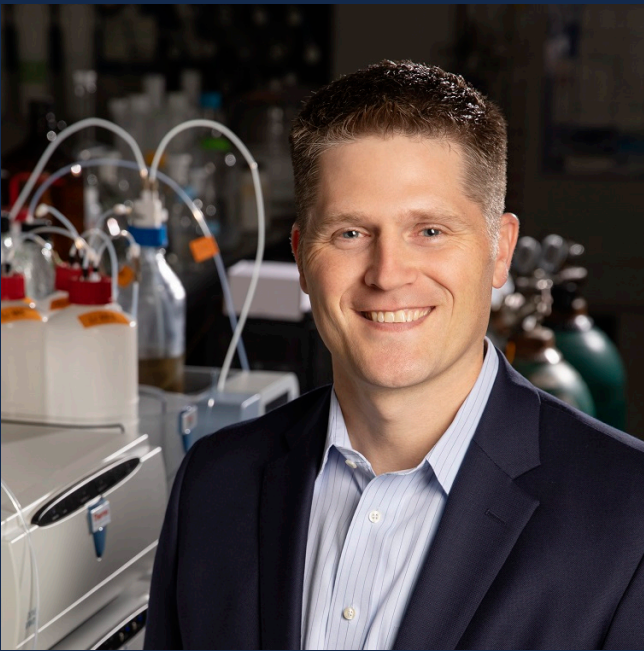


Opportunities for Distillers Products in Pet Foods



Kelly Swanson

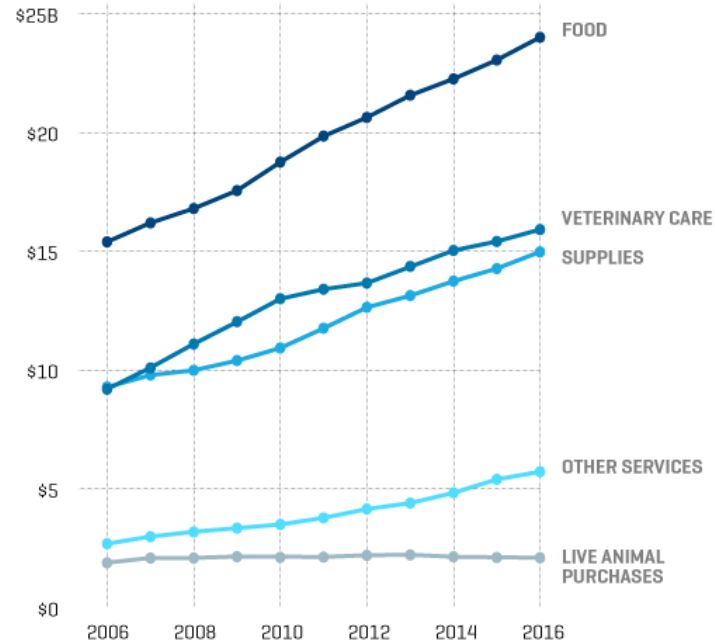
**Professor, Department of
Animal Sciences**

**Distillers Grains Symposium
Louisville, KY
October 26, 2021**

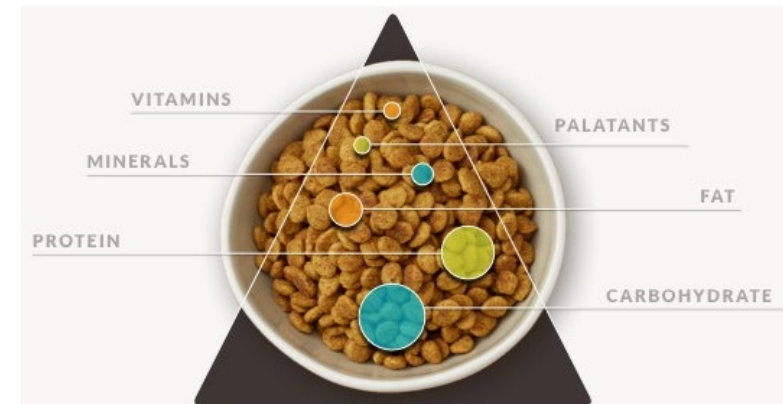


Presentation Outline

- Pet food industry
 - Size and growth
 - Trends and opportunities
 - Sustainability
 - Health and wellness
 - E-commerce and convenience

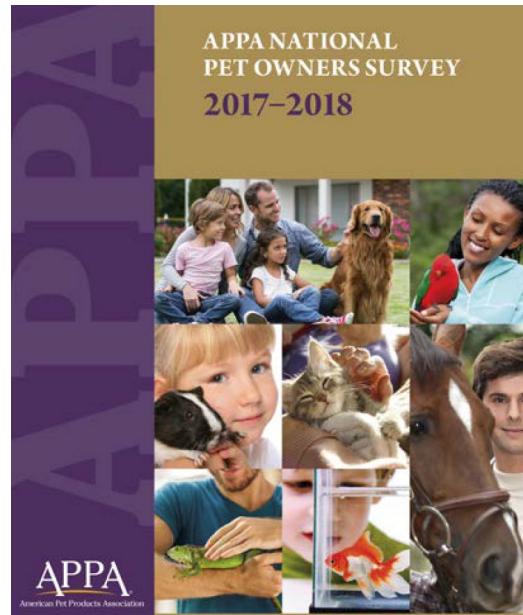


- Role and considerations for distillers products
 - Source of protein and/or fiber
 - Postbiotic?
 - Data in pets?



