

Let your livestock business gain more, starting with the right ingredient source.

# EMPYREAL<sup>®</sup> 75

## Pure protein. More gains.



Gain more with  
**EMPYREAL<sup>®</sup>**

Real and consistent business results are achieved when nutritional advantage is gained beginning with the right source.

And that's what EMPYREAL<sup>®</sup> 75 is -- a pure, clean, highly digestible protein source, and high quality feed ingredient that let your livestock production gain more.

# GAIN MORE FROM GUARANTEED QUALITY.

## EMPYREAL® 75

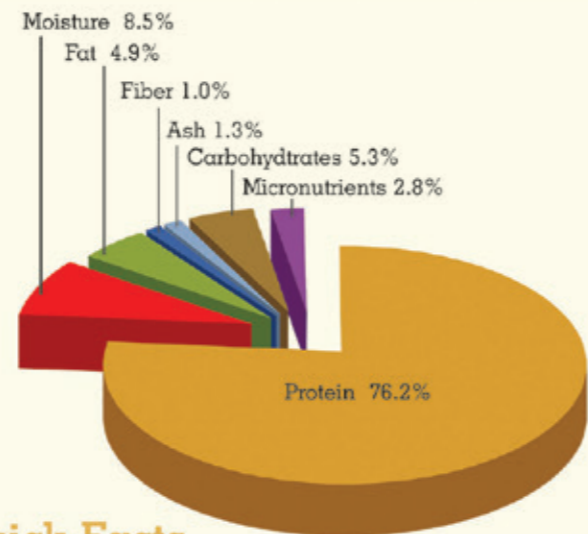
- ✓ Consistent source of high quality protein
- ✓ Highly digestible protein and key source of essential amino acids
- ✓ EMPYREAL® 75 is a good source of energy for livestock. A 100% protein concentrate from wet corn-milling process. Think of it as extracting the finest protein from corn and what you get is a pure and concentrated protein ingredient for your livestock's feed that will optimize animal productivity, enabling you to have more gains in your business.

EMPYREAL® 75 is a natural and pure source of consistent, clean and highly concentrated protein that has **HIGH** amino acid digestibility and **EXCELLENT** level of energy, suited for livestock formula, resulting in consistent feed formulation and more predictable animal performance.

EMPYREAL® 75 guarantees consistently excellent nutritional ingredient quality, free from impurities, low in anti-nutrition factor, low in mycotoxin, and certified by only the strictest, superior manufacturing systems and processes from EMPYREAL® 75 plants in the United States.



Cargill® is the first animal food facility in the US to get FSSC 22000 certification for the manufacturing process of its EMPYREAL® animal food ingredient product at its Blair, Neb., and Dayton, Ohio facilities as certified by Lloyd's Registry Quality Assurance. The new certification validates that Cargill's robust food safety management system meets the safety and quality requirements of major branded feed companies worldwide. In addition to this certification, EMPYREAL® production facilities are Occupational Safety and Health Administration, Voluntary Protection Programs (OSHA VPP) - and International Organization for Standardization (ISO) 22000-certified.



### Quick Facts

- 100% pure plant protein
- Essential and functional nutrients
- Low in fiber
- High level of natural antioxidants
- Low in anti-nutritional factors and low in mycotoxins
- Low ash and moisture



## PHYSICAL PROPERTIES AND FUNCTIONALITY

Revised: 1 May 2016

**Ingredient(s):**  
100% Corn Protein Concentrate

**Description (AAFCO 48.89):**  
*Corn Protein Concentrate* is the dried proteinaceous fraction of the corn primarily originating from the endosperm after removal of the majority of the non-protein components by enzymatic solubilization of the protein stream obtained from the wet-milling process. The proteinaceous fraction of the corn must contain not less than 80% protein on a moisture free basis and not more than 1% starch on a moisture free basis. The product must be labeled on an "as fed" basis. This fraction shall be free of fermented corn extractives, corn germ meal, and other non-protein components except in such amounts as might occur unavoidably in good manufacturing processes.

