PETFOOD FORUM

Where the GLOBAL PET FOOD INDUSTRY does business

#petfoodforum

Combating the Pet Obesity Epidemic:

New Food Approaches and Ingredients

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Topics

Obesity Overview

Pet food characteristics & watchouts

- Feeding guidelines
- Calorie content
- Proven nutritional designs

New food approaches & ingredients

- Inflammation
- Metabolism
- Microbiome

Future Opportunities

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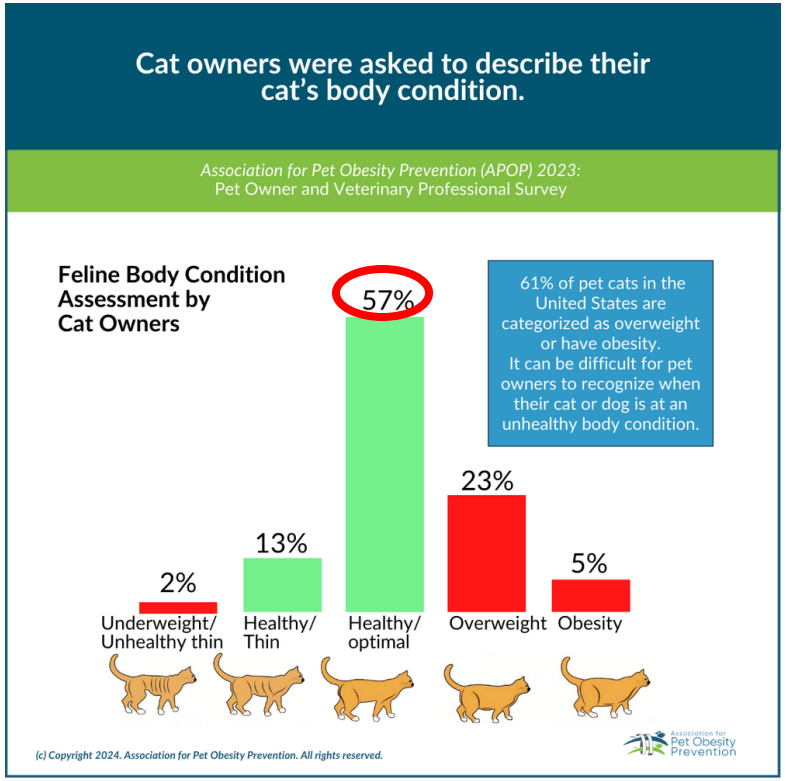
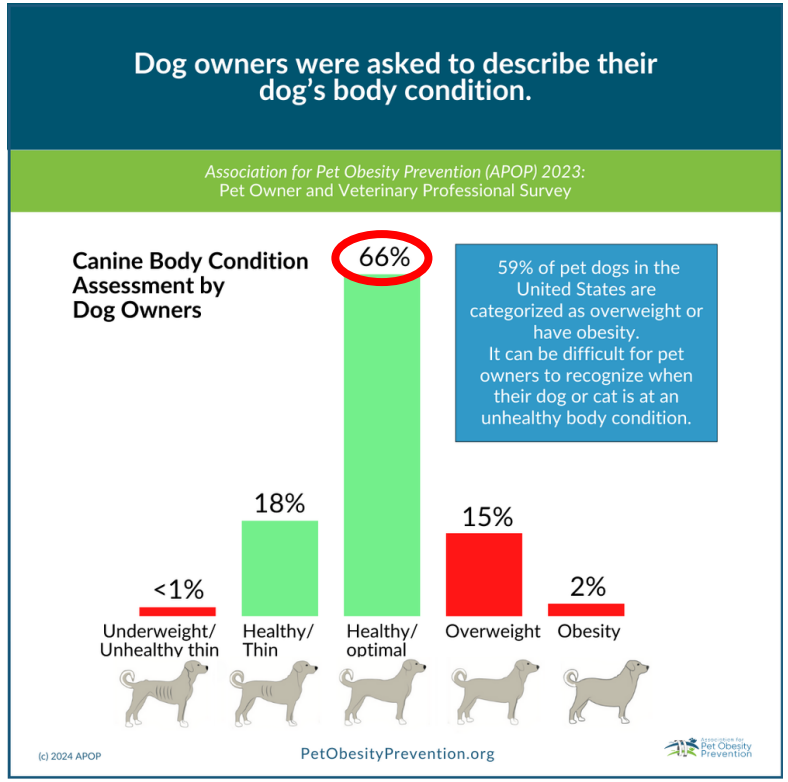
Pet Owners Believe Obesity is a Problem but… Say *THEIR* pet is at a Healthy/Optimal Weight

