CHAPTER III

OBJECT OF THE PRESENT WORK: PLAN OF WORK
It has been shown in the Introduction to this thesis that ghee is the most important indigenous dairy product, occupying an important place in the over-all dairy economy of the country. It is highly prized as a dietary fat due to its pleasing flavour. A major part of ghee marketed in this country is prepared from 'makhan', i.e., indigenous or desi-butter. Ghee prepared via 'makhan' is generally preferred to that prepared by other methods because of its more pleasing flavour.

Ghee, like other oils and fats, is highly susceptible to off-flavour development on storage, the most common off-flavours encountered in ghee being oxidised flavours. A considerable amount of ghee, especially in our sub-tropical country with inadequate storage facilities, is rendered unsuitable for consumption as dietary fat due to development of off-flavours, thus affecting the dairy economy of the country to a great extent.

It is evident from a survey of literature that while significant information is available about the flavours of many food stuffs, little information is available to date about the chemical nature of ghee flavours including off-flavours. Recent preliminary
studies (Jain and Bindal, 1968; Jain and Singhal, 1969; and Jain et al., 1971), in this laboratory, have emphasized the role of carbonyls in the desirable flavours of ghee, but little information is available to date about the role, if any, of carbonyls in off-flavours of ghee.

A study of the chemistry of the carbonylic flavours (desirable and undesirable) of ghee would thus be of obvious interest. It would not only give, in part, the basic information about ghee flavours, but it would also possibly indicate the way in which off-flavour development in ghee could be eliminated or reduced. It may also be possible from this study to suggest scientific methods by which ghee with marked off-flavour could be rejuvenated for human consumption. This study would, therefore, be of fundamental as well as applied interest.

The present work was taken up with the above objective in view. The technical programme that was drawn up for this study included:

1. Preparation of ghee (cow as well as buffalo) by distillation method, using 110°C as the temperature of clarification, and its storage at 37°C for 0-200 days.
2. Isolation, fractionation, characterization and
estimation of the 'volatile', 'total' and 'head space' carbonyls of different ghee samples. (Techniques involving thin-layer, column and gas chromatography and spectrophotometric methods, where necessary).

3. A comparative study of the carbonyl make-up of ghee prepared from fresh and 'ripened' butter and stored for 0-100 days.

* The term 'head space' has a connotation different from that used here. In this study 'head space' carbonyls were really the carbonyls chased out of ghee as well as the air in contact with ghee by passing a stream of nitrogen gas through molten ghee at 40-50°C and trapping the carbonyls in the effluent gas as 2,4-dinitrophenylhydrazones.