

RESULTS

4. The results obtained in the present investigation in the different groups have been presented in Table A1. to J2 along with histogram figures 20 to 23.

4.1. Body weight gain :

The body weight gain in respect to different feed regime has been shown in table A1 (Fig.20). The mean body weight gain in group I, 36.46 ± 0.67 gm, Group II, 24.00 ± 1.0 gm, Group III, 34.60 ± 1.0 gm with an individual variation 35-40 gm, 20-32 gm and 30-40 gm respectively has been observed. The highest body weight gain has been noted in animals belongs to Group I and lowest in Group II, where the animals were maintained under 10% level of protein diet. There is statistical significance ($P/0.01$) between the groups (Table A2). The critical difference test (Table A3) reveals significant difference between groups I & II and II & III. However, there is no significant difference between group I & III. It was observed that the body weight gain was lower in the group maintained with 10 per cent protein.

Table- A.1. : Showing average value of body weight (gm) in different groups.

Group	No. of Animals	Average with SE	Range	S.D.
Gr. I	15	36.46 ± 0.67	35 to 40	2.5
Gr. II	15	24.00 ± 1.0	20 to 32	3.8
Gr. III	25	34.60 ± 1.0	30 to 40	3.8

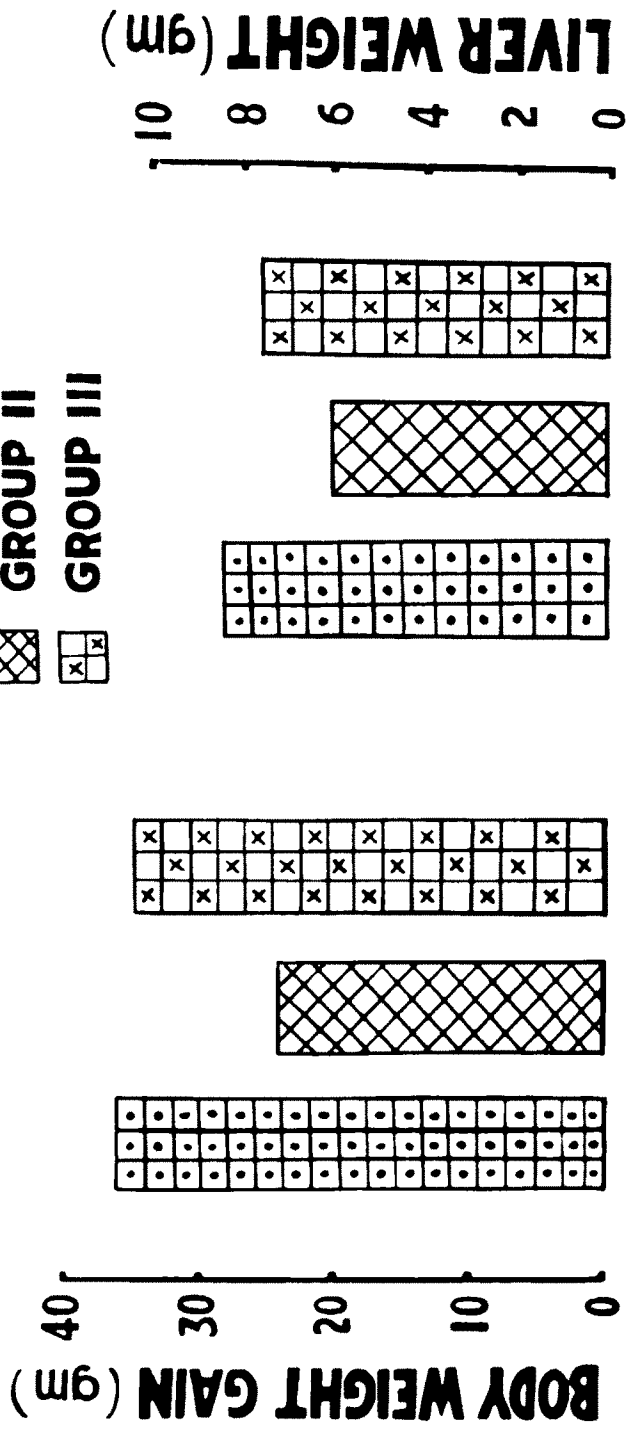


FIG.20.SHOWING THE BODY WEIGHT GAIN AND LIVER WEIGHT IN DIFFERENT GROUPS

Table - A.2. Analysis of variance of body weight gain in male Albino rat in different groups.

