

THE AVERAGE COMPOSITION OF BUTTER AND CANADIAN CHEDDAR CHEESE.

Per cent—	Butter.*	Cheese.**
Water..	13.0	32.06
Fat..	83.5	34.43
Casein..	1.0	28.00
Salt and ash..	2.5	5.51

* Van Slyke.

** Shutt.

DETERMINATION OF THE SPECIFIC GRAVITY OF MILK.

By specific gravity (Sp. Gr.) is meant the weight of a definite volume of any substance as compared with the weight of an equal volume of some other substance chosen as a standard, both being at the same temperature.

In determining the specific gravity of liquids or solids, pure distilled water is taken as a standard and the specific gravity of water is represented by 1.

One gallon of water weighs ten (10) pounds. If one gallon of sulphuric acid is found to weigh eighteen (18) pounds, the specific gravity of the acid is found by the following calculation:—

When a volume of water weighs 10 lbs. an equal volume of sulphuric acid weighs 18 lbs.

When a volume of water weighs 1 lb. an equal volume of sulphuric acid weighs $18 \div 10 = 1.8$ lbs.

This means that the acid is 1.8 times as heavy as water or has a specific gravity of 1.8.

THE USE OF HYDROMETERS.

The specific gravity of a liquid is not usually obtained by weighing a definite volume of the liquid, but it is obtained by means of an instrument known as an hydrometer. The hydrometer is a glass instrument which floats upright in the liquid, constructed with a small bulb on the lower end, which is loaded with either mercury or fine shot, and a larger hollow bulb above, to the top of which is attached a slender stem with a graduated paper scale inside from which to read the specific gravity. The use of such an instrument for determining the specific gravities of liquids is based on the natural law that "A body floating in a liquid will displace a volume of that liquid equal in weight to the weight of the body floating." The hydrometer sinks in the liquid until it has displaced a volume of the liquid equal in weight to the weight of the hydrometer. In constructing hydrometers for determining the specific gravities of different liquids, the weight of shot or mercury in the lower bulb, and the size of the hollow bulb above, are varied, depending on the specific gravity of the liquid or liquids to be tested. The greater the specific gravity of the liquid or liquids to be tested, the heavier must the hydrometer be loaded in proportion to the size of the hollow bulb. The reading on the graduated stem is taken just at the surface of the liquid. The lighter the liquid, the farther will the hydrometer sink into the liquid, and the heavier the liquid, the higher up will the hydrometer float.

Since liquids expand and become lighter when warmed, and contract and become heavier when cooled, an hydrometer will only give a correct reading when used in a liquid at the temperature for which it is constructed to be used.

THE LACTOMETER.

Such an hydrometer is used to determine the specific gravity of milk and is usually called a lactometer. The lactometer commonly used in determining the specific