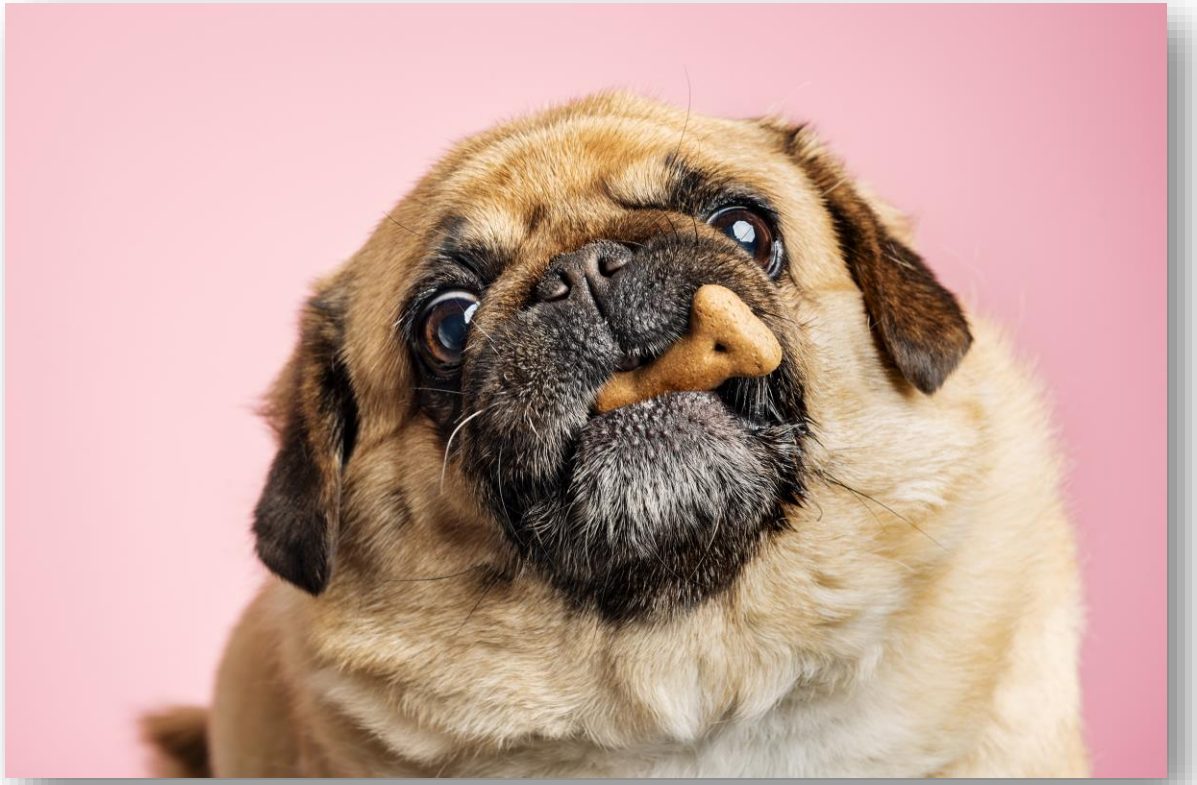
- Widespread disease
  - 61% of cats
  - 59% of dogs
- Higher risk for osteoarthritis, cancer, diabetes mellitus, & behavioral problems
- Shorten lifespan & reduces quality of life
- Recognized as a problem by 94% of cat owners & 84% of dog owners





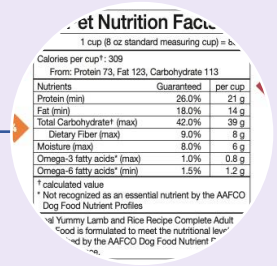
Multiple Factors Contribute to Overweight and Obesity in Pets

- Lack of awareness or recognition
- Sedentary lifestyles of pets
- Neutering/spaying
- Reluctance of veterinarians to discuss pets' weight
- Excess calories as snacks, treats, toppers and human foods
- Over consumption of highly palatable foods
- Over feeding food calories



What Goes into the Bowl Matters Too

Nutritional design



Accurate calories

Feeding guidelines

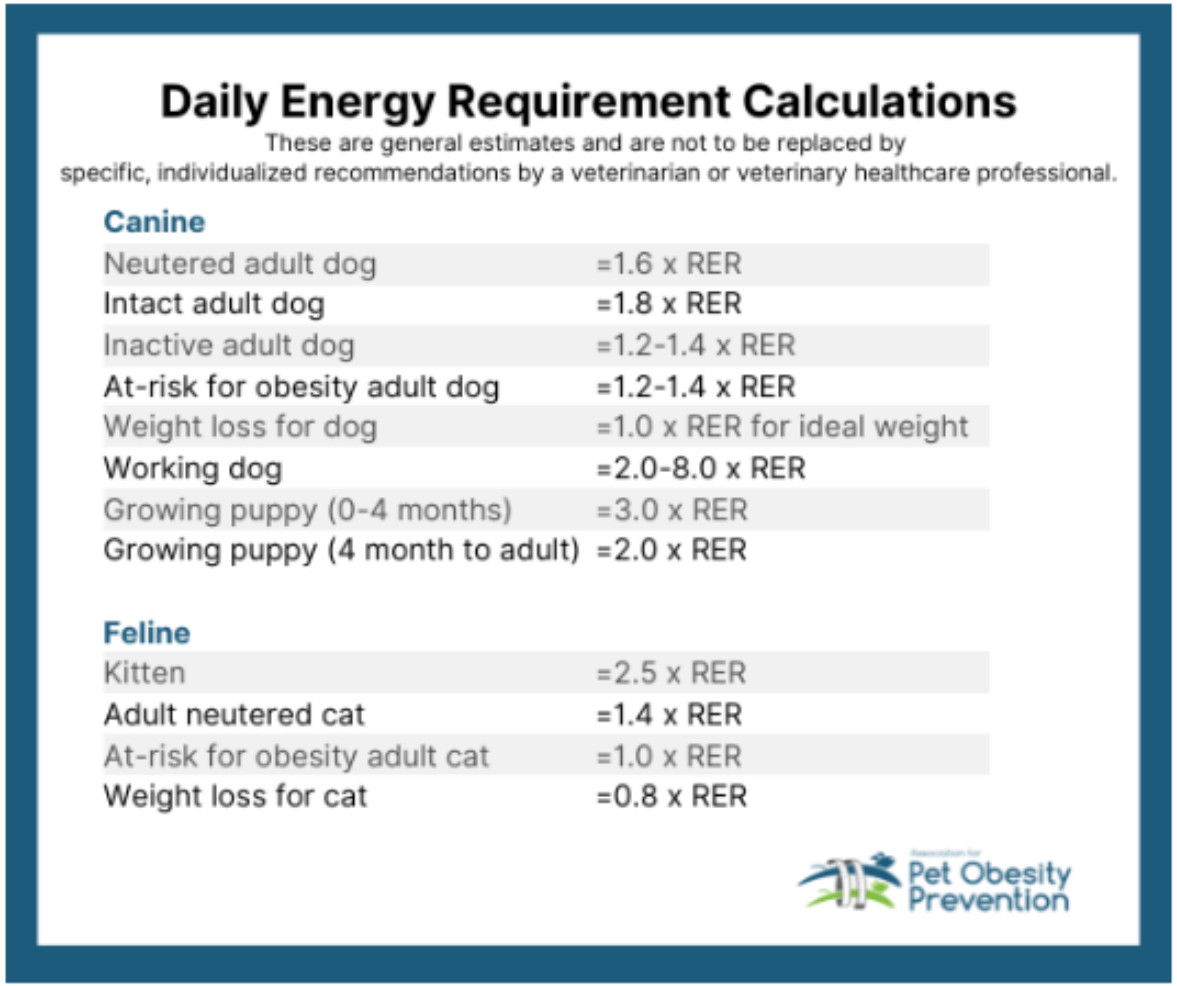
Recognition: Most pets are ***NOT*** at ideal weight

Use Appropriate Daily Energy Requirements for Today's Pet Population

Inactive/neutered	1.2 – 1.4 x RER
Obese-prone/at-risk	1.0 – 1.2 x RER
Weight loss	0.8 – 1.0 x RER

Note: most pet owners over-estimate their pet's activity levels and don't think their pet is overweight....