**Intended Use:**  
For use as an ingredient in the manufacture of animal feeds of all life stages.

**Manufacturing:**  
EMPYREAL® is produced in Cargill facilities located in the United States and meets all applicable U.S. Federal and State regulations for animal food. EMPYREAL® is produced in accordance with current good manufacturing practices for animal food with quality, food safety, and prerequisite programs.

**Certifications:**  
Kosher, Halal, Food Safety Systems Certification 22000, ISO22000

**Shelf Life:**  
Eighteen months from manufacture date. Evaluate for fitness of use after 18 months.

**Optimum Storage Conditions:**  
Store in a clean, dry place.

**Packaging:**  
Bulk rail, hopper trailer, ocean container. Equipment shall be in good working order. Bags and totes are available upon request.

### Guaranteed Analysis: (\*COA available with shipment)

Parameter	Minimum	Target	Maximum	Primary Method
Moisture (%)*	--	8.0	12.0	CRA G-16
Protein (%)*	75.0	--	--	AOAC 990.03 or CRA G-22
Fat (%)	2.0	--	--	CRA G-11
Aflatoxin (ppb)*	--	< 10ppb	< 20.0	Lateral Flow Assay/HPLC
Fumonisin (ppm)*	--	< 5ppm	< 10.0	Lateral Flow Assay/HPLC
Vomitoxin (DON) Deoxynivalenol (ppm)	--	< 2ppm	< 2.0	HPLC
Starch (%)*	--	--	1.0	Ewers Starch - EC L123/72

\*Sampling methods and Toxin Testing Methods used are GIPSA approved

Physical Characteristics:	
Uniformity	Free flowing, no clumps present
Odor	Cereal-like
Color	Golden Yellow
Specific Gravity	0.6 to 0.65 typical

# GAIN MORE DIGESTIBILITY & VALUE FOR YOUR LIVESTOCK



## EMPYREAL® 75 Amino Acid Digestibility in Ileal-cannulated Pigs

### Background:

Pigs, as any other livestock, require energy, amino acids, minerals and vitamins for proper growth and development. Which ingredients these nutrients are obtained from are not imperative, as soon as they are digestible, absorbable and available in accurate proportions, predominantly in their early ages for optimal future development. An indirect look at how pigs digest and absorb the nutrients in EMPYREAL® 75 will further assist on formulating feed for this livestock.

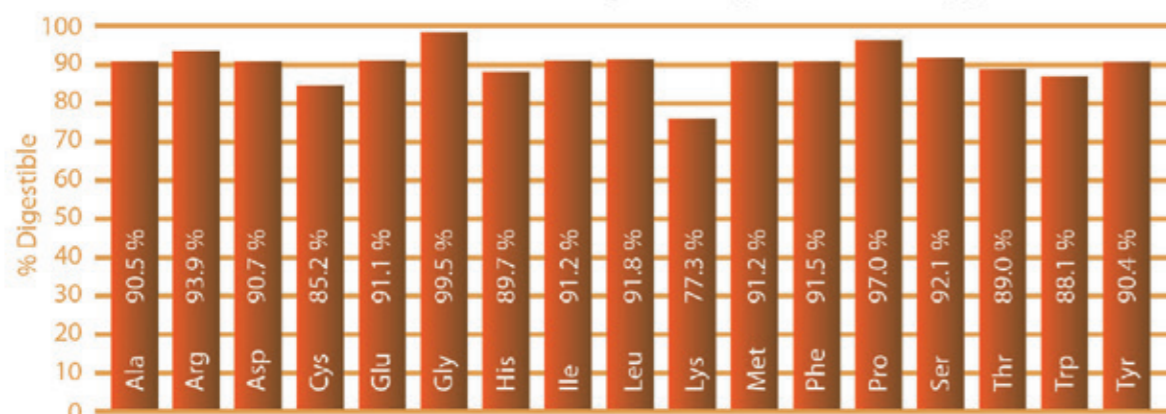
### Objective:

Assess the standard amino acid digestibility of EMPYREAL® 75 in ileal-cannulated pigs.

### Materials and Methods:

- A nitrogen-free diet, or a diet with EMPYREAL® 75 (28.3% inclusion, 21% crude protein diet), were fed for 2 weeks to 12 ileal-cannulated pigs (6 animals per treatment);
- Pigs were fed twice a day at 3 times the pig daily ME maintenance requirement (NRC, 1998);
- Digesta samples were freeze-dried and pooled within pig and period and amino acid were analyzed.

