

It may be as well to state here the method pursued in these analyses. Each sample was examined in duplicate, 5 grammes being used for each assay, and kneaded up in a certain quantity of asbestos fibre. The weight of the latter being known and also of the tube containing it, the loss sustained by the sample in the waterbath was regarded as water. Both assays, contained in the extraction tubes, were then placed in the Soxhlet apparatus and extracted with Petroleum Ether and afterwards dried. The loss thus sustained is that given under the heading of "Butter-fat." The assays were then washed with warm water containing 1 p.c. of acetic acid and again dried and weighed. This loss was regarded as "Salt and Soluble Matter," and in some cases may include lactose or the soluble substances produced in the fermentation of the Caseine. That part of the cheese remaining as residue among the asbestos in the extraction tube was regarded as "Caseine."

The fat from both assays was obtained by distilling off the Ether, and heating in the waterbath. It was not sufficient in quantity to allow of the determination of its specific gravity, but its contents in volatile fatty acids was ascertained by Reichert's method. The modification of the method pursued was, in the main, that recommended by Mansfeld (*Repertorium der Chemiker Zeitung*, Jahrgang XII No. 14, p. 120), but decinormal ammonia was used for titrating with rosolic acid as indicator. According to Mansfeld, butter-fats requiring 12.75 c. cm. or over of decinormal alkali to neutralize the volatile fatty acids in 2½ grammes, are undoubtedly genuine; when less than 12.75 c. cm. are used they are characterized as adulterated. Reichert gives 13.97 c. c. as the quantity of decinormal alkali required to saturate the volatile fatty acids from 2.5 grammes pure butter. When less than 12.5 c. c. are used the butter is to be regarded as adulterated.

Whether these figures are strictly applicable to fats extracted from cheese is doubtful, because it has not yet been ascertained whether, or to what extent, butter-fat undergoes a change in the fermentation or "ripening" of cheese. From some of the figures given in the above table it would appear, that during this process a diminution in the quantity of volatile fatty acids contained in the butter of the cheese does take place. For instance in the case of No. 7361 cheese curd from the factory of Macfarlane & McPherson, Huntingdon, P. Q., the fat from it is richer in volatile fatty acids, than that from ripened cheese obtained at the same factory. Moreover, while the fat from cheese curd has only a slight yellow tint that from ripened cheese is frequently coloured brown, showing that it has no longer the properties of pure butter-fat. Nevertheless it will be observed from the foregoing tables, that only in a very few cases is the amount of volatile fatty acids present less than that mentioned by Mansfeld, as indicating adulteration, and of these it will be seen that their origin is unknown. Many of the samples were simply purchased in shops, and the vendors were unable to state where they were manufactured. It is further to be remembered that some cheese sold in Canada is not of Canadian manufacture. For instance in 1887, 62,878 los. of cheese were imported into Canada from the United States and entered for home consumption. With reference to those samples of cheese or cheese curd, collected in Canadian cheese factories, their examination shows that only pure butter-fat enters into their composition, and that nothing approaching in character to "filled cheese," has so far been manufactured or even sold in Canada.

From the above data it will therefore be evident that no admixture of foreign fat whatever takes place in the manufacture of Canadian cheese. At the same time it must be admitted that the nature of the change which takes place during the "ripening" of cheese has not yet been thoroughly investigated, and that this will require to be done before the methods now in use for its analysis can be regarded as entirely satisfactory.

THOMAS MACFARLANE, F.R.S.C.,
Chief Analyst.

30th July, 1888.