SUMMARY

The present study was carried out at Animal Experimental Station at Nuclear Reseanch Centre, Enshas .

Radioimmunological and biochemical assays were performed in Laboratories of Radioimmunology and Biochemistry unite of Atomic Energy Autority .

It was planned investigate the effect of using different dietary protein levels on the antibody formation oin female and male Hubbard chicks .

The study was also aimed to point out the effect of both dietary protein levels and thyroglobulin immunization on growth measurments and some metabolic blood parameters in relation to induced thyroid immunity to provide some insights on the autoimmune diseases in fowl .

Atotal of 300 one - dau old Hubbard chicks (150 females and 150 males) were used . Birds were reared on starter diet during the first two weeks of age then randomly classified into 3 groups of 50 of each sex, representing three nutrional diets applied up to the end of the experimental period that lasted 14 weeks . Low (14.44 %) , medium (18.41 %) and high (22.11 %) levels of protein in diet were fed to female and male chicks of the first , second and third group , respectively .

All diets were formulated to be of equal energy and to cover the nutritional requirements recommended by NRC, (1984) .

Thyroglobulin immunization treatment was carried out after 3 weeks of applying the experimental diet (at the 5^{th} week of age) . Chicks of each sex and dietary protein level were subdivided into three subgroups (each of 15 chicks) . Birds of the first subgroup was injected with 0.5 mL saline solulion and considered to be control, while birds of the second and third subgroup

were injected with 0.5 mL Complete Freund's Adjuvant (CFA) or thyroglobulin , respectively . Repeated injections were carried out a week later (at the 6^{th} week of age) to induce secondary immune response for chemical and immunological assays . Blood samples were collected prior to and at the 2^{nd} , 4^{th} , 6^{th} and 8^{th} week after active thyroid immunization .

Immunoresponse was evaluated by estimating antibody strength (%T_4-^{125}I bound to gamma globulin) using ammonium sulphate method , qualitative and relative concentration of gamma globulin and fractions of serum protein using cellulose acetate electrophoresis and by estimating thyroid hormones thyroxine (T_4) and triiodothyronine (T_3) levels in blood serum .

Total protein, albumin , globulin and A/G ratio ; total lipids , cholesterol and serum transaminases activities (SGOt and SGpt) were estimated as prameters related to both dietary protein and thyroglobulin immunization .

Body weight , weight gain , feed consumption and efficiency were recorded weekly and considered to be growth performance measurments .

Obtained results could be summerized as follows :

I - Effect of dietary protein level on immune response .

1- Percentage of T_4-^{125}I bound to gamma globulin . As a result of thyroglobulin immunization antibody formation could be detected in all groups of chicks at the second week after immunization , reaching its peak values at the 4^{th} week for the group of chicks fed low protein diet and at the 6^{th} and 8^{th} week for those group fed medium and high protein levels , respectively .

- Antibodies formed against thyroglobulin immunization were found to be significantly affected by sex , dietary protein level . immunization and time intervals .

- Females attained higher antibody titres than males in most groups .

- Birds of higher protein level group had the highest % of T_4-^{125}I bound to gamma blobulin than those of medium or low level .

- Antibody production was found to be increased in all groups with the progess of time

2 - Electrophoretic fractionation of serum proteins .

- Qualitative and relative concentration of gamma globulin showed similar results to that obtained by ammonium sulphate method .

- Dietary protein level , immunization and time intervals significantly affected gamma globulin concentration in serum .

- Serum albumin and alpha and beta globulin levels were not found to be affected by thyroglobulin immunization . However , albumin and alpha - globulin were significantly affected by dietary protein levels and time intervals .

- Serum Beta globulin content was not significantly affected by any of the studied factors .

3 - Serum Thyroid hormones levels .

Chick's sex was found to be of no significant effect on both T_4 or T_3 levels in serum . Increased level of T_4 was observed in the group of birds fed medium or high levels of protein while those birds fed lower dietary protein levels had lower T_4 levels in serum .

- T_4 increased at the time of antibody formation and decreased with the progress of time .

- T_3 was significanthy affected by the level of protein in diet and time intervals .

II Effect of dietary protein levels and thyroglobulin immunization on blood parameters

1 - Total proteins :

- Serum total proteins . albumin and globulin were found to be significantly affected by dietary protein level and time intervals (increased values in all the last mentioned parameters were associated with the increasing percentages of protein in diet and with the progress of time).

- Serum total proteins and globulins were found to be significantly ($P < 0.05$) affected by immunization . while sex showed a highly significant effect ($P < 0.001$) on serum globulins .

2 - Total lipids and total cholesterol .

Total lipids were significantly affected by dietary protein (decreased with increasing levels of protein in diet) and time intervals (increased with the progress of time) . While cholesterol decreased in concentration with the progress of time . No significant effect due to immunization was found on either total lipids or cholesterol .

3 - Serum Transaminase activities (GOT and GPT)

Increasing levels of both GOT and GPT in serum were found in the group of birds fed lower levels of protein in diet than those fed medium or higher levels . Thyroglobulin immunized groups showed higher levels of both enzymes than the control . They were increased with the progress of time .

- Protein level in diet, immunization and time intervals significantly affected both Got and Gpt in serum .

III Effect of dietary protein and thyroglobulin immunization on growth measurments .

- Body weight and feed efficiency were found to be significantly affected by sex , dietary protein level and time intervals .

- Females had lighter body weights and lower feed efficiency than males.
- Lighter body weights and lower feed efficiency were associated with feeding the birds lower dietary protein levels, while the heaviour weights and higher feed efficiency were associated with feeding higher dietary protein levels .

- Significant effect due to immunization was found to affect body weight , while immunization had no effect on either feed consumption or feed efficiency .