



Plant-based Solutions

Pet & Equestrian Nutrition

We're built around you. Just add Glanbia.



Market Trends

33.5B

Forecasted 13% rise in pet food sales between 2020 and 2025, bringing the category to \$33.5 billion



88%

of pet owners in the US say it is important to take preventative measures to protect a pet's health



55%

Of pet food purchasers view 'healthy digestion' as the most important added value benefit in pet food.



84%

Of pet food purchasers agree that it's important to consider nutrition when choosing treats



36%

of pet owners in the US look for all-natural pet foods

Plant-based Solutions

Pet Plant-based Solutions Portfolio for Pet & Equestrian Nutrition

| | Kibble | Baked Treats & Biscuits | Dry Toppings, Supplements | Pouches & Canned Food | Omega-3 EPA & DHA Inclusion |
|----------------------------------|--------|-------------------------|---------------------------|-----------------------|-----------------------------|
| PetFlax™ Kibble Binder | X | X | | | |
| CuisineFlax™ Binder | | X | X | X | |
| CuisineFlax™ Extender | | X | X | X | |
| UltraGrad™ | X | | | X | X |
| CuisineFlax™ Granules | X | | | X | |
| CuisineFlax™ Coarse | X | | | | |
| CuisineFlax™ Stone Ground | | | X | | |

PetFlax™ Kibble Binder

A Solution Based Ingredient for Achieving High Inclusion of Fresh Meat in Extruded Pet Foods

PetFlax™ Kibble Binder is a Patented - scientifically developed ingredient:

- Solution for high meat incorporation into extruded pet food.
- All natural way to provide low/no grain, highly palatable pet food.
- Kibble strength and durability
- Clean label

The Science

- Emulsification and Stabilization Systems that allows for up to 75% fresh meat in extruded and baked pet foods.
- The hydrocolloid is derived from flaxseed thru a special process
- The hydrocolloid complex is then combined with a protein/high phospholipid complex isolated from a whey protein base.

Cross Sectional Photos

30% fresh meat (MDC) inclusion rate



**With PetFlax™
Kibble Binder**



**Without PetFlax™
Kibble Binder**

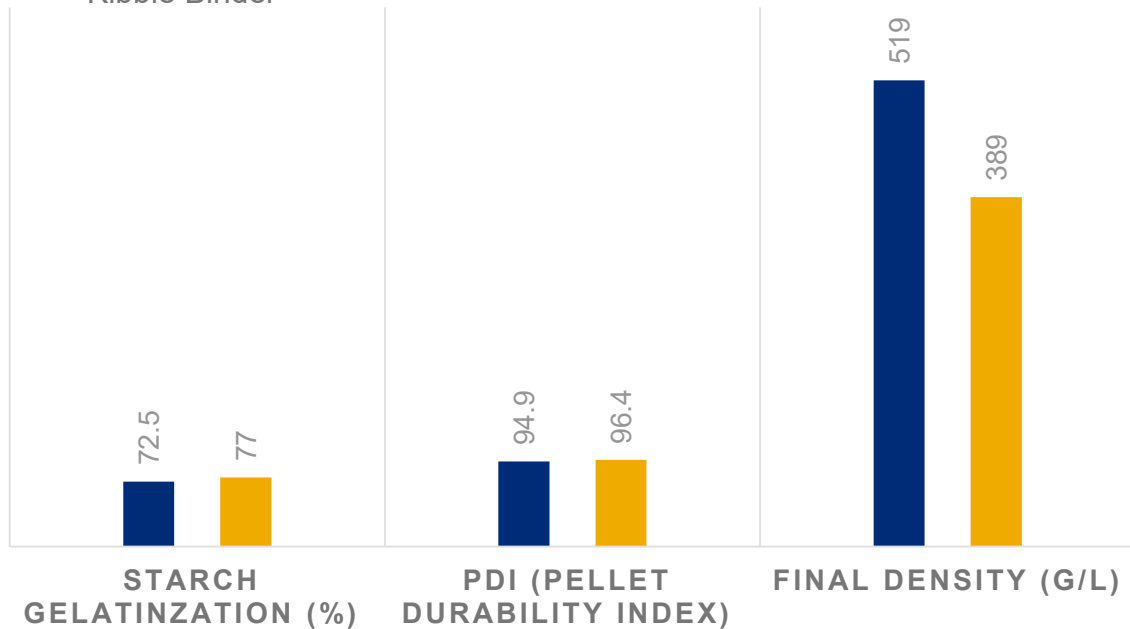
Note: Kibble is less dense,
less prone to breakage
with addition of PetFlax™
Kibble Binder

***8% Inclusion PetFlax™
Kibble Binder**

PetFlax™ Kibble Binder

40% Fresh Meat Added to Extrusion Formula (comparing with & without PetFlax™)

- 100810-011 Grain-based diet with 40% fresh meat (% of dry)
- 100810-011 Grain-based diet with 40% fresh meat (% of dry) + PetFlax Kibble Binder