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	1356.31	678.15	56.14**
Error	42	507.3	12.079	
Total	44			

** , P \leq 0.01.

Table - A.3 : Showing critical difference test of body weight gain in different groups.

Group of comparison		Mean difference	C.D. value
I & II	36.46-24.0	12.46*	8.7
II & III	24.0-34.60	10.60*	
III & I	34.60-36.46	1.86	

4.2. Liver weight :

The average liver weight gain was 8.22 ± 0.39 gm, 6.07 ± 0.18 gm and 7.69 ± 0.39 gm in group I, II and III respectively (Table B1 and Fig.20). Wide range of variation amongst the animal has been recorded in all the groups, however this variation seems to be less amongst the animal

belonging to group II. In these three different groups of animal, the group I revealed highest liver weight gain (8.2 ± 0.39 gm), and in group II the weight gain in liver was lowest. Analysis of variance revealed significant differences ($P < 0.01$) between the groups of animals (Table-B2). Critical difference test (Table-B3) between group I with group II reveals significant difference, where the animals were maintained in 10% protein diet. Significant difference was also observed between group II and group III.

Table B1 : Showing average value of liver weight (gm) in different groups.

Group	No. of Animals	Average with S.E.	Range	S.D.
Gr. I	15	8.22 ± 0.39	5.6 to 10.4	1.52
Gr. II	15	6.07 ± 0.18	5.1 to 7.5	0.70
Gr. III	15	7.69 ± 0.39	5.8 to 10.5	1.48

Table B2 : Analysis of variance of liver weight in male albino rat in different groups.

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	37.73	18.86	11.23**
Error	42	70.83	1.68	
Total	44			

** , $P < 0.01$.

Table - B.3. : Showing critical difference test of liver weight in different groups.

Group of comparison		Mean difference	C.D. value
I & II	8.22-6.07	2.15*	
II & III	6.07-7.69	1.62*	0.96
III & I	7.69-8.22	0.53	

4.3. Blood haemoglobin :

Table C1 represent blood haemoglobin content in gm% per 100 ml blood. The values of haemoglobin were 14.5 ± 0.45 gm% in group I, 11.6 ± 0.38 gm% in group II, and 15.1 ± 0.36 gm% in group III (Table C1 & Fig.21). It has been observed that the highest blood haemoglobin content is due to the 20% protein diet and almost same value in animal as of the control diet. The values of haemoglobin have been reduced in animal maintained with 10% protein diet. The statistical analysis of variance has revealed significant difference in two groups ($P/0.01$) (Table C2). The critical difference test (Table C3) showed the significant differences between group I & II, group III & II, but there is no difference between group I & III.

Table - C.1. : Showing average value of Haemoglobin (gm%) in different groups.

Group	No. of Animal	Average with SE	Range	S.D.
Gr. I	15	14.5 ± 0.45	11.4 to 16.8	1.72
Gr. II	15	11.6 ± 0.38	9.5 to 14.5	1.46
Gr. III	15	15.1 ± 0.36	12.3 to 17.8	1.39

Table - C.2 : Analysis of variance of Haemoglobin in male albino rat in different groups.

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	104.53	52.6	20.38**
Error	42	105.76	2.581	
Total	44			

** , P \leq 0.01

Table - C.3. : Showing critical difference test of Haemoglobin in different groups.