...consider *"typical house pet" on the feeding guide*



Daily Energy Requirement Calculations

These are general estimates and are not to be replaced by specific, individualized recommendations by a veterinarian or veterinary healthcare professional.

Canine

Neutered adult dog	=1.6 x RER
Intact adult dog	=1.8 x RER
Inactive adult dog	=1.2-1.4 x RER
At-risk for obesity adult dog	=1.2-1.4 x RER
Weight loss for dog	=1.0 x RER for ideal weight
Working dog	=2.0-8.0 x RER
Growing puppy (0-4 months)	=3.0 x RER
Growing puppy (4 month to adult)	=2.0 x RER

Feline

Kitten	=2.5 x RER
Adult neutered cat	=1.4 x RER
At-risk for obesity adult cat	=1.0 x RER
Weight loss for cat	=0.8 x RER

Association for Pet Obesity Prevention

Watch Out: Daily Nutrient Intake

- Adjusting feeding guides using smaller RER factors = feeding less food
- However, *without* adjusting nutrient content, feeding less food can result in chronic undernutrition of essential nutrients

Fewer calories *but* also less daily intake of essential nutrients

Undernutrition	Consequence
Essential amino acids, taurine, fatty acids	Reduced muscle mass, DCM, skin & coat deterioration
Minerals	Poor growth in puppies/kittens, abnormal bone growth
Vitamins	Reduced immunity in young and older pets

Opportunity to update AAFCO nutritional guidelines for reduced calorie intake

Nutritional Design for Obese-prone or Overweight Pets

AAFCO has descriptive terms for these pet foods

Calorie Content Terms: Light, Lite, or Low Calorie

Light – PF10(a)(1)(A) – Dog Food

≤3100 kcal/kg	<20% moisture
≤2500 kcal/kg	<65% & ≥20% moisture
≤900 kcal/kg	≥65% moisture

Light – PF10(a)(1)(A) – Cat Food

≤3250 kcal/kg	<20% moisture
≤2650 kcal/kg	<65% & ≥20% moisture
≤950 kcal/kg	≥65% moisture

Fat Content Terms: Low fat, Lean

Lean – PF10(b)(1)(A) – Dog Food

≤9% fat	<20% moisture
≤7% fat	<65% & ≥20% moisture
≤4% fat	≥65% moisture

Lean – PF10(b)(1)(B) – Cat Food

≤10% fat	<20% moisture
≤8% fat	<65% & ≥20% moisture
≤5% fat	≥65% moisture

Watch Out: 'One-size-fits-all' Modified Atwater Calculation of ME can be Imprecise & Inaccurate

Metabolizable Energy kcal/kg = [(3.5 X crude protein) + (8.5 X crude fat) + (3.5 X nitrogen-free extract)] X 10

***UNDER*-estimates ME**

~ 5% for dry foods

~ 11% for wet foods

Why?

- Ingredient digestibility variability
- Fiber content
- Processing methods
- Dogs and cats metabolize foods differently

Until alternatives in calculated calorie equations are available, consider determining product ME by testing

Is Calorie Control and Low Dietary Fat Effective?

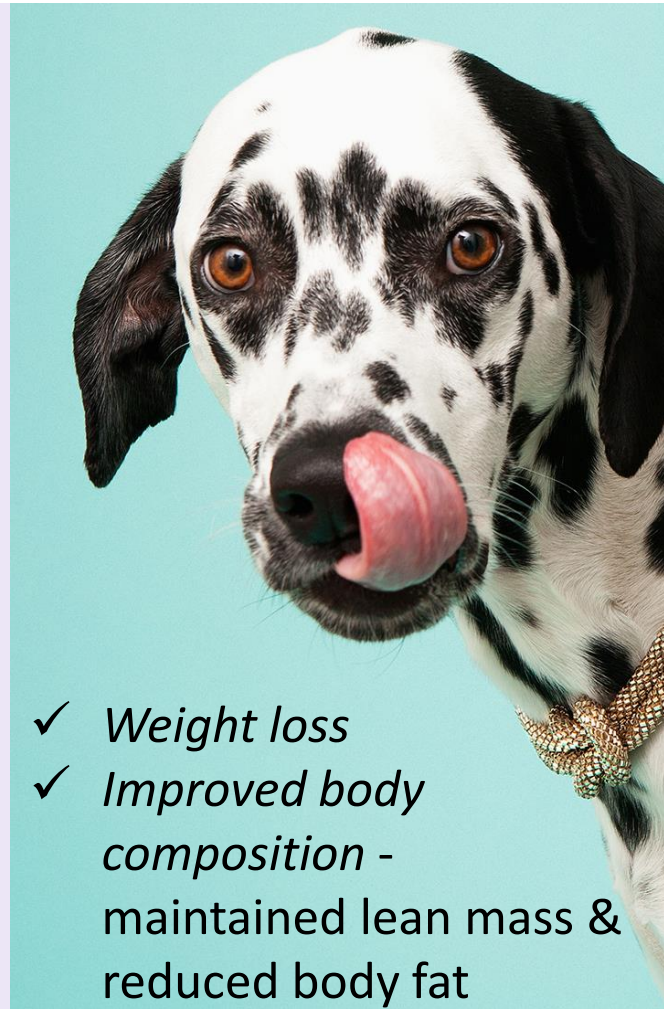
YES!

