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THE FARMERS' ADVOCATE.

Dairy.

Coloring Butter and Cheese.

BY L. B. ARNOLD, SECRETARY AMERICAN DAIRYMEN'S ASSOCIATION. There is constant complaint coming from both dealers in and consumers of dairy products, and we will not say unjustly, of a want of skill in producing goods which are durable, palatable and wholesome. But these same parties almost invariably insist on conditions which contribute more or less directly to the very faults of which they complain. Reference is made to the demand for artificial color in butter and cheese. There is a limited demand for uncolored butter and cheese, but the great bulk of either must be obtained with a pigment, or be accepted at a loss in the market.

The most favorable view that can be taken of this artificial coloring is, that it is useless and expensive, but it generally happens that it is a positive injury. It is a fact, apparent to those who are careful to observe, that coloring in cheese is detrimental to both quality and keeping.

The matter from which the color is derivedannattee or an extract of it-is not very objectionable, except that it occasions a needless cost. It is a comparatively inert substance. But the strong alkali, in which it is prepared, is a different thing. An alkali is invariably injurious both in butter and cheese, according to the amount used. Its chief injury is not, as one might naturally suppose, from soporifying the fats in either. Its chief action upon both is upon their albuminous matter, for which it has a stronger affinity than for their fats. The powerful action of potash upon fats in soap-making, leads to the supposition that its strongest affinity is for fats. But this is not true. Potash has a stronger affinity for flesh and flesh-forming matters, of which casein in cheese is one, than it has for oleaginous substances. There is from one-half to two per cent. of flesh-forming matter in butter, and it makes up about one-third of the substance of cheese. The action of alkalies upon cheesy and other fleshforming matter is to soften, dissolve and decompose them, and hence hasten their decay; and it is from this action of the alkalies used to cut the coloring for cheese and butter, that the injury from coloring usually comes. Our butter and cheese are, in their best estate, too short lived, and we have no occasion to impair their keeping by treating them with alkaline solutions to hurry on their decay. The affinity between alkalies and the coloring matter in annatto, is also stronger than their affinity for fats, and it is from this strong attraction that concentrated solutions of potash and sal soda are used to dissolve and take up the coloring. Fats also have a considerable affinity for coloring matters, and are capable of taking them up quite freely. These various affinities of alkalies, fats and coloring matters, when used in cheese, occasion some curious changes which it may not be altogether uninteresting to trace. In using, the liquid coloring is mingled with the milk of which cheese is to be made, just before the rennet is applied. Upon mixing with a large mass of milk the lye becomes so diluted that its action is slow and weak and only noticeable after some time and by careful observation. In the cheese the following changes occur :- The potash and sal soda slowly let go of the coloring matter and combine with the cheesy matter, for which they have a stronger attraction, and which they tend to soften and dissolve. The coloring matter being now free from its alkaline companions, is at liberty to unite with something else, which it does by uniting with the fat in the cheese, for which hit expensive and foolish custom.]

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has a stronger affinity than for the caseous matter. In the curing of cheese, the fat holds all the coloring matter and the casein none. This is proved by separating the constituents of cheese by digesting with pepsin. The case in dissolves out in a colorless liquid, and even lumps of undigested curd appear as white as snow. The fat not being much acted on by stomach digestion, separates and rises to the surface, holding all the coloring, its final digestion appearing to be the slower the more coloring it holds.

Observation has settled the fact that caustic alkalies destroy the action of rennet, fast or slow, according to their strength. If an extract of rennet is made alkaline, its destruction is only a question of time. All the caustic alkali put into cheese, counteracts the cheesing process to the extent of its strength, and impairs the texture of the cheese. If enough is put in, the cheesing will be entirely arrested and the curd not without curing.

The quantity of lye used in coloring cheese, though small, is enough to enable an expert cheese-maker to discover that his highly-colored cheese cure a little more slowly and imperfectly, and get "off" a little sooner than his uncolored ones.

From the readiness with which potash and sal oda dissolve annatto, they are generally used to prepare coloring for both cheese and butter. But other things are sometimes used. Ureic acid, a well known and offensive acid of animal origin, is sometimes added to potash or soda, forming a urate of potash or soda. The action of the urate is less severe upon the cheese, and makes a finer color to begin with, than the coustic potash or soda. But strong, lactic acid decomposes it, often changing its hue and causing the surface, and sometimes the interior, to have a mottled appear. It is a filthy coloring for either butter or ance. cheese.

