INTRODUCTION
The productivity of cattle in the tropics depends primarily on their genetic merit. Although there is considerable scope for improvement in productivity through the introduction of better management practices such as new grazing routines, heavy supplementary feeding, yet the basic attributes of any dairy cattle industry is the genetic merit or the quality of the animals which comprise it. The great bulk of resources already invested in cattle enterprises in the developing countries could produce substantially greater returns if the genetic merit of these cattle could be raised.

Organized and concerted efforts have of late been intensified in India to popularize crossbreeding of cattle with exotic breeds to step up milk production in the country at a rapid rate. The Indian Council of Agricultural Research has also taken up the task of improving dairy cattle through All India Coordinated Research Projects on crossbreeding to develop suitable breeds of crossbred cattle. In North India crossing between Brown Swiss x Sahiwal, Brown Swiss x Red Sindhi, Friesien x Red Sindhi and in South of this country crossing between Friesien x Red Sindhi has been practised and a high average milk yield as compared to indigenous stock has been achieved (15, 245). Though crossing of Indian cattle with exotic breeds has gained momentum, no systematic account of the impact of crossbreeding
particularly on the physico-chemical properties of milk constituents is available.

Secretion of milk proteins is wholly an inherited character. Inherited differences in certain blood and milk proteins of cattle are well established (221). These differences generally referred to as genetic polymorphisms, are of interest because they provide genetic markers which help to trace the evolution of modern breeds of cattle. Such an appraisal from different breeds is, therefore, desirable and will help in better understanding of the genetic influence on variation in the quality and quantity of this valuable component of milk.

The physico-chemical studies of the individual casein fractions are important for the characterization of cow’s milk from different breeds. The changes in the composition of the individual casein fractions make it possible to follow various factors that affect their formation and their properties. The heterogeneous make-up of casein further complicates the picture in the studies. Both micellar and acid casein differ in their rennet action and give variable proportion of chemically different glycopeptides. The biological activity of casein particularly of the $\kappa$-casein is important because of its likely stabilizing role.

The second characteristic group of cow’s milk proteins is the whey proteins. Inspite of their low proportion of the total amount of cow’s milk proteins
(about 25 percent), the whey proteins have important biological significance. Whey proteins are modified by their dependence on various factors, e.g. breed of cow, kind of fodder. Compared with casein, the whey proteins are more labile to heat treatment and hence the extent of their change in composition can be readily used for assaying the intensity of the heat treatment received by the milk during processing. It may, therefore, be contemplated that such an appraisal will contribute useful information for comparing the properties of milk from Zebu and crosses of exotic breeds.

Detailed investigations into the distribution and the physico-chemical characteristics of immunoglobulins of milk are relatively less carried out (39). Such data are primarily on the milk and blood of exotic breeds and there seems to be hardly any report from Indian cattle. The relative paucity of information on bovine immunoglobulins requires that investigations should be carried out in this field.

Heterogeneous make-up of the enzyme phosphatase due to crossbreeding has been reported recently. No data is, however, available on the above effects particularly in relation to crossbred animals.

From the above preamble it appears that a comprehensive study of milk proteins of crossbred animals is ineffably promising to gain a precise and detailed knowledge for utilizing such data technologically. The present study will encompass certain physico-chemical facets of milk proteins from crossbred animals.