- Vanelli, et. al. (2025) conducted a meta-analysis of 20 peer reviewed studies
- Assessed weight loss and body composition in overweight and obese dogs fed various foods with different macronutrient profiles

Table 3. Nutritional recommendations for the treatment of obese dogs.

ME (kcal)	CP%	EE%	TDF%	NFE%
3.275	25	10	12	40

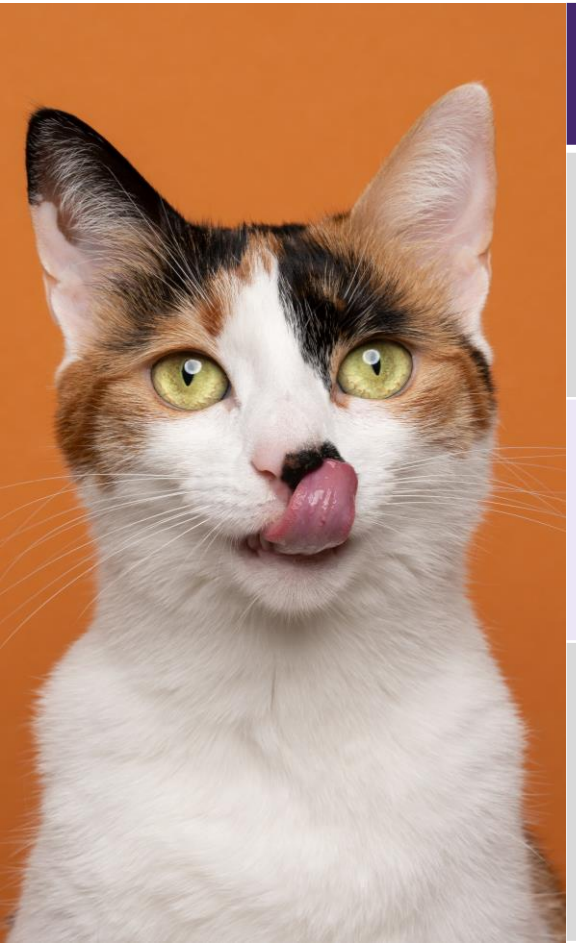
CP: crude protein; EE: ether extract; NFE: nitrogen-free extract; ME: metabolizable energy; TDF: total dietary fiber.



- ✓ *Weight loss*
- ✓ *Improved body composition* - maintained lean mass & reduced body fat

https://doi.org/10.3390/ ani15020210

Yes, Reducing Calories Does Work for Cats Too



Cat Description	Food Calorie Content	Macro Nutrients	Results	Reference
8 neutered, male colony housed cat using calorie-controlled feeding	3207 kcal/kg (extruded)	36% protein 9% fat 17% TDF	✓Reduced body weight ✓Reduced fat mass & fat % -Loss lean & BMC after 12 weeks	Palotto et. al. 2018 doi:10.2460/ajvr.79.2.181
24 overweight or normal weight colony cats using time-limited feeding	3700 kcal/kg (extruded)	33% protein 9% fat 6% CF	✓Fat cats lost weight ✓Normal weight cats maintained their weight	Michel et. al. 2005 doi:10.1016/j.jfms.2005.05.003
53 obese or overweight cats living at homes using calorie-controlled feeding	2963-3394 kcal/kg (extruded) 620-677 kcal/kg (wet)	33-45% Protein 9-14% Fat 9-22% TDF	✓Reduced body weight ✓Reduced fat mass & fat% --None or slight lean loss	German et. al. 2023 doi:10.3389/fvets.2023.1211543

How? Carefully Select and Balance Ingredients to Achieve Lower Calorie and Fat Levels

Bulking Fibers

- Cellulose, oat fiber, pea fiber, soybean hulls, resistant starches

Hydrocolloids

- Psyllium seed husk, gums, gelatin, whey, beta-glucans

Vegetables

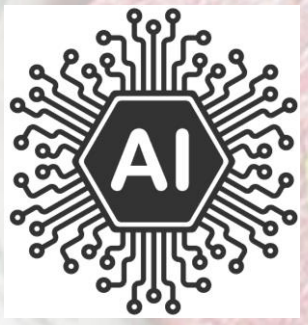
- Carrots, spinach, green peas, yellow peas, green beans, yellow beans, navy beans

Fruits

- Cranberries, tomatoes strawberries, blueberries

Protein Sources

- Plant Proteins
- Insect Proteins
- Some Fish
  - pollack
  - tuna
  - whitefish
- Organ meat
  - heart
  - liver
  - gizzards
  - tripe



