

Biotics in Pet Food and Modulation of Feline Gut Microbiome

by Diet and Biotic
Supplementation

By Jeff Alix, dsm-firmenich, Global Pet BD Manager

By Brian Klein Ph.D., dsm-firmenich, Principal Scientist



PETFOOD[®]
FORUM

dsm-firmenich 

Biotics Market Review

Sources

- The global innovation and consulting firm Alcimed conducted two global studies for dsm-firmenich to identify key drivers in the pet Biotics space (2019, 2024)
- Other sources of information came from the global marketing and insights agencies:



Biotics Market Review

Types of Biotics

Prepare



Prebiotics

A **substrate** that is selectively utilized by host microorganisms conferring a health benefit

Plant



Probiotics

Live microorganisms that, when administered in adequate amounts, confer a health benefit on the host

Harvest



Postbiotics

A preparation of **inanimate microorganisms** and/or their components that confers a health benefit on the host

Biotics Market Review

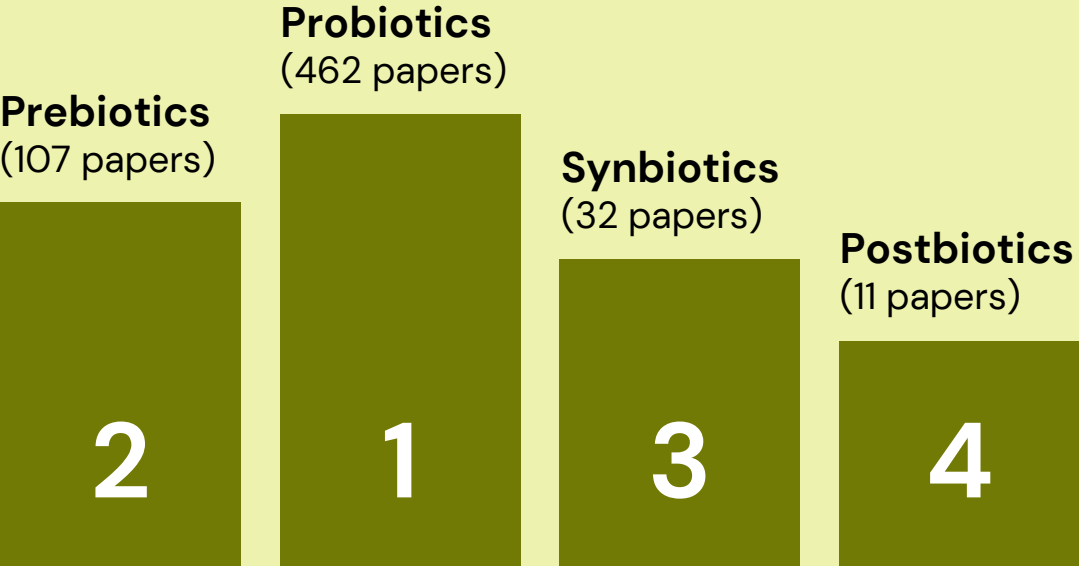
Why use biotics in pet food?

- Pet health trends follow human health trends which leads to an increased use of **Biotics**
- There is a growing body of scientific evidence supporting the use of **Biotics** to improve the health and wellbeing of dogs and cats
- Leading health challenges perceived by pet parents can be addressed by **Biotics** (e.g. anxiety, metabolic health, oral care)
- These are among the most searched problems by pet consumers, which has show double-digit growth YOY
- “Fiber” and “Probiotic” are among the top 4 most searched ingredients by pet consumers
- In 2022, MINTEL reported that “Gut health has the potential to have a big impact not only on overall pet health and wellness but also on pet food marketing due to its connection to many different aspects of pet health, such as skin and coat health, immunity support, weight management and even calming and anxiety relief.”