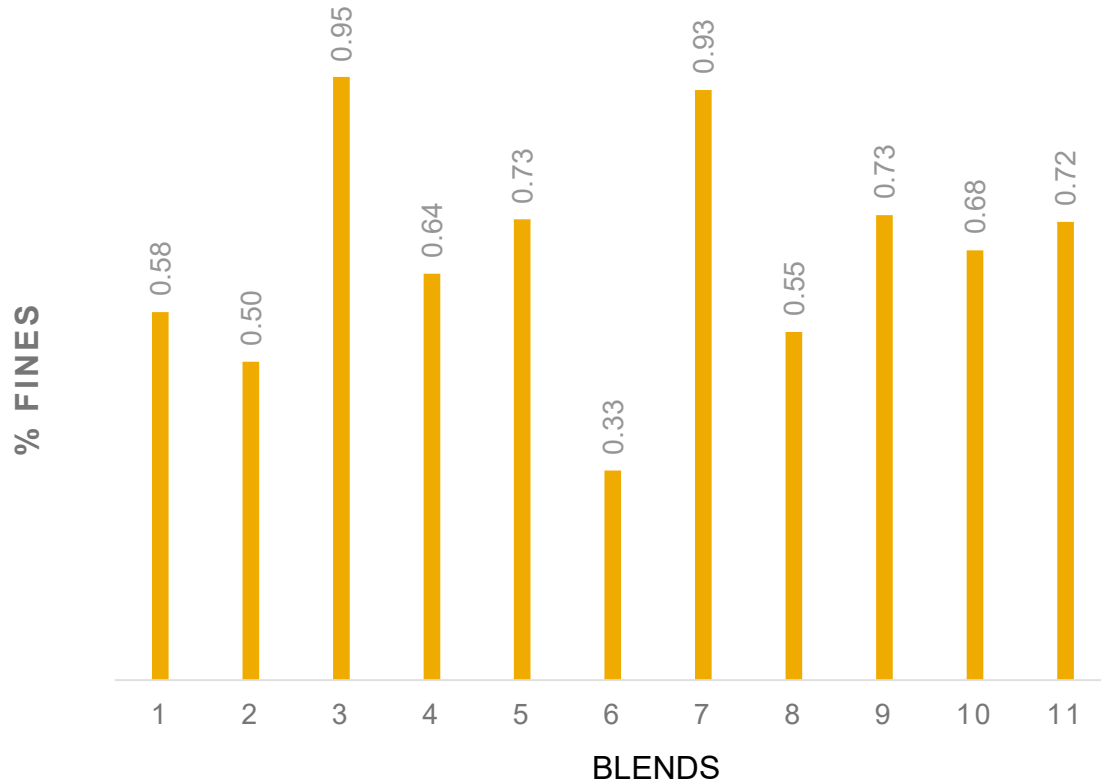


Reduced Motor Load with PetFlax™ Kibble Binder

| Sample | Motor Load | Extruder RPM |
|---|------------|--------------|
| Control with 30% MDC, 0% PetFlax™ Kibble Binder | 40 | 600 |
| 30% MDC Test with 12% PetFlax™ Kibble Binder/2.7% of formula | 36 | 600 |
| 33% MDC Test with 12% PetFlax™ Kibble Binder | 25 | 600 |
| 30% Salmon/MDC Test with added Refined Starches +12% PetFlax™ Kibble Binder | 22 | 600 |

PetFlax™ Kibble Binder

PetFlax™ Kibble Binder Kibble Strength and Durability



Summary of All Trials in Star Shape Extruded test material breakage results *

*Glanbia R & D; Twin Falls ID test after LTL transport from Wenger 40- 50lb bags on pallet

Pictures with and without Inclusion of PetFlax™ Kibble Binder

30% fresh meat (MDC) inclusion rate



With PetFlax™
Kibble Binder

*8% Inclusion PetFlax
Kibble Binder



Without PetFlax™
Kibble Binder

Note: Stickiness of
kibbles when not using
PetFlax™ Kibble Binder

Key Attributes & Opportunities

PetFlax™ Kibble Binder Premiumization

- Potential to go up to 75% of Fresh Meat Inclusion
- Market Driven: High Meat / No Grain Pet Foods
- PetFlax™ Kibble Binder will Bind with MDM to Optimize Kibble Durability
- Improves Nutrition, Palatability and Digestibility
- Helps Improve % Cook, excellent PDI
- Specialized Recipes: Using alternative (non-grain starches) i.e. Potato, Pea, Tapioca; In combination with high levels of fresh meat
- Mechanical & Processing Controls & Equipment: Enhance the ability to include higher levels of fresh meat when combined with ideal recipe and potentially lower processing cost and wear on equipment.