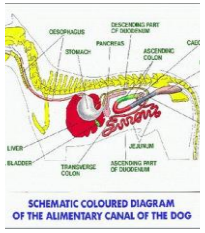
Grains & Flours

- White rice, brown rice, barley, millet, sorghum
- Defatted soy flours

Other New Food Approaches and Ingredients

INFLAMMATION

METABOLISM



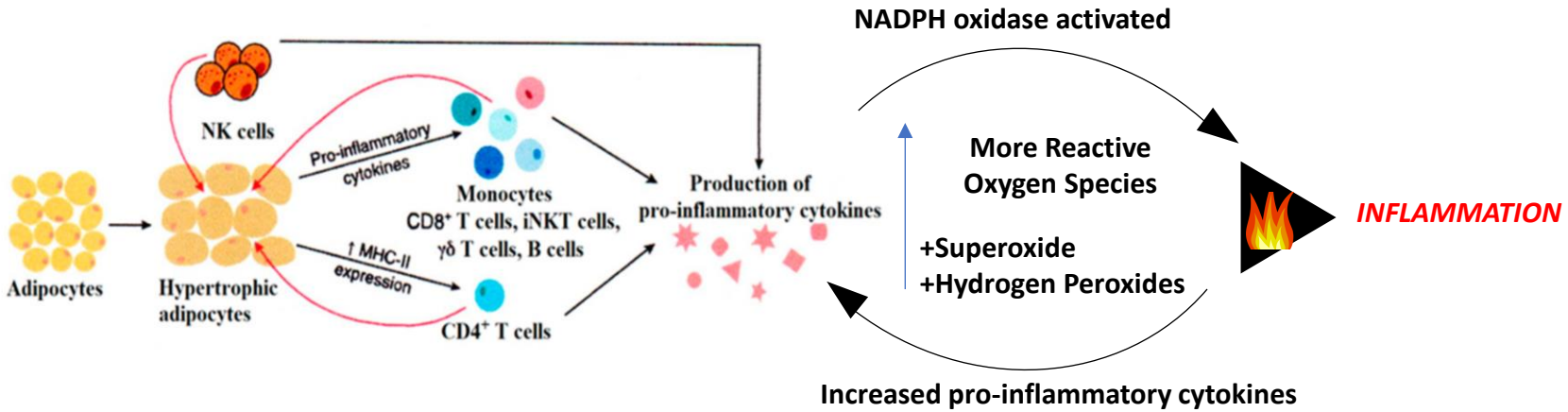
MICROBIOME

Excess Body Fat Creates Inflammation

Engorged fat cells produce pro-inflammatory cytokines

Cytokines increase reactive oxygen compounds (superoxide & hydrogen peroxide) that further increase pro-inflammatory cytokines

Vicious cycle ignites inflammation



Adapted from doi.org/10.3390/antiox10111729

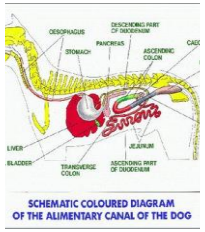
Addressing Inflammation Nutritionally

Category	Sources	Active Compounds	Evidence in Pets
Fatty acids	Omega-3s-Fish oil, Green lipped mussel, Algae	α-linolenic acid, EPA, DHA	
Vitamins	Vitamins E & C	Alpha-tocopherol, Ascorbic acid	
Plant extracts	Soy, Green tea, Boswellia, Lemon balm	Isoflavones, Catechins, Phenolics, Flavonoids	
Herb & Spice extracts	Chili pepper, Ginger	Capsaicins, Gingerols,	
Colorful Fruits & Vegetables	Blueberries, Broccoli, Cherries, Citrus, Corn, Cranberry, Leafy greens, Tomatoes	Anthocyanins, Carotenoids, Flavonoids, Alpha-lipoic acid	

Other New Food Approaches and Ingredients

INFLAMMATION

METABOLISM



MICROBIOME

Address Obesity as a Metabolism Issue

Many of risk factors for weight gain are due to changes in underlying metabolism

- Neutering/Spaying
- Lack of exercise
- Insulin resistance
- Satiety, hunger, appetite regulation

Changes in enzyme activity

decreased fat burning

increased fat storage

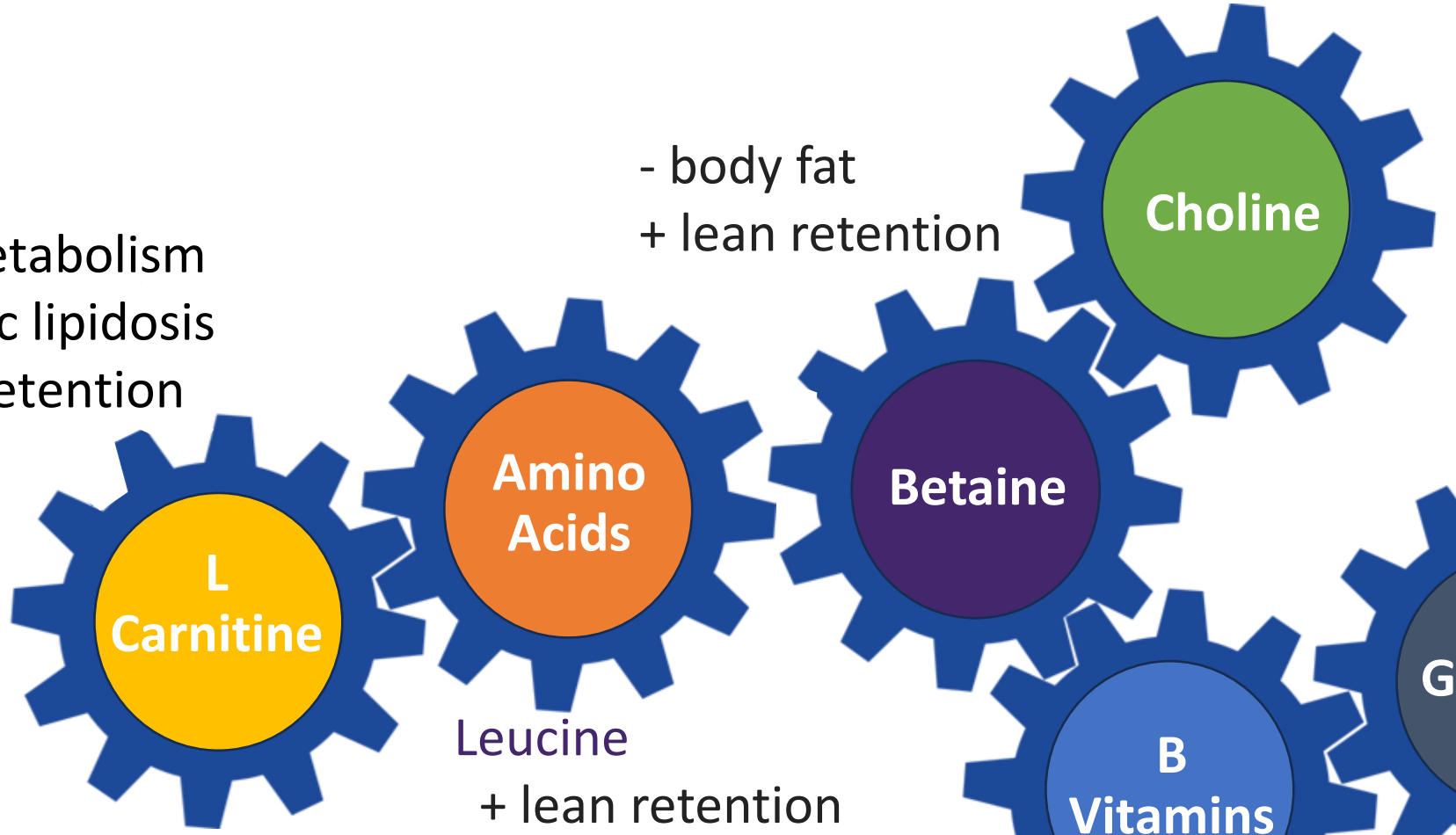
Changes in hormones

reduced anabolic hormones (testosterone, estrogen)

