SUMMARY
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- An attempt has been made to study the effect of different photoperiod (12L: 12D, 16L: 8D and 8L:16D) on the compensatory growth of the fishes on refeeding for 8 weeks after 4 weeks of starvation.

- About 200 fishes were divided into 4 groups in duplicate.

- Group I was fed throughout the experiment and were subjected to natural photoperiod (12L: 12D). Group II was starved for 4 weeks and subjected to natural photoperiod (12L: 12D). Group III and Group IV was starved for 4 weeks and subjected to long photoperiod (16L: 8D) and short photoperiod (8L: 16D) respectively.

- In the present study there was no mortality in the four groups of fishes during the 12 week experimental period.

- The weight of the fishes obtained after 4 weeks of experiment showed an increase in Group I by 0.88%.

- The fishes of the three experimental groups (Group II, Group III and Group IV) showed a decrease in weight after 4 weeks of experiment. The decrease in the weight of Group II, Group III and Group IV were found to be 7.60%, 7.81% and 13.83% respectively.

- The weight of the three groups of fishes was not significantly different from that of Group I at the end of 4 weeks of experiment.

- The highest decrease was in Group IV (13.83%) fishes which were subjected to short photoperiod.
• Fishes of Group II and Group III which were starved under natural photoperiod (12L: 12D) and long photoperiod (16L: 8D) respectively, had a lower decrease in the weight when compared to Group IV.

• The weight of the fishes increased in all the three groups of fishes and by the end of the 10 weeks of experiment the weight of the Group III was higher than the all the other three groups.

• At the end of experiment i.e. after 12 weeks of experiment, the weight of the fishes of Group II was statistically similar to Group I. Thus Group III compensated and reached the weight of Group I after 6 weeks of refeeding while it took 8 weeks of refeeding in Group II. This difference in compensatory growth between Group II and Group III might be due to the difference in photoperiod.

• The condition factor increased in Group I while it decreased in all the 3 experimental groups. Decrease in the condition factor may be due to the non availability of food and decrease in the weight of the fishes. On refeeding the condition factor increased in all the group of fishes. The condition factor of Group III was highest after 10 weeks of experiment.

• After 4 weeks of starvation there was a decrease in the specific growth rate in the three experimental groups when compared to the Group I and increased in the three experimental groups of fishes after 4 weeks of refeeding.

• The specific growth rate of the fishes of Group II was higher than the other groups after 4 weeks of refeeding. However, it increased in
Group III after 10 weeks of experiment. This increase in the specific growth rate corresponds to the increase in the weight of the fishes.

- Hyperphagia was not seen in the present study. Increase in feed consumption after refeeding was not the cause behind the compensation in weight seen in Group III.

- Increase in the feed conversion efficiency of Group III by the 10th week of experiment may have been the reason for the complete compensation observed in Group III.

- The decrease in the weight of the organs studied was the reason for the decrease in the weight of the fishes on starvation. All the organs decreased in weight except the brain of the fishes of the three experimental groups. However, the weight increased on refeeding and did not reach the value of the control in the liver, gonad and the digestive system.

- There was a decrease in the erythrocyte, leucocyte and hemoglobin count in all the three groups of fishes after starvation. Food deprivation decreased the lymphocyte, neutrophil count but increased the basophil count in all the three groups. The values recovered on refeeding but needed more time to reach the value of the control.

- Plasma glucose was maintained but the plasma protein, triglycerides and plasma cholesterol decreased on starvation to provide energy during starvation. The values increased on refeeding. Glucose was maintained either through prevention of glycolysis or through gluconeogenesis.
Proximate analysis studies reveal that the whole body protein level is maintained but lipids reduced drastically with an increase in the water content. Ash and NFE increased on starvation. Moisture content decreased on refeeding while lipid content increased but did not reach the value of the control group.

The protein content, lipid content, carbohydrate content and the glycogen content decreased in all the tissue studied except the lipid content of the brain of the fishes of Group II and Group III.

All enzymes studied amylase, lipase and protease decreased on starvation and recovered on refeeding.

Drastic starvation induced changes in the histology of the intestine and liver was observed in all the three groups of fishes and the recovery of the digestive system to normality did not occur till the end of the experiment but the digestive function was not drastically affected.