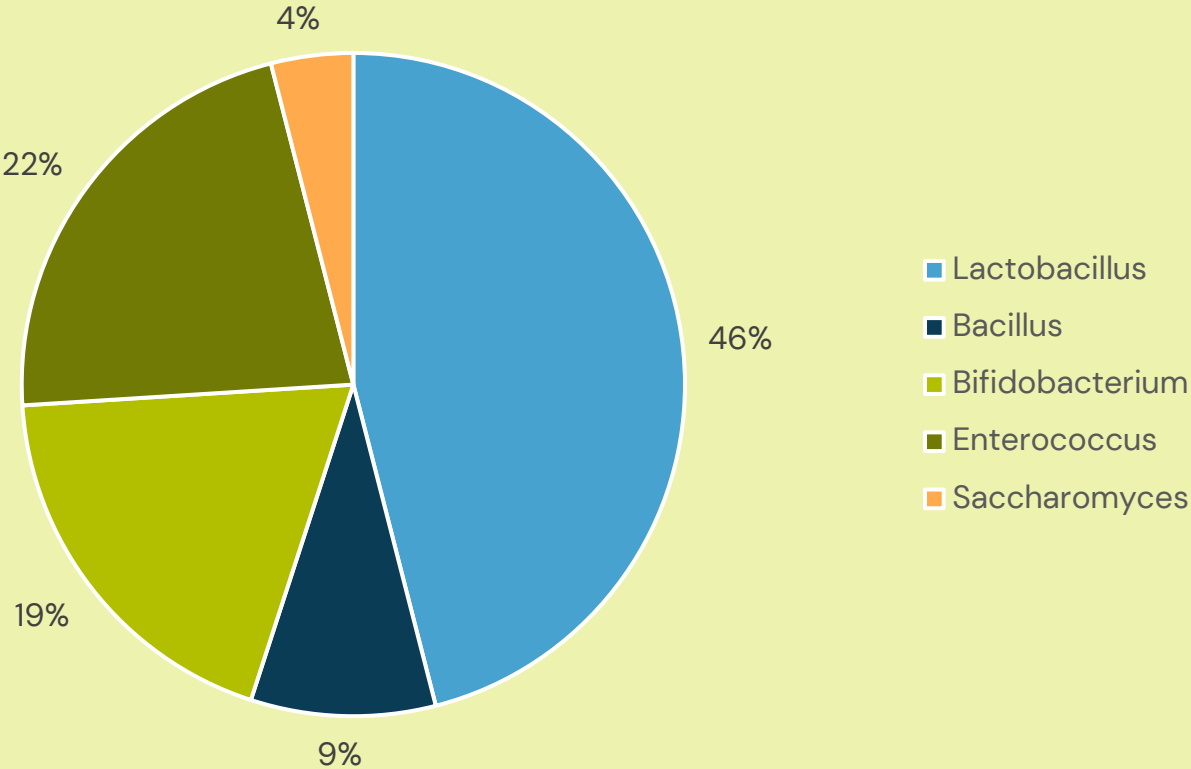
Biotics Market Review

The most studied Biotics used by the pet industry



Scopus query: (canine* OR feline* OR dog* OR "cat" Or "cats" AND pro/pre/syn/post biotic* AND NOT "CAT" (This to avoid excess irrelevant papers studying the CAT enzyme.)

Main Probiotic genera studied in scientific publications



Biotics Market Review

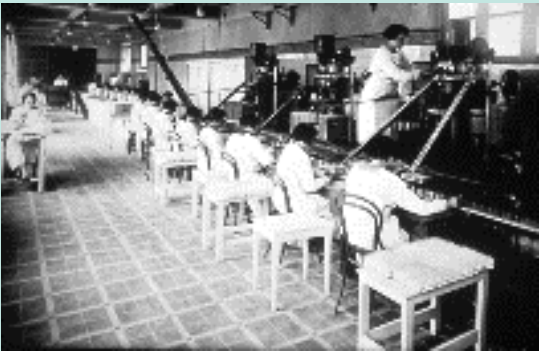
The problem with Prebiotics and Probiotics

- Non-specific **Prebiotics** are widely used in pet foods and are no longer seen as a differentiating factor; opposed to precision prebiotics
- Probiotics, like lactobacillus, are:
 - heat-labile and cannot survive wet or dry pet food processing
 - when applied topically on dry pet foods and treats will not maintain their CFUs over the shelf-life of the product
 - might interfere with production facilities GMP and GHP

Dry extruded pet food is 75% and wet pet retorted food is 21% of the global pet food volume sold



