

ESTIMATION OF CRUDE FIBRE AND CRUDE PROTEIN IN COMMERCIAL POULTRY RATIONS AND SOME IMPORTANT FEED INGREDIENTS

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ABSTRACT

A total of 1218 samples relating to compound poultry rations and feed ingredients were analysed for crude fibre content. The crude fibre contents ranged between 4.79 ± 0.75 and 5.69 ± 2.03 with CV ranged between 14.89 and 35.68 for six categories of commercial poultry rations including chick starter, grower mash, layer mash, broiler starter, broiler finisher and breeder mash. The crude protein contents estimated on 2679 feed samples of compound poultry feed and feed ingredients ranged between 15.86 ± 1.41 and 18.63 ± 1.67 , while the CV ranged from 8.89 to 10.99. The crude fibre and crude protein contents in feed ingredients, agricultural and animal byproducts are specific to each item and the values are based on chemical analyses which are broadly within values prescribed by nutritional standards.

Key Words: Crude protein, fibre, ration, feed ingredients, poultry.

INTRODUCTION

Feed plays an important role in economics of poultry production. It constitutes about 60 to 70 percent in cost of production of eggs and poultry meat (North and Bell, 1990). A balanced poultry ration is prepared based on cereals for energy, vegetable and animal protein sources for amino acids and additives containing vitamins and minerals (Scott *et al.*, 1976). In least cost feed formulation the protein and fibre contents of feed ingredients are of crucial significance (Feltwell and Fox, 1979; North and Bell, 1990), as the latter facilitate nutritionist to choose the ingredients which are economical and have less fibre contents and high protein values to meet nutrient requirements of chickens of different categories (NRC, 1994). In Feed Testing Laboratory of Poultry Research Institute, Rawalpindi, a total of 1218 and 2679 feed samples received during 1996-2000, were analysed for fibre and protein contents, respectively. The analytical results needed to be critically examined so that they are reported for guidance to the poultry nutritionists and farmers, hence this communication.

MATERIALS AND METHODS

A total of 1218 samples of compound poultry feed and feed ingredients for fibre contents and 2679 samples for protein contents were received during 1996-2000 in the Feed Testing Laboratory of Poultry Research Institute, Rawalpindi for estimation of crude fibre and crude protein contents. The number of samples received for analyses is given in Table 1. The samples were received from poultry farmers through

post, with feed samples packed in polyethylene bags. In some cases, feed samples were collected by Feed Samplers of the Institute on request or complaint. Feed samples received for analyses represented different feed Mills and different areas throughout the Punjab Province. When feed samples were received in Feed Testing laboratory, these were stored in glass bottles with tight caps and kept in dry and ventilated room. Prior to analysis, the feed samples were ground and mixed thoroughly. One gram of compound poultry feed or feed ingredient sample was taken each time analysis was to be conducted either for crude fibre or crude protein. Feed samples were chemically analysed by means of standard methods (AOAC, 1990). Mean (\pm SD) and co-efficient of variation (CV) were computed in order to assess dispersion of values around means (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

The results of analyses of compound poultry feeds and feed ingredients for crude fibre and crude protein are given in Table 1. The results show that mean(%) crude fibre contents ranged between 4.79 ± 0.75 and 5.69 ± 2.03 and CV ranged between 14.89 and 35.68 for the six categories of commercial poultry rations including chick starter, grower mash, layer mash, broiler starter, broiler finisher and breeder mash. The crude fibre contents are in line with nutritional standards laid down for such group of chickens (NRC, 1994). The fibre contents in poultry rations are crucial, as levels above recommendations affect feed conversion efficiency in birds thus lower economics of efficient production (Scott *et al.*, 1976; Ensminger, 1980; North and Bell, 1990). The fibre content with

Table 1: Estimation of crude fibre (%) and crude protein (%) on dry matter basis in feed stuffs used in poultry feeding during 1996-2000.

