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EVALUATION OF POULTRY FEEDS IN DIGESTION TRIALS WITH REFERENCE TO SOME FACTORS INVOLVED

By

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Fifteen digestion trials with adult Fayoumi cocks were under taken to study the feeding value with common feeds using 4 cocks in 13 trials. The associative effect of feeds and the effect of trichloacetic acid versus uranyl acetate for faecal N separation were studied allong with discussing N retention and feed consumption in digestion trials.

The feeding value as starch value as fed was 77.74, 73.44, 63.41, 60.32, 64.54, 63.87, 30.24, 50.06, 37.99 with maize, wheat, barley, beans, maize gluten, decort. cake, undecort. cake ,rice bran (high ash) and wheat bran respectively being the lowest down to 23.42% with bad quality rice bran samples containing high ash and crude fibre. The feeding value of feed mixtures ranged between 51.27 and 73.14% SV. The average digestibility of protein was 76.75± 2.52 in 8 feeds and 78.60 ± 2.0 in 9 mixtures.

There are doubts about the feeding value of feeds obtained indirectly due to associative effect. The level of protein, crude fibre or the feeding value appeared to have no direct effect on feed consumption. Applying trichloro-acetic acid did not materially affect the feeding value but produced high digestible protein.

In U.A.R., there is a great shortage in the suitable concentrates for feeding poultry. Preliminary work was done to determine their feeding value Ismail, 1964 and Abou-Raya *et al.*, 1966. It was important to continue confirmatory work on their feeding value and to study the suitability of some of the currently used by-products for feeding poultry particularly those from extracting cotton seeds, polishing rice and milling wheat. Some of these products contain relatively high content of fibre, and perhaps should be used with reservation as poultry feeds. At the same time grains, high in feeding value, are used preferably for human consumption.

Figures of the feeding value obtained by ruminants were sometimes used for poultry, bing very approximate particularly with feed high in crude fibre. This study was undertaken to evaluate the feeding value in common poultry feeds in digstion trials. Some factors involved were investigated to overcome some difficulties in the procedure.

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Experimental and Methods

Adult Fayoumy cocks were taken from the Poultry Farm of the High Institute of Agriculture at Minia. For each experiment, four cocks were housed individually in metabolic cages except in cases of rice bran III, and the two mixtures of rice bran II with maize, only two cocks were used.

The preliminary period continued for 5 days, and the collection period was extended to 4 days up to 10 in some cases to collect suitable quantities of the excreta.

The metabolic cage was made from metalic wires with wooden frames (50×50×70 cm.). as described by Abou-Raya *et al*., 1966.

Food was offered coarsely ground; the daily ration was kept in paper bags for each bird. Nine feeds were used in the study including 15 digestion trials. In nine cases of indirect feeding, the feeding value of the tested ration was determined as well as that of the feed mixture (Table 1).

Calculation of urinary organic matter, OM :

The data published by Strukie, 1954 were consulted which indicated the composition of urine. The following table was calculated from a knowledge of N% in each urinary component.

Component (A)	N in A as g/100 g urinry N	N% in A	OM of each component /gs urinary N
	g.		g.
Uric acid	62.9	33.33	1.89
Ammonia	17.3	82.35	0.21
Urea	10.4	46.66	0.23
Creatine and other compounds (assumed to be creatine) . . .	9.4	32.06	0.29
Total	100.0	—	2.62

Therefore, each 100 g. urinary N, would equal 262 g. organic matter. The factor for deuermining organic matter would be then 2.62. The factor appeared to be lower than that recorded by Katayama, 1924.

Calculation of the feeding value :

It was calculated as total digestible nutrients TDN and as starch value, S.V. The conversion factors for starch vaule per one unit of different digesttible nutrients were according to published data by Bachmann (in Ghoneim, 1964) being 1.03, 3.11 and 1 for crude protein CP, crude fat EE and crude carbohydrates (crude fibre. CF and nitrogen free extract. NFE) respectively.

For computing the strach value, the deduction of crude fibre was considered 0.30 unit of strach value for each 1% crude fibre. Metabolizable energy, ME was calculated as 4.20 per gram TDN as suggested by Titus, 1961; the calorie : protein ratio was considered as kilocalories ME correspond to 1 gram CP in feed.