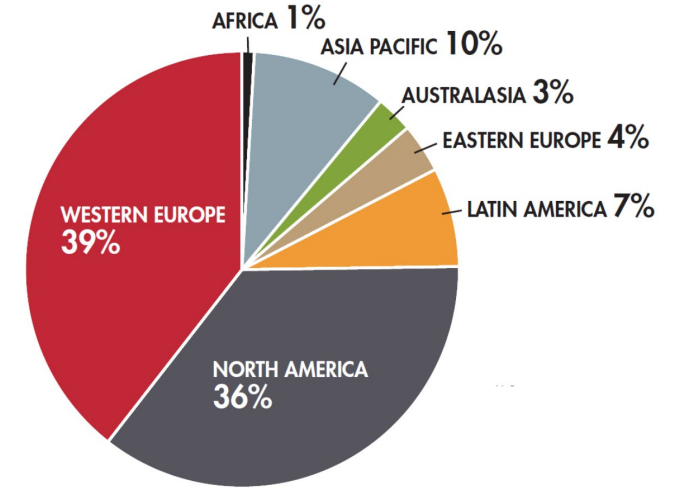
Pet Food and Care Industry

- ~170 million dogs/cats in US
- Pet ownership by species
 - Dog: 48%
 - Cat: 38%
 - Freshwater fish: 10%
 - Bird: 6%
 - Small mammal: 5%
 - Reptiles: 4%
 - Horse: 2%
 - Saltwater fish: 2%

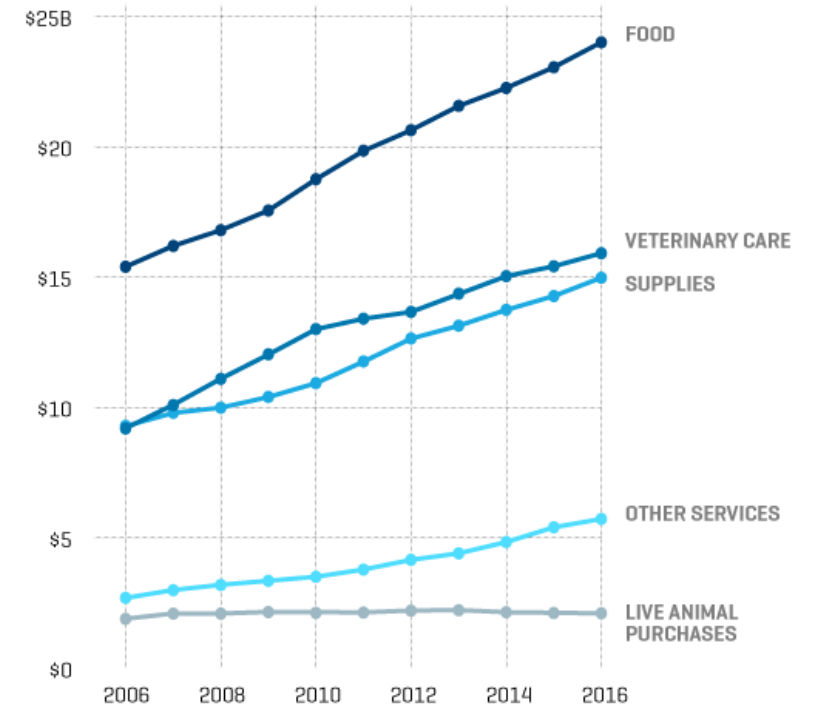


Pet Food and Care Industry

- Strong growth (~4-6%/yr) in US and world
 - US pet product sales: >\$100B
 - US pet food/treat sales: ~\$45B



	2020	2019
Pet Food and Treats	42.0	38.3
Supplies, Live, and OTC Meds	22.1	19.2
Vet Care & Product Sales	31.4	29.3
Other Services	8.1	10.3
TOTAL	103.6	97.1



Pet Food and Care Industry

- Rapid growth
 - Pet Services
 - E-Commerce
 - Vet/Health
 - Wearables
 - Hardware
 - Food and treats

