ammoniacal principle, and is liable to run very rapidly to decay. It begins to ferment, and an acid is formed, which immediately determines the solid parts of the milk by uniting with an alkali, which keeps the solid part of the milk in a state of solution; under these circumstances are formed two substances, technically known as curds and whey. The solid portions are distinctly developed, and fall down—these are the curds; the watery particles in which they were before dissolved, are also determined, and become the whey.

If these be now separated, the solid parts—acted upon by the changing agency of the nitrogenous matter, having moisture, heat and air added—soon shew signs of putrefaction; mouldiness and decay induces the deposit of the eggs of innumerable insects, and the whole mass very soon becomes a heap of putrefaction. If the whey, or watery part, is then suffered to ferment, and this is exposed to sufficient heat and plenty of air, another kind of fermentation will take place, and a slightly alcoholic drink will be produced, which is used for exhilarating or intoxicating purposes by some of the inhabitants of the north-east of Asia.

As the separation of the cream from the milk does not take away all the oily or butyraceous matter from the milk, neither does it remove the whole of the solid (caseous) matter from the cream. The envelope of the oleaginous globules is of this same albuminous and changing substance, and in this, by absorbing oxygen from the air, a change also takes place—curds and whey are formed in the cream itself, but intermixed with a considerable quantity of butter. This butter may be separated in various ways; heat will send it to the surface by breaking the enveloping globules of casein; but being merely animal oil, it has an insipid taste, and is very different from our table butter. Agitation, with warmth, especially after incipient fermentation has gone on, is the most effectual mode of breaking down the globules, by fracturing their enveloping skin, and this is the well known process of *churning*, of which we shall speak more fully in reviewing the several dairy systems.

Let it be remembered first of all, in considering the constituents of milk, that it contains 87 parts of water, something more than 4½ parts of sugar, a little more than 3 parts of butter, something beyond one-half part of saline matter, and 4½ parts of cheesy matter (curd or casein). Its weight, from containing so many matters in suspension and solution is some three per cent. greater than that of water. The milk of different animals, however, contains different properties, and is different again according to the breed, food, and treatment of the animals. The following exhibits a few of these differences:—

	Cow.	Woman.	Ass.	Ewe.	Mare.
Casein (curd)	4.5	1.5	1.8	4.5	1.6
Butter.....	3.1	3.6	0.1	4.2	trace.
Sugar.....	4.8	6.5	6.1	5.0	8.7
Salts.....	0.6	0.5	0.3	0.7	89.6
Water.....	87.0	87.9	91.7	85.6	89.6
	100.	100.	100.	100.	100.

Now all dairy operations are aids for developing, or arresting these natural changes of milk; and if we give a faint outline here of the principles of these processes, it will very much assist in determining the relative value of the different dairy system when we come to details.

The object of the dairyman is sometimes to assist and sometimes to retard these natural stages of decomposition into which the milk will run when left to itself; sometimes it is necessary to defer, sometimes to hasten these stages, and he possesses great power for controlling them. Thus heat, it will be seen, is necessary to all these stages of action. Hence in winter he can easily arrest, and by artificial application as easily advance the manipulations of his craft. But in summer it is not so easy to control. He has often to be in his dairy watching his milk under the influence of the sun's rays, and he contrives his dairy so as to keep out the hot rays of the sun as far as possible; or he endeavors, by evaporation or profound shade, to counteract their influence.

To begin with the new milk, it is by no means necessary that the cream should be separated from the milk. If butter be the object, it can be attained without any separation of the cream. There are two modes of breaking the globules of casein, one by the application of a gradually increasing gentle heat to the new milk, until the butter matter floats at the top, which is then taken almost in a boiling state and churned to butter in a very few minutes. The other is, by at once applying the beaters of the churn to the whole mass of the milk; but, as the bulk of liquid is so much greater in the latter case than the former, and skim-milk is of greater value than butter-milk, it is much less frequently resorted to.

Generally the cream is allowed time to ferment. This process aids in breaking down the structure of the enveloping skin, in precipitating the casein of the mass, and thus assisting the maturation and development of the butter. In churning, the heat of the mass rises from five to ten degrees, and in very cold weather it is sometimes necessary to pour in boiling water in order to obtain the necessary heat. This heat is also indispensable in separating the cream. At a temperature nearly freezing it will rise with difficulty; perhaps the most regular and healthy temperature is 55°, but so rapidly does it rise at 76° or 77° as to require great skill and watching to prevent the whole of the mass becoming sour. At the first named temperature it will be perfectly raised in twenty-four hours, and may be kept two meals; but in the latter state of the temperature it will be complete in ten or twelve hours. As the globules have to rise by specific gravity chiefly, it is desirable that the milk should be disposed in shallow dishes. Glass is clean