LBiome™ Overview – a postbiotic with a century of history



LBiome



HEAT-STABILIZED
INANIMATE
BACTERIAL CELLS

+



METABOLITES
PRODUCED DURING
FERMENTATION

+



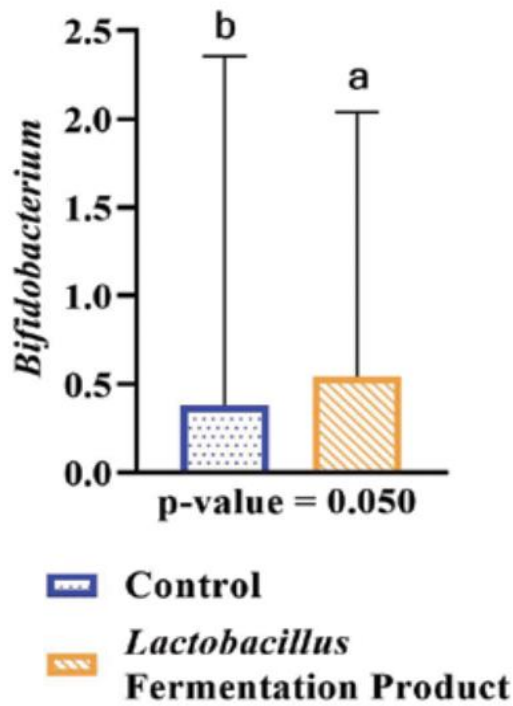
BACTERIAL FRAGMENTS
INCLUDED IN FERMENTED
CULTURE MEDIUM



Prior published LBiome™ data in pets

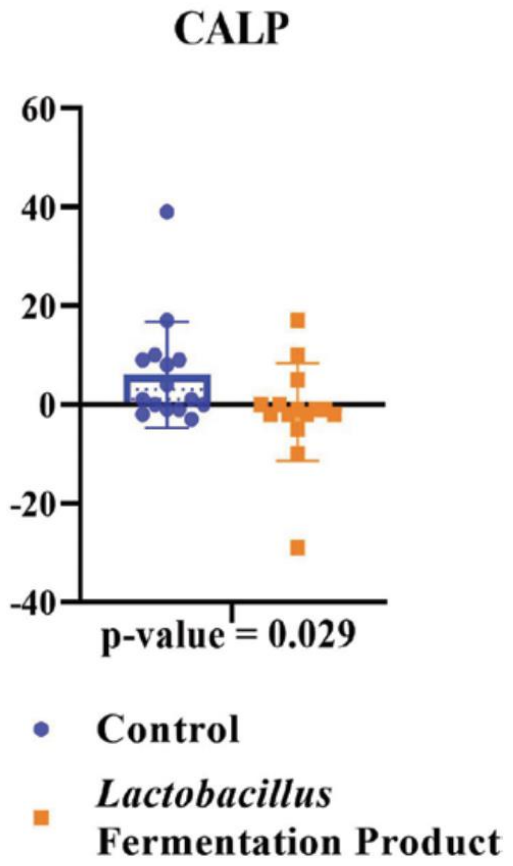
Effects of *Lactobacillus* fermentation product on the fecal characteristics, fecal microbial populations, immune function, and stress markers of adult dogs

Samantha A. Koziol,[†] Patricia M. Oba,^{†,ID} Katiria Soto-Diaz,[†] Andrew J. Steelman,^{†,‡} Jan S. Suchodolski,^{||} Erik R. M. Eckhardt,[§] and Kelly S. Swanson^{†,‡,||,1, ID}



