

to 1.040; thus a milk which has a Sp. G. of 1.032 would show on the lactometer a reading of 32. These lactometers are made to give the Sp. G. at a temperature of 60° F., and as it is not always convenient to have the temperature of the milk at 60° when the reading is taken, corrections may be made for slight variations (not more than 10°) by adding to the L. (lactometer) reading .1 ($\frac{1}{10}$) for each degree of temperature above 60°, or subtracting .1 for each degree below 60°. For example, the L. reading is 29, and the temperature 68°; then the correct reading or Sp. G. for 60° would be $29 + .8 = 29.8$. Had the temperature been 56°, the correct reading would be $29 - .4 = 28.6$.

The average composition of milk is as follows:

Water, 87 to 88 per cent.

Fat (F.), 3.0 per cent. and upwards.

Solids not fat (S. N. F.), 8.5 to 9.5 per cent.

The Sp. G. or L. reading of pure milk ranges from 28 to 34, skim-milk 33 to 36.

The next step to be taken is to find out the per cent. of fat. This we do by means of the Babcock Tester. Then having obtained the per cent. of fat and the Sp. G., the per cent. of S. N. F. (solids not fat) may be obtained by the following formula:

$$\frac{L \times F}{4} = \text{per cent. of solids not fat.}$$

L=Lactometer reading or specific gravity at 60°.

F=Per cent. of fat.

To find the extent to which a known sample of milk has been watered, multiply the per cent. S. N. F. in the adulterated sample by 100 and divide by the per cent. S. N. F. in the pure sample. The result will be the number of pounds of pure milk in 100 pounds of the sample examined, and the remainder will be the number of pounds of water. Pure milk contains not less than 8.5 per cent S. N. F., and often as high as 9 and $9\frac{1}{2}$ per cent., and where it is not possible to get a sample of the pure milk for testing, use 8.5 as a standard for the first half of the season and gradually increase to 9 as the season advances, say beginning to use 9 the 1st of September. To make the foregoing more plain, take the following example:

L. reading 28, temp. 54°, per cent. fat 2.6, and, suppose the pure milk to test 9 per cent. S. N. F. Required to find the per cent. of water added. The correct L. reading is $28 - .6 = 27.4$, then substituting for formula we get:

$$\frac{27.4 + 2.6}{4} = \frac{30.0}{4} = 7.5 \text{ per cent. S. N. F.}$$

$$\text{then } \frac{7.5 \times 100}{9 \text{ (per cent. S. N. F. in pure milk)}} = \frac{750}{9} = 83.3 \text{ per cent. pure milk.}$$

Then $100 - 83.3 = 16.6$ per cent water in the adulterated sample.