PET SERVICES



E-COMMERCE



VETERINARY & PET HEALTH



WEARABLES



HARDWARE

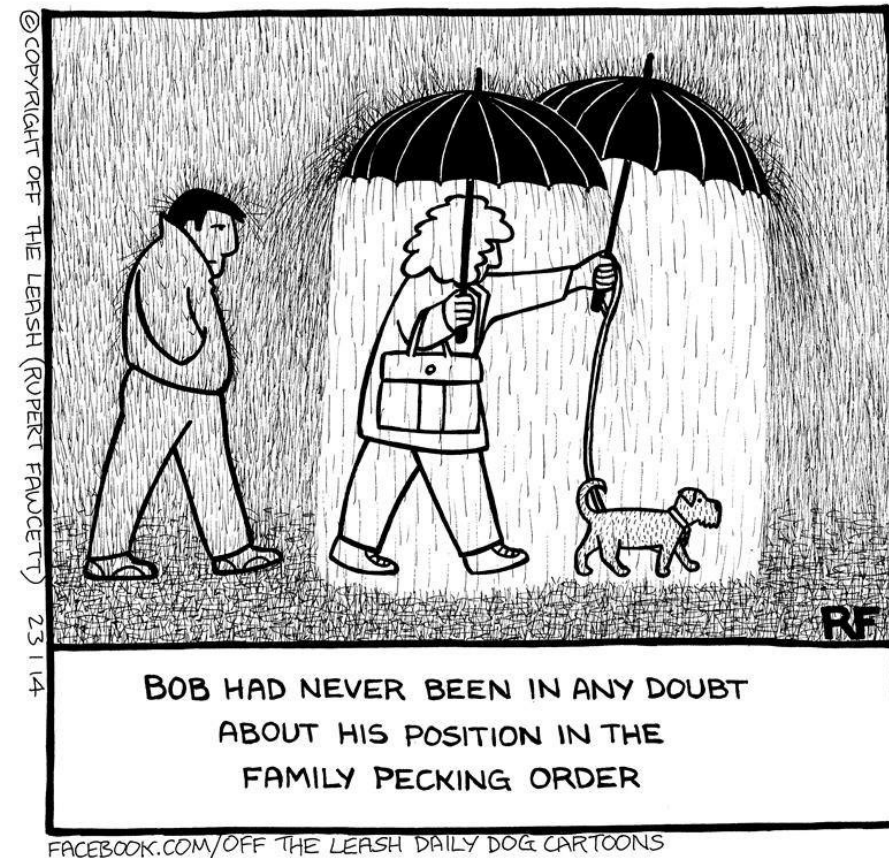


SUBSCRIPTION & FOOD PRODUCTS



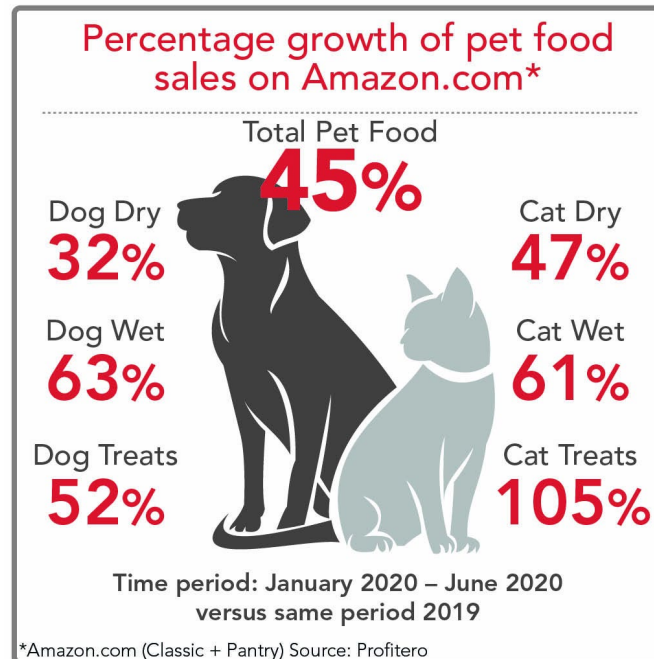
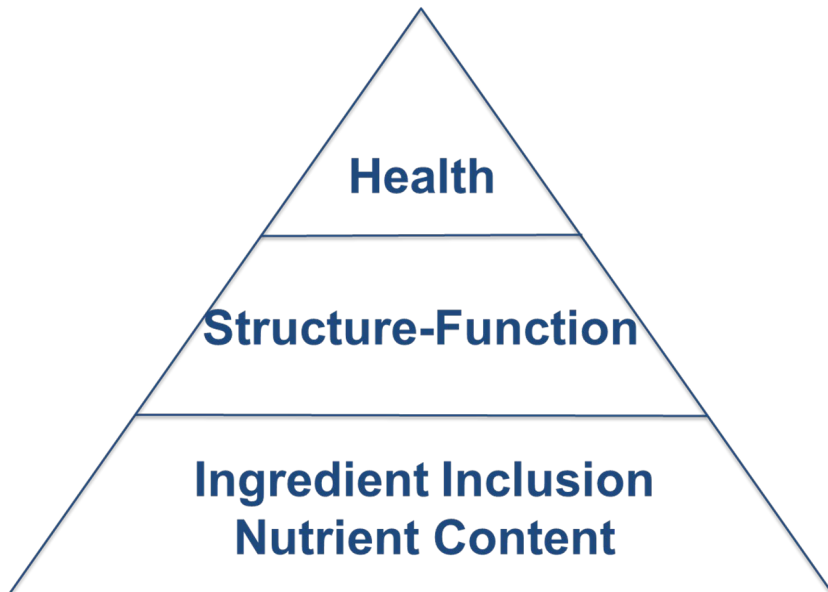
Industry Drivers?

- Pet population
 - Growing numbers
 - Pet species and size
 - Health status
 - Status in household

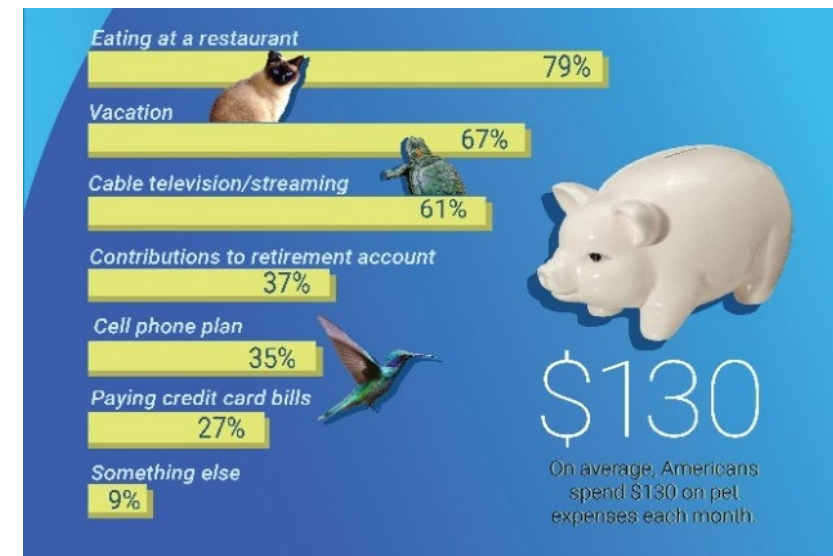
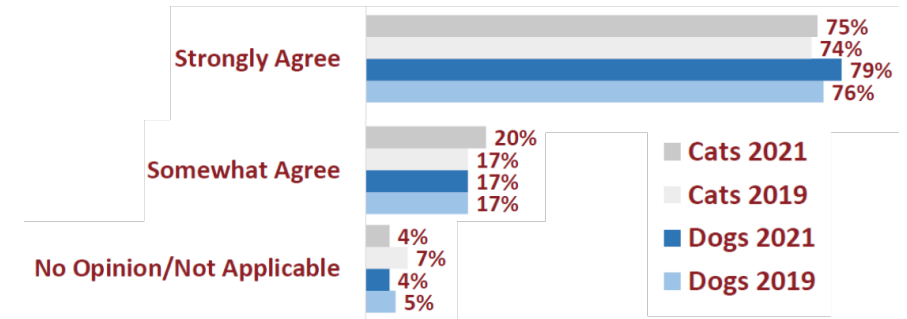


Industry Drivers?

