



FATS AND PROTEINS RESEARCH FOUNDATION, INC.

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MINERAL CONSTITUENTS IN ANIMAL BY-PRODUCT MEALS

Animal and poultry by-product meals are widely used as ingredients in mixed feeds for all classes of livestock. As our knowledge of feeding requirements for all animals becomes more complete and precise it becomes increasingly important to know the minor element composition of these meals as well as the gross composition, amino acid content, vitamin content, and calcium and phosphorus levels.

Detailed analyses on nearly 300 samples of animal by-product meals collected from more than 50 plants at four different seasons of the year have been reported previously (see Director's Digest Nos. 36, 44, 52 and Feedstuffs, March 15, 1969, p 24). In this same FPRF study, the samples were analyzed spectrographically for many of the inorganic elements that may have nutritional significance in some cases. A summary of these results is presented in Tables 1 and 2. The values from a few completely atypical samples have been omitted from this summary. For example, several samples of meat and bone meal and tankage, all from one plant, contained more than 150 ppm of copper compared to a maximum value of less than 100 ppm in samples from other plants. These values and a few others that were obviously not typical are not included in the summary tables.

Even with these omissions however, the range of values for all the inorganic components is quite great. This of course is due to the wide range of mineral content in the raw material processed. Although some plants produced products of quite uniform mineral composition, there is no indication from the detailed data that mineral element content was related to geographic location or type of operation (meat packer vs. independent renderer). Samples obtained in the spring tended to be somewhat lower in iron and potassium than samples obtained at other seasons of the year.

Despite the relatively large range in values for the various minor elements in animal and poultry by-product meals, the data reported here should give nutritionists a rough indication of the levels of important inorganic constituents in these important feed ingredients.

Table 1. The Potassium, Magnesium, Iron and Boron Content of Animal By-Product Meals

	Potassium		Magnesium		Iron		Boron	
	%		%		ppm		ppm	
	Range	Av.	Range	Av.	Range	Av.	Range	Av.
45% M&B Meal	.8-1.6	1.4	.18-.29	.21	126-610	348	13-25	21
50% M&B Meal	.6-1.6	1.2	.12-.22	.17	170-1120	506	9-25	17
53-55% M&B Meal	.8-1.4	1.2	.12-.22	.17	190-1230	516	9-25	16
60% Tankage	.6-1.4	1.0	.02-.19	.11	640->2000	1382	9-25	15
Feather Meal	<.2-1.0	.4	<.02-.06	.02	130-1310	593	<2-9	4
Poul.By-Prod.Meal	.8-1.4	1.1	.08-.15	.10	256-1080	658	6.8-19	12

Table 2. The Copper, Zinc, Manganese, and Chromium Content of Animal By-Product Meals

	Copper		Zinc		Manganese		Chromium	
	ppm		ppm		ppm		ppm	
	Range	Av.	Range	Av.	Range	Av.	Range	Av.
45% M&B Meal	5.6-18	12	104-196	150	<4-28	9	<6-32	20
50% M&B Meal	5.6-62	15	76-253	138	<4-28	11	<6-76	16
53-55% M&B Meal	5.6-18	11	84-207	135	<4-20	11	<6-30	15
60% Tankage	2.0-98	15	38-281	120	<4-62	14	<6-22	11
Feather Meal	<2 -13	4	96-225	140	<4-28	10	<6-9	6
Poul.By-Prod.Meal	5.5-36	18	104-171	130	<4-19	12	<6-20	10