elevated cortisol, elevated insulin

reduced IGF-1

Address Metabolism Nutritionally



+ fat metabolism
- hepatic lipidosis
+ lean retention

- body fat
+ lean retention

+ lipid mobilization
+ lean retention
- hepatic lipidosis

Leucine
+ lean retention

Lysine:Calories
- body fat
+ muscle, + leptin

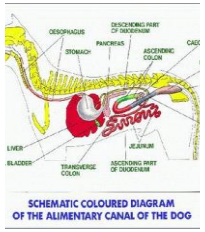
Pyridoxine *(& Leucine)*
+ weight loss

- glycemic control
- satiety

Other New Food Approaches and Ingredients

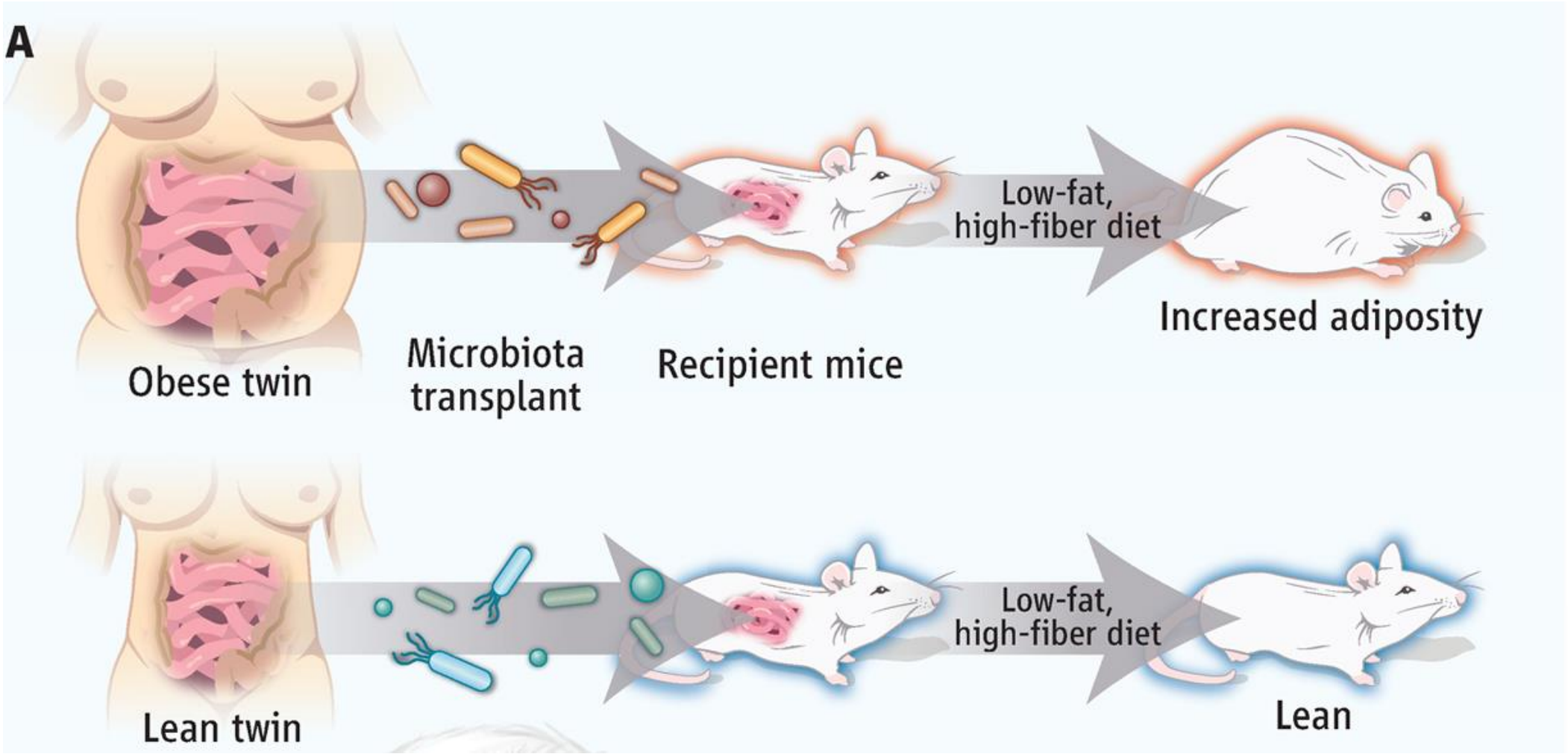
INFLAMMATION

METABOLISM



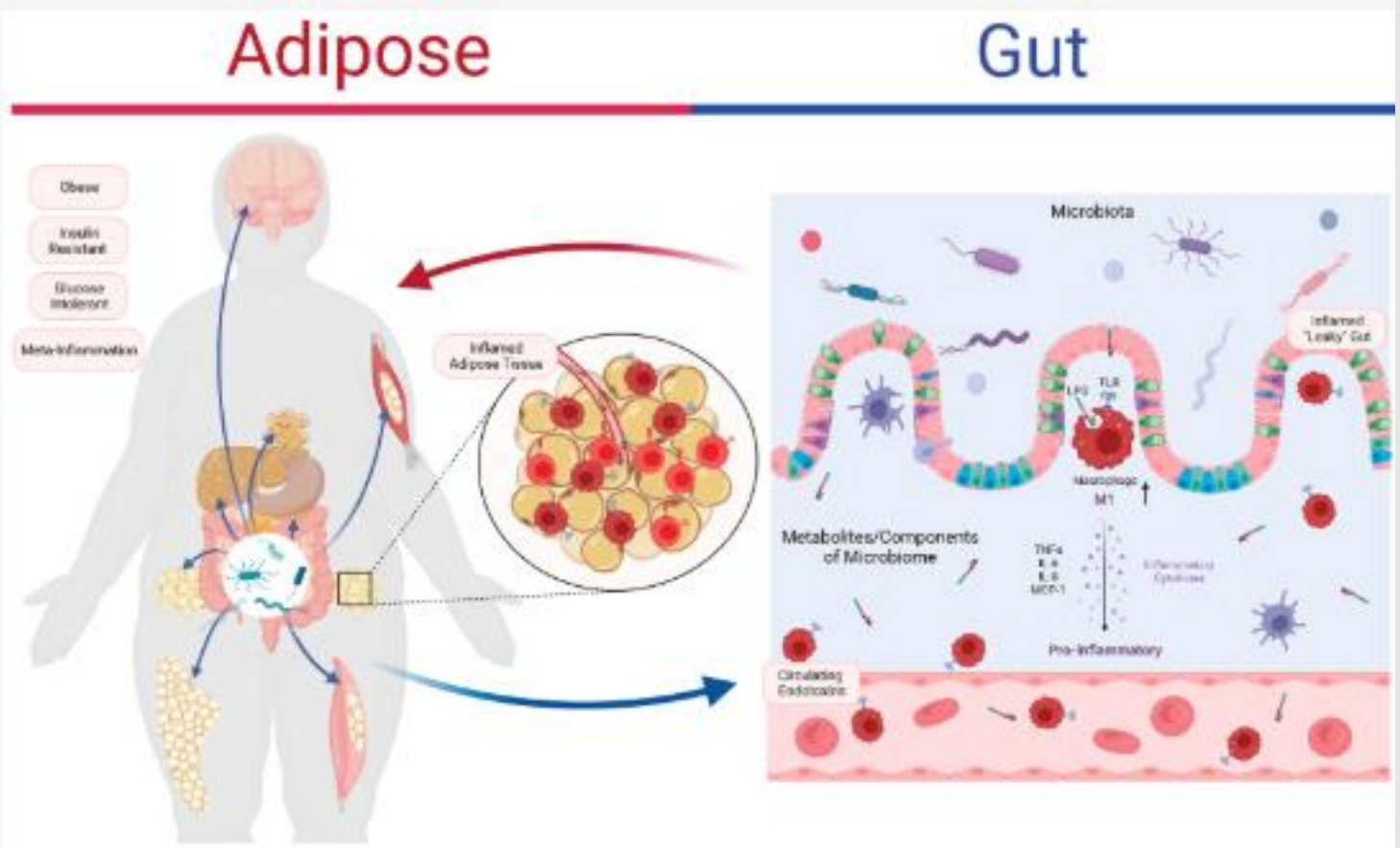
MICROBIOME

The Gut Microbiome Maybe to Blame



Riduara, et. al. 2013 DOI: 10.1126/science.12412; Walker & Parkhill 2013 DOI: 10.1126/science.1243787

Gut Microbiome and Host Body Do Communicate



Wang, et. al. 2023 doi: 10.3390/metabo13070821

