



## BIOGRO SUPER® - A HIGH QUALITY ALTERNATIVE TO FISHMEAL

Recently, a commercial A.O.A.C. referred laboratory compared **BIOGRO SUPER®** to several samples of fishmeal obtained from Thailand in a series of laboratory tests. Results of these analyses reveal that **BIOGRO SUPER®** is an excellent alternative to Asian fishmeal for incorporation in livestock and poultry feeds.

ITEM	FISHMEAL #1	FISHMEAL #2	FISHMEAL #3	<b>BIOGRO SUPER®</b>
MOISTURE	9.59	9.65	10.96	<b>7.49</b>
PROTEIN, %	57.40	59.90	56.40	<b>57.30</b>
NON-PROTEIN NITROGEN, % OF PROTEIN	4.92	8.37	3.22	<b>0.65</b>
TRUE PROTEIN, %	52.48	51.53	53.18	<b>56.65</b>
FAT, %	5.70	4.81	8.30	<b>7.33</b>
SALT, %	2.30	2.60	2.20	<b>1.60</b>
ASH, %	30.20	28.67	28.93	<b>27.95</b>
CALCIUM, %	7.12	7.74	8.43	<b>6.81</b>
PHOSPHORUS, %	2.74	2.90	4.02	<b>2.53</b>

**BIOGRO SUPER®** contained a similar level of crude protein as the fishmeal samples. However, much less of the protein provided by **BIOGRO SUPER®** was in the form of non-protein nitrogen – up to 92% less than the fishmeal! Although non-protein nitrogen is included in the protein content of these ingredients, it is of no nutritive value to pigs and poultry. Non-protein nitrogen is found at relatively high concentrations in fishmeal that has been improperly processed, or contaminated with chemicals, such as urea. So, **BIOGRO SUPER®** had significantly more true protein than any of the fishmeal samples – protein that is available for the animal's growth, production, and reproduction.

**BIOGRO SUPER®** also compared favorably with the three fishmeal samples for fat, ash, calcium and phosphorus content. The fishmeals contain greater salt than **BIOGRO SUPER®**. High salt content is undesirable because it can limit the use of fishmeal in the complete feed. The lower salt present in **BIOGRO SUPER®** gives this product an advantage over fishmeal.





Fishmeal is added to the diets of pigs and poultry primarily as a source of amino acids. Therefore, the laboratory also compared the amino acid profile of **BIOGRO SUPER®** to a composite sample of the Asian fishmeals. Again, **BIOGRO SUPER®** proved to be an excellent alternative to fishmeal.

## COMPARISON OF AMINO ACID COMPOSITION

AMINO ACID	BIOGRO SUPER®	FISHMEAL
Lysine	4.02%	3.44%
Methionine	1.62%	1.56%
Cystine	0.64%	0.45%
Tryptophan	0.55%	0.48%
Valine	2.99%	1.79%
Arginine	2.85%	3.24%
Aspartic Acid	6.83%	5.92%
Serine	2.54%	2.19%
Glutamic Acid	6.18%	7.32%
Proline	2.86%	2.50%
Glycine	4.28%	3.88%
Threonine	2.06%	2.24%
Alanine	3.60%	3.04%
Isoleucine	1.01%	1.99%
Leucine	5.05%	3.82%
Tyrosine	1.49%	1.34%
Phenylalanine	2.82%	1.85%
Histidine	2.31%	0.85%

**BIOGRO SUPER®** had greater concentrations of nearly all of these essential amino acids than fishmeal, including many of the key amino acids for pig and poultry diets.

AMINO ACID	PERCENTAGE INCREASE WITH BIOGRO SUPER®
Lysine	16.9
Methionine	3.7
Cystine	42.0
Tryptophan	14.6
Valine	67.0
Arginine	13.7

So, **BIOGRO SUPER®** is an excellent alternative to Asian fishmeal, for use in all pig and poultry feeds. Not only does the nutrient content of **BIOGRO SUPER®** compare favorably to Asian fishmeal, but the UGF content of **BIOGRO SUPER®** exceeds that of fishmeal many times over, thanks to the incorporation of BIOGRO® - Dawe's Laboratories, USA's primary fermentation product with proven UGF effectiveness.

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