Group of comparison	Mean difference	C.D. value
I & II	14.5 - 11.6	2.9*
II & III	11.6 - 15.1	3.5*
III & I	15.1 - 14.5	0.6

4.4. Total Protein :

Table D1 and Fig.21 reveal that the total protein in blood plasma were 7.1 ± 0.25 gm%(Group I), 5.8 ± 0.19 gm% (Group II) and 7.1 ± 0.24 gm%(Group III) respectively. The range of variation amongst the animal was in group I, 6.0 to 8.5 gm%, group II, 5.1 to 7.5 gm% and group III, 5.8 to 8.7 gm% respectively. It has been observed that the total protein

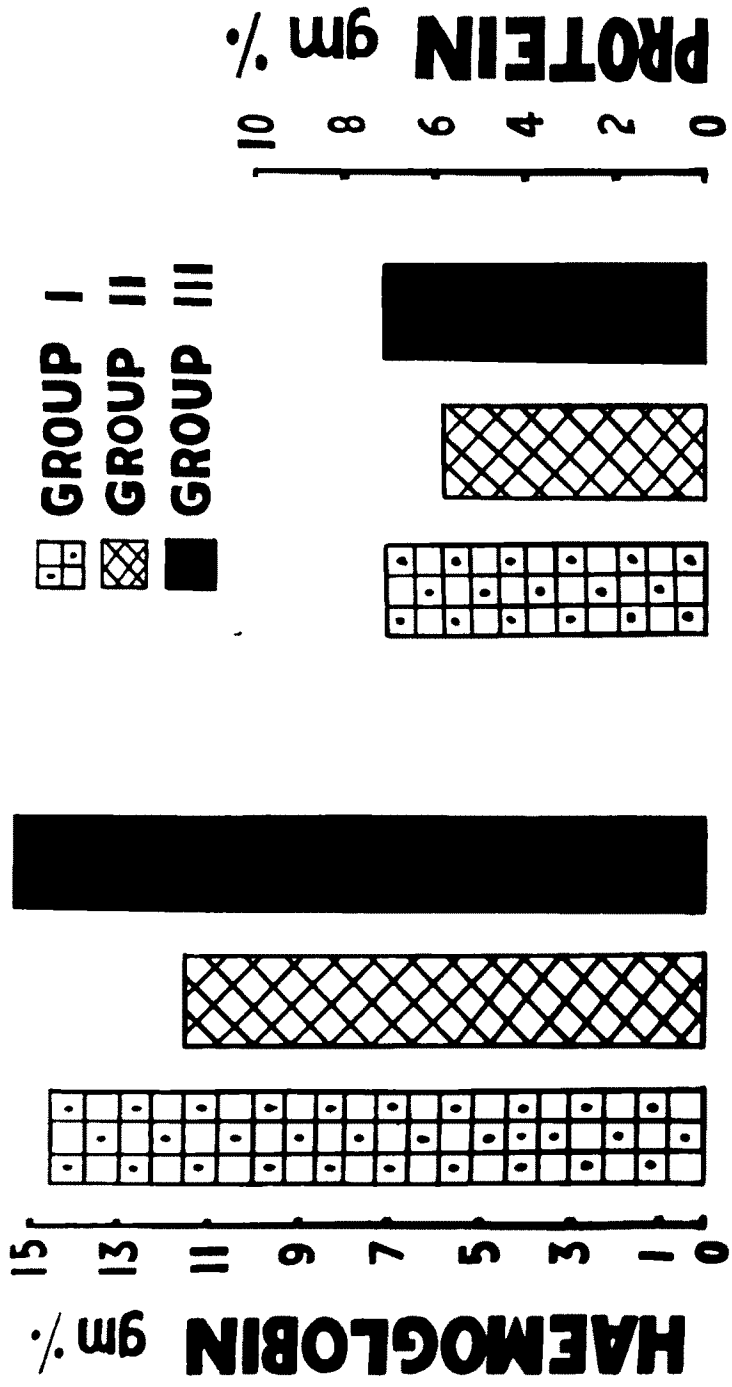


FIG.21. LEVEL OF HAEMOGLOBIN AND PLASMA PROTEIN IN DIFFERENT GROUPS.

content in blood plasma is lowest in animals maintained on 10% protein diet. The total protein content in animals belonging to group I i.e., control and group III (20% protein) revealed quite normal. There is significant difference between group I and II, and III & II, no such difference has been observed between group I and III (Table D.3).

Table- D.1. Showing average value of protein (gm%) in different groups.

