J. Agric. Sci. Mansoura Univ., 28(1): 663 - 677, 2003

ELECTROPHORETIC CHARACTERISTICS OF CARCASS PROTEIN OF BROILERS FED ON SUGAR CANE BAGASSE

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ABSTRACT

The present study was performed on 50 chicks of 14 days old, classified equally into 5 groups to study the electrophoretic pattern of the protein bands of Pectoralis major muscle after feeding on diets containing untreated or treated sugar cane bagasse for 4 weeks. The sugar cane bagasse and wheat germ were mixed at 4:1 w/w (untreated bagasse) only or with rumen liquor at 1:4 (w/v) and incubated at 39°C and pH 6.5 for 72 hrs., the mixture was irradiated at 2 M rad of gamma irradiation (treated bagasse) and then added by 10 and 20% to the original chicks diet. In comparison with the control, the untreated bagasse 10% group showed almost no change in the qualitative protein bands, to the contrary untreated bagasse 20% group was the worst treatment having apparent reduction in fibrillar proteins. The treated bagasse 10% group has proved to be the best of the 5 groups including the control one with apparent increase in the protein bands responsible for muscle strength, while the treated bagasse 20% group has reduced the feeding quality but to a less extent than the untreated bagasse 20% group. The results denoted that the chicks can well tolerate the substitution of their diets with 8% treated bagasse with no affection on the quality of carcass proteins with consequent saving of 8% of the costs and getting rid of unsuitable by-product. It is also pointed the beneficial effect of using rumen liquor after incubation and sterilization by γ-irradiation as it renders the bagasse more digestible and increase the organic nitrogenous compounds in the diet.

INTRODUCTION

In developing countries animal feeding had faced a real problem due to shortage of grain and legume seeds consumed by man. In the last decades agro-industrial by-products which have high fiber and low nutritive value were introduced in ruminant nutrition to overcome this problem on one hand and on the other hand to reduce the pollution of the environment (*Balch, 1977; Chenost and Mayer, 1977; Klopfenstein and Owen, 1981 and Schingoethe and Kamstra 1981).*

In poultry feeding it was more complicated due to absence of micro-organisms which can convert this fibrous material to easily digestible ones and improve their nutritive values.*(Han, 1974 and Bauchop 1985)* Thus chemical, physical and biological treatments were used to reduce fiber contents and improve their digestibility for ruminant feeding *(Gray.et al, 1978; Prasad, and Prassad, 1986; Gulati, 1992; Gupta. et al, 1992; Wadhwa et al. 1992; Subhaschandra et al., 1993; Neuat and Gallagher, 1997; Ravi and Natanam, 1997 and Wadhwa and Bakshi 1997).*

Bagasse is the main fibrous by-product of sugar cane, it represents about 4.125 million tons per year according to Anon *(1995).* Many efforts are being made to improve the utilization of lignocellulosic crop residue through chemical, physical and biological treatments for poultry feeding *(EL-*

Faramawy et al, 1998; Mohamed, 1998; Mekkawy, et al,1998 ; Mekkawy et al, .1999 and EL-Faramawy et al, 2000).

Most authors evaluated the treatments quantitatively by measuring weight gain, live body weight and digestibility of dry matter (DM), crude protein (CP), crude fiber (CF) and ether extract (EE). Few had paid attention to qualitative carcasses protein feeded on these treated by-products especially that it is directly reflected on human health *(Centoducati, 1984) and (Hegazy, et al,1998)*. The present study was carried out to evaluate the addition of bagasse either treated or untreated to the poultry feeding regarding carcass protein quality. Pectoralis major muscle was used for this evaluation because of its largest weight.

MATERIALS AND METHODS

Preparation of untreated bagasse (UTB):

Bagasse was dried at 50°C, ground and mixed with wheat germ at 4:1 (w/w).

Preparation of treated bagasse (TB):

UTB was mixed with rumen liquor at 1:4 (w/v), incubated at 39°C and pH 6.5 for 72 hrs, the mixture was irradiated at 2 M rad in the National Center for Radiation Research and Technology, Nasr City, Cairo, Egypt . The irradiation was conducted using a Mega Gamma–I, Mmodel AECL Js 6500 irradiatar, The Irradiation source was ^{60}Co and the average dose rate was 2.4 KGy / h^{-1}. and dried at 50°C.

Feeding trial:

One day-old broiler chicks were maintained on standard broiler ration for the first 13 days of their age. On day 14th the chicks were randomly divided into 5 groups of 10 chicks, each in an electrically heated battery brooders, based on equal average group weights and assigned randomly to control and four experimental diets for 4 weeks. The untreated and treated bagasse were added to the control diets at 10 and 20 % for the experimental groups so as to render all the diets iso caloric and isonitrogenic (Table 1). The five groups are termed, the control group (A), the untreated 10% (B), the untreated 20% (C) , the treated 10% (D) and the treated 20 (E).

Electrophoresis:

During the feeding period the growth rate and feed consumption were recorded weekly. At the end of the experiment 5 chicks of each treatment were slaughtered, samples for electrophoretic analysis were taken from Pectoralis major musle of chicks breast and minced. The minced muscles were rapidly dried in "SPT-200" vacum drier. The dried meats were milled in " Maulinex" mill, defatted three times by cold acetone and then dissolved in the sample buffer. The method of *(Laemmli, 1970)* was used for the separation of protein bands, and estimation of their molecular weights using the following protein marker: Carbonic anhydrase 29 k Da, egg albumin 45 k Da, bovine

albumin 66 kDa, phosphorylase 97 kDa, β-glalctosidase 116 k Da, myosin 205 k Da. The electrophoretic runs were done using "Biometra" runing chamber 11x12 cm under cooling conditions. Scanning of the gels and densitometric analysis of the results were accomplished using "Epson, GT 8000" scanner. The software of gel analysis were "Scan Pack 3.0".