Emerging Science is Full of Surprises

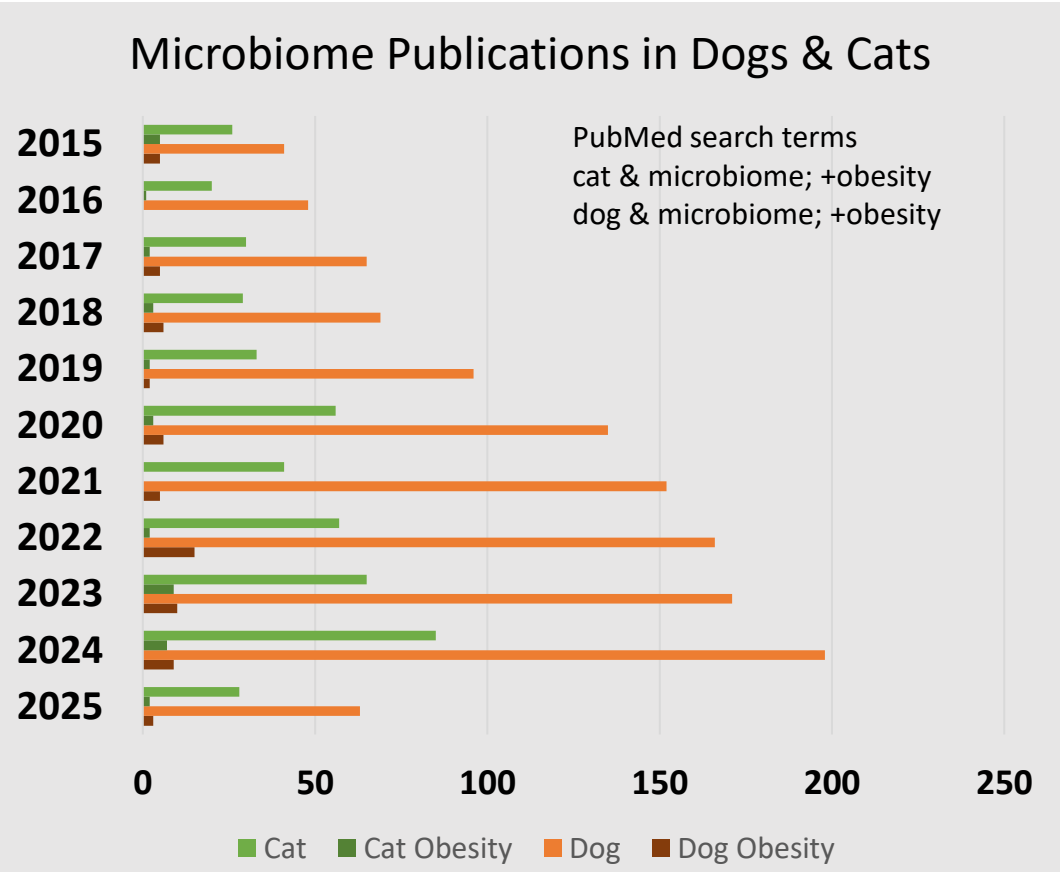
"Crosstalk"

Occurs between gut microbiome & distal organs

- **Metabolites from microbes** are signals that are recognized by other organs
- Host-microbiome **interactions are complex**

Understanding Pets' Microbiome is in Progress

- ? Is the microbiome of overweight & obese pets different than lean/thin pets?
- ? What bacteria species are different & what do they do?
- ? What sort of 'cross-talk' happens between the microbiome & the pet host?
- ? What and how do microbiome-produced metabolites differ between healthy & overweight and obese pets?
- ? What and how do metabolites produced by adipose tissue affect the microbiome?
- ? What microbiome interventions help pets avoid obesity or help them lose weight or reduce comorbid conditions?