Group	No. of Animals	Average with SE	Range	S. D.
Gr. I	15	7.1 ± 0.25	6.0 to 8.5	0.98
Gr. II	15	5.8 ± 0.19	5.1 to 7.5	0.73
Gr. III	15	7.1 ± 0.24	5.8 to 8.7	0.90

Table - D.2. Analysis of variance total protein in male albino rat in different groups.

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	17.08	8.54	
Error	42	26.65	0.634	13.47**
Total	44			

** , P /0.01.

Table D.3. : Showing critical difference test of protein in different groups

Group of comparison		Mean difference	C.D. value
I & II	7.1 - 5.8	1.3*	
II & III	5.8 - 7.13	1.33*	0.59
III & I	7.1 - 7.1	0.00	

4.5. Enzyme liver catalase :

As shown in the table E1 and Fig.22, the mean values of liver catalase are as follows, 1.73 ± 0.13 , in group I, 1.91 ± 0.04 in group II and 1.70 ± 0.13 in group III. With an individual range of variation from 1.10 to 2.76, 1.15 to 2.79 and 1.38 to 1.91 in control, group II and group III respectively. It has been observed that the range of variation is much wider in the individual animals belongs to group I i.e. control group. Further it has also been observed that the enzyme liver catalase activity is highest in animals belongs to group II in which animals are fed with 10% protein diet and the lowest liver catalase is recorded in group III. However, statistical analysis reveals no significant variation in two different groups with that of control group.