- Owner beliefs and wants
 - Important part of family
 - Health and nutrition are important
 - Willing to sacrifice
 - Convenience and personalization



“I consider my dogs/cats to be part of the family,”



Trends and Opportunities: Sustainability

- Sustainability

- Packaging

- Transport

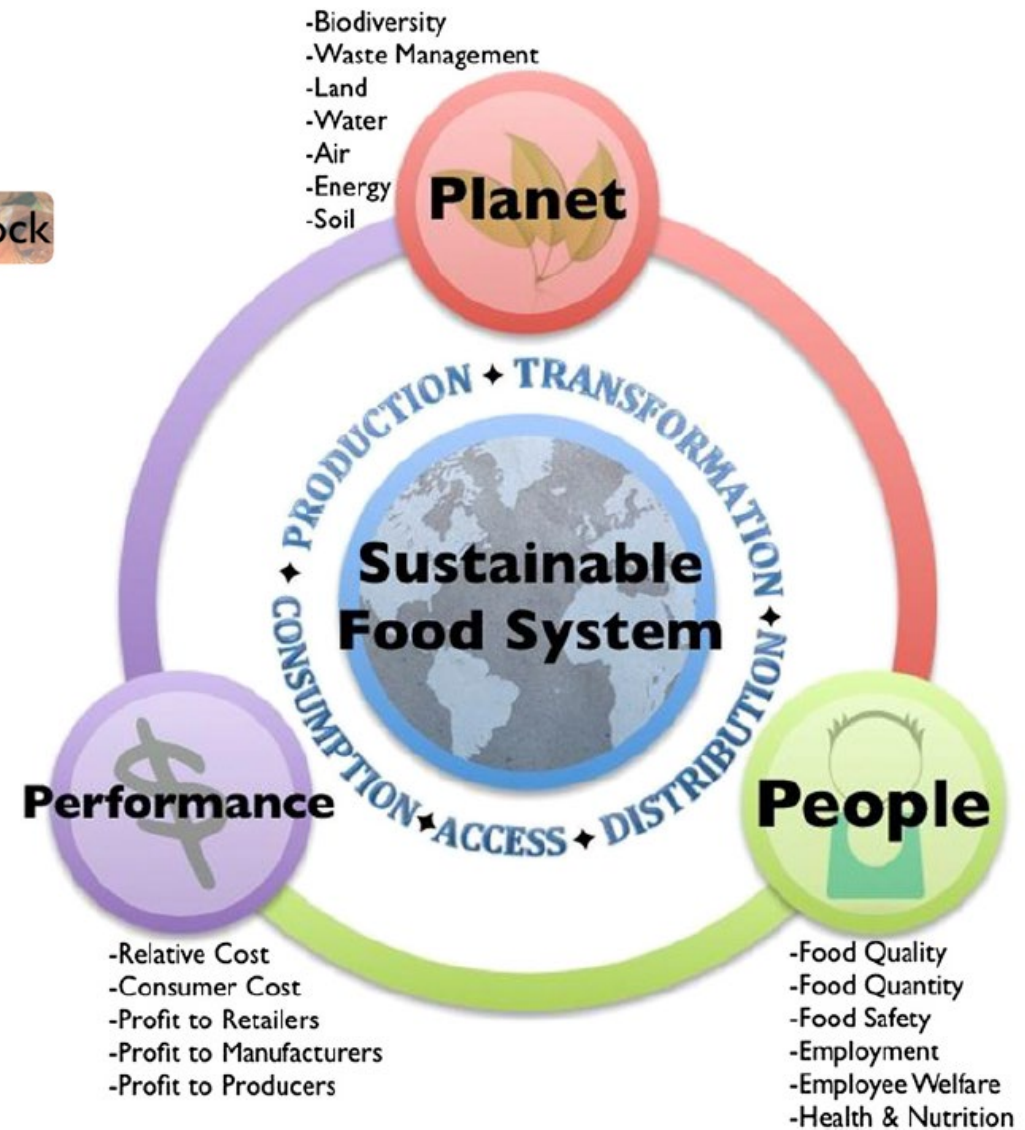
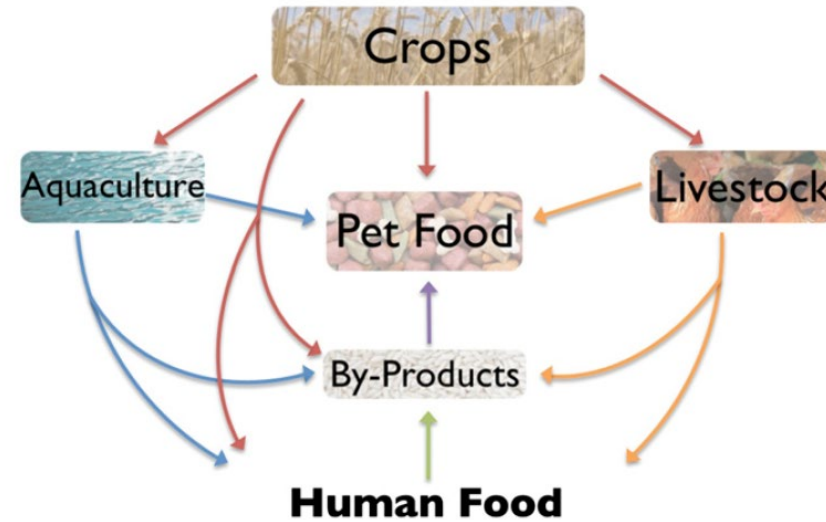
- Processing

