GENERAL CONCLUSION

Our observations suggest that the RIR pullets are definitely photosensitive and can be manipulated for reproductive efficiency and egg laying performance. Step-Up photoperiod has a significant effect on the age at first egg, egg weight and calorific value. Further, the present study has also indicated the favourable influence of appropriately timed hypothyroidism on age at first egg, egg production and biochemical composition and nutritive value of eggs. It is also evident that the HPOT has a dominating influence over short photoperiod, and a combination of HPOT+ SuP could affect the biochemical composition of eggs and lead to the yield of low calorie eggs. Results also suggest a favorable influence of hypothyroidism on activation of hypothalamo-hypophyseal axis as well as ovarian development with consequent early attainment of sexual maturity and initiation of egg lay possibly due to interaction between gonadotropic hormones and physiological hypersecretion of thyroid hormones subsequent to withdrawal of Methimazole from the diet. Further it can be concluded that rearing pullets under a short photoperiod from day of hatch to 90 days followed by a Step-Up photoperiod, has a favorable

influence in the number of follicles while rendering the pullets hypothyroidic just prior to a shift to a Step-Up photoperiod has a further favorable influence on progression of follicular growth.

The effect of rearing photoperiod on carbohydrate metabolism is also evaluated and has provided some evidence for alterations in carbohydrate metabolism due to different lighting regimens. An increasing insulin action during the first three months of chick development with consequent glycogenic effect and the interactions of melatonin and corticosterone as additive or antagonistic/ resistant on insulin mediated homeostatic changes. However it is also evident from the present observations that, there is a lipogenic and cholesterogenic effects in NP birds during the post hatch development essentially due to an increasing insulin action. A long photoperiod potentiates the insulin action by higher corticosterone levels. And in the case of short photoperiod, there is a melatonin induced reduced body lipid load and hypocholesterolemia marked by increased tissue deposition. Further, corticosterone and melatonin related alterations in the hormonal *milieu* of growing RIR pullets under a long and short photoperiod respectively contributing to a negative protein and AA balance, under LP, and, a qualitatively similar but quantitatively less positive protein and AA balance under a short photoperiod compared to a normal photoperiod.