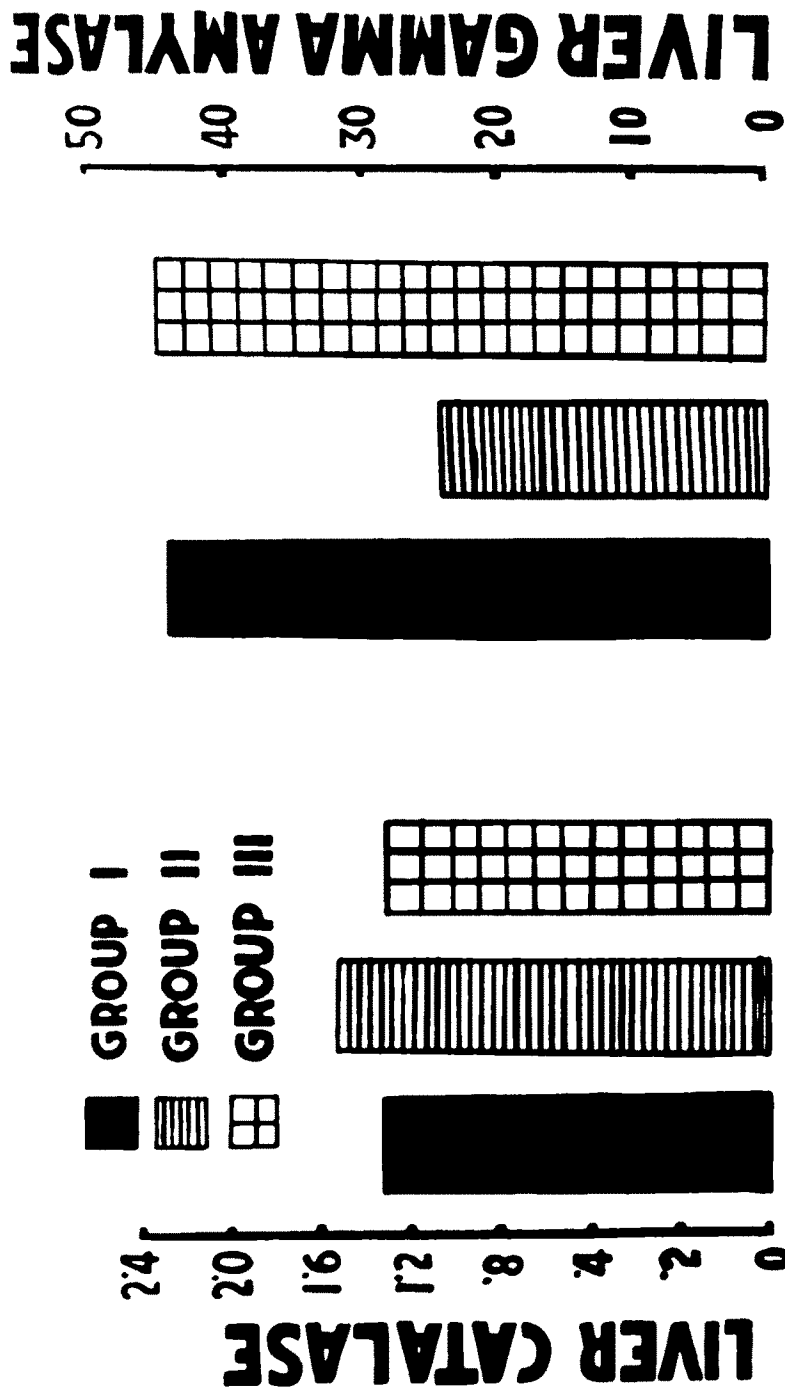


FIG.22.THE LIVER CATALASE AND GAMMA AMYLASE IN DIFFERENT GROUPS

Table - E1 : Showing average value of catalase activity in different groups

Group	No. of Animals	Average with SE	Range	S.D.
Gr. I	15	1.73±0.13	1.10 to 2.76	.51
Gr. II	15	1.91±0.04	1.15 to 2.79	.41
Gr. III	15	1.70±0.13	1.38 to 1.91	.15

Table - E2 : Analysis of variance of catalase in male albino rat in different groups

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	0.39	0.195	
Error	42	6.29	0.149	1.31 NS
Total	44			

NS, Not Significant.

4.6. Gamma amylase :

Table F1 and Fig.22 show the average value of liver, gamma amylase. The mean values with their standard errors recorded were 44.40 ± 0.92 , 24.13 ± 1.77 , and 45.26 ± 1.95 in group I, Group II and Group III respectively. The lower value recorded in the group II i.e., maintained under 10% protein. The range of variation in different groups are as follows 40 to 50 in group I, 16 to 38 in group II and 32 to 62 in group III. The range of variation widest in the group III.

Significant difference amongst the group was noticed showed in table F2. The critical difference test reveals significant difference between group I and II and group III and II. However the values of control groups and animals maintain under group III did not showed any significant difference.

Table F.1. Showing average value of gamma amylase activity in different groups.

Group	No. of Animals	Average with SE	Range	S.D.
Gr. I	15	44.40 ± 0.92	40 to 50	3.50
Gr. II	15	24.13 ± 1.77	16 to 38	6.73
Gr. III	15	45.26 ± 1.95	32 to 62	7.42

Table - F.2. Analysis of variance of Gamma amylase in male albino rat in different groups

Source	d.f.	S.S.	M.S.	F
S.S. between group	2	4290.52	2145.26	
Error	42	1578.28	37.57	57.10**
Total	44			

** , P < 0.01.

Table - F.3. Showing critical difference test of gamma amylase activity in different groups

Group of comparison		Difference between means	C.D. value
I & II	44.4-24.13	20.27*	
II & III	45.26-24.13	21.13*	4.52
III & I	45.26-44.4	0.86	

4.7. Enzyme GOT :

Table G1 and Fig.23 shows the average value of liver glutamic oxaloacetic transaminase, the average values in different groups are as follows : 226 ± 22.19 Iu/mg of L.T.P. (control group) 126 ± 5.76 Iu/mg (group II) and 226 ± 4.79 Iu/mg LTP (group III) with individual range of variation from 182 to 266 in group I, 75 to 168 in group II and 196 to 258 in group III. The highest average value of GOT is observed in animals belongs to group I and group III and lowest in group II. There is significant difference in the level of GOT at ($P/0.01$) (Table G2). The critical difference test (Table G3) also reveal significant difference between the groups I and II and group III and II. However no difference was observed between group I & III.