- Diet design and feeding

- Dietary formulation

- Ingredient inclusion

- Feeding guidelines



Sustainability: Alternative Proteins

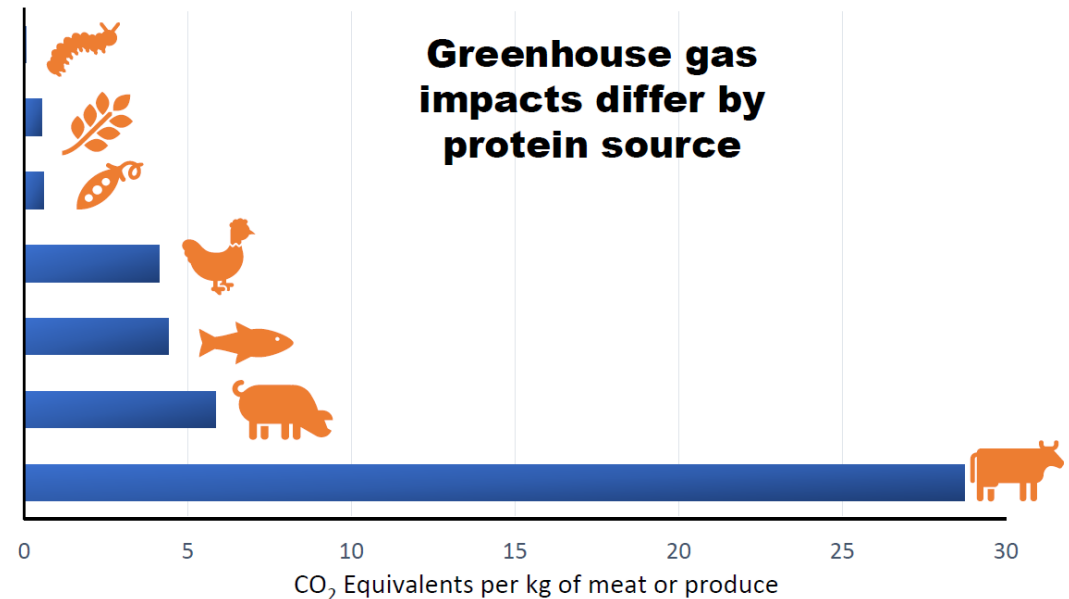
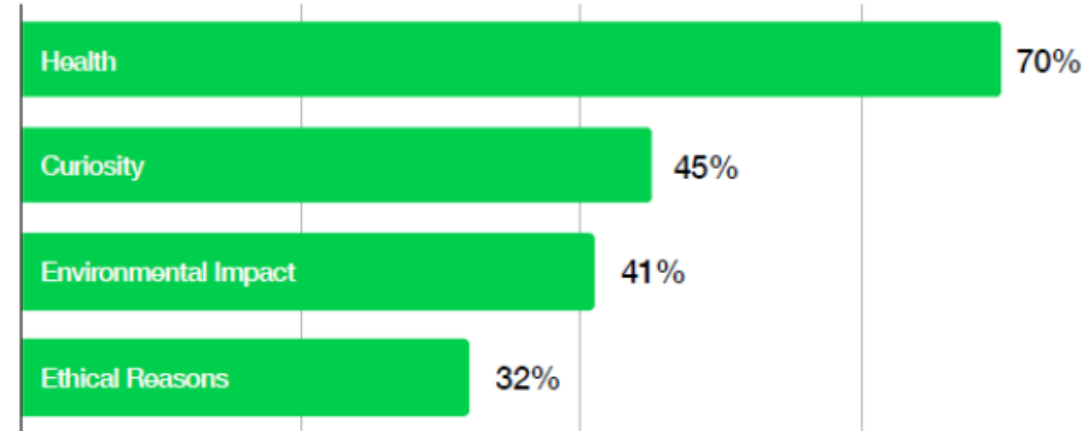
- Main categories
 - Insects:
 - Black soldier fly; crickets; mealworms
 - Plant-based:
 - Legumes; potato concentrates; grain concentrates
 - Single cell:
 - Yeast; microalgae
 - Lab grown:
 - Cultured muscle cells (several species)



Sustainability: Alternative Proteins

- Consumer thoughts
 - Human and pet products and foods
 - Willing to pay a premium?
- Key criteria
 - Protein concentration and quality
 - Consistency and stability
 - Processing needs/damage
 - Presence/risk of contaminants
 - Animal response

Reasons to try meat alternatives



Trends and Opportunities: Health and Wellness

- Common health and wellness targets
 - Gastrointestinal health
 - Immune health
 - Aging
 - Joint support
 - Oral care
 - Skin and coat health
 - Hairball control
 - Cognitive function



Gut health tops pet owner discussions on social media

(E.W.: Bigstock.com)

TIM WALL
SEPTEMBER 14, 2021

EASY-TO-DIGEST

— helps to support healthy digestive function —



GUT HEALTH

Helps support a healthy digestive system

Health and Wellness: Gastrointestinal Health

- Gastrointestinal health outcomes
 - Stool quality and volume
 - Microbiome and metabolites
 - Flatulence and odor
- Ingredients of interest
 - Novel and/or functional fibers
 - Biotics (providing health benefits)
 - Probiotics: live microbes fed to host
 - Prebiotics: feeding beneficial microbes in host
 - Synbiotics: combination of live microbes and substrate(s)
 - Postbiotics: non-viable microbes with or without metabolites