Table (1): Composition of the experimental diets.

Ingredients	Control	Untreated Bagasse		Treated Bagasse	
	(A)	UTB 10 % (B)	UTB 20% (C)	TB 10% (D)	TB 20% (E)
Yellow corn	65.0	55.5	47.0	55.0	48.0
Soybean meal	27.5	27.0	26.5	27.5	25.0
Oil	4.0	4.0	3.0	4.0	3.5
Bagasse +Wheat germ	--	10.0	20.0	--	--
Bagasse+Wheatgerm+ Rumen Liquor	--	--	--	10.0	20.0
Dicalcium phosphate	2.2	2.2	2.2	2.3	2.2
Methionin	0.3	0.3	0.3	0.3	0.3
Premix*	0.5	0.5	0.5	0.5	0.5
Salt	0.5	0.5	0.5	0.5	0.5
Total	100	100	100	100	100
CP%	17.7	17.7	17.5	18.2	17.6
ME K cal/Kg	3157	3217	3221	3212	3262
CF	2.9	5.1	7.2	4.98	7.4

* Supplied per Kg of diet : Vit. A, 120000 IU ; Vit. D_3, 2000 ICU ; Vit. E, 10 mg ; Vit. K_2, 2 mg ; Vit. B_1, 1 mg ; Vit. B_6 , 1.5 mg ; Vit.B_{12} , 10 mcg ; VitB_2 , 4 mg ; pantothenic, 10 mg ; Nicotinic, 20 mg ; Folic, 1 mg ; Biotin, 50 mcg ; Cholin chloride, 500 mg ; Copper, 10 mg ; Iodin, 1 mg ; Iron, 30 mg ; Manganese, 55 mg ; Zinc, 55 mg and Selenium, 0.1 mg.

Statistical Analysis

Statistical analysis of electropharesis data were performed by cluster analyhsis and match lane statistical analysis in conjunction with gel scanning supplied by the softwere "scan pack –3" – Germany.

RESULTS AND DISCUSSION

In a previous study *(Hegazy, et al,1998)* the protein bands of Pectoralis major muscle of chicks was identified depending upon several previous studies *(Etlinger and Fischman, 1976; Porzio and Pearson, 1977; Penny, 1980; Schingoethe et al, 1981; Greaser et al. 1983; Locker et al. 1986; Uytterhagen et al. , 1992 and Wadhwa et al, 1992).* Before discussing the influence of different treatments on the denstogram of protein bands, we shall recapitulate the sequence of the separated protein bands of the control chicks muscles (treatment A, Fig.1) as follows: myosin heavy chain (m Hc,

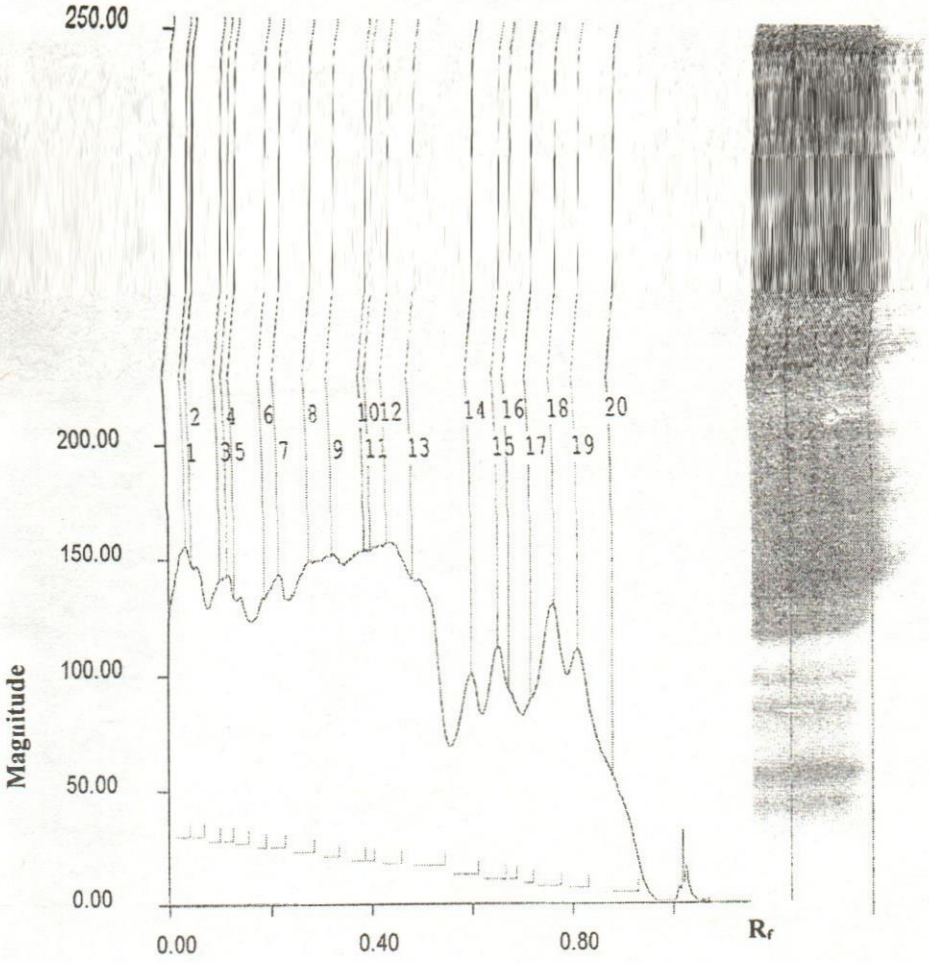
band1), C-protein (band 2), M1, M2, M3, M4 (bands 3,4,5, and 6), α-actin (band 7); Tropomysins (bands 8 and 9), not identified bands (bands 10, 11 and 12), actin (band 13), myosin light chain-1 (mlc-1, band 14); Troponin-1 (band 15), Troponin-C (band 16), myosin light chain-2 (mlc-2, band 17), myosin light chain-3 (mlc-3, band 18) and degradation products (bands 19 and 20). It should refer to the absence of Troponin-T band in the control sample, which appeared in different treatment in a separate band. It is predicted that it have corporated with actin (band 13, Fig 1) in a mixed band of 7.4% of total protein and could not be resolved enough into two separate bands. The significance of different diets, in affecting the constitution of the muscle composition of chicks raising on such diets, was summarized in Table (1).