For butter, alkaline coloring is always wasteful. It must be used by mingling it with the cream, when the great bulk of it is taken up by the buttermilk, which is only the worse for being colored. The very small part which attaches to the butter is too minute to produce any ill effects which are immediately visible. After a time they develop. But they are so slow and so slight that many people-the writer among them-have been led to be lieve, and to express the opinion, that no injury was done. More extended and careful observation have shown otherwise. The juice of carrots and other vegetables are sometimes used for butter, but the vegetable matter carried into the butter soon decays and changes its fine aroma and develops rancidity. No matter what artifical coloring is applied to butter, the butter is always intrinsically the worse for it. But consumers require it and the requisition must be heeded. In complying it is best to use what is least objectionable. This is believed to be coloring prepared in oil. It takes the smallest quaning prepared in oil. It takes the smallest quan-tity, leaves no color in the buttermilk, and affects the butter the least. If skillfully prepared it is nearly inert. But even this is unsafe, for if oil, which is not sound and pure in flavor is used, it leads to rancidity and decay. But if oil is em-ployed which will remain sound and sweet as long or longer than the butter-fats with which it is to mingle-it reduces objections to a minimum. But it would be better to avoid artificial coloring at all, both in butter and cheese, if it could be done without a loss. So long as it cannot, it must be regarded as a necessity and legitimate. If dealers would join with manufacturers in trying to do away with the foolish demand, there might be some hope of success. But so long as dealers encourage it, and such high authority as the execu-tive committee and judges of the late Interna-tional Fair insist and such such a successful the s tional Fair, insist on giving to artifical color as much importance as they do to flavor, texture and make, there is little hope of mending the injurious,

Scientific Butter-Making.

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The milk stands thirty-six hours before it is skimmed, and after that of the evening has been received, our superintendent, like a good clerk, fills out her return for the day. She has printed blanks which gives the names of the cows as they stand in the stable. Two columns are ruled for morn-ing's and evening's milk, and the weight of milk given by each cow is recorded as we have said. The disposition made of the whole quantity is then noted, and the dairy is charged with its propor-tion, when deductions have been made for the house, the families of the men, and the young Such a report is filed daily, and so comcalves. plete is the system that it takes only a few hours at the end of the year to tabulate a full statement of the 365 days.

The cream is strained or filtered, by which a thorough homogenousness is secured, and without which it is impossible to obtain all the butter except by a second churning. The strainer in this instance is a cylindrical can divided into two compartments by double bottoms, the upper one having two tube-like sieves with conical mouths, into which two "plungers," worked by a pump-handle, fit. The cream is poured into the upper compart-ment, and the "plungers" force it through the sieves into the lower compartment, in which it arrives ready for churning. The churning is done twice a week, in a Blanchard factory churn, and, the temperature being 62° , the butter appears in about 40 minutes. The next process is known as working," which is altogether done by a machine, in quantities of 30 pounds at a time. The machine consists of a turn-table in the form of an exceedingly flat truncated cone and a conical grooved presser. Between the revolving cone and the presser the butter passes, and is crushed and crushed again until all the buttermilk is forced out of it, and discharged into a pail at the outside edge of the turntable. The crank that causes the The crank that causes the revolutions is attended by an assistant, while Perdita herself supervises, dredging in the salt. and taking care that the work is not overdone .--

The Production of Butter and Cheese in the United States.

The rapid development of this source of national wealth in the United States within a few years has done more for the advancement of improved agriculture than any other industrial pursuit. It has been a means of diverting the farmers from the almost exclusive attention of the cultivation of wheat and maize; to the care of cattle and to the providing food for them for winter, as well as for summer; to the growing of grasses and leguminous plants, and as an inevitable result to the enriching of the soil by improved systems of agricul-The more stock fed on the farm, the more ture. manure. The importance attached to the dairy industry by the United States was well shown by the interest centered in the International Dairy Fair, held at New York, during the week ending December 2nd. Within a period of thirty years the production of butter and cheese, as specialties, has extended throughout the States of New York, Pennsylvania, Ohio, Illinois, Wisconsin and Iowa. California has within ten years changed from an importing to an exporting State in dairy products, and even in Colorado there are cheese factories.

"The productions of cheese and butter have increased 33 per cent. this year, and the exports have been in like proportion. The cheese and have been in like proportion. The cheese and butter exported this year have paid freight to the amount of over \$1,000,000 to the ocean commerce of this port, or a sum almost sufficient to support a line of weekly steamers. These articles pay to the railroad companies over \$5,000,000 annually for transportation, and the article of milk pays nearly as much more. Loaded on railway cars, ten tons to each car, the butter and cheese pro-duced in the United States in one year would fill 22,000 cars, and make a compact line 135 miles long.

The great extension of this industry is of great interest to Canada, as well as the States. productions of butter and cheese as well as meat for the European markets is with us but in its commencement, and even now it is acknowledged that Canada within a brief period has become a competitor worth noticing in the English markets -competitor to the extent of 80,000,000 pounds whereas she formerly imported cheese yearly from the United States.