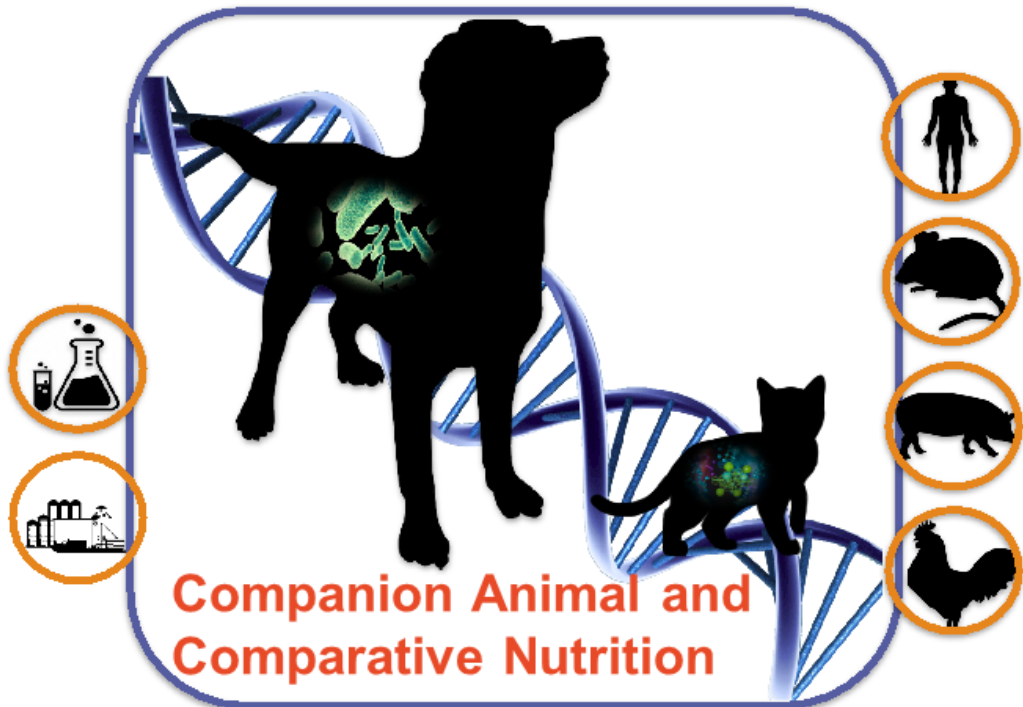


Pet Food Manufacturer Considerations

- Role and function in food
 - Nutrient profile; food functionality (texture; binding)
- Ingredient name and potential label claims
 - Approved for use?
 - Made in USA; ‘natural’ or ‘organic’; non-GMO
- Supply chain
 - Consistency; traceability; sustainability
- Data in pets?
 - Palatability; digestibility; safety and efficacy



Pet Nutrition Research Options?

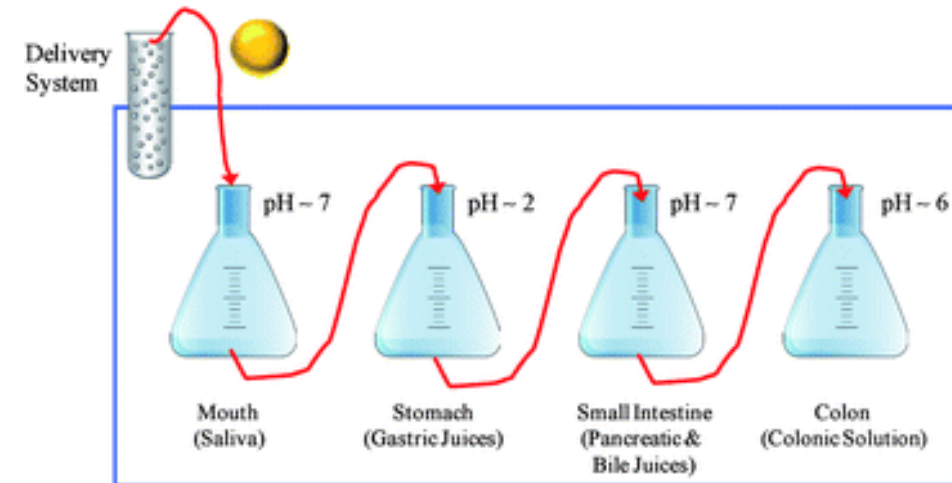
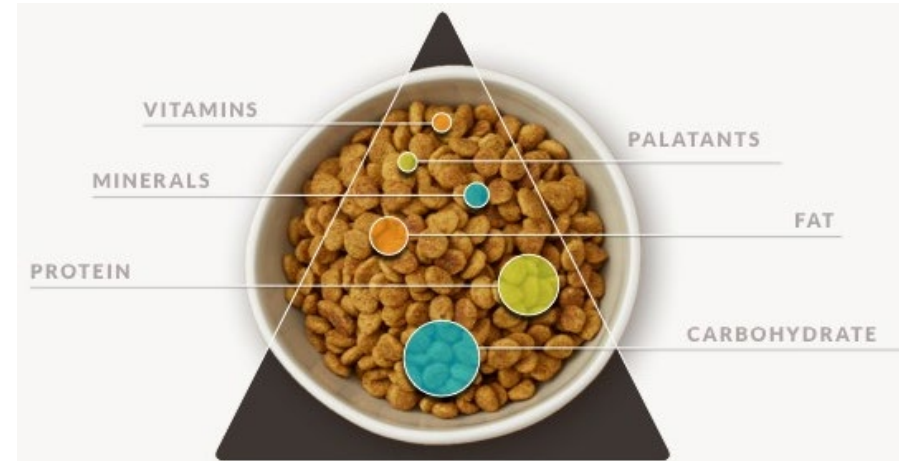