Name of feed stuff	No. of samples tested	Nutrient tested	Range	Mean \pm SD
A) Compound Poultry Feed				
Chick Startar	76	C.F	3.0-8.0	5.17 \pm 0.77
	627	C.P	13.12-21.0	18.02 \pm 1.62
Grower Mash	34	C.F	3.5-15.5	5.69 \pm 2.03
	63	C.P	12.25-21.87	16.29 \pm 1.79
Layer Mash	386	C.F	3.0-9.0	5.12 \pm 0.84
	925	C.P	13.12-21.87	15.86 \pm 1.41
Broiler Starter	308	C.F	3.5-9.5	5.12 \pm 0.84
	343	C.P	14.0-24.5	18.63 \pm 1.67
Broiler Finisher	205	C.F	3.0-9.1	5.12 \pm 0.98
	204	C.P	13.12-21.87	18.02 \pm 1.62
Breeder Mash	21	C.F	3.0-6.0	4.79 \pm 0.75
	49	C.P	14.0-21.87	16.26 \pm 1.58
B) Feed ingredients/by products				
Rice	1	C.F	2.0-2.0	2.0 \pm 0.0
	12	C.P	7.0-11.37	8.7 \pm 1.1
Rice Polish	13	C.F	2.5-11.0	6.38 \pm 2.56
	22	C.P	7.0-16.62	11.41 \pm 2.57
Wheat	9	C.F	1.5-11.0	5.17 \pm 3.7
	26	C.P	7.8-14.0	10.75 \pm 1.53
Wheat Bran	4	C.F	7.0-12.5	9.38 \pm 2.43
	24	C.P	11.37-16.62	11.99 \pm 1.6
Maiz	11	C.F	1.5-7.5	3.81 \pm 1.49
	24	C.P	6.12-15.75	9.51 \pm 1.78
Fish Meal	29	C.F	2.0-5.0	2.79 \pm 0.88
	58	C.P	32.37-61.25	46.87 \pm 5.75
Feather Meal	12	C.F	2.5-5.0	3.83 \pm 0.72
	23	C.P	30.62-55.12	45.02 \pm 4.95
Blood Meal	14	C.F	2.0-5.0	2.96 \pm 0.93
	27	C.P	50.75-74.37	65.57 \pm 7.14
Bone Meal	5	C.F	2.0-6.0	3.8 \pm 1.89
	11	C.P	17.50-28.0	23.07 \pm 3.46
Canola Meal	2	C.F	10.0-11.0	15.5 \pm 0.7
	30	C.P	28.89-42.87	35.9 \pm 3.4
Guar Meal	10	C.F	5.5-9.5	8.15 \pm 1.86
	21	C.P	26.25-41.12	36.17 \pm 3.73
Rape Seed Meal	9	C.F	4.0-7.5	5.72 \pm 1.15
	38	C.P	22.75-49.0	33.52 \pm 4.03
Corn Gluten 30%	14	C.F	4.0-7.5	5.86 \pm 0.79
	31	C.P	18.37-43.75	25.67 \pm 4.69
Corn Gluton 60%	13	C.F	2.0-8.5	4.58 \pm 2.41
	33	C.P	40.25-60.37	56.05 \pm 4.54
Sunflower Meal	15	C.F	5.0-21.5	15.62 \pm 4.33
	43	C.P	26.25-45.50	32.67 \pm 4.02
Soyabean Meal	10	C.F	5.0-16.5	9.50 \pm 4.14
	29	C.P	30.62-48.12	44.69 \pm 4.06
Cotton Seed Meal	17	C.F	2.0-19.0	9.26 \pm 4.21
	16	C.P	30.12-45.50	37.44 \pm 3.51

C.F = Crude Fibre

C.P = Crude Protein

regard to feed ingredients were found to be within normal range, as reported earlier (Ensminger, 1980; NRC, 1994).

Any deviation in blood meal and fish meal would be explained in terms of processing methods. The crude protein contents (%) ranged between 15.86 ± 1.41 and 18.63 ± 1.67 with CV ranged between 8.89 and 10.99 in all six categories of compound poultry rations. The levels of crude protein contents in case of chick starter, broiler starter, breeder mash and blood meal were estimated to be slightly on lower side against standards (Ensminger, 1980; NRC, 1994) which could be explained due to formulation in compound feeds and processing in case of blood meal. This calls for consistent analysis of feed samples prior to use of such feed stuff for poultry flocks.

The crude fibre and protein contents (%) in feed ingredients, as analysed in Feed Testing Laboratory, are based on standard techniques used (AOAC, 1990). Any deviation in fibre and protein contents from the standard laid down (NRC, 1994) and results reported herein may be attributed to the processing method in case of meals and geoecological condition of the areas in which cereals and legumes were cultivated. The analyses with regard to crude fibre and crude protein contents provide a general profile of composition in respect of compound poultry feed and feed ingredients to be considered in least cost poultry feed formulations.

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