Address Obesity as a Gut Microbiome Alteration

Microbiome in Obese vs Thin

Dogs: Abundance differences
Bacteroidetes, Fusobacteria, & Firmicutes spp

Cats: Abundance differences
Firmicutes, Bifidobacterium sp., Olsenella provencensis, Dialister sp.CAG:486, Campylobacter upsaliensis, & Phascolarctobacterium succinatutens

PREBIOTICS

SYNBIOTICS

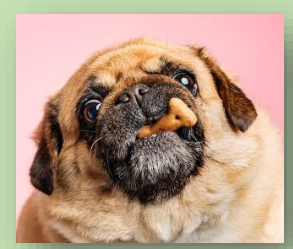
PROBIOTICS

POSTBIOTICS

Most house pets today are already overweight or at high risk…..*so what can we do?*

- More products for overweight pets than products for normal pets
- Provide accurate calorie content
- Adapt feeding guidelines to recommend fewer calories

- New regulatory formulation guides for foods for weight management
- Approve alternative ME calculation methods
- Focus on new ingredient approvals

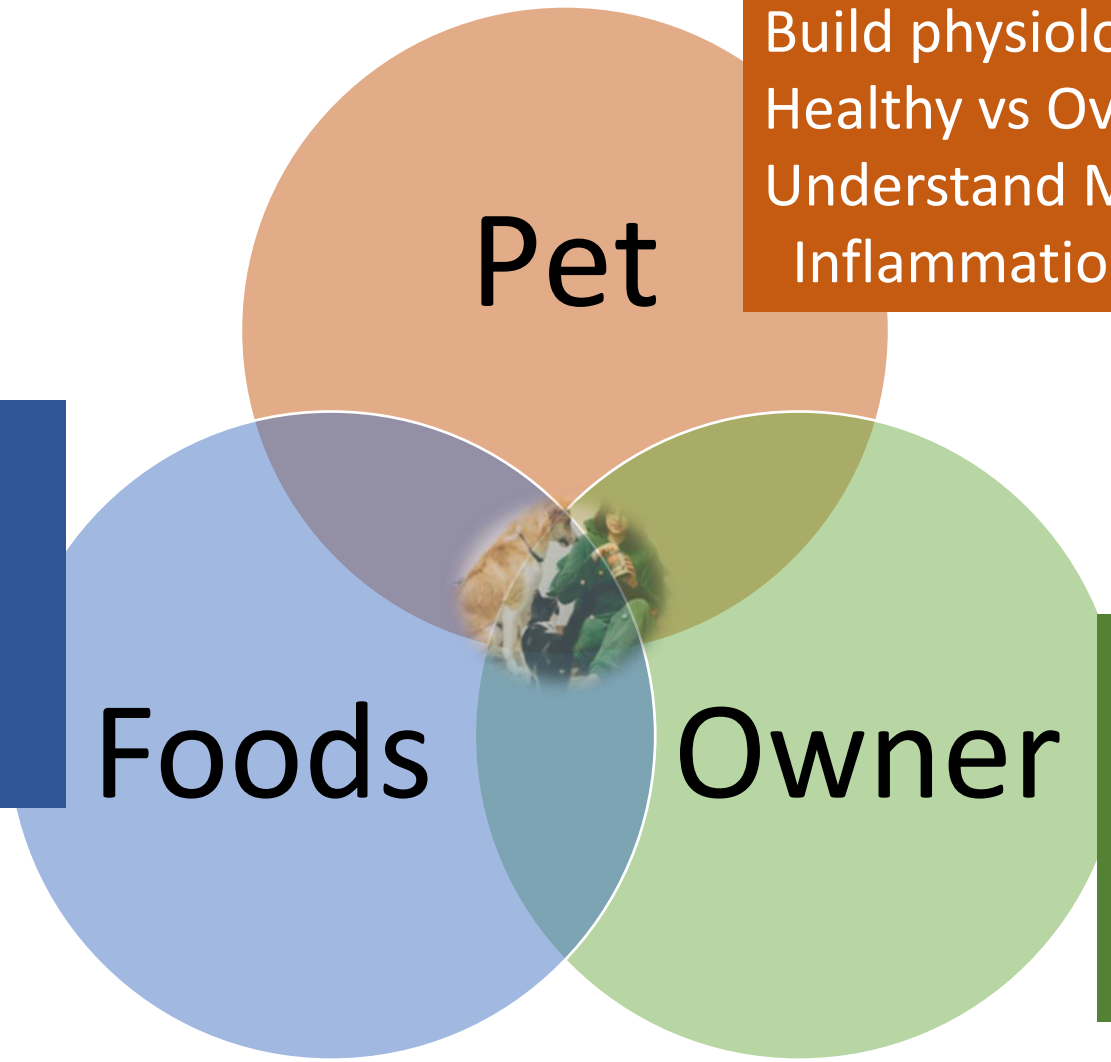


- Fund research to understand pet obesity & health physiology
- Research on novel, differentiated & *effective pet food products & ingredients*

- Highlight existing ingredients with weight benefits
- Develop low fat options
- Develop healthier alternatives with great taste to pets & pet owner appeal

- Engage in owner education
- Avoid promoting 'fat is cute'
- Partner with veterinarians, groomers, trainers about healthy house pet lifestyles

New Approaches to Combat Obesity in Pets



Build physiology knowledge
Healthy vs Overweight/Obesity
Understand Metabolism, Satiety, Inflammation, Microbiome

Nutritional Design
Ingredient selection
New ingredients
Calorie calculation
Feeding guidelines

Engaging Education
Build Owner Connection
Provide Resources
Leverage vets & other pet professionals

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