Analytical methods :

For summative analysis of food and faces the ordinary official methods of analysis are used for determining moisture, ash, protlin, crude fibre and ether extract. Faecal nitrogen was determined directly using the method of Ekman *et al.*, 1949. NFE was determined by differenec. In the dry matter of the excreta this was as follows :—

% NFE = 100 (% CP + % EE + %CF + % Crude ash + %urinary OM).

Results and Discussion

The analysis of feeds used in these experiments (Table 1a) was within the suandard specifications publishd in the U.A.R. 1967 except with rice bran samples. The lowest protein content was with rice bran I, II, and mixtures containing either of them. Rice barn samples I and II contain much higher ash and crude fibre and much less crude protein than permitted including most likely some rice hulls. Rice bran III contains high ash being contaminated during polishing when chemical drying is used by $CaSO_4$.

Crude protein was highly digested with most feeds having a coefficient ranging between 54.33 up to 88.20%. The protein of rice barn was the least digested, the coefficients being between 54 and 63%. Excluding rice bran and feed mixtures, the other 8 common feeds would have an average of ca. 76.75 $\pm$ 2.52% for CP digestion. This is probably similar to the figure recorded using 22 common concentrated feeds (79 + 4.7%); Crampton, p. 164, 1956). Protein digestion coefficient of the 9 mixtures was 78.60$\pm$2.0%, being 2 percent degrees higher than with single feeds.

The coefficients of CF ranged from — 3.57 to 40%. Henning 1929 found that the digestion of fibre derived from different food meterials varies from 0 to 40%. The average digestion coefficients in all studied feeds (20 cases) was 9.03 1.76% indicating a significant digestion. It is probable that slight digestion of CF could be achieved by microorganisms in the caecum and the crop (Ibrahim, 1969).

It is equally possible that a small fraction of CF could have been subjected to partial degradation to products which are physiologically unabsorbed but chemically are dissolvable in the reagenents of CF determination. In this connection, Maynard and Loosli 1962, and Abou-Raya 1967, discussing this matter indicated that in routine digestion trials particularly with ruminants, there is an apparent overestimation of CF digestion coefficient. It might be also argued that the differences in texture and fineness of feed material and that of the droppings might apparently reduce the recovery of CF in the droppings.

The digestibility of ether extract by poultry was usually high, particularly with feeds having higher ether extract %. Except one case of negative digestion with beans, (due to associative effect) the coefficients ranged from 49 to 94%. It appears that feeds containing higher level of true fat in the ether extract had high digestion coefficients. Grains and their by-products containing relatively high proportion of non-fatty extracted material, had a low digesion coefficient for ether extract. In the majority of feeds the low coefficient was associated with low EE content.

Concering NFE with grains such as maize, wheat, barley and beans, the digestibility ws 87.93, 87.57, 80.55 and 70.18% respectively being lower with legumes. The digestion with wheat bran, rice bran samples and decorticated cotton seed cake was somewhat low ranging from 36.83 to 55.05%. The digestion with undecorticated cotton seed cake was very low (5.11%). A low figure of 17% was recorded by Halnan 1943, for NFE in sun flower seeds. Halnan 1944 explained the low digestibility of NFE of wheat brans as due to their low starch content. The nature and the proportion of ingredients in NFE and their digestibilities appeared to vary greatly. This subject is thoroughly studied by the authors, and will be prepared for publication shortly.

The digestion coefficients of organic matter in each feed was a resultant of other coefficients of separte ingredients. It is commonly known that poultry feeds should have an organic matter digestion coefficient not less than 70%. Therefore, feeds of low digestion could be only partly added to other poultry feeds of very high OM digestion.

Feeds with poultry, had a distinct lower feeding value than those recorded for ruminants. Undecorticated cotton seed cake, rice bran I and II had a very low feeding vlue being 30.24, 26.83 and 23.42 respectively. Such feeds cannot be considered suitable for poultry. The figure for the undecorticated cotton seed cake was as obtained by Ismail, 1964, being about half that obtained with sheep (30.24 against 55%). The two rice bran samples high in CF were unsuitable for poultry being adulterated samples. Such by-products from rice polishing shuold be ckecked at least for analysis before being purchased or used for poultry feeding.