Treatment B has led to the appearance of Troponin-T in 3.5% concentration of total proteins (Fig.2) with molecular weight of 27 k Da. On the other hand M4 band (band 6, Fig.1) was completely disappeared upon the treatment B. In general, myosin heavy chain (band 1 Fig.2) was not affected. C-protein, M3 band, α-action, Troponin-1 and myosin light chain-3 were slightly decreased (-). Tropomysins (bands 7 and 8 Fig.2) were apparently decreased(- -). M4 and actin were sharply decreased (over 50%). Proteins which increased upon treatment B are myosin light chain-1 (+), myosin light chain-2 (+), M2 band (+ +), Troponin-C (+ +), M1 band (+ + + +) and Troponin-T(+ + + +)

Treatment C has also affected the protein bands as follows: C-protein, M3 band, α-actin, Tropomysins, myosin light chain-1 and myosin light chain-3 have slightly decreased (-), myosin heavy chain and M1 band have apparently decreased (- -), M4, actin and Troponin-C have sharply decreased (> 50% decrease). Protein bands which increased upon treatment C are M2 band (+), Troponin-1 (+ +), and Troponin-T (+ + + +). It is obvious that treatment C have apparently reduced fibrillar proteins, which responsible for muscle strength.

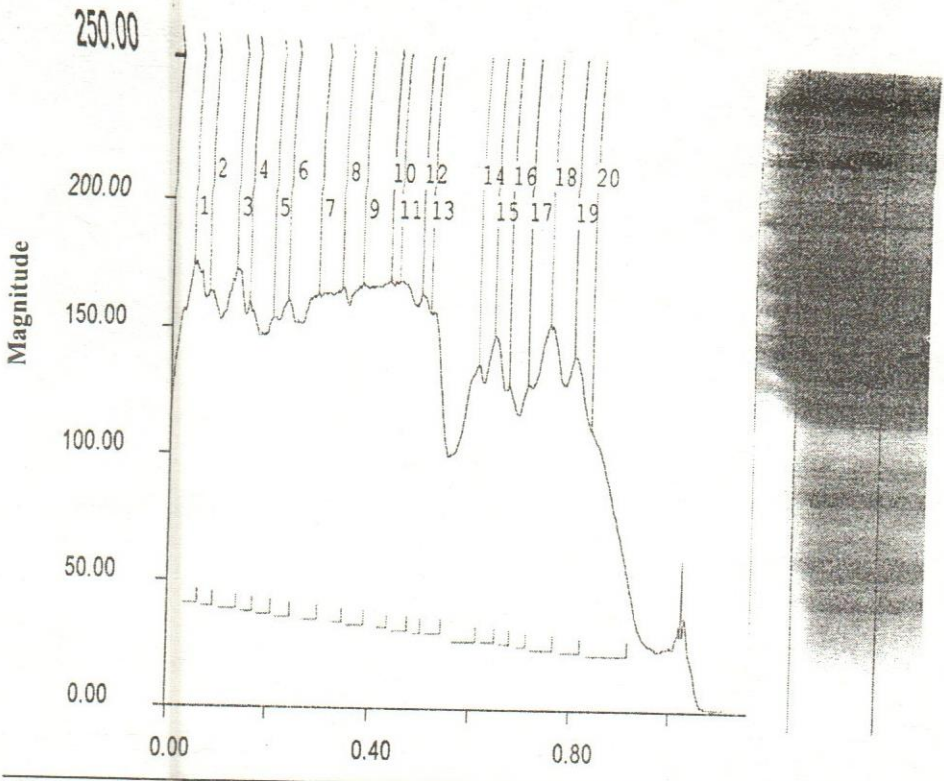
Treatment D has apparently affected the structure of chick muscles as follows: myosin heavy chain (mHc), M4 band, myosin light chain-1 (mlc-1). Troponin-1, Troponin-C and myosin light chain-3 were apparently increased (up to 50% increase). Proteins which have sharply increased are M1 band Troponin-T (from 50 to 100% increase). Proteins which apparently decreased are C-protein, α-actin Tropomysins and myosin light chain-2 (up to 50% decrease), and those which have sharply decreased are M3 band, M4 band and actin (from 50 to 100% decrease). The overall result of the treatment D could be noted as increase in fibrillar proteins, which are responsible for expansion and contraction of the muscle, more than the decrease in the other proteins. It is apparent that treatment D have proved to be the best of all treatments carried out.