Standard ideal amino acid digestibility (SID) of Empyrean® 75



### AMINO ACIDS

Metabolizable Energy (ME) for swine: 4,480 Kcal/kg

### Results:

- ✓ The pigs responded very well to the diet palatability;
- ✓ The amino acid digestibility numbers were very good, averaging 90%;
- ✓ The overall animal performance and health of the animals were excellent.

## EMPYREAL® 75 Amino Acid Digestibility in cecectomized Roosters

### Background:

Protein digestibility of animal and vegetable origin can be variable due to manufacturing practices and the presence of anti-nutritional factors. To verify the availability of EMPYREAL® 75, an in vivo digestibility study was conducted at the University of Illinois in cecectomized roosters.

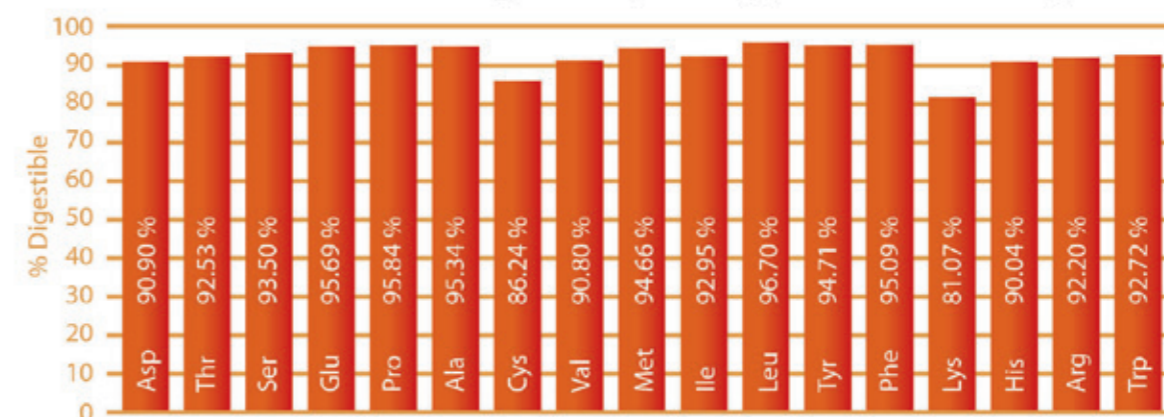
### Objective:

Evaluate the digestibility of EMPYREAL® 75 in cecectomized roosters.

### Materials and Methods:

- Four Single Comb White Leghorn roosters (40-week old) were fed about 25 grams of as-is EMPYREAL® 75 in 25ml of water
- Excreta was collected for 48 hours, lyophilized, weighed, ground, and the parameters analyzed.
- The ingredient was analyzed for gross energy, total metabolizable energy (TME<sub>n</sub>), and true amino acid digestibility (TAA) in cecectomized roosters.

True Amino Acid Digestibility of Empyrean® 75 in Poultry



### AMINO ACIDS

True Metabolizable Energy (TME) for poultry: 4,453 Kcal/kg

### Results:

- ✓ The total metabolizable energy value shows digestibility of about 80%
- ✓ True amino acid digestibility is mostly above 90%.



## GAIN MORE CONFIDENCE

that you get consistently pure protein  
in every shipment straight from the U.S.

EMPYREAL® 75 is a natural source of high-purity plant-derived protein delivered without artificial preservatives. Our quality-assurance focus ensures product integrity, every shipment, every time. EMPYREAL® 75 is a consistent, valuable source of low-ash, highly digestible protein that is rich in nutrients and is also a natural source of antioxidants. This plant-based protein concentrate is an environmentally sustainable and economically affordable source of naturally pure protein. Because EMPYREAL® 75 is manufactured on purpose and is not a by-product, you can depend on it to be consistent nutritionally and provide the same functional advantages every time. EMPYREAL® 75 promotes superior texture, binding and physical characteristics when used as an ingredient in your products.

