6. SUMMARY

Pesticide exert toxic effects on various organ system of the body. These effects are manifested both on acute administration and after prolonged exposure. The former may be accidental or after sudden or acute exposure while the latter is a common among the persons occupationally exposed to them or among spraymen. The factors influencing the toxicity of pesticides are several; the toxicity may vary in males and females since the LD$_{50}$ values of a number of pesticides have been reported to differ in males and females. The climatic factor may be involved and above all the diet including the proteins may also affect the toxicity of pesticides.

The purpose of the present study was to (i) compare the toxicity of certain pesticides in animals maintained on normal and protein deficient diet; (ii) to determine the biochemical and neurochemical changes in pesticides treated animals maintained on protein deficient diet; and (iii) to perform histological studies in different sensitive organs of pesticides treated animals maintained on protein deficient diet.
The two commonly used pesticides, malathion (organophosphorous) and endosulfan (organochlorine) were used. Experimental studies were conducted in white albino rats maintained on protein deficient diet for 45-60 days.

It was found that cholinesterase inhibition induced by malathion in the brain of rats (a) maintained on usual laboratory diet and (b) those on low protein diet, was almost similar; there being no significant difference in the values of cerebral acetylcholinesterase activity in the two groups of animals.

Similarly the increase in the level of cerebral free ammonia induced by endosulfan in the two groups of animals (those on usual laboratory diet and those on protein deficient diet) was almost the same, indicating that the particular diet did not influence the neurochemical changes induced by the acute administration of the compound.

Endosulfan did not significantly change the level of cerebral or striatal cholinesterase activity in rats.
It was, however, found that the degree of hyperglycaemia induced by malathion was more in animals on usual laboratory diet than those on synthetic or protein deficient diet; The depletion of glycogen from the brain and liver was also more in malathion treated hyperglycaemic animals maintained on usual laboratory diet.

The degree of hyperglycaemia induced by endosulfan was only marginal and was not influenced by the particular diet given to animals.

Histological changes induced by endosulfan in certain organs were also influenced by the particular diet on which the animals were maintained. Endosulfan treatment for 60 days produced histological changes in liver, kidney and testis. The degenerative changes in these organs were quite marked. The histological changes were more manifest in animals maintained on protein deficient diet than those on normal laboratory diet. Thus the deficiency of proteins in the diet aggravated the histological damage induced by endosulfan in certain organs of rats. The GOT and GPT activity was significantly increased in liver and serum, more
in animals maintained on protein deficient diet than those on normal laboratory diet.

Thus it seems that the deficiency of proteins in the diet influences only certain toxic effects, particularly those which are associated with histological damage in tissues as a result of prolonged treatment; The enzyme activities in damaged tissues may also be influenced by the protein deficient diet. However, the acute neurochemical changes which are usually associated with stimulatory effects, do not seem to be significantly influenced by the protein deficient diet given to animals for 45-60 days.