Treatment E has apparently reduced myosin heavy chain and C-protein (up to 50 %) and has sharply reduced M3, M4, actin, Troponin-C and myosin light chain-2 (up to 100%). On the other hand the same treatment has apparently increased M2, α-actin, Tropomysin (band 7 and 8, Fig.5), Troponin-1 and myosin light chain-3 (up to 50% increase) and have sharply



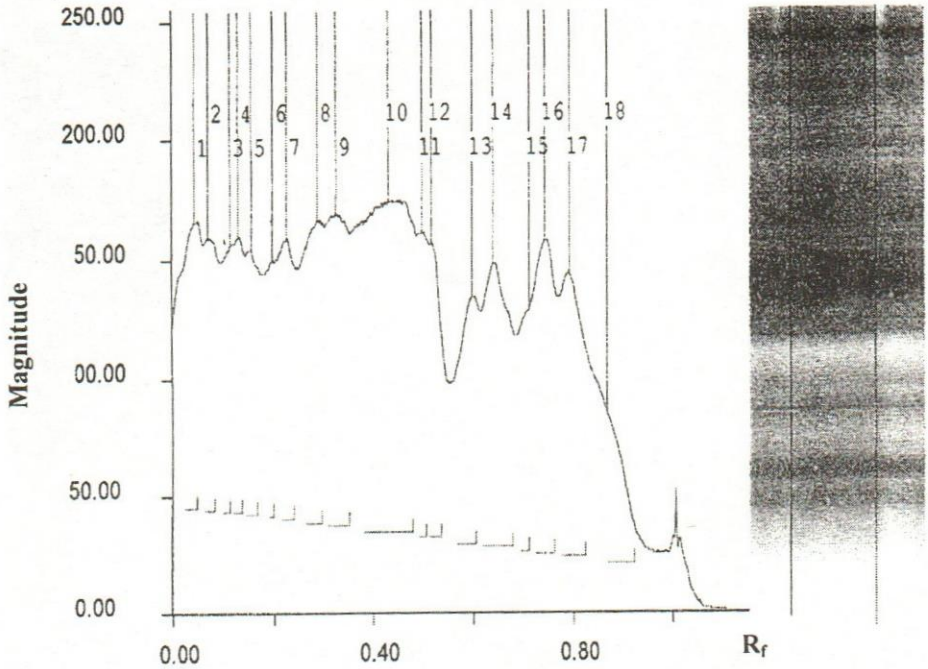
No.	Bas.	Start	End	R_f	Max	rea	rea	kDa	Remark
1	30	0.010	0.040	0.032	126	2546	3.7	207	mHc
2	30	0.043	0.067	0.043	118	2078	3.0	191	C-protein
3	28	0.078	0.099	0.099	113	1719	2.5	104	M1
4	28	0.107	0.124	0.113	115	1260	1.8	094	M2
5	27	0.126	0.153	0.127	107	2085	3.1	087	M3
6	25	0.169	0.188	0.185	109	1464	2.1	065	M4
1	25	0.196	0.226	0.213	118	2424	3.6	059	α-actin
8	23	0.239	0.282	0.273	126	3731	5.5	049	Tropomysins
9	21	0.301	0.334	0.320	131	2980	4.4	043	
10	19	0.355	0.385	0.384	135	2776	4.1	037	Not identified
11	19	0.390	0.404	0.396	136	1352	2.0	036	
12	18	0.417	0.458	0.428	139	4130	6.1	034	
13	17	0.479	0.544	0.480	124	5074	7.4	031	Actin
14	13	0.560	0.611	0.597	088	2779	4.1	026	mlc-1
15	11	0.622	0.665	0.650	101	2798	4.1	024	Troponin-1
16	11	0.670	0.687	0.672	083	882	1.3	023	Troponin-c
17	09	0.700	0.719	0.715	081	1005	1.5	022	mlc-2
18	08	0.727	0.776	0.762	123	3817	5.6	021	mlc-3
19	07	0.789	0.829	0.808	104	2839	4.2	019	Degradation products
20	05	0.878	0.929	0.879	051	1342	2.0	018	

Fig.(1): SDS- PAGE densitogramm of Pectoralis major muscle of chicks fed control diet (treatment A).