Swanson Lab



Ingredient Evaluation

- 3-pronged approach
 - Chemical/nutrient analysis
 - In vitro* digestibility and/or fermentability
 - Animal testing



Ingredient Evaluation

- Most common analyses

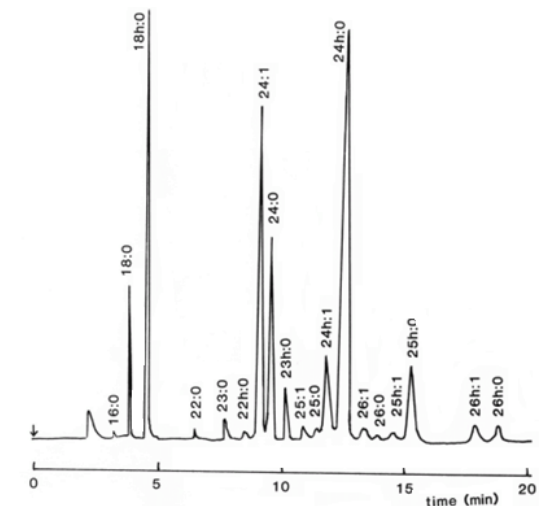
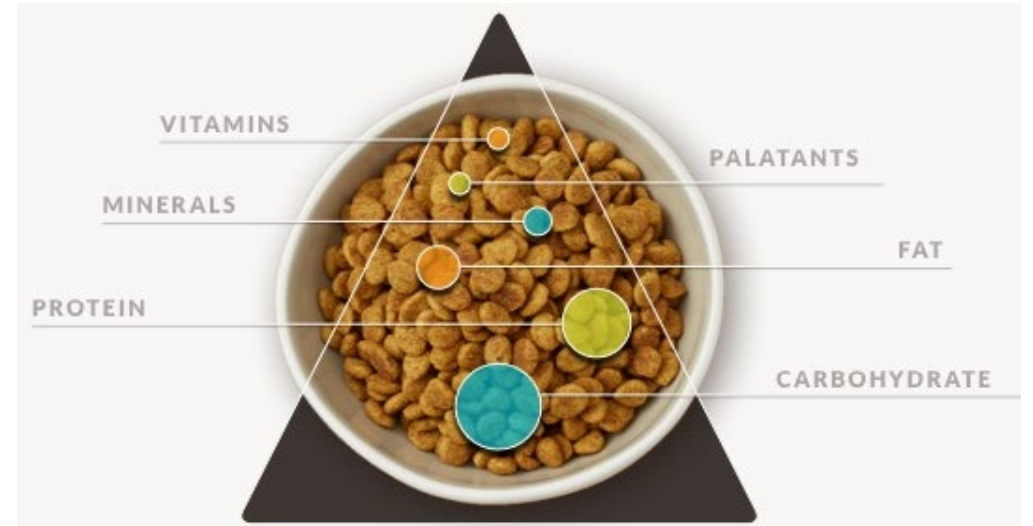
- Proximate analyses

- Carbohydrates

- Fiber assays
- Sugars/oligosaccharides

- Long-chain fatty acids

- Amino acids



In vitro Assays

- Host digestion and safety
 - Gastric phase
 - Small intestinal phase
- Microbial fermentation
 - Large intestinal phase
 - Fecal inoculum, substrate, & media
 - Anaerobic conditions
 - Various time points
 - SCFA, gas, pH, & microbes



