I. INTRODUCTION

During the past three decades, Indian poultry industry has transformed from a backyard activity into a modern, scientific and vibrant industry driven by technology. Our poultry industry contributes approximately Rs.20,000 crores to the GNP and supports the livelihood of two million people (Desai, 2004).

Soaring high cost and sometimes the non-availability of conventional feed ingredients act as the major constraints in future expansion of poultry industry as feed alone occupies 70 per cent of the production cost. Hence, the quest for newer alternative feed ingredients has increased to economise the feed cost. The search for alternatives to replace the traditional corn-soya diet has led to the use of agro-industrial byproducts like sunflower meal (SFM), deoiled rice bran (DORB), etc. (Devegowda, 1987)

Sunflower is a new introduction to India in seventies, gained a strong foothold during eighties and has emerged now as a promising oilseed crop with great potential. It is estimated that 1.5 million tons of sunflower is produced during 2003 and approximately 1.05 million tons of SFM was available for use in animal feeds. The composition of SFM is similar to other oilseed meals except that it has high fibre and ash content which tend to reduce the metabolizable energy. Since independence, India has done remarkably well in rice production front, particularly during the post Green Revolution of 1960’s. It is estimated that 76 million tons of rice was produced during 2003 and approximately 15.2 million tons of rice bran was available for livestock feeding. Rice bran is rich in B complex vitamins, trace minerals and has 13 per cent oil, 13 per cent crude protein and 12 per cent fibre. Deoiled rice bran is the byproduct after the oil extraction from rice bran.

The major constraint in using the unconventional feedstuffs in poultry diets is the presence of high fibre which includes the non-starch polysaccharides (NSPs) of the cell wall which is not effectively digested. The major adverse
effects of the soluble NSPs (β glucans, arabinoxylans, pectins, etc.) are increased viscosity of the digesta leading to poor digestion and absorption, wet droppings and alteration of the microflora leading to reduction in performance (Annison and Choct, 1991; Smits and Annison, 1996; Chesson, 2001). As birds do not secrete enzymes to degrade the NSPs, supplementation of NSP degrading enzymes will be the novel solution to overcome these adverse effects (Annison and Choct, 1991; Devegowda, 1991).

Enzyme supplementation has a history of less than 20 years old. During this period, the first phase of development was the use of enzyme to enhance the nutrient digestibility focusing on soluble NSPs in poultry diets based on viscous grains like wheat, rye, barley and triticale. During early nineties, phytase was used to increase the utilization of phytate phosphorus and to reduce the environmental pollution of phosphorus excretion in the excreta. Then focus was made on enzyme addition to the non-viscous grains like corn and sorghum. The next phase is on vegetable proteins as they are the sources of high NSPs, and on the use of non-conventional feed resources, that is, the agro-industrial byproducts. (Choct, 2004)

Studies conducted on SFM and DORB inclusions in layer diets with enzyme supplementation are scanty. Hence, an experiment to find out the maximum possible inclusion of SFM and DORB in layer feed formulation with NSP degrading enzymes is highly essential.

In view of the above facts, the present study was undertaken with the following objectives.

1. To screen the NSP contents of SFM, DORB and compounded layer diets.
2. To evaluate the performance of layers fed on diets containing different levels of SFM and DORB with and without enzyme supplementation.
3. To determine the influence of enzyme supplementation on the intestinal viscosity and litter moisture.
4. To work out the cost effectiveness of enzyme supplementation in layer diets.