CHAPTER I

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It has been known for a long time that the composition of milk fat is influenced by the type of fat in the diet of cattle; the changes in composition have been demonstrated indirectly by changes in Reichert Nessler, Pelenksee and Iodine values. The relation between the level of fat in the diet and the content or yield of fat in milk, is however, less obvious for several reasons. First, in some instances only changes in the content of total fat in milk have been measured and frequently any increased fat production has been marked by simultaneous increase in milk yield. Variations in response to dietary fat can probably be due to difference in experimental conditions, as for example the quantity, frequency and length of period of feeding with fat. The quantity and quality of the fat in the basal diet may also be an important factor and in most investigations basal diets already supplying a 'normal' quantity of fat have been used, rather than Solvent extracted or low fat basal diets, it is likely that under these conditions animals would respond less markedly to further increases in dietary fat. In more recent studies where individual fatty acids have been determined, a lack of response to dietary fat in terms of total milk fat yield has been shown to be due to increased yields of certain acids being offset by decreased yields of other acids.
There exists a practice of adulteration of ghee with animal body fats due to the high price of the genuine product. The pernicious practice has permeated even to rural areas and in many instances adulteration of ghee starts from the stage of curd. Though many reliable chemical tests for detecting adulteration in ghee are available every ingenuity is used to baffle the analyst and with the result that unless elaborate analysis is carried out, it is not possible to arrive at a correct decision from a simple test.

The composition of ghee from cow and buffalo milk varies. Further there are marked regional differences combined with the seasonal variations due to alteration in the ration of the milch animals. Keeping these facts in view, a provision has been made in the Prevention of Food Adulteration Act (1954), whereby lower values of R.M. and higher values of B.R. have been provided as legal standards for the ghee produced in the cotton tract areas. Evidence has accumulated to believe that feeding of cottonseed has a distinct impact on certain physical-chemical properties of ghee such as lowering of Reichert Weisz value etc.

Feeding of cottonseed to milk cattle is observed to be a common practice in areas where cotton is grown. It may be due to the fact that cottonseed is a byproduct of the crop and that there is a belief among the farmers that cottonseed feeding is advantageous for milk or
butterfat production. It has been reported by Patel and Ray (226) that heavy feeding of cottonseed in a ration containing no green fodder, the milk yield decreases rather at a quicker rate and the animals go dry sooner than usual. No information is available where the effect on lactation period is studied even after stopping cottonseed to milk animals and also on the effect of feeding cottonseed to late lactation milk animals.

The detection of adulteration of milk fat with animal body fats is difficult and in small quantities impossible. It must never be forgotten that these body fats do not contain any fatty acids foreign to butterfat and that the natural variations of the amount of each fatty acid present in butterfat provide considerable scope of any one being added before adulteration could be proved or even assumed.

Considerable work has been carried out on the detection of foreign fats in ghee based on differences in fatty acid composition, unsaponifiable matter, glyceride structure and opacity. A method based on the solubility of different fats in solvent (23, 24) has been used for the detection of animal body fats in ghee from animals fed with cottonseed cake. Singhal, Ganguli and Dastur (274a) proposed an opacity method for the detection of animal body fat in ghee but the
method fails when ghee is prepared from the animals fed with cottonseed. They have further modified the method (274) by introducing a methylene blue reduction test which can be used to distinguish normal ghee from ghee of animals fed with cottonseed. However, there exists a paucity of information wherein animal body fats could be detected in ghee obtained from the milk of animals fed with cottonseeds by a simple test.

The present study provides information on the effect of feeding cottonseed to early as well as late lactation animals on the lactational yield and quality of milk produced. Further, the basic physico-chemical differences between ghee obtained from milk of animals fed with cottonseeds at different levels and animal body fats had been investigated. These data were utilised to develop a test for the detection of animal body fat in ghee.