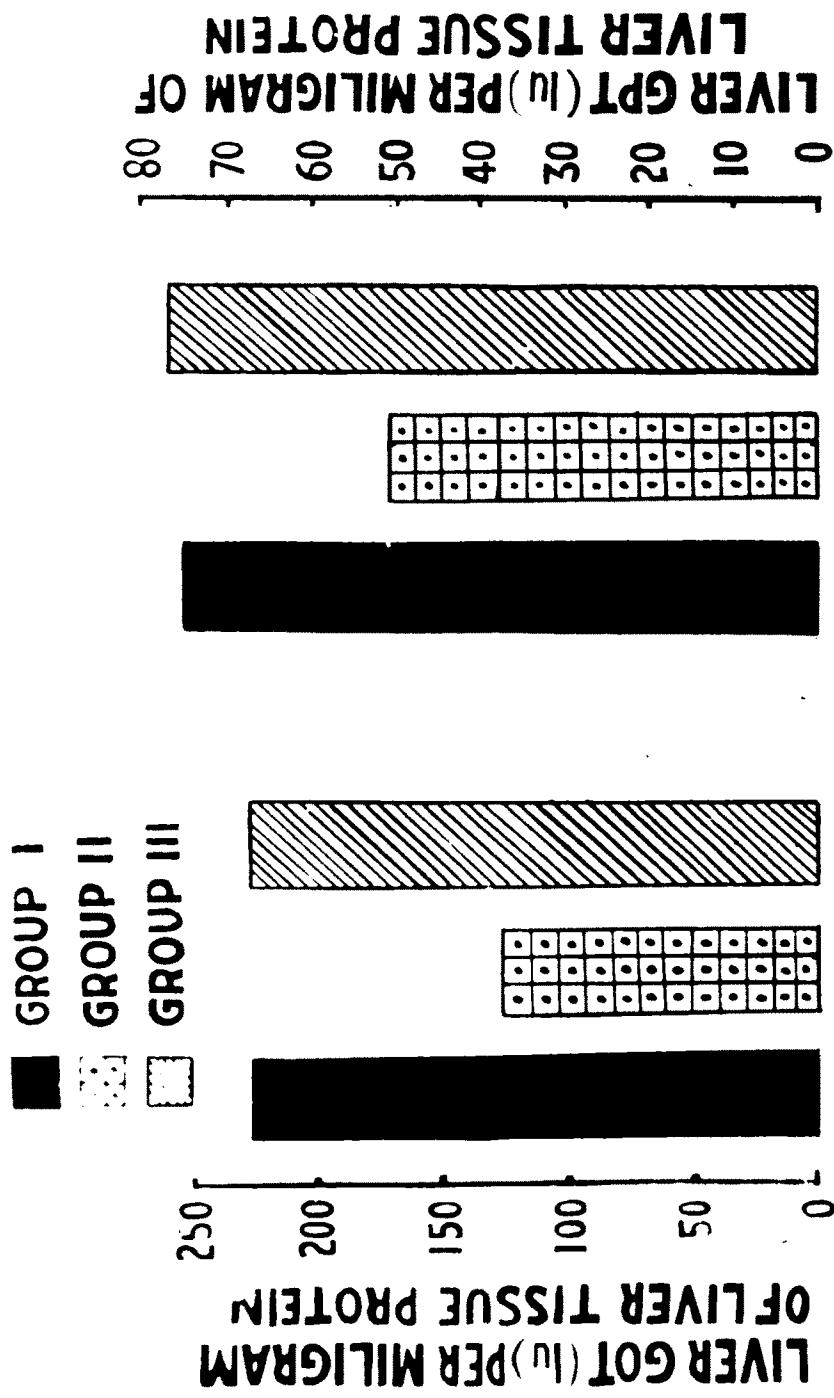


FIG.23. THE LIVER GLUTAMIC OXALOACETIC AND GLUTAMIC PYRUVIC TRANSAMINASES IN DIFFERENT GROUPS

Table - G.1. Showing average value of GOT (lu/mgm L.T.P.) in different groups

Group	No. of Animals	Average with SE	Range	S.D.
Gr. I	15	226 ± 22.19	182 to 266	84.33
Gr. II	15	126 ± 5.75	75 to 168	21.91
Gr. III	15	226 ± 4.79	196 to 258	18.23

Table - G.2 : Analysis of variance of GOT in male albino rat in different groups

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	99867.27	49933.63	
Error	42	18706.53	445.39	112.11*
Total	44			