Rice bran III, though high in ash proved to be more suitable as a poultry feed than wheat bran. Further studies with good qualtity rice bran sample low in both ash and crude fibre would decide more about the quality of such product.

TABLE 1.—THE ANALYSIS, DIGESTION COEFFICIENTS AND FEEDING VALUE OF COMMON FEEDS AND FEED MIXTURES

(a) *Analysis*

Feed	Percent as fed	D m as fed %	Analysis on dry matter basis %					
			OM	Ash	CP	CF	EE	NFE
Yellow maize	100	88.89	98.29	1.71	9.78	2.91	2.98	82.62
Wheat	100	88.74	98.00	2.00	11.05	2.92	1.97	82.06
Barley	100	89.45	95.98	4.02	9.60	6.02	1.41	78.95
Wheat bran	100	90.70	94.13	5.87	16.34	11.52	3.95	62.32
Rice bran II	100	92.72	69.78	30.22	5.63	23.98	6.49	33.68
Rice bran III	100	92.35	75.16	24.84	10.40	10.41	9.58	44.77
Rice bran I (indirect)	100	92.40	68.01	31.99	6.58	23.05	6.58	31.80
Maize gluten (indirect)	100	89.40	97.57	2.43	33.91	6.42	6.07	51.17
Beans (indirect)	100	92.24	96.76	3.24	30.43	8.98	1.02	56.33
Und.cotton seed cake (Indirect)	100	93.72	94.40	5.60	28.38	27.99	5.82	32.21
Decort. cotton seed cake (indirect)	100	93.34	92.30	7.70	45.01	12.97	7.19	27.13
Maize : maize gluten	40 : 60	89.26	97.86	2.14	24.28	5.02	4.84	63.72
Wheat : ,, ,,	40 : 60	89.70	97.72	2.28	24.72	5.01	4.42	63.59
Maize : rice bran I	40 : 60	91.46	81.00	19.00	8.15	11.20	4.37	63.34
Maize : rice bran II	70 : 30	89.88	89.21	10.79	8.79	9.14	4.09	66.90
Maize : rice bran III	55 : 45	90.47	84.34	15.66	8.30	12.19	4.64	59.20
Maize : Wheat bran	40 : 60	89.33	95.81	4.19	13.66	8.01	3.56	70.61
Maize : beans	50 : 50	92.20	97.53	2.47	20.10	5.95	2.00	69.48
Maize : und. cotton seed cake	60 : 40	92.78	96.72	3.28	17.30	13.04	4.13	62.25
Maize : decort. cotton seed cake	60 : 40	92.38	95.87	4.13	24.02	6.97	4.69	60.19

TABLE 1.—THE ANALYSIS, DIGESTION COEFFICIENTS AND FEEDING VALUE OF COMMON FEEDS AND FEED MIXTURES.
(b) *Digestion coefficients and feeding value*

Feed	Digestion coefficients					Feeding value as fed	
	OM	CP	CF	EE	NFE	SV	TDN
Yellow maize	85.00	84.59	15.26	72.92	87.93	77.74	76.66
	± 0.06	0.33	1.72	1.24	0.12		
Wheat	83.57	75.72	3.92	49.82	87.57	73.44	73.25
	0.54	0.60	5.99	3.71	0.24		
Barley	73.36	70.81	–3.57	54.54	80.19	63.41	64.26
	0.40	0.61	3.16	5.19	0.51		
Wheat bran	42.97	68.99	77.7	54.94	41.86	37.99	39.13
	0.99	0.80	0.98	3.78	1.55		
Rice bran II	31.41	63.06	–0.89	79.14	36.83	23.42	25.57
	0.68	2.76	1.00	2.09	1.93		
Rice bran III	49.29	55.56	6.48	87.49	33.05	50.06	46.14
Rice bran I (indirect)	35.42	54.33	9.53	89.58	37.92	26.88	28.82
	2.05	1.73	4.11	2.15	0.78		
Maize gluten (indirect)	67.81	87.46	7.68	49.30	65.99	64.54	63.17
	0.90	0.45	1.97	3.21	1.50		
Beans (indirect)	66.94	78.99	13.78	–11.69	70.18	60.32	61.49
	1.49	0.64	2.57	18.75	1.92		
Und. cotton seed cake (indirect)	30.29	68.50	7.70	93.70	5.11	30.24	33.28
	1.90	2.14	3.95	1.42	3.00		

TABLE 1 b (Cont.)

