

churn and agitated, the globules of fat are run together and butter is formed. When rennet is added to milk it is curdled. The ferment of the rennet causes the casein to coagulate forming the curd. If from this the liquid is expressed, cheese is formed, since cheese contains the casein and with it fat and other materials which were in the milk and were entangled in the coagulating casein. The whey from which the curd has been separated contains a form of sugar which when separated from the liquid is sold as milk sugar. After the sugar has been removed there still remain considerable amounts of mineral matters.

Except in the percentage of fat the composition of mixed or herd milk is remarkably uniform whatever the breed, and the average composition may be given as follows:—

	Per cent
Fat.....	4.00
Carbohydrates.....	4.50
Proteids.....	3.50
Salts.....	.75
Water.....	87.25
	<hr/> 100.00

It will be seen then that the chief bulk of milk is, of course, made up of water, the amount of which may vary even in ordinary unadulterated milk from 90 per cent. in a very poor quality to 84 per cent. in an unusually rich milk. The principal nitrogenous compound of milk is casein. Besides the casein there is a certain amount of albumin

present, called albumin of milk. This is more or less similar to the albumin in the white of egg.

The quantity of albumin is, however, much smaller than that of casein, being on the average about one-seventh of the total protein. The fat of milk is commercially the most important of its constituents, since it is the source of butter and enters largely into the composition of cheese. The amount of fat in milk varies, but it should not fall below 3 per cent. and except in unusually rich milk it will not exceed 5 per cent., while good ordinary unadulterated milk from a herd of well fed cows should average about 4 per cent. of fat. The chief carbohydrate in milk is sugar of milk. It is similar in chemical composition to cane sugar but is not nearly as sweet. The amount present averages about 5 per cent.

THE CHARACTERISTICS OF MILK

Are quite familiar to all. Good cows' milk should be neutral in reaction. The color should be white or slightly yellow, the taste sweet and the odor faint and fresh. Bad milk often has a bad odor, either sour or derived from absorption from some neighboring material. It is sour to the taste and if held to the light in a test tube or small thin glass it may have a bluish or reddish tinge and appear watery. It is true also that milk varies in composition and this makes it possible for one person to pay nearly twice as much as another for the same quantity of nutrient material when both buy their

AMOUNTS OF NUTRIENTS IN A POUND (PINT) OF MILK AS COMPARED WITH A POUND OF MEAT, BREAD AND OTHER FOOD PRODUCTS.

FOOD MATERIALS	EDIBLE PORTION					FUEL VALUE (calories)
	WATER (pound)	NUTRIENTS				
		PROTEIN (pound)	FAT (pound)	CARBOHYDRATES (pound)	MINERAL MATTER (pound)	
MILK (1 pint)						
Whole Milk.....	0.87	0.03	0.04	0.05	0.01	325
Skim Milk (0.3 per cent. fat).....	0.90	0.04	....	0.05	0.01	170
Buttermilk.....	0.91	0.03	0.01	0.05	0.01	165
OTHER FOOD MATERIAL (1 pound each)						
Cheese.....	0.34	0.26	0.34	0.02	0.04	1965
Butter.....	0.11	0.01	0.85	....	0.03	3605
Beef, Sirloin.....	0.53	0.16	0.17	....	0.01	1040
Mutton, side.....	0.43	0.13	0.24	....	0.01	1275
Loin of Pork.....	0.44	0.14	0.25	....	0.01	1340
Ham.....	0.35	0.13	0.34	....	0.04	1655
Salt Pork, fat.....	0.07	0.02	0.87	....	0.04	3715
Chicken.....	0.48	0.15	0.01	....	0.01	325
Fresh Cod Fish.....	0.58	0.11	....	....	0.01	205
Salt Cod Fish.....	0.40	0.16	....	....	0.19	315
Mackerel, Salt.....	0.38	0.17	0.17	....	0.10	1050
Oysters, solids.....	0.88	0.06	0.02	0.03	0.01	235
Wheat Flour.....	0.12	0.11	0.01	0.75	0.01	1645
Cornmeal.....	0.13	0.09	0.02	0.75	0.01	1655
Oatmeal.....	0.07	0.16	0.07	0.68	0.02	1860
Wheat Bread.....	0.35	0.10	0.01	0.53	0.01	1205
Crackers.....	0.08	0.11	0.10	0.69	0.02	1895
Dried Beans.....	0.13	0.22	0.02	0.59	0.04	1500
Beets.....	0.70	0.01	....	0.08	0.01	170
Potatoes.....	0.67	0.02	....	0.15	0.01	325
Turnips.....	0.62	0.01	....	0.06	0.01	135
Apples.....	0.62	0.01	....	0.12	....	255