Parasitic diseases are inherent ecological problems and their endemicity or suppression is dependent upon man's ability to control his environment. A variety of parasitic helminths are known to infest animals, birds or man. The ravages caused by them were recognized long ago; none the same they continue to sap the vitality of our race. Undoubtedly, epidemiological measures to improve environmental sanitation have led to dramatic successes in the eradication of many infectious diseases in continental Europe and America. In countries like India, only in recent years have control and prevention programmes been initiated and as such, helminthiasis and filariasis continue to be among the biggest public health problems.

Due to the lack of effective immunotherapeutic remedies, the only available treatment of helminthic infections is by synthetic drugs designed on piperazines and other naturally occurring compounds. Chemotherapy of the ailments caused by the filarial worms or the intestinal round worms has not been successful so far on account of the fact that the meagre information on the biochemical activities of these parasites do not permit a rational design of new drugs.

Information available on the morphology, anatomy and nutritional requirements of many helminth species suggests that a specific biological interaction between the host and
the parasite is a pre-requisite for the manifestation of the pathological symptoms. These advances notwithstanding, in vitro cultivation of parasitic helminths in a medium independent of the host has not yet been achieved. Naturally, progress in the chemotherapy of helminthiasis has been slow.

The work presented in this dissertation was carried out with the aim of gaining some understanding of the carbohydrate metabolism of *Setaria cervi*, the filarial parasite of buffaloes and *Ascaridia galli*, the intestinal nematode of domestic fowls, and proteinase inhibitors present in *A. galli*. These test organisms were used as models in the absence of the human parasite *Brugia malayi*.

The investigations have indicated that glucose, the main energy source for the filarial parasite *S. cervi*, can conveniently be employed for its maintenance in vitro for studying the effect of antifilarial compounds acting particularly on the motility of the parasite. The worm is equipped with nearly all the enzymes mediating the Embden-Meyerhof pathway of glycolysis by which glucose is metabolized. The parasite is capable of synthesizing glycogen in an environment having surplus amount of glucose and the polysaccharide thus synthesized can be utilized for supplying energy under conditions of starvation. The parasite also has a full complement of enzymes of the Krebs cycle similar to those present in other animals. *A. galli*, the intestinal
parasite, contains most of the enzymes mediating TCA cycle indicating resemblance of the two nematodes. Presence of an alternate pathway branching off at PEP level has been detected in these two parasites and the production of some unusual end-products of glycolysis could be explained on the basis of the enzymes of PEP-oxaloacetate pathway.

A study with the purified aldolase of *S. cervi* revealed that the filarial enzyme resembled more closely the mammalian aldolase and hence can be classified as aldolase I. Among the various metabolic inhibitors and antifilarial drugs tried, cyanine-863 strongly inhibited the activity of this enzyme.

The intestinal parasite *A. galli* contained potent inhibitors for trypsin and chymotrypsin activities. The inhibitors separated by TCA and heat treatment followed by DEAE- and CM-cellulose chromatography were found to be low molecular weight proteins.

The work presented, is not claimed to be complete nor does it throw light on all unillumined areas of parasitic metabolism. The author is conscious of the fact that he has touched only the fringe of the vast uncharted area of helminth carbohydrate biochemistry. The questions that have been left unanswered are many; but the efforts have been fruitful in enabling the identification of some aspects of the energy metabolism of these parasites which need more intensive investigation.