Feed	Digestion coefficients %					Feeding value as fed	
	OM	CP	CF	EE	NFE	SV	TDN
Decort. cotton seed cake (indirect)	62.53	78.93	33.51	90.07	41.35	63.87	61.31
	2.36	1.06	4.15	3.05	4.64		
Maize : maize gluten	75.15	87.00	9.35	55.02	77.35	69.97	68.61
	0.82	0.38	1.52	2.33	0.73		
Wheat : maize gluten	73.08	88.20	7.88	54.55	73.63	67.90	66.76
	0.24	0.50	1.87	1.22	0.41		
Maize : rice bran I	58.51	70.37	9.95	85.70	68.65	53.78	53.75
	0.97	0.69	3.61	1.75	0.30		
Maize : rice bran II, 70 : 30	70.21	80.24	5.55	83.67	76.74	60.23	59.86
Maize : rice bran II, 55 : 45	62.27	71.48	40.00	77.87	71.77	51.27	51.61
Maize : wheat bran	64.66	75.53	11.95	63.53	68.30	59 93	7.06
	0.85	0.37	2.79	4.82	0.73		
Maize : beans	75.97	80.36	14.17	50.37	80.48	68.63	69.32
	0.67	0.56	2.00	4.60	0.80		
Maize : und. cotton seed cake	63.42	73.92	8.25	84.81	70.62	60.49	60.97
	0.76	1.59	3.74	0.90	0.64		
Maize : decort. cotton seed cake	76.01	80.31	28.89	85.01	79.44	73.14	72.14
	0.93	0.80	3.80	1.84	0.84		

TDN values in studied poultry feeds were numerically as starch value because they have low fibre content.

It is usually considered that poultry mixtures should contain at least ca. 2.7 Kilocal. Me per gram. In studied feeds it was found to vary between 1.40 (undecort. cake) and 3.22 in yellow maize (excluding bad quality rice brans. The range with mixtures was 2.17—3.02 Kilocal./g. The calorie protein ratio ranged between 1:5.25 and 1:37.05.

Associative effect in digestion trials with poultry :

Effect of direct and indirect feeding

Results in Table 2 with maize (No 2) indirectly fed using wheat bran as basal show that noticeable increase occurred in all digestion coefficients and feeding value when compared with direct feeding in No. 1 (77.74% SV against 88.79). The same occurred with wheat bran which when fed alone, the feeding value was 37.69% SV becoming 42.52% when fed indirectly using maize as a basal ration (No. 5 and 6). In both cases, differences were highly significant when comparing the resultant of the effect on average digestion coefficients of OM as follows :

	direct feeding	indirect feeding
Maize.	58.00 ± 0.06	94.56 ± 1.85
Wheat bran . .	42.97 ± 0.99	94.64 ± 1.34

Whn comparing the results with maize and rice bran II (No. 1 against 3 and No. 7 aginst 8), the assiciative effect was of a decreasing nature.

Therefore, the feeding value of certain feed mixtures obtained directly in digestion trials, with poultry would differ from that calculated from the knowledge of the feeding value of the separate feeds owing to associative effcts. Calculating the feeding value from that of the separate feeds would not represent the actual feeding value of their mixtures.

Effect of the nature of the basal ration on the feeding value of the tested ration :

Results in Table 2 with maize, indicated that using wheat bran as a basal ration (No. 2) produced a net feeding value of 88.79/SV., but using rice bran (No. 3) produced a net feeding value 67.22% SV. This was due to the fact that both basal rations differed greatly in their nature producing different trends in the associative effect.