**, P / 0.01

Table G.3 : Showing critical difference test of GOT in different groups

Group of comparison		Mean difference	C.D. value
I & II	226-126	100*	
II & III	126-226	100*	12.4
III & I	226-226	0	

4.8. Enzyme GPT :

It is observed that the average values of GPT in 3 different groups are 75.73 ± 4.46 (group I), 50.93 ± 5.63 (group II) and 77.73 ± 4.71 (group III) (Table H1 & Fig. 23). With individual range of variation in control group 50 to 100, in group II, 20 to 100 and in group III, 48 to 109 has been observed that the range of variation are much wider in animals belongs to group II. The highest average value is observed in group III and lowest average value in group II. Analysis of variance reveals (Table H2) significant difference amongst the groups. The critical difference test (Table H3) reveals that there was significant difference between group II with that of group I & III. However, there was no such difference observed in between control (group I) and group III is maintained with 20% protein diet.

Table - H.1. Showing average value of GPT (Iu/mgm of L.T.P.) in different groups.

Group	No. of Animals	Average with SE	Range	S.D.
Gr. I	15	75.73 ± 4.46	50 to 100	16.95
Gr. II	15	50.93 ± 5.63	20 to 100	21.40
Gr. III	15	77.73 ± 4.71	48 to 109	17.91

Table - H.2. Analysis of variance of GPT in male albino rat in different groups

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	6686.38	3343.19	9.88**
Error	42	14208.82	338.30	
Total	44			

** , P \leq 0.01

Table - H.3. Showing critical difference test of GPT in different groups

Group of comparison		Difference between mean	C.D. value
I & II	75.73-50.93	24.80*	
II & III	77.73-50.93	26.80*	13.57
III & I	77.73-75.73	1.999	

4.9. Triiodothyronine :

The average values of T_3 with their standard error in different groups have been presented in the table I1 and Fig.24. The average value of T_3 for the group I was 1.30 ± 0.11 , 0.63 ± 0.07 in group II and 1.49 ± 0.16 ng/ml in group III. The highest average value was in group III and lowest average was recorded in group II. Their significant difference