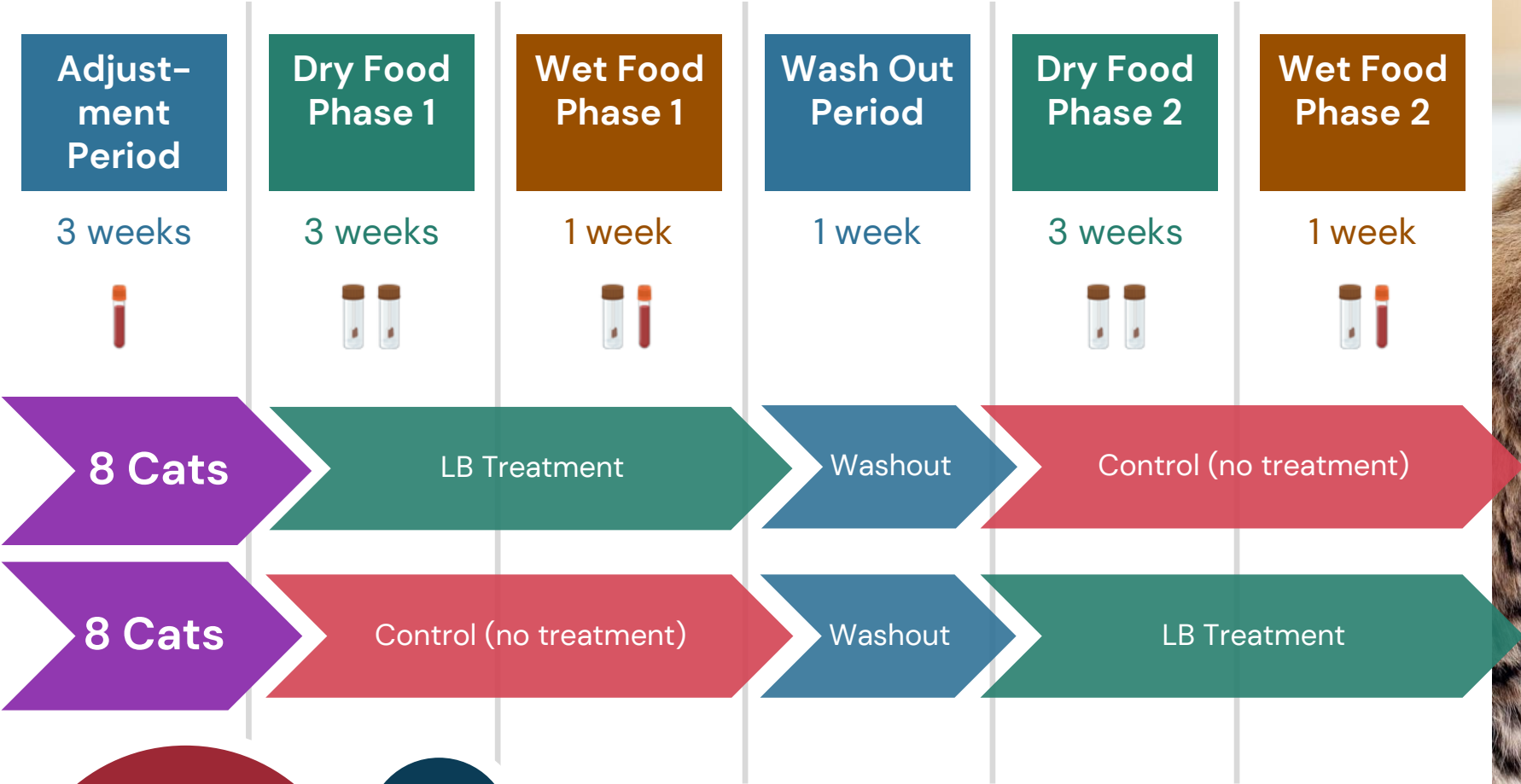
Item	Control	LBFP ¹	P-value
Serum cortisol, ng/mL	-2.45	14.62	0.431
Serum SOD ³ , ng/mL	-8.51 ^b	68.59 ^a	0.0001
Salivary cortisol, µg/dL	1.95	1.45	0.130
Serum MDA ⁴ , nmol/mL	2.08	3.61	0.483

1 *Lactobacillus* fermentation product.
2 Pooled standard error of the mean.
3 Superoxide dismutase.
4 Malondialdehyde.
a,b Means lacking a common superscript differ ($P < 0.05$).