On the other hand, results with maize gluten (No. 10 and 11) indicated that using maize as a basal ration produced a similar feeding value as with wheat (64.54% SV), against (63.10%). This indicated that maize and wheat grains were nearly of the same nature affecting very similar associative effect. It was therefore preferable to stick to a standard basal ration in order to make results of the feeding values of tested feeds relativély comparable.

TABLE 2.—ASSOCIATIVE EFFECT IN DIGESTION TRIALS WITH POULTRY

Serial No.	Feed	Basal				Digestion coefficients %					Feeding value as fed		
						OM	CP	CF	EE	NFE	SV	TDN	DP
	Maize :												
1	Maize	100	—	—		85.00	84.59	15.26	72.92	87.93	77.74	76.66	7.35
2	Maize	40	Wheat bran	60		94.56	91.33	36.22	85.02	98.36	88.79	87.36	8.05
3	Maize	70	rice bran II	30		82.23	85.48	25.19	88.22	83.85	76.22	74.77	7.42
4	Maize	55	rice bran II	45		80.50	76.32	30.28	75.45	83.26	74.05	72.90	6.62
	Wheat bran :												
5	Wheat bran	100	—	—		42.97	68.99	7.77	54.94	41.32	37.69	38.82	10.22
6	Wheat bran	60	Maize	40		49.64	71.81	11.39	58.42	50.85	42.52	43.51	10.22
	Rice bran :												
7	Rice bran II	100	—	—		31.41	63.06	-2.08	79.14	36.83	23.42	25.57	3.85
8	Rice bran II	30	Maize	70		22.42	65.83	2.78	90.61	13.12	19.35	20.89	4.01
9	Rice bran II	45	Maize	55		23.80	48.82	2.15	78.44	22.63	18.66	20.86	2.97
	Maize gluten :												
10	Gluten	60	Maize	40		67.81	87.46	7.68	49.30	65.99	64.54	63.17	26.52
11	Maize	60	Wheat	40		66.04	90.94	3.82	55.64	58.58	63.10	61.24	27.25

Effect of the proportion of the basal ration on the feeding value of the tested ration :

When determining the feeding value of rice bran II (No. 8 and 9) indirectly using two levels of maize as a basal ration (70 and 55%), the difference was negligible not exceeding 3.50%. Comparing the results with maize (No. 3 and 4) using 30% rice bran as a basal ration and 45% in the other case, revealed the fact that the difference in calculated feeding value was also negligible being 2.17%. The results appeared to indicate generally that in digestion trials there was relatively a wide range for the proportion of the basal ration in the feed mixture, producing practically the same results for the tested feeds.

It was obvious from this study of the associative effect, that there are always doubts about the feeding value of feeds obtained indirectly. In some cases, the values obtained are under-or over-estimated. With poultry feeds which are usually mixtures of several ingredients, a mean should be tried to evaluate the feeding value of single feeds when being in the mixture rather than when fed alone.

Feed consumption in digestion trials with poultry :

Feed consumption ranged between 55.69 to 98.34 gm. (51.67—89.62 DM) as in Table 3. Some samples contained high protein level (up to 20.66 CP) and had a high consumption up to 95.42gm. Similar consumption (94.48gm.) was recorded with a low protein level (1.0048 gm. N or 6.28 CP).

With rice bran II, containing up to 24% CF, consumption was on the high side. The same was found with the starch value level.

Therefore, the protein level, crude fibre level or feeding value appeared to have no direct effect on feed consumption. Multiple factors appeared to be involved. Perhaps the palatibility of the feed also might be concerned.

It was also clear that in practical feeding, the feed consumption *ad. lib.* might fail to provide the bird with the necessary requirements. With rice barn (23 SV) although feed consumption appeared satisfactory, yet the starch value consumed was 23gm. being below the basal requirements. It seems nesessary in practical voluntary feeding with poultry, that a test for the adequacy of the consumed feed for the type of production is necessary.

N-retention in digestion trials :

It appears from the N retention (results in Table 3) that in the majority of cases, the mount of digestible protein in feeds was adequate to maintain either neutral or positive N retention. It was also clear that using cereal grains alone did not result in a negative N balance with adult cock fed *ad lib.* Therefore, such grains could be used as suitable basal rations for feeds usually having higher protein content.