### Typical Analysis (As-is Basis)

Protein	76.2%	Ash	1.3%
Fat, Acid Hydrolysis	4.5%	Starch	0.5%
Crude Fiber	1.0%	Carbohydrates	5.3%
TDF	5.0%	Density, lb/cu ft	41
Moisture	8.5%	Linoleic Acid	2.55%
		Xanthophyll, mg/kg	287

### Nutritional Information

Amino Acid Content	As-Is	% Protein	Carotenoids/Antioxidants (ppm)	
Alanine	6.17	8.16	cis-Lutein	35-55
Arginine	2.28	3.02	trans-Lutein	90-150
Aspartic Acid	4.24	5.62	cis-Zeaxanthin	20-35
Cystine	1.15	1.52	trans-Zeaxanthin	90-120
Glutamine/Glutamic Acid	15.29	20.26	alpha-Cryptoxanthin	20-28
Glycine	1.79	2.37	beta-Cryptoxanthin	10-16
Histidine	1.55	2.06	alpha-Carotene	2-4
Isoleucine	3.06	4.06	beta-Carotene	15-25
Leucine	12.63	16.73		
Lysine	1.08	1.43	<b>Minerals</b>	
Methionine	1.70	2.29	Calcium	0.05%
Phenylalanine	4.65	6.16	Potassium	0.15%
Proline	6.68	8.84	Phosphorus	0.24%
Serine	3.47	4.60	Magnesium	0.05%
Threonine	2.25	2.98	Chloride	0.29%
Tryptophan	0.32	0.42	Sulfur	0.95%
Tyrosine	3.95	5.24	Sodium	0.25%
Valine	3.36	4.45	Iron, ppm	73.6
<b>Vitamins (mg/kg)</b>			Zinc, ppm	47.9
Vitamin A (Retinol)	13.4		Manganese, ppm	4.3
Choline	190		Copper, ppm	11.1
Niacin (B3)	46.9		Chromium, ppm	0.00
Pantothenic Acid (B5)	1.88		Molybdenum, ppm	0.74
Pyridoxine (B6)	5.45		Selenium, ppm	1.97
Riboflavin (B2)	2.73		Iodine	<5.0
Thiamine (B1)	0.41			
Biotin (B7)	0.18			
Inositol	1604			



EMPYREAL® 75 is a high quality, highly concentrated, natural protein. The nutritional composition of EMPYREAL® 75 is extremely consistent in every batch, creating a consistent feed formulation.

Presence of natural antioxidants (carotenoids) gives EMPYREAL® 75 a long shelf life and boosts the piglet's immune system.

A flowable, consistent, and fine particle presentation of the ingredient makes it easy to blend in the diet with very good digestibility numbers for growth and health.

Feeding baby pigs diets made with EMPYREAL® 75 helps ensure a consistent high performing starter diet to accelerate growth early in life, giving the farmer peace of mind, and making your feed mill their partner of choice.

### RECOMMENDED USAGE FOR LIVESTOCK ANIMALS:

**SWINE:** Piglets: 3-7% in the formula

Starter- Grower- Finisher- Breeders:  
2-5% in the formula

**POULTRY:** Broiler and Layer:

3-5% depending on stage

\*\*Always consult your ANIMAL NUTRITIONIST for your specific farm/ feedmill formulation

### RECOMMENDED USAGE FOR FISH NEEDS:

**A:** All Shrimp species, Carnivore fish (marine fish, salmon, snakehead, seabass (barramundi), etc.)

Starter feed for fresh water fish:

Inclusion rate: 8-30%

**B:** Fresh water fish

(tilapia, milkfish or bangus, catfish, etc.)

Inclusion rate: 3-5%



The total metabolizable energy value for EMPYREAL® 75 of about 80% is commonly seen in protein ingredients with extremely low fat and carbohydrates.

Numbers above 90% for true amino acid digestibility.

EMPYREAL® 75 is recognized as an outstanding highly concentrated protein source for livestock feed, pet food and aquaculture feed.



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Gain more with  
**EMPYREAL**

For more information, about EMPYREAL® 75, visit <http://www.empyrealgrowth.com>  
or call 866.369.5498 or 402.533.4282.

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