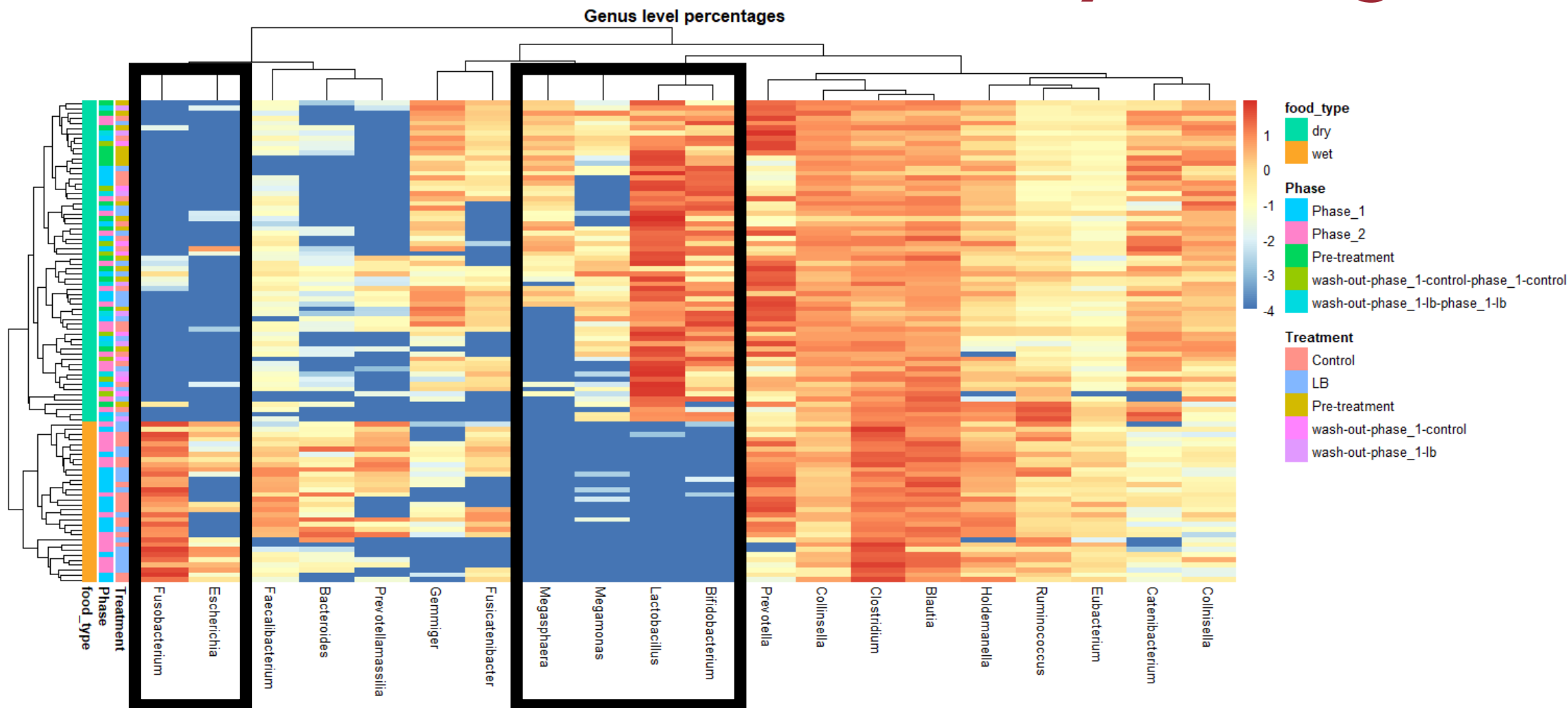


ONIRIS – Trial/Design – Subjects/Time/Samples

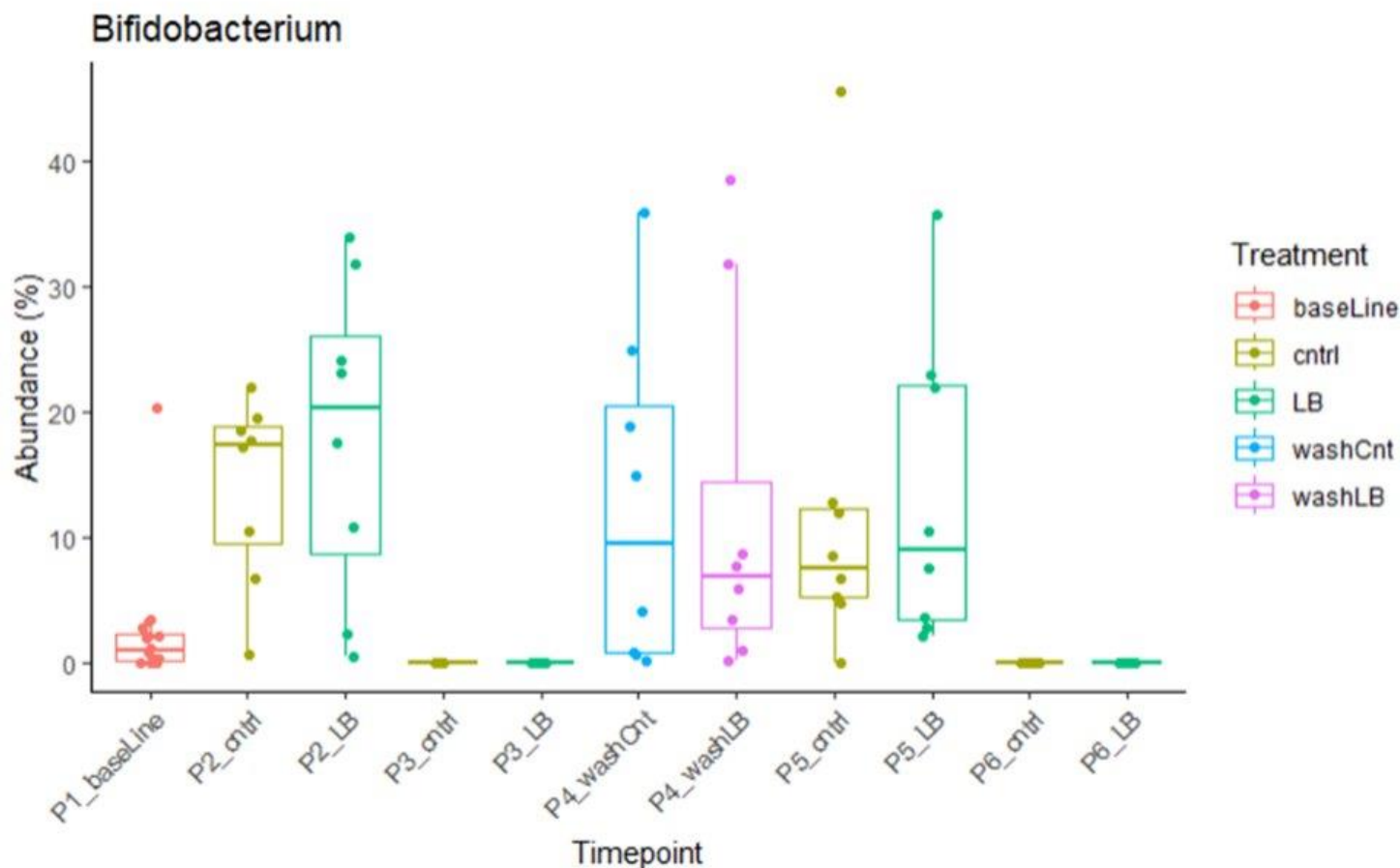
Looking to stabilize the feline gut microbiome when placed under common stressors (e.g., diet change) with the hope of reducing diarrhea



