

Dairy.**Butter Changing to Tallow.**

A. W. H., Hamden, N. Y., says: My make consisted of 12 firkins and 12 tubs, made on my farm during the past summer, and was shipped to New York the last of November. It has since been held, owing to a dull market, and to-day (April 16th) I find, upon inspection, that with a portion of them, upon the top and sides a layer of tallow has formed, perhaps half an inch thick, and by advice, I send you to-day a sample of the same. The packages which had this on were made in May and June. The layer of tallow comes off quite easily, and the butter underneath is perfectly sound and sweet. I understand that other lots of butter have exhibited the same phenomenon this season. I shall be glad if you can throw any light on this matter.

REPLY BY L. B. ARNOLD, PRESIDENT AMERICAN DAIRYMEN'S ASSOCIATION.

The phenomenon of butter turning to tallow is not new. It occurs every now and then when butter is permitted to stand exposed to the air. When we compare the composition of butter and tallow we need not be surprised at such a fact. Tallow is composed of three fats—stearine, the hard white fat of which candles are made; margarine (more properly palmatine), which is light colored and so soft as to melt at a little above 100°; and oleine, a still softer fat which melts below 100°, and which takes the name of oleine from its resemblance to oil. Stearine constitutes the largest part and oleine the least in tallow. In lard these proportions are reversed, and hence the stiffness of one and the softness of the other. In butter these three fats are nearer equal, and hence its consistency between lard and tallow. Fats and butter are hard according to the amount of stearine they contain.

Butter differs but little from tallow in composition. It contains the fats just named, and from two to ten per cent. of various kinds of fatty matters so soft and light as to fly off in vapor upon the application of different degrees of heat. It is these light fats which give flavor and value to butter. They are lightest and most abundant when grass is young and tender, as in early June, and hardest and in smallest proportion when cows live on well matured hay or other ripe fodder, and hence the difference between June and winter butter. If cows live upon dried grass in winter their butter would have the same consistency and flavor in January as in June.

These volatile oils are corroded (burned) at low temperature by the oxygen of the air, more or less easily, according to their volatility. When they have been thus consumed their residuum is tallow (stearine, margarine and oleine). Oils are composed of carbon, and oxygen and hydrogen in the proportions which form water. When the oxygen of the air combines with the carbon in these oils there is formed carbonic acid gas, which at once flies away, and water remains, which soon goes off in vapor, leaving behind only the tallowy part of butter, which, if the temperature is high enough, crystallizes into a soft granular tallow. The oils in summer butter will pass off in this way when those of fall or winter butter will not, and if kept cold enough such changes will not occur in either. Neither would they occur if the butter was perfectly excluded from the air. Covering butter with strong brine will protect it against changing to tallow on the surface, but will not prevent change around the sides of the package if the staves are porous enough to allow air to penetrate them. Perfect exclusion from air in wooden pack-

ages is not easily effected, as it will penetrate the pores of the wood and reach the butter through the staves unless they are saturated with salt or something else to prevent it. There is no safety in packing summer butter in such packages for long keeping, it is so liable to undergo change in them.

This liability to oxydise is least when cows are living upon wholesome food and drink, and are perfectly healthy and comfortable, and their milk is in a perfectly normal condition. It is greatest when the blood or milk of cows is feverish or in any way heated or inflamed. Changes will then go on much more rapidly and at lower temperatures than they otherwise would, and they are believed to be facilitated by breaking the grain of the butter, as in over-churning or over-working.

The safeguards against tallowy butter, therefore, begin with the food and care of the cows, and follow through the making and handling, or care of the butter. If there is anything like strong animal odor, or taint, about the milk, the butter made from it, if exposed to the air, is always liable to become tallowy by keeping. The tendency of the butter from such milk to change to tallow may, however, be overcome by heating the milk while it is new and fresh, to 100° or above, according to the intensity of the taint. Such a heat removes both the obnoxious odor and the cause of an unusual inclination to change.

The changes which occur in butter are so easy and rapid, and the causes which facilitate them are so numerous and subtle, that there is no safety in holding butter for a future market unless we are perfectly sure that all the conditions connected with the milk and manufacture and handling are just what they should be.

Milking.

In milking do not seize the teat between the thumb and forefinger and drag down until the end slips from the grasp of the digits. Do not grasp, with the hand pressing the nails into the teat, with a squeeze and a pull. Grasp the teat with the thumb partly upwards, and the fingers in their natural position when closed, next the udder, and closing the fingers in succession, force the milk downward, with a gentle pull on the udder. So proceed alternately with each hand, going farther and farther up into the udder as the flow ceases, until you have all the milk drawn. Thus you may milk easily for yourself and the cow; in fact, the cow soon comes to like the manipulation.

If a few simple rules founded upon common sense were observed in milking, instead of kicking cows and holding up of the milk, we should soon find our cows gentle to handle, and much vexation would be spared to the milkers. It should, however, be remembered that in milking cows gentleness is a cardinal virtue.—[Prairie Farmer.

Corn vs. Grass.

In discussing the question of the comparative value of corn fodder and grass, Prof. L. B. Arnold recently stated that he had taken the milk of three patrons of a cheese factory, in October, who were feeding nothing but grass, and the milk of three others who fed nothing but corn sown broadcast. He took an equal quantity of the milk of each, and curdling it with the same amount of rennet, at the same temperature, found, after drying the curd, that the milk of the corn-fed cows gave eight and a half per cent. of curd, while that fed on grass alone gave only six and a half per cent. of curd; showing a gain of nearly thirty-three per cent. in favor of corn fodder over grass.

While our best farmers are disposed to increase their grass-crops by every possible means, they are also in favor of providing a generous supply of fodder to supplement the pasture during drought.—[American Dairyman.

Feeding Milch Cows—Soiling.

At a recent profitable meeting of the Fitchburg, N. E., Farm Institute, the following important discussion took place:

Dr. Jewett spoke of a cheese factory in a western State, where it was noticed that the cheese decomposed. The cause was finally traced to a farm where the cows drank from a brook, the headwaters of which were tainted by the carcass of a dead animal. Mr. Ellsworth related a similar instance. The milk of a cow will, if saved too soon after the cow calves, spoil cheese. If a cow is ailing from any cause whatever, her milk is not fit for butter or cheese. A milch cow is a wonderful machine, and no modern invention will compare with her. A cheese can be made so it will not be fit for use in six months, or it can be made to keep in good condition for a year. In reply to an inquiry in relation to cows troubled with garget, the speaker said "prevention is better than cure." If a cow has all the food she needs to produce milk, butter and cheese, and also for the formation of bone and muscle, she will not have the garget. Mr. Ellsworth said he mixed wood ashes with salt and plaster, and gave his cows a spoonful of the mixture, and he had never been troubled by diseased cows. The best root for cows is the globe mangel; it costs too much to raise carrots. There is no better food for cows than apples; they will eat half a bushel per day. Three-quarters of the cream can be taken from milk and still good merchantable cheese can be made from the milk. Bad odors about a barn affect the quality of milk. The odor of manure from a close cellar will destroy the varnish on a carriage or sleigh