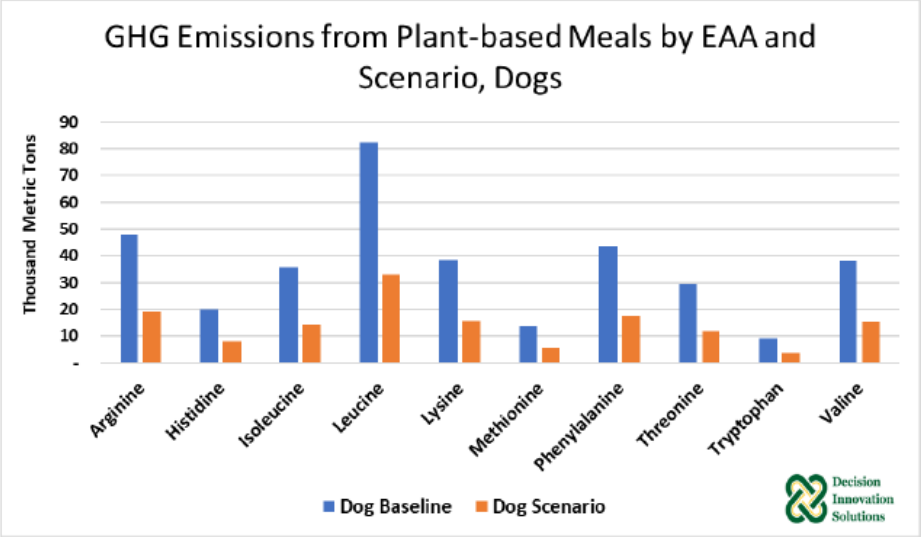


Figure 80. GHG Emissions from Plant-based Meals by EAA and Scenario, Dogs

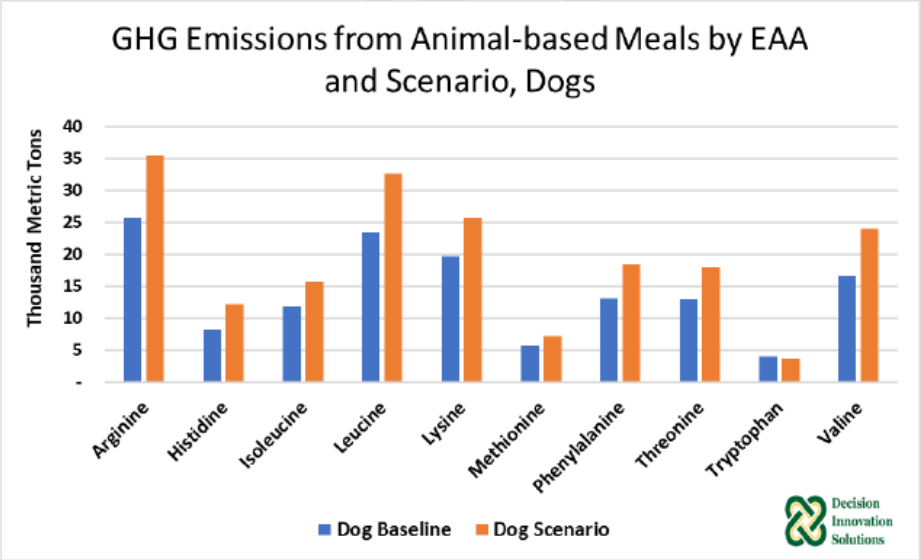


Figure 81. GHG Emissions from Animal-based Meals by EAA and Scenario, Dogs



New research demonstrating benefits of rendered products on sustainability in pet formulas