TABLE 3.—FEED CONSUMPTION AND NITROGEN RETENTION WITH SINGLE AND MIXED FEEDS FED *ad libitum* WITH MATURE COCKS.

Feed	Initial wt. of cocks kg.	Feed consumption		N eaten	N excreted		N retained
		feed as fed gm.	SV gm.	gm.	Faecal gm.	Urinary gm.	gm.
Single feeds :							
Yellow maize	2.133	98.34	76.45	1.3676	0.2108	0.9553	0.2015
Wheat	2.018	83.99	61.69	1.3180	0.3188	0.9958	0.0034
Barley	2.017	91.32	58.14	1.2548	0.3664	0.7140	0.1744
Wheat bran	1.870	78.06	29.41	1.8504	0.5740	1.2079	0.0685
Rice bran II	1.935	96.65	22.64	0.9432	0.3484	1.0596	-0.4648
Rice bran III	1.735	77.08	37.76	1.1592	0.5192	0.6512	-0.0112
Mixed feed :							
Maize : maize gluten	2.145	95.43	66.59	3.3056	0.4296	2.4820	0.3940
Wheat : maize gluten	2.010	87.29	59.24	3.0960	0.3644	1.9359	0.7957
Maize : rice bran I	2.165	94.48	50.81	1.0048	0.2984	0.6976	0.0088
Maize : rice bran II	1.585	75.77	45.63	0.9576	0.1896	0.7222	0.0458
Maize : rice bran III	1.493	77.00	39.48	0.9256	0.2640	0.7272	-0.0656
Maize : wheat bran	1.990	80.60	45.89	1.5568	0.3808	0.9267	0.2490
Maize : beans	1.903	70.39	48.29	2.0872	0.4092	1.5340	0.1440
Maize : und-cotton seed cake	2.038	55.69	33.68	1.4300	0.3692	0.9907	0.0701
Maize : decort cotton seed cake	1.975	60.22	44.51	2.1380	0.4248	1.4037	0.3092

Effect of replacing uranyl acetate by trichloroacetic acid in digestion trials with poultry :

Regarding digestion coefficients of CP and NFE, (Table 4), it was claer that trichloroacetic acid appeared to fail to percipitate a part of the falcal protein producing higher digestion coefficients of crude protein than with uranyl acetate. Decreasing the CP would increase accordingly the feacal organic matter. This would raise the NFE of the faeces and would accordingly, reduce their digestion coefficients.

As th eaten fraction of NFE was usually much higher than that of crude protein, the NFE coefficients were slightly reduced. Such differences would not affect materially the amount of calculated digestible NFE in the feed.

TABLE 4.—EFFECT OF USING TRICHLOROACETIC ACID ON DIGESTION COEFFICIENTS OF CRUDE PROTEIN AS WELL AS COMPARED WITH URANYL ACETATE METHOD.

Sambl6	Uranyl acetate method		Trichloroacetic acid method	
	CP	NFE	CP	NFE
Wheat :				
eaten	8.75	64.98	8.75	64.98
excreted	2.10	8.52	1.15	9.10
digested	6.65	56.46	7.60	55.88
Dig. coeffs. %	76.00	86.89	86.86	86.00
Wheat bran :				
eaten	11.76	44.86	11.76	44.86
excreted	3.64	25.75	1.92	26.80
digested	8.12	19.11	9.84	18.06
Dig. coeffs. %	69.05	42.60	83.67	40.26
Rice bran II :				
eaten	5.86	28.33	5.86	28.33
excreted	2.47	17.56	1.54	18.42
digested	3.39	10.77	4.32	9.91
Dig. coeffs. %	57.85	38.02	73.72	35.10

The digestible protein in the three feeds (Table 5), was 7.45, 10.43 and 3.53 uranyl acetate against 8.52, 12.40 and 4.50 with trichloroacetic acid in wheat bran and rice bran respectively. This was reflected on the nutritive ratio, becoming narrower with trichloroacetic acid particularly with rice bran. This may lead to errors in calculating the level of protein if "digestible protein" was taken as basis. From this point, it would be preferable to use uranyl acetate for more efficient separation of faecal crude protein.

