FATS AND PROTEINS
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THE DIRECTOR'S DIGEST

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It has been stated in previous issues of "The Director's Digest" that feeding trials were under way to determine the nutritive value of meat meal produced by the enzymatic rendering process. We now have results from two different tests using this product in chick rations. The results are somewhat disappointing as indicated by the following summary of these trials.

Professor H. M. Scott, Department of Animal Science, University of Illinois, compared the enzymatically rendered meat meal with isolated soybean protein supplemented with methionine. He used a highly purified diet and a 7-day feeding period in an experiment designed to determine whether or not the meat meal contained available, essential amino acids in proper proportions for optimal chick growth. The results (Table 1) show that the meat meal was not as good as the soybean protein when used as the sole source of protein in the ration.

Table 1. Chick Response to Soya Protein and Enzymatically Rendered Meat Meal as Protein Supplements.

Protein %	Source of Protein	Gain per Chick g	Feed per Chick g	Gain / Feed	Protein Consumed per Chick g	Gain / Protein	Net Protein Retention
10	Soya	56.3	134.7	.418	13.47	4.179	4.432
	Meat Meal	20.2	86.7	.233	8.67	2.328	2.730
15	Soya	75.6	137.0	.552	20.55	3.678	3.844
	Meat Meal	33.7	97.8	.345	14.67	2.295	2.529
20	Soya	90.8	137.7	.660	27.53	3.299	3.422
	Meat Meal	49.7	116.3	.427	23.27	2.137	2.282
25	Soya	97.0	131.0	.742	32.75	2.965	3.066
	Meat Meal	59.9	118.4	.506	29.59	2.026	2.139
0		-3.4	62.3	-.055	0	-	-

In fact the ration containing 25% protein from the meat meal was only as effective as the ration containing 10% protein from soybean protein on the basis of weight gains and feed efficiency.

Professor Hans Fisher, Department of Animal Sciences, Rutgers University, studied the growth response and protein utilization of the enzymatically rendered meat meal as compared to regular meat meal in a purified ration and in a corn-soy broiler type ration.

Table 2. Three Week Body Weights and Net Protein Utilization of Chickens Fed Various Proteins at 13% Portein Level in Diet. (Mean values with standard error)

Protein Source	Body Weight g	Protein Utilization %
Regular Meat Meal	92 ± 3	34.3 ± 3.0
Ditto + 0.1% Tryptophan	93 ± 3	41.9 ± 0.3
Enzyme Meat Meal	85 ± 3	36.5 ± 1.4
Ditto + 0.1% Tryptophan	83 ± 4	29.8 ± 3.2
Corn-soy	201 ± 6	55.2 ± 1.6
Corn-soy - reg. meat meal	199 ± 7	67.3 ± 0.6
Corn-soy - enz. meat meal	202 ± 5	62.8 ± 2.2
Corn-soy - fish meal	220 ± 5	61.6 ± 0.4

The results (Table 2) show that weight gains of chicks on the enzymatically rendered meat meal as the sole source of protein were slightly inferior to those observed when regular meat meal was fed at the 13% protein level. When meat meal was substituted for part of the soy meal (1.8% protein in a 13% protein ration) in a low protein broiler-type ration, the enzymatically rendered product and regular meat meal both gave growth responses similar to the unsubstituted ration and the protein utilization was somewhat improved.

Table 3. Four Weeks Weights and Feed Efficiencies of Chickens Fed Supplements in a Corn-Soy Ration Containing 21% Protein

Protein Supplement[1]	Body Weight g	Feed Efficiency gain/feed
None	432 ± 8	0.54
Regular Meat Meal	432 ± 9	0.54
Enzyme Meat Meal	430 ± 9	0.57
Fish Meal	454 ±10	0.58

1/ Added at 4% protein level to replace an equivalent amount of soy protein

The results from a four week feeding trial, in which part of the soy protein in a 21% protein broiler ration was replaced with meat meal or fish meal, showed that the ration containing emzymatically rendered meal gave equivalent gains and better feed efficiency than the straight soy or regular meat meal rations (Table 3). In this experiment neither type of meat meal gave weight gains as great as those obtained with fish meal.

These results clearly reflect the type of starting material that was used to produce the enzymatically rendered meat meal. The amino acid analysis of the finished product indicates that the protein from which it was derived was approximately 40% collagen. A product of higher nutritive quality would of course be obtained if the raw stock contained a lower proportion of collagen type proteins.

NEWS NOTES

Several technical papers of direct interest to the rendering industry were presented at the 56th Annual Meeting of the American Oil Chemists' Society in Houston, Texas, April 25-28. Dr. A. M. Schwartz, Harris Research Laboratories, reported that sucrose-fatty acid ester surfactants in heavy duty laundering formulations performed as well in detergency as standard anionics. They were outstandingly better in redeposition performance and lime soap dispersion. Esters of the 18carbon fatty acids (tallow fatty acids) generally performed better than esters of shorter chain acids. C. C. Galeener, Wilson and Company, described a new method for determination of the chick edema factor in fats. This method uses electron capture gas chromatography and requires two days to complete as compared to the 21 day chick bioassay.

The April issue of the Journal of the American Oil Chemists'Society carries a note on the detergent studies now in progress at Lehigh University under the direction of Dr. A. C. Zettlemoyer (see The Director's Digest, September 18, 1964). The Lehigh research team is investigating which of a series of fat-based specimens provided by USDA is the most efficient potential detergent and why. The samples, consisting of salts of esters of alpha-sulpho fatty acids, were produced from animal fats by the Eastern Utilization Laboratory.