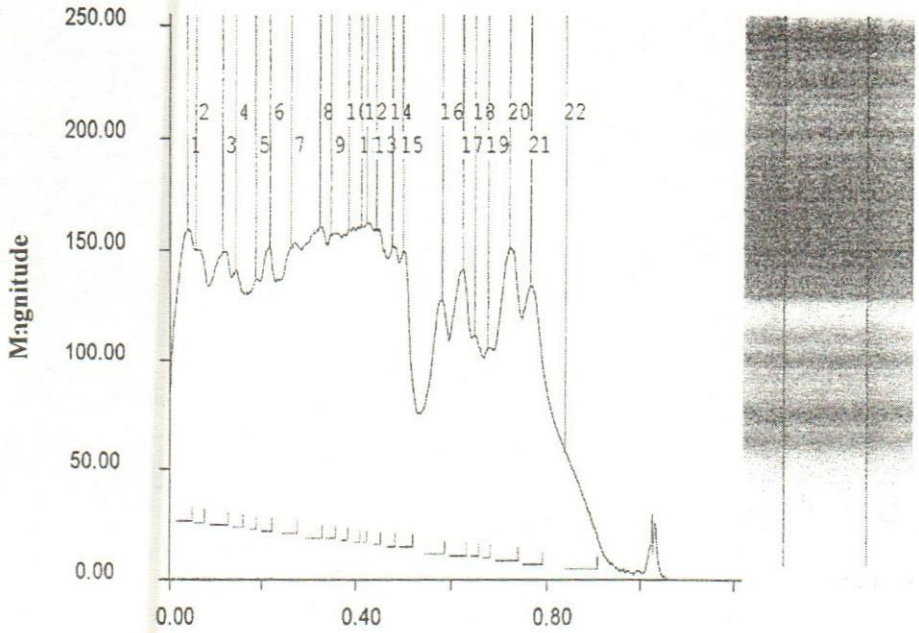
No.	Bas.	Start	End	R_f	Max	Area	%Area	Fit	Remark
1	41	0.029	0.059	0.041	135	2732	3.7	197	mHc
2	40	0.067	0.091	0.073	124	2072	2.8	165	C-protein
3	39	0.102	0.139	0.128	135	3420	4.6	100	M1
4	38	0.148	0.172	0.154	122	1997	2.7	084	M2
5	37	0.180	0.207	0.201	117	2155	2.9	066	M3
6	36	0.215	0.244	0.230	125	2541	3.4	058	α-actin
7	35	0.269	0.298	0.289	129	2674	3.6	047	Tropomysins
8	34	0.322	0.347	0.335	132	2347	3.2	041	
9	33	0.355	0.390	0.376	135	3326	4.5	037	Not identified
10	32	0.416	0.435	0.431	138	1913	2.6	032	
11	31	0.446	0.476	0.449	138	2859	3.9	031	
12	30	0.489	0.503	0.494	134	1331	1.8	028	Actin
13	30	0.511	0.543	0.512	127	2582	3.5	027	Troponin-t
14	27	0.564	0.613	0.609	110	3213	4.3	023	mlc-1
15	27	0.624	0.650	0.640	121	2209	3.0	022	Troponin-1
16	26	0.661	0.680	0.669	103	1307	1.8	021	Troponin-c
17	25	0.694	0.712	0.707	104	1310	1.8	020	mlc-2
18	24	0.720	0.766	0.750	129	3968	5.3	018	mlc-3
19	23	0.782	0.820	0.798	117	3014	4.1	017	Degradation products
20	22	0.833	0.914	0.835	089	3664	4.9	016	

Fig.(2): SDS- PAGE densitogramm of Pectoralis major muscle of chicks fed untreated bagasse 10% (treatment B).



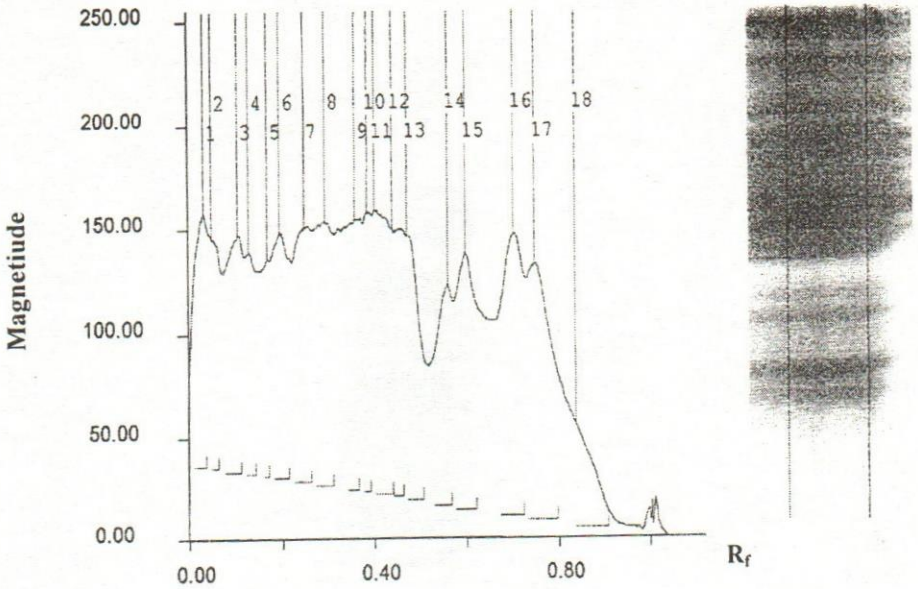
No.	Bas.	Start	End	R_f	Max	Area	%Area	KDa	Remark
1	45	0.024	0.048	0.042	122	2097	02.9	195	mHc
2	44	0.061	0.083	0.069	116	1831	02.5	174	C-protein
3	43	0.099	0.113	0.112	113	1104	01.5	112	M1
4	43	0.118	0.137	0.128	117	1503	02.1	100	M2
5	42	0.142	0.166	0.154	113	1867	02.6	084	M3
6	41	0.191	0.199	0.196	109	0650	00.9	068	M4
7	40	0.212	0.239	0.224	119	2190	03.0	060	α-actin
8	38	0.263	0.295	0.289	129	2867	04.0	047	Tropomysins
9	37	0.306	0.352	0.325	133	4165	05.8	042	
10	34	0.382	0.478	0.429	141	9508	13.2	032	Not identified
11	32	0.489	0.505	0.496	130	1545	02.1	028	Actin
12	32	0.511	0.535	0.515	125	1933	02.7	027	Troponin-T
13	29	0.567	0.605	0.596	105	2563	03.6	023	mlc-1
14	28	0.618	0.677	0.638	120	4570	06.4	022	Troponin-1
15	26	0.694	0.710	0.710	103	1105	01.5	019	mlc-2
16	25	0.723	0.761	0.741	133	3421	04.8	019	mlc-3
17	24	0.774	0.823	0.791	121	3746	05.2	017	Degradation products
18	21	0.866	0.922	0.867	·65	1722	02.4	016	