Concerning the feeding value, slight differences were found between the two methods either as TDN, SV or ME. The increased fraction in digestible protein with trichloroacetic was compensated with approximately the same magnitude in digestible NFE. From a practical point of view, calculating the feeding value by either methods would lead practically to the same results. As the uranyl acetate costs more and is not availble as a common reagent, using trichloroacetic acid would be quite satisfactory for determining the feeding value of poultry feeds.

It is also suggestive to use an average digestion coefficient of crude protein in common feeds of 57% and to obtain faecal N by calculation without any necessity of using certain reagents for seperation. The error introduced would be even less than when using trichloroacetic acid in poultry digestion trials.

TABLE 5.—Effect of using trichloroacetic acid on the feeding value as compared with uranyl acetate method.

Feed	Feeding valué (as fed)	Uranyl acetate	Trichloroacetic acid
***Wheat*:**	DP %	7.45	8.52
	SV %	72.29	72.74
	TDN %	72.26	72.68
	ME Kcal/100 g.	303.49	305.26
	Nutritive ratio	1 : 8.69	1 : 7.71
Wheat bran:	DP %	10.43	12.40
	SV %	39.78	40.69
	TDN %	40.58	41.42
	ME Kcal/100 g.	170.44	173.96
	Nutritive ratio	1 : 2.97	1 : 2.34
Rice bran II:	DP %	3.53	4.50
	SV %	22.44	22.58
	TDN %	24.89	24.99
	ME Kcal/100 g.	104.54	104.96
	Nutritive ratio	1 : 6.04	1 : 4.55

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تقييم مواد علف الطيور فى تجارب الهضم مع دراسة بعض العوامل الموجودة

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الملخص

أجرى خمسة عشرة تجربة هضم على الديوك الفيومى البالغة ، وذلك لدراسة القيمة الغذائية لمواد العلف الشائعة وقد استخدم ٤ ديوك فى ثلاث عشرة تجربة منها كما درس التأثير الاضافى الغـذاء وتأثر استخدام ثلاثى كلور وحامض الخليك مقارنا مع خلات اليورانيل لفعل أزوت الروث ــ على القيمة الغذائية لمـادة العلف ونوقش أيضا ميزان الآزوت والمستوى الغذائى فى تجارب هضم الدواجن .

وقد وجد أن القيمة الغذائية كمعادل نشا هى ٧٧ر٧٤ للذرة ، ٧٣ر٤٤ للقمح ، ٦٣ر٤١ للشعير ، ٦٠ر٥٤ للفول ، ٦٤ر٥٤ لجلوتين الذرة ، ٦٣ر٨٧ لكسب القطن مقشور ، ٣٠ر٢٤ لكسب القطن غير المقشور ، ٥٠ر٠٦ فى عينة رجيـــع عاليـــة الرماد ٣٧ر٩٩ لردة القمح ، وقد انخفضت القيمـــة كثيرا فى عينات رجيع عالية فى الألياف والبروتين الى ٢٣ر٤٢٪ وكانت القيمـــة الغذائية للمخاليط المستخدمة بين ٥١ر٢٧ ، ٧٣ر١٤٪ . وكان متوســط معامل هضم البروتين فى ثمانية أغذية هو ٧٦ر٧٥ ± ٢ر٥٢ وفى ٩ مخاليط هو ٧٨ر٦٠ ± ٢٠ .

ووجد من الدراسة أن هناك شك فى القيمة الغذائية للأغذية المقدرة بالفرق (تغذية غير مباشرة مع عليقة أساسية) وذلك لوجود التأثير الاضافى كما ظهر أن مستوى البروتين او الألياف الخام أو القيمة الغذائية لمـادة علف لا تؤثر تأثيرا مباشرا على كمية الاستهلاك اليومى من الغذاء ، ووجد أن استخدام ثلاثى كلور وحامض الخليك لا تؤثر على القيمة الغذائية لمـادة العلف ولكنه ينتج أرقاما عالية للبروتين المهضوم .

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