ONIRIS – Microbial Community Changes

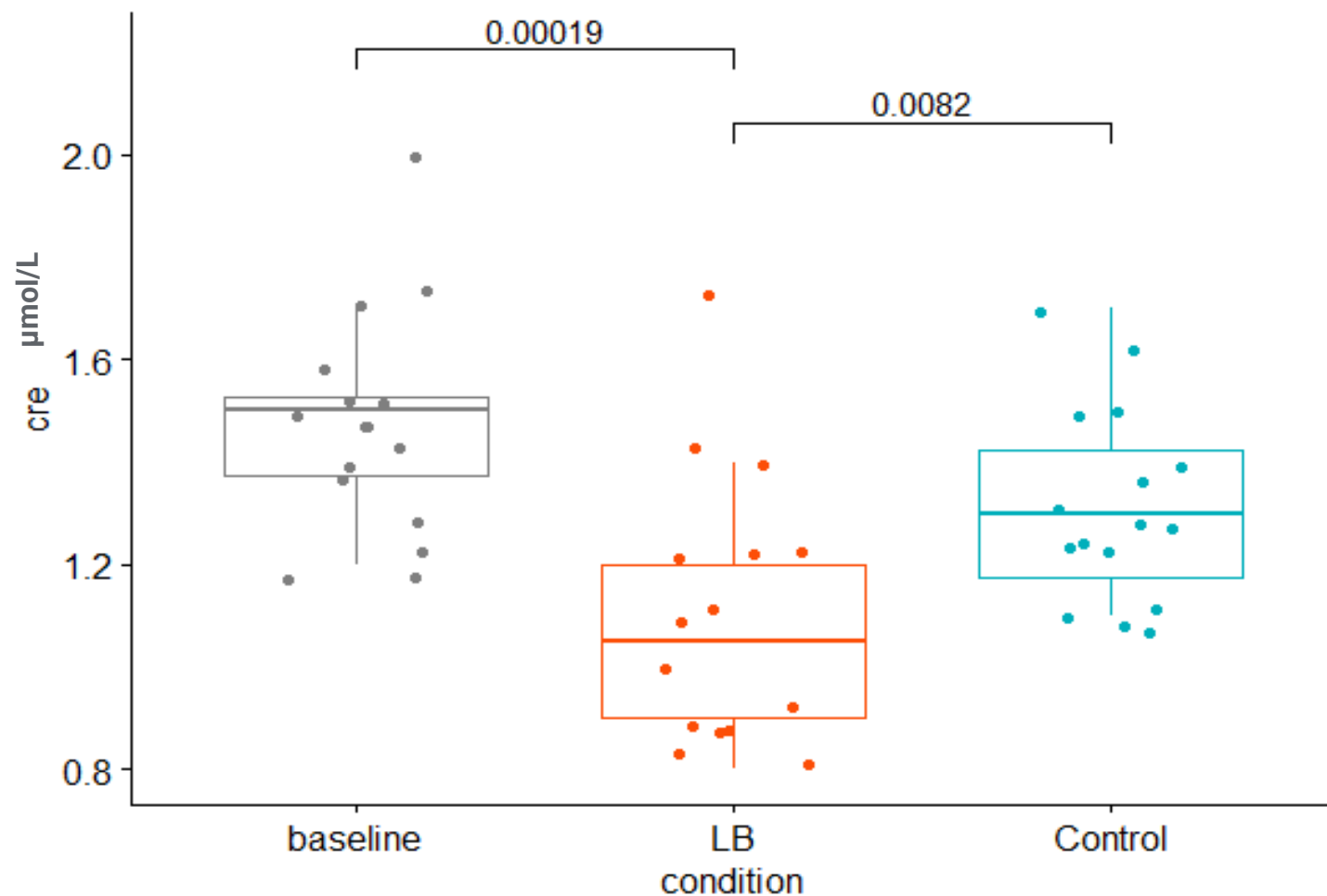


ONIRIS – Specific Genera Modulated



Temporal tracking allows to interrogate acute and reproducible outcomes, as well as to differentiate between the effects of a product versus the environment

ONIRIS – Host Metabolite Modulated



Modulating the host via the microbiome allows for greater examination of the MOA at play

