General Summary
1. The present experiment aims at the study of the effect of unsaturated fat (safflower oil) supplement and deficient diets in a group of healthy male albino rats of approximately same age and same weight (± 20 gms.)

2. Sixty male albino rats were procured from the Departmental animal house of Gauhati University and the experiment was carried out under laboratory conditions for a period of one year.

3. Observations were made every three months i.e. at the end of 3 months, 6 months, 9 months and 12 months.

4. For best results the experiment was carried out in two sets of animals for two consecutive years under the same laboratory facilities.

5. Observation on morphological changes reveals that there was gradual loss of hair from the face, trunk and tail of deficient groups of animals after 3 months period.

6. Substantial differentiation of growth was also observed between deficient and supplement groups. A low growth rate in deficient group and high
growth rate in supplement group was observed, although food and drinking water intake was more in deficient and less in supplement group. Growth rate and food intake were not related in this experiment.

7. The improvement of growth resulting from adding of 0.5 ml/100 gram body weight/day of Safflower oil to the Bengal-gram diet was more than in control and deficient groups.

8. Death of two animals in first set and one in second set during period from the deficient group was also observed.

9. The careful anatomical study of microscope preparations showed an irregular architectural pattern of hepatocytes with some fat deposition in the liver of animals of deficient group.

10. Some tubular degenerative changes with deposition of fat droplets in the kidney tissue were observed which became more prominent in the deficient group of 6 months period.

11. The normal architecture of the glomeruli were not retained, reduction in capsular spaces with degeneration of some of the tubules was also observed in kidney tissue of deficient group. These changes were not visible in the kidney
sections of the 'supplement group' which show more or less normal structure as seen by comparing with the control group.

12. Observations of metabolic synthesis of DNA showed a high rate of its synthesis in the 6 and 9 months deficient group and less in 12 months group compared to that of supplement group of animals where suppression of DNA synthesis occurs.

13. There was an increased intensity of the PAS reaction for glycogen in liver of deficient group which indicates more glycogen storage in the tissue compared to supplement and control group of animals.

14. Increased activity of alkaline phosphatase enzyme in kidney sections of both supplement and deficient groups was observed.

15. A biochemical study was made for correct evaluations of physiological changes occurring in health and in disease. The analysis of blood sample provides information of great clinical importance for diagnosis of diseases and other physiological disturbances produced by supplement of unsaturated fat (safflower oil) in the diet and its deficiency.
16. Biochemical analysis of blood for plasma glucose level, plasma cholesterol concentration, plasma protein and serum alkaline phosphatase concentration from the samples collected from the experimental animals of different groups for different experimental periods was performed.

17. The blood glucose level is the reflection of the state of total carbohydrate metabolism. Significant increase in plasma glucose concentration in the deficient group of 6 months period (DII - 260 mg/dl) and then its decline to 198 mg/dl in 9 months (DIII) and 195 mg/dl in 12 months (DIV) group is statistically highly significant (p < 0.001) when compared with corresponding deficient and control values.

18. A fasting blood glucose level above normal was also observed in the animals of supplement groups and it remains more or less constant throughout the experimental period i.e. 120 mg/dl in 3 months (SI), 141 mg/dl in 6 months (SII), 148 mg/dl in 9 months (SIII), and 144 mg/dl in 12 months group (SIV).

19. The effect of unsaturated fat supplement diet on the plasma cholesterol levels of experimental animals were observed. Plasma cholesterol levels of deficient group of animals, declined gradually
i.e. 98 mg/dl in 3 months (DI), 94 mg/dl in 6 months (DII), 74.2 mg/dl in 9 months (DIII), and 70 mg/dl in 12 months (DIV) but not below that of the control value, 65 mg/dl.

20. The plasma cholesterol concentrations in case of supplement groups elevate gradually from 100.3 mg/dl in 3 months (SI), 106.5 mg/dl in 6 months (SII), 117 mg/dl in 9 months (SIII) to 134.2 mg/dl in 12 months (SIV) with the advancement of age, which shows the metabolic processes of plasma cholesterol in male albino rats is elevated slightly throughout the experimental period under the influence of unsaturated fat supplement diet.

21. From the observations of plasma protein levels it has been found that both the groups of rats fed with unsaturated fat supplement and deficient diets showed no significant change of elevation or depression except a slight change in 12 month period supplement group i.e. 6.9 mg/dl.

22. The biochemical analysis of plasma protein levels for both deficient and supplement groups indicates that the male albino rat fed with a diet of bengal gram in presence of unsaturated fat or in absence of it showed equal trend of elevation or depression of its metabolic activities.
23. Observation of serum alkaline phosphatase of all experimental groups shows that there was a high elevation in the deficient group of 6 months period (DII 40 KAU/dl) from 17 KAU/dl of 3 months and more elevation in 9 months period (DIII 46 KAU/dl) and 12 months period (DIV 52 KAU/dl) which is highly significant statistically (p < 0.001) when compared with control group.

24. Mild elevation in supplement group was also observed throughout the experiment with readings of 16 KAU/dl in 3 months (SI), 20 KAU/dl in 6 months (SII), 24 KAU/dl in 9 months (SIII) and 30 KAU/dl in 12 months period (SIV).

25. In the general discussion, attempt has been made to correlate the different findings of the present investigation with respect to morphological, histopathological, histochemical and biochemical changes of different experimental groups of male albino rats.

26. In this study, unsaturated fat (Safflower Oil) supplemented at the rate of 0.5 ml/100 grams body weight/day appears to be adequate to promote growth, to overcome the hair loss, to retain normal architecture of the histological appearance of liver and kidney tissue, to regulate glycogen storage and DNA Synthesis in liver and to regulate
glucose level and plasma protein level in the blood.