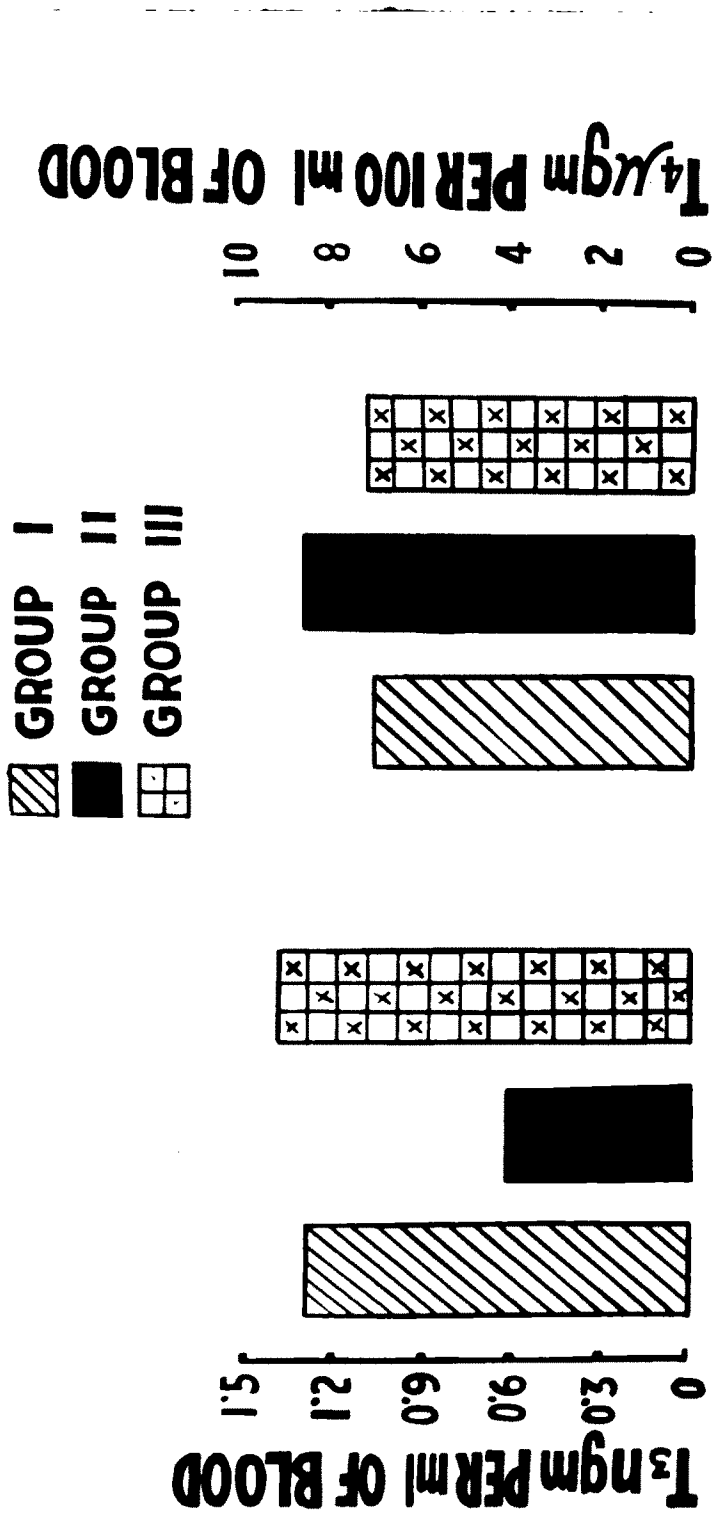


FIG.24. LEVEL OF TRIIODOTHYRONINE(T₃) AND THYROXINE (T₄) IN DIFFERENT GROUPS.

was shown in table I2. Anova reveals this difference is significant at (P/0.01) level. The critical difference test was presented in table I3, showed that the difference is significant in between group I and II and Group III and II. However, the variation is not significant between group I and III which is maintained under 20% protein.

Table - I1 : Showing average value of T_3 (ngm/ml) in different groups

Group	No. of Animals	Average with SE	Range	S.D.
Gr. I	15	1.30 ± 0.11	0.72-2.2	0.44
Gr. II	15	0.63 ± 0.07	0.28-1.2	0.27
Gr. III	15	1.49 ± 0.16	0.77-2.6	0.63

Table I2 : Analysis of variance of T_3 in male albino rat in different groups

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	6.11	3.057	13.5*
Error S.S.	42	9.47	0.2255	
Total S.S.	44			

Table I.3. Showing critical difference test of T_3 in different groups.

Group of comparison		Difference between mean	C.D. value
I & II	1.30 - 0.63	0.67*	
II & III	0.63 - 1.49	0.86*	0.35
III & I	1.49 - 1.30	0.19 NS	

4.10. Thyroxine (T_4) :

The mean average value of thyroxine (Table J1 and Fig.24) in 3 different groups are, $7.16 \pm 0.6 \mu\text{gm}\%$ in group I, $8.6 \pm 2.9 \mu\text{gm}\%$ in group II and $7.6 \pm 3.7 \mu\text{gm}\%$ in group III respectively. It was observed that the highest value of T_4 was recorded in group II. However, the values of thyroxine is almost similar in group I and group III. The range of variation in 3 different groups were 5.5 to 9.8 in group I, 5.8 to 11.5 in group II and 5.5 to 10.2 in group III, there was wide range of variation amongst the animals belongs to group III. However statistically significant difference was not observed in between the groups (Table J2).

Table J1 : Showing average value of T_4 ($\mu\text{gm}/100 \text{ ml}$) in different groups

Groups	No. of Animals	Average with SD	Range	S.D.
Gr. I	15	7.16 \pm 0.6	5.5 to 9.8	2.3
Gr. II	15	8.6 \pm 2.9	5.8 to 11.5	11.1
Gr. III	15	7.6 \pm 3.7	5.5 to 10.2	14.3

Table J2 : Analysis of variance of T_4 in male albino rat in different groups

Source	d.f.	S.S.	M.S.	F
S.S. between groups	2	26.452	13.226	.11 NS
Error S.S.	42	4667.26	111.12	
Total S.S.	44			