A process stable biotic solution

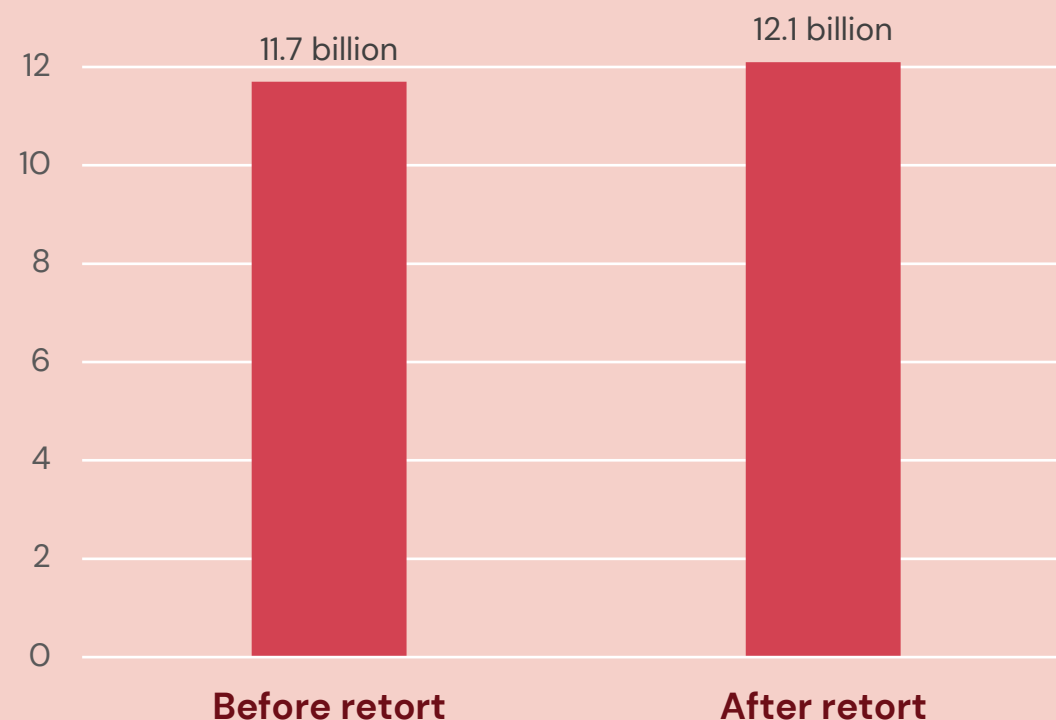
Dry extruded pet food

Measured cell bodies/gram (flow cytometry)

	Before extrusion	After extrusion	Predicted LBiome cell count
Dry pet food	2.5 billion	1.8 billion	0
Dry pet food + LBiome	12 billion	12 billion	13 billion

Wet retorted pet food

Measured cell bodies/gram (flow cytometry)

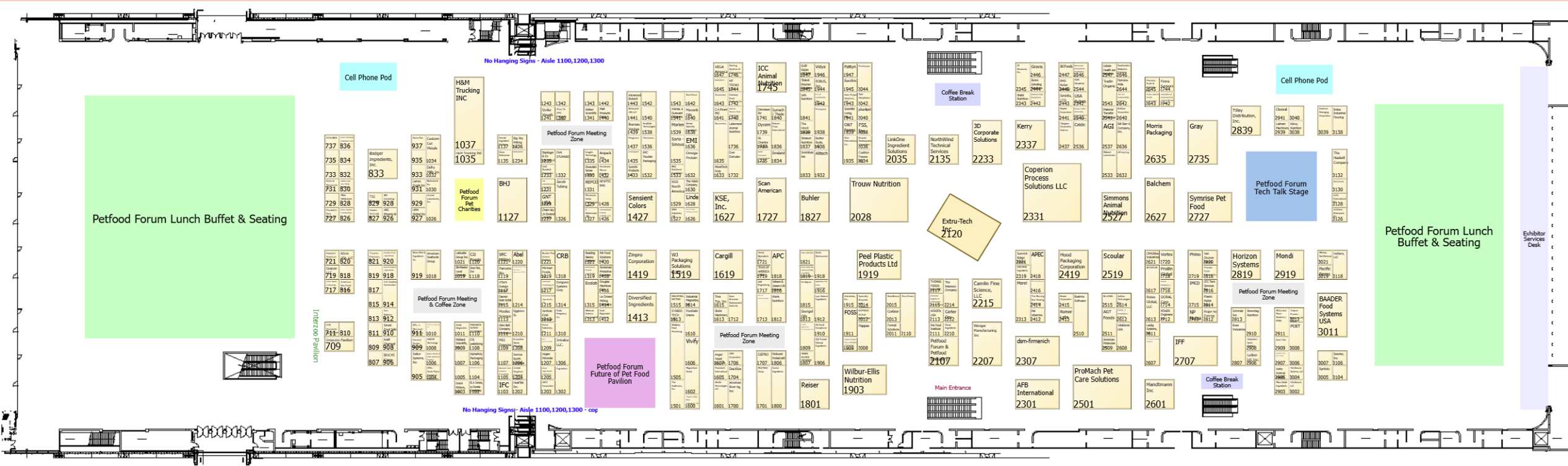


A biotic solution that meets the need

- 😊 consumer friendly lactobacillus-based postbiotic
- 🧩 process stable in dry extruded pet food and wet retorted pet food
- 🧪 Science backed and clinically proven pet health and wellness benefits



Come talk to us at booth #2307



We bring progress to life