Summary of Results

Consistent Results With PetFlax™ Kibble Binder

- Binds with fresh meat to allow extrusion with high kibble durability
- 5 types of fresh meat tested
- 5 types of starches tested
- Optimized performance level 8 to 18% of the meat
- Results will vary based upon:
 - Type and level of meat
 - Process controls
 - Recipe



Possible Brand Claims with PetFlax™ Kibble Binder

Nutrition: Fiber, Protein

Wellness: High in Omega-3 for early development
and aging pets

Clean-label: Eliminates gums, hydrocolloids

Improved yield: <1% fines builds brand equity

2 year shelf life: MeadowPure quality seed selection



CuisineFlax™ Extender and Binder

CuisineFlax™ Extender and Binder are all-natural, highly-functional ingredients derived from flaxseed that can show cost savings over gum and hydrocolloid systems.

Where does the functionality come from?

- Synergistic functionality from fibrous hydrocolloid mucilage and protein network to aid in viscosity building properties.
- CuisineFlax™ Extender contains fat (>40%), protein (>22%) and fiber (>15%) and is a source of ALA-Omega-3
- CuisineFlax™ Binder is high in fiber (>23%) and high in protein (<40%) which provide excellent moisture migration control properties and the ability to bind both fat and water.



CuisineFlax™ Extender and Binder

- CuisineFlax™ Binder mixes well with ambient temperature water/ high moisture ingredients
- Use consistent / rapid mixing (paddle, ribbon, or other industrial mixing at mid to high speeds).
- Readily absorbs moisture.

| | CuisineFlax™ Extender | CuisineFlax™ Binder | Guar Gum |
|---|---------------------------------|-----------------------------------|------------------|
| Viscosity (cP) on a 1% solution* | 1000-3000 | 1000-3000 | 4270 |
| Total Fat | >40% | <12% | 1% |
| Linolenic Acid (ALA-Omega 3) | 24% | 9% | 0% |
| Fiber | ~18% (soluble and insoluble) | 25-37% (soluble and insoluble) | 85% (soluble) |
| Protein | >22% | <40% | 4% |
| Suggested Use Level | 2X-3X of Guar | 2X-3X of Guar | 1X |
| Suggested Labeling | Milled Flax | Milled Flax | Guar Gum |

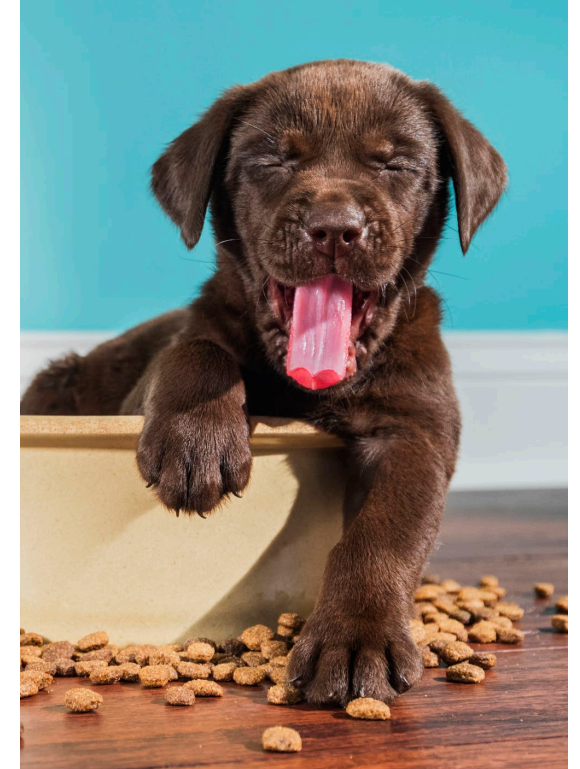
CuisineFlax™ Extender and Binder

Quality Overview

- Natural Food Grade Product
- North American Sourced Product
- Non-GMO
- Lactose Free
- Gluten Free
- Flaxseed is not a known allergen to pets
- AAFCO Approved
- 2-year shelf-life

Replace starches or gums for a cleaner label

- Canned Pet Foods
- Baked Treats & Biscuits
- Chewable Treats or Supplements
- Dry Toppings
- Gravy Toppings



UltraGrad™

Flax and fish oil benefits for equestrian nutrition

Glanbia Nutritionals' UltraGrad™ line combines nutritious flax and EPA/DHA fish oil in an ingredient with superior stability.

"An optimal ratio of Omega-3 and Omega-6 in the diet appears to have effects on more than just giving a shiny, healthy-looking coat, it has been found to have an influence on the immune system and healthy joint tissues.

Specific Omega-3s such as... ALA found in plant tissues like flax, and... DHA and... EPA found in marine oils are showing promise.¹

Rich Omega-3 sources include

- Flax
- Fish oil



Other CuisineFlax™ Solutions

A Cost-Effective Solution for Including Fiber and Omega-3 Fats into Pet Foods

- Natural Food Grade Product
- North American Sourced Product
- Non-GMO
- Lactose Free
- Gluten Free
- Flaxseed is not a known allergen to pets
- High in Omega-3
- AAFCO Approved
- 2-year shelf-life

CuisineFlax™ Coarse / Granules

- Golden flaxseed

CuisineFlax™ Stone Ground Brown

- Brown flaxseed
- Darker brown in color
- Nutty flavor notes