Chicken liver and heart pet treats

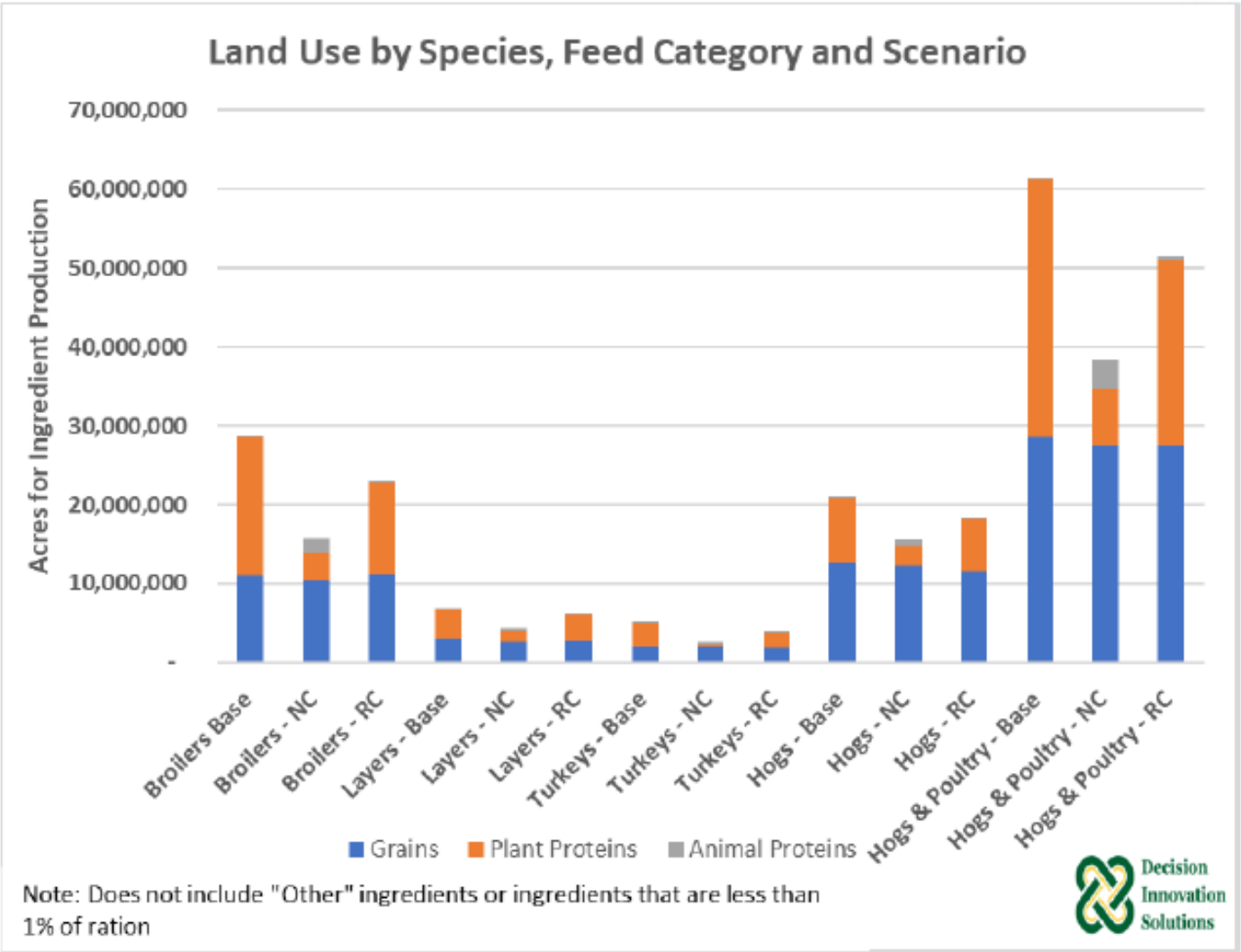


Figure 86. Land Use by Species, Feed Category and Scenario



Rendered products: Nutrient and Land-Conservation

Valuable nutrients are saved / upcycled

The demand for arable land and fertilizers is lowered

For example in 2017 Brazilian renderers:

- recycled 1.9 million tons of pure protein and 32.4 billions kcal (5.3 million tons of fats and meals)*. The phosphorous recycled were equivalent to 650 thousand tons in dicalcium phosphate*****
- To replace the rendered products by corn/soybean, 2.1 millions hectares of arable land and 910 thousand tons of NKP would be needed*.***

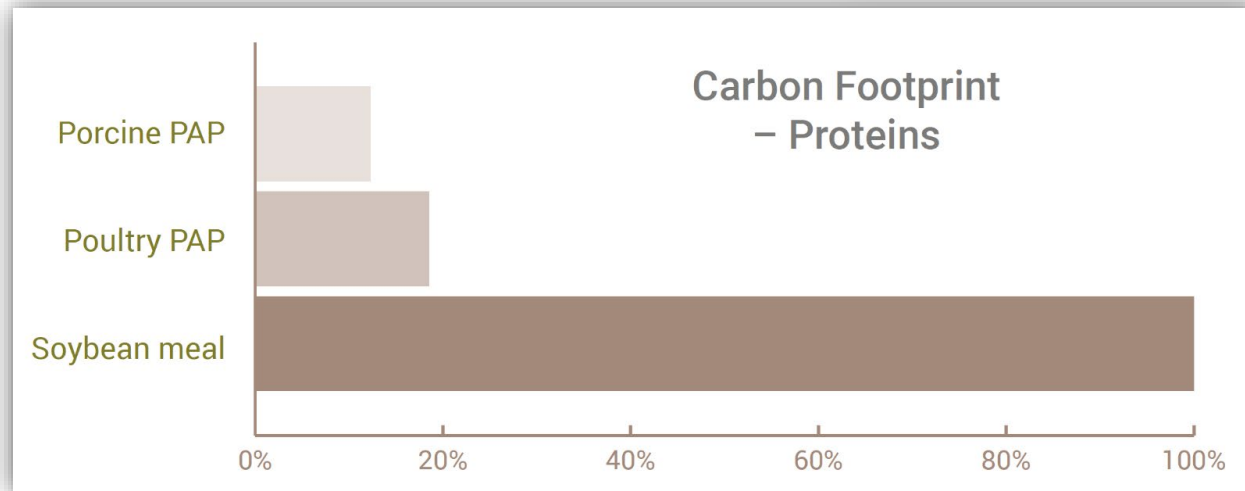
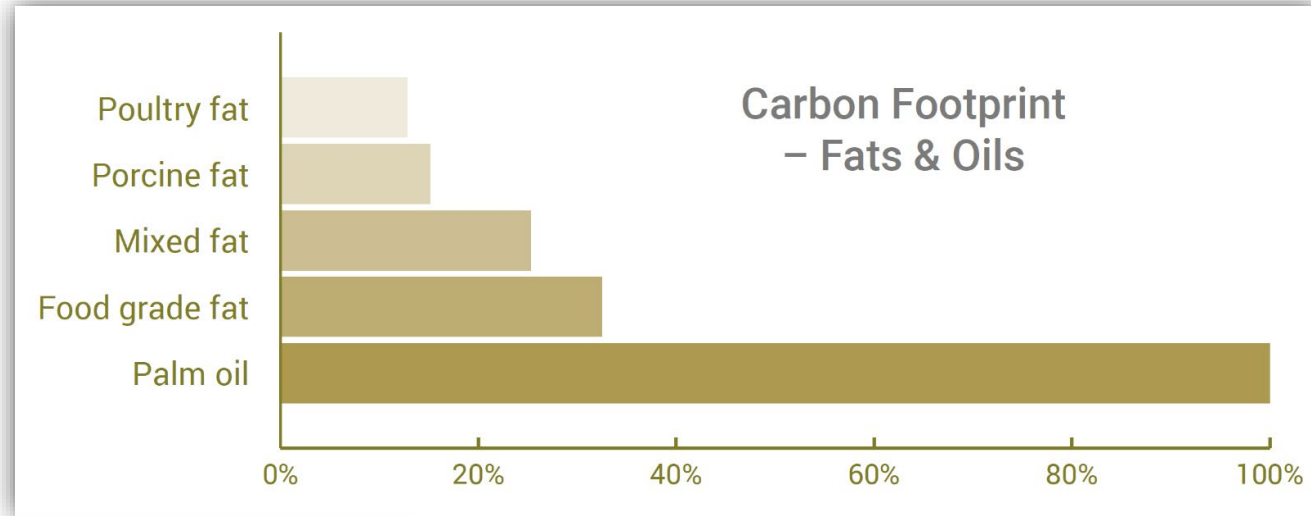


***: L. Cypriano, Revista Reciclagem Animal, Jan/Feb 2018, pp. 60 a 63 - <http://www.mflip.com.br/pub/stilo/?numero=61&edicao=10598#page/61>**

**** : L. Cypriano, Revista Reciclagem Animal, Dec/Nov 2017, pp. 50 a 55 - <http://www.mflip.com.br/pub/stilo/?numero=60&edicao=10538#page/51>**

Rendered products: Low Carbon Footprint

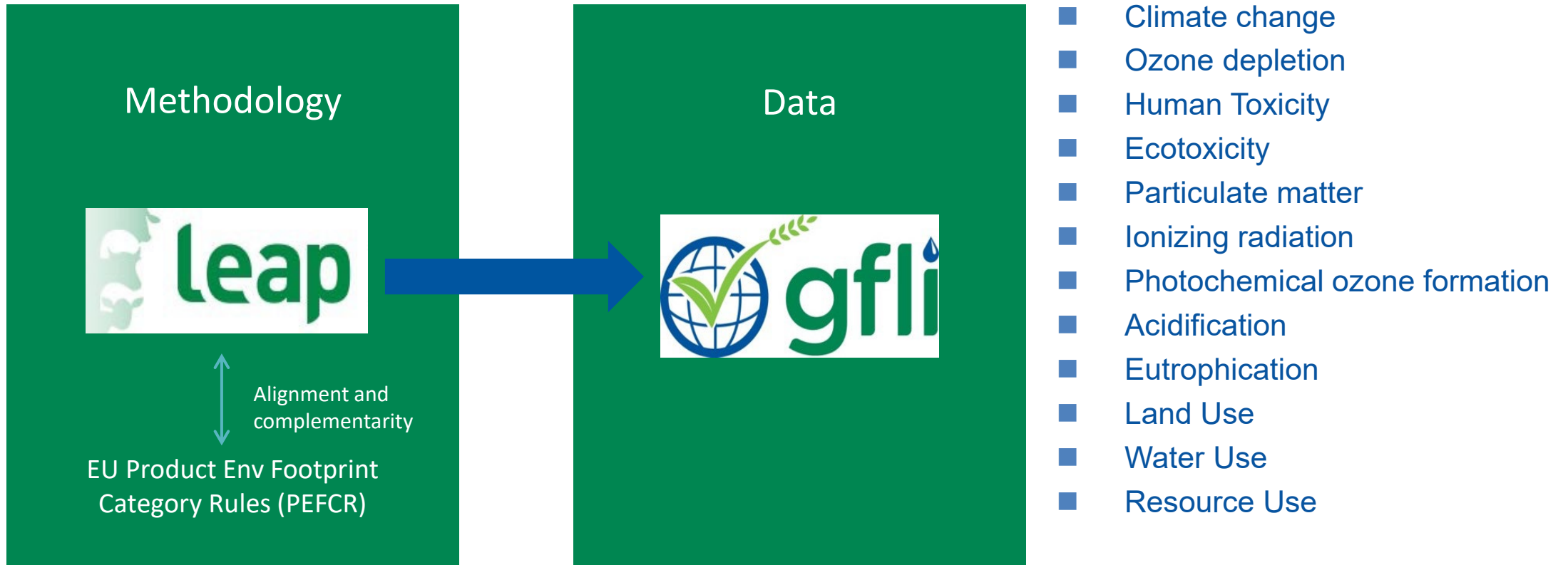
**Rendered products do not
compete with food!**



Sustaining relationships through science

- **Life cycle assessments are expected**
 - **Suppliers are weighed against one another**
 - “Does your company conduct an Environmental and Social Impact Assessment (ESIA) or equivalent for all new business developments?”
- **Models have changed**
 - **Employee welfare and safety**
 - **Environmental consciousness**
 - “We avoid conversion of habitat with valuable biodiversity for biomass production.”
 - “Has your company been in breach of any environmental legislation and/or environmental permits in the past 10 years?”
 - **Brand integrity**
 - “Has any of your locations been a focus of any NGO attacks or negative campaigns during the past 10 years?”
 - “Is your company currently subject to any environmental investigations or legal case(s) regarding environmental matters?”





Alignment with the FAO-Livestock Environmental Assessment and Performance (LEAP) guidelines for feed and feed additives ensures the integrity & quality of LCA feed datasets.

Independent animal nutrition and food industry non-profit institute with the purpose of:

- developing a **publicly available** Animal Nutrition Life Cycle Analysis (**LCA**) **database**;
- supporting the **meaningful environmental assessment** of animal nutrition products; and
- stimulating **continuous improvement**.

*GFLI database to be recognized as **the global reference** for Feed LCA Data by the public and private sectors.*

We are not getting younger

- Next Generation



Next Generation

- Internships
 - IPPE Student program
 - University job fairs



Next Generation

- JUCO and trade school mentoring
- Leadership development



Thank you, Questions???



NORTH AMERICAN RENDERERS ASSOCIATION
Reclaiming Resources, Sustainably

Animal protein meals,
a sustainable piece
to the feed ingredient puzzle

A large graphic of a green puzzle piece with a glowing yellow outline. The puzzle piece is shaped like a recycling symbol and contains several smaller images: a cow's head, a pig's head, a chicken, and a fish. To the left of the puzzle piece, there are smaller images of feed ingredients and a hand holding a bowl. Text labels include "Recycled animal proteins from the food chain", "High Protein", "Amino Acids", and "Greater than 10% fat".

Recycled animal proteins from the food chain
High Protein
Amino Acids
Greater than 10% fat

WORLD
R ENDERS
O RGANIZATION

www.worldrenderers.org

Click to register for the [International Rendering Symposium](#)



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Visit NARA at booth A219



NORTH AMERICAN RENDERERS ASSOCIATION
Reclaiming Resources, Sustainably



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