Animal Studies

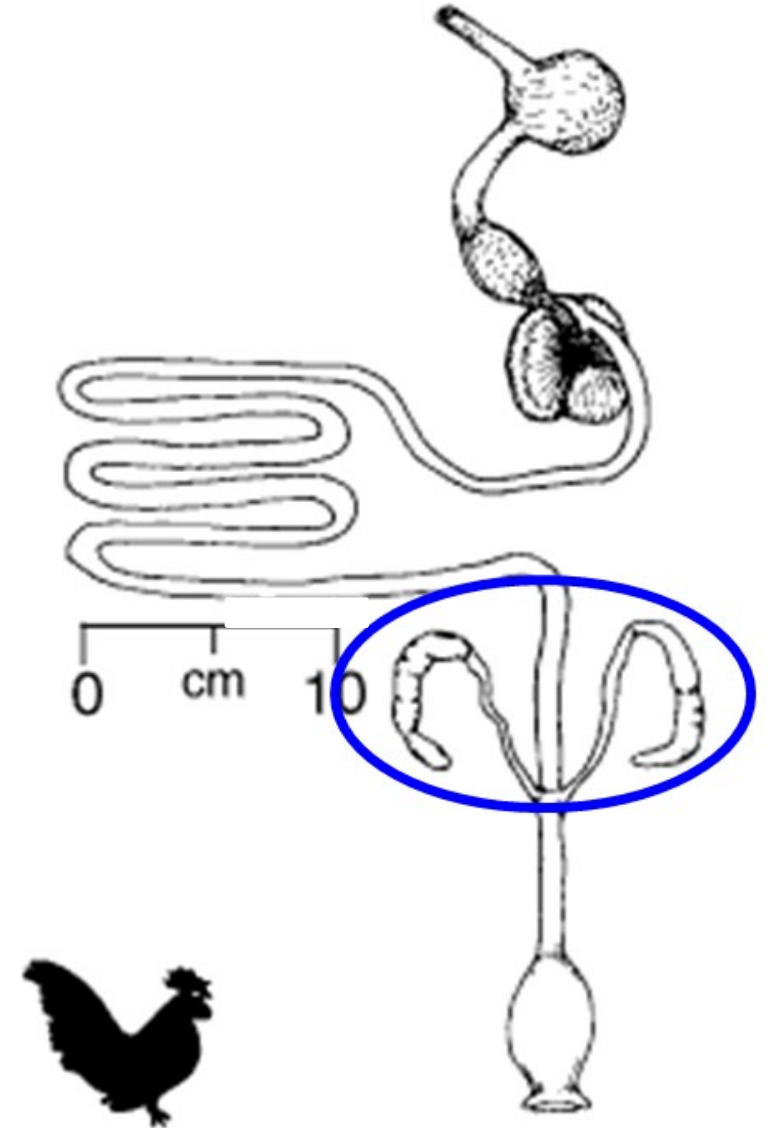
- Roosters

- Cecectomized: nutrient (AA) digestibility

- Exotic animal proteins (alligator; calamari; venison)
- Insect proteins (black soldier fly; mealworms)
- Processing effects (raw → meals)
- Human-grade pet foods

- Conventional roosters: total metabolizable energy (TME_n)

- Novel carbohydrates
- Complete diets



Animal Studies

- Dog and cats
 - Palatability
 - Nutrient digestibility of novel ingredients and foods
 - Stool characteristics
 - Specific health applications
 - Obesity
 - Gastrointestinal health
 - Immune function



Research on Distillers Products in Pets

- Handful of peer-reviewed publications

- Up to 25% of dietary inclusion

EVALUATION OF BYPRODUCT FEEDSTUFFS AS DIETARY INGREDIENTS FOR DOGS

S. E. Allen, G. C. Fahey, Jr., J. E. Corbin,
J. L. Pugh and R. A. Franklin

- Main outcomes

- ↓ nutrient digestibility and ↑ stool output

- Improved with enzymes (xylanase; protease)

- ↓ fecal pH

- ↑ fecal metabolites

Select corn coproducts from the ethanol industry and their potential as ingredients in pet foods

M. R. C. de Godoy, L. L. Bauer, C. M. Parsons, and G. C. Fahey Jr.¹

Use of distillers dried grains with solubles (DDGS), with and without xylanase, in dog food

J.R. Silva, T.T. Sabchuk, D.C. Lima, A.P. Félix, A. Maiorka, S.G. Oliveira*

Department of Animal Sciences, Federal University of Paraná, Curitiba, PR, Brazil

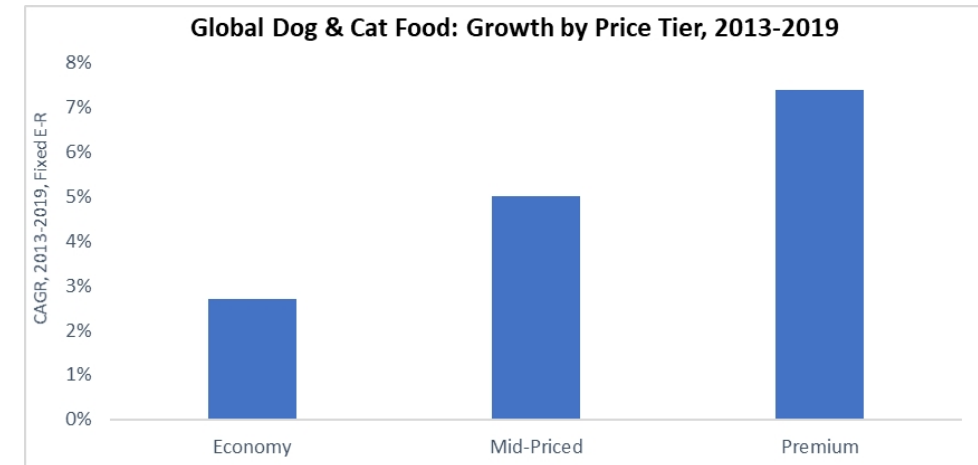
Effects of adding dried distillers grains with solubles (DDGS) to dog diets supplemented with xylanase and protease

Larissa Wünsche Risolia¹ , Tabyta Tamara Sabchuk¹ , Fabiane Yukiko Murakami¹ , Ananda Portella Félix¹ , Alex Maiorka¹ , Simone Gisele de Oliveira^{1*} 

¹ Universidade Federal do Paraná, Departamento de Zootecnia, Curitiba, PR, Brasil.

Research on Distillers Products in Pets

- Moving forward
 - Commodity or value-added products?
 - Economy diets
 - Structure-function claim in premium foods



–Potential uses

- Protein: sustainable and reliable complementary protein source
- Fiber: laxation or weight management
- Yeast: potential for postbiotic activity
 - Gut and immune health
 - Microbiome modification



Summary Points

- Steady pet food industry growth
- Opportunities in sustainability and health/wellness
- Primary options for distillers products
 - Protein source
 - Fiber
 - Postbiotic
- Research/data in pets essential

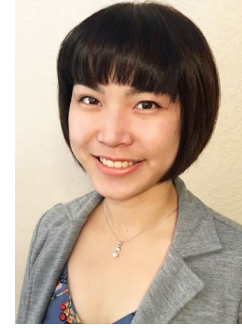


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- Breanna Metras
- Kelly Sieja
- Elizabeth Geary
- Sara Belchik
- Samantha Koziol
- Leah Roberts
- Meredith Smola
- Kristian Kelly



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- Freshpet
- Perfect Companion
- Diamond V
- Lallemand
- Phileo Lesaffre
- Nippon Pet Food
- DNA Genotek
- Gnubiotics Sciences
- PetSmart
- Archer Daniels Midland
- Champion Petfoods
- Just Food For Dogs
- AKC Canine Health Foundation

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- George Fahey
- Carl Parsons

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