Fig.(3): SDS- PAGE densitogramm of Pectoralis major muscle of chicks fed untreated bagasse 20% (treatment C).



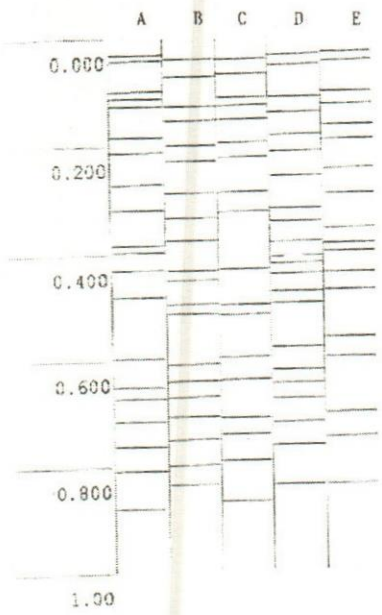
No.	Bas.	Start	End	R_f	Max	Area	%Area	Fit	Remark
1	27	0.011	0.048	0.036	132	3082	4.5	199	mHc
2	26	0.053	0.076	0.055	124	1820	2.7	147	C-protein
3	25	0.088	0.127	0.114	124	3233	4.8	086	M1
4	24	0.139	0.158	0.142	117	1574	2.3	073	M2
5	23	0.175	0.187	0.185	114	0895	1.3	060	M3
6	22	0.198	0.221	0.214	130	1993	2.9	054	α Actin
7	21	0.241	0.275	0.260	132	2931	4.3	046	Tropomysins
8	19	0.292	0.329	0.321	141	3436	5.1	039	
9	19	0.337	0.357	0.345	138	1923	2.8	037	
10	18	0.368	0.383	0.382	141	1250	1.8	034	
11	17	0.394	0.408	0.408	144	1281	1.9	032	Not Identified
12	17	0.414	0.422	0.420	145	0865	1.3	032	
13	16	0.436	0.451	0.439	143	1279	1.9	031	
14	15	0.465	0.482	0.473	137	1486	2.2	029	actin
15	15	0.490	0.519	0.496	134	2155	3.2	028	Troponin-T
16	12	0.541	0.587	0.578	116	2950	4.4	024	mlc-1
17	11	0.595	0.632	0.621	131	2984	4.4	023	Troponin-1
18	11	0.641	0.658	0.646	101	1093	1.6	022	Troponin-C
19	10	0.666	0.680	0.675	096	0855	1.3	021	mlc-2
20	09	0.692	0.740	0.719	142	4222	6.2	020	mlc-3
21	07	0.748	0.791	0.763	127	3352	4.9	019	Degradation
22	05	0.836	0.907	0.837	053	1691	2.5	017	products

Fig.(4): SDS- PAGE densitogramm of Pectoralis major muscle of chicks fed treated bagasse 10% (treatment D).

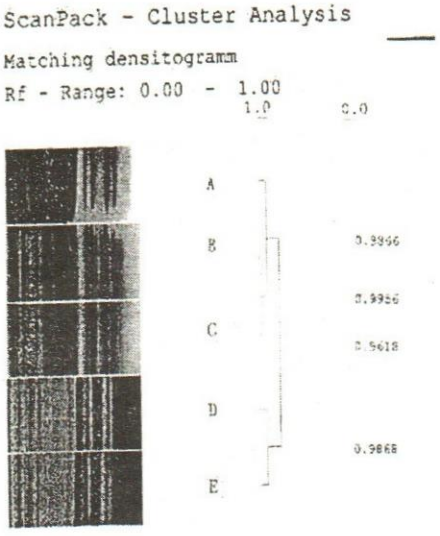


No.	Bas.	Start	End	R_f	Max	Area	%Area	Fit	Remark
1	36	0.011	0.036	0.033	122	1916	3.0	212	MHc
2	35	0.048	0.062	0.049	111	0983	1.5	159	C-protein
3	33	0.076	0.110	0.105	114	2463	3.9	092	M1
4	32	0.119	0.141	0.129	107	1567	2.5	079	M2
5	31	0.158	0.170	0.169	105	0719	1.1	065	M3
6	30	0.181	0.212	0.195	119	2397	3.8	058	α actin
7	28	0.224	0.261	0.249	123	2990	4.7	048	Tropomysins
8	26	0.269	0.312	0.296	128	3631	5.7	042	
9	24	0.343	0.366	0.359	130	2067	3.2	036	
10	23	0.377	0.391	0.386	135	1338	2.1	034	Not identifed
11	22	0.400	0.439	0.401	137	3481	5.5	033	
12	21	0.439	0.462	0.439	129	2063	3.2	031	actin
13	19	0.470	0.505	0.472	127	2430	3.8	029	Troponin-T
14	16	0.527	0.567	0.561	107	2529	4.0	025	mlc-1
15	14	0.575	0.621	0.599	124	3391	5.3	023	Troponin-1
16	11	0.672	0.723	0.703	136	4244	6.7	020	mlc-3
17	09	0.731	0.797	0.749	124	4685	7.3	019	Degradation
18	05	0.836	0.907	0.837	051	1494	2.3	017	products

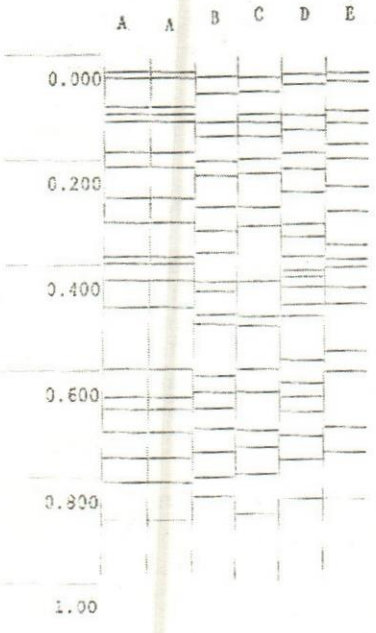
Fig.(5): SDS- PAGE densitogramm of Pectoralis major muscle of chicks Fed treated bagasse 20%(treatment E).



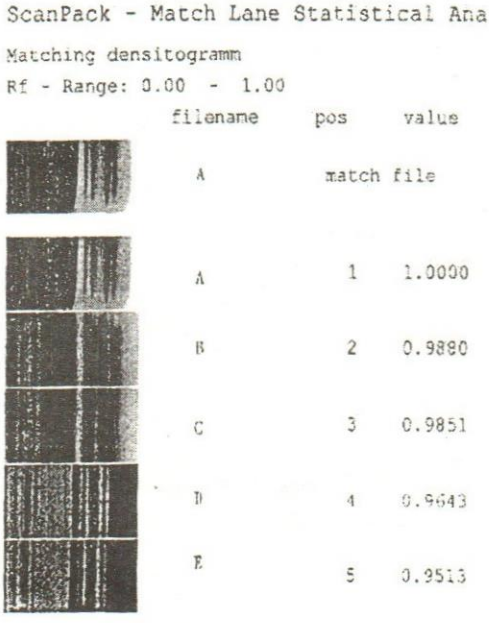
Banding Pattern



Pattern A



Banding Pattern



Pattern B

increased M_1 band and Troponin-T. The total decrease upon treatment E seems to be more than the total increase in some protein bands.

The total gain upon treating chicks with the four treatments B, C, D and E was calculated as : B = o which reflects that it is equal to control (A), C = -13 which means that it is the worst treatment among the four treatments, D = + 1 which means that it was the best treatment among the four treatments for raising the chicks and improving their health, E = -7 and that means that it was of less properties than the control (treatment A) in feeding quality or nutritional properties.

From the present study two observations could be noticed:-

1- The substitution of 8% sugar cane bagasse in their diets has no effect on the quality of carcass protein of pectoralis major muscle. In previous work *(EL-Faramawy et al, 1998)* we found that the body weight gain was also not affected in UTB 10% and increased in TB 10% which mean that addition of 8% sugar cane bagasse was beneficial not only qualitatively but also quantitatively.

This observation is of atmost importance for small farmers raising chicks as, from the economical point of view, they can save 8% of the costs by addition of dry sugar cane bagasse which is a simple available technique.

Ffurthermore, they can get rid of the unsuitable by product by a healthy way.

2- There is an obvious beneficial effect upon the use of rumen liquor, its addition to UTB 10% allow positive quality increase compared to the control, while its addition to UTB 20% reduce its harmful effect from -13 (UTB 20%) to –7 (TB 20%) as appeared in Table (2). The effect of rumen liquor is most probably due to its content of microorganisms which can transform crude fiber to simple sugars *(Prins and Clarke 1979)* and incubation of these microorganisms with UTB 10% for 72 hours renders it more palatable and more digestible for monogastric.

Statistical Analysis:

Statistical analysis of the protein patterns (densitograms) of pectoralis major muscle of 5 replicates in each experimental group (A, B, C, D and E) by cluster analysis (simultanously provided by the software used in gel analysis) have resulted in high matching degrees among the five densitogramms in all groups (above 99.90%) which reflects a very little differentiations among replicates (data not presented). Cluster analysis and matching densitogram among the five treatments (A, B, C, D and E) was presented in pattern A and attached banding pattern which could be interpretted as follows: Treatments B and C are of matching degrees as high as 99.56%, B and C as one group are 98.66% matched treatment A, treatment D was 98.68% matched treatment E, the last group (D and E) was 96.18% matched the first group (A, B and C) basing upon R_f values of each protein (mobility on the gel). If we used the denstogramm of a treatment as

Table (2) : Protein bands of Pectoralis theb major muscle of chicks raised on different diets.

Protein	A		B			C			D			E		
	b. No%	%	b. No%	%	Indication	b. No%	%	indication	b. No%	%	Indication	b. No%	%	Indication
MHc	1	3.7	1	3.7	i	1	2.9	- -	1	4.5	+	1	3.0	-
c-protein	2	3.0	2	2.8	-	2	2.5	-	2	2.7	-	2	1.5	- -
M1	3	2.5	3	4.6	+ + + +	3	1.5	- -	3	4.8	+ + + +	3	3.9	+ + +
M2	4	1.8	4	2.7	+ +	4	2.1	+	4	2.3	+ +	4	2.5	+ +
M3	5	3.1	5	2.9	-	5	2.6	-	5	1.3	- - -	5	1.1	- - -
M4	6	2.1	-	0.0	- - - -	6	0.9	- - -	-	0.0	- - - -	-	0.0	- - - -
α-actin	7	3.6	6	3.4	-	7	3.0	-	6	2.9	-	6	3.8	+
Tropomysins	8,9	9.9	7,8	6.8	- -	8,9	9.8	-	7,8	9.4	-	7,8	10.4	+
Actin	13	7.4	12	1.8	- - -	11	2.1	- - -	14	2.2	- - -	12	3.2	- - -
Troponin-T	-	0.0	13	3.5	+ + + +	12	2.7	+ + + +	15	3.2	+ + + +	13	3.8	+ + + +
mlc-1	14	4.1	14	4.3	+	13	3.6	-	16	4.4	+	14	4.0	i
Troponin-1	15	4.1	15	3.0	-	14	6.4	+ +	17	4.4	+	15	5.3	+ +
Troponin-c	16	1.3	16	1.8	+ +	-	0.0	- - - -	18	1.6	+	-	0.0	- - - -
mlc-2	17	1.5	17	1.8	+	15	1.5	i	19	1.3	-	-	0.0	- - - -
mlc-3	18	5.6	18	5.3	-	16	4.8	-	20	6.2	+	16	6.7	+
Gain	---		0.0			-13			+1			-7		

. No.: Band Number i : Identical. - : 0 - 25% decrease. + : 0 - 25% increase.

reference for comparison (Pattern B and attached Banding Pattern) the data could be interpretted as follows:

Treatment A (Control) was 98.80% matched treatment B, 98.51% matched treatment C, 96.43% matchedd treatment D and 95.13% matched treatment E basing upon R_f values of protein bands on the accrylamide gel.

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خواص الذبيحة للكتاكيت المغذاه على عليقه تحتوي على مصاص القصب

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أجّرى البحث علي خمسون كتكوت تسمين فى عمر ١٤ يوم . قسمت الى خمسة مجموعات – حيث تم دراسة الشكل الالكتروفوريتى لبروتينات عضلة الصدر الكبرى وذلك بعد تغذيتها لمدة أربعة أسابيع علي عليقة استبدال بنسب مختلفه من مصاص القصب المعامل والغير معامل. ويتكون مخلوط مصاص القصب من مطحون مصاص القصب المجفف وجنين القمح بنسبة ١:٤ (كنسبة وزنيه) حيث اضيف الي المخلوط السابق سائل الكرش للحيونات المجتره بنسبة ١:٤ (كنسبة وزنية : حجميه) وتم تحضين الخليط على درجة ٣٩°م ،pH٦,٥ لمدة٧٢ ساعه (مصاص القصب غير المعامل). وكذلك معاملة المخلوط الاخير بالتشعيع بأشعة جاما بجرعة ٢ ميجا (مصاص القصب المعامل) وكلا من المصاص المعامل والمصاص غير المعامل تم إضافتهم إلى العليقة الأصلية للكتاكيت بنسبة ١٠ ، ٢٠ % بالوزن مقارنة بالكنترول.

وقد أظهرت الدراسة أن المجموعة المغذاه على مصاص غير المعامل بنسبة ١٠% من العليقة لم يظهر بها تغيراً يذكر في البروتينات المفصولة على العكس من ذلك فإن المجموعة المغذاه على مصاص غير المعامل ومضاف بنسبة ٢٠% من وزن العليقة كانت أسوأ معاملة حيث كان هناك نقصاً واضحاً في البروتينات الليفية.بينما المجموعة المغذاه على مصاص معامل ومضاف بنسبة ١٠% من وزن العليقة فقد وجد أنها أفضل المجموعات التجريبية الخمسة بما في ذلك مجموعة الكنترول وكان ذلك واضحا في زيادة نسبة البروتينات المسئولة عن القدرة العضلية بينما كانت المجموعة المغذاه على مصاص معامل مضاف بنسبة ٢٠% من وزن العليقة فقد ظهر بها نقص في نسبة هذه البروتينات ولكن إلى حد أقل سوأ من تلك المجموعة المغذاه على مصاص غير المعامل ومضاف بنسبة ٢٠% من وزن العليقة.

وتوضح النتائج أن كتاكيت التسمين ممكن أن تتغذى على علائق يدخل مصاص القصب المعامل في تركيبها بنسبة ٨% بدون أي تأثير على بروتينات الذبيحة وذلك يوفر ٨% من تكاليف العلائق وبالتالي يسهم في التخلص الأمن من النفايات ويجب أن نشير هنا إلى التأثير المفيد لسائل الكرش وذلك بعد التحضين والتعقيم بأشعة جاما والذي من شأنه أن يجعل مصاص القصب أكثر قابلية للهضم ويزيد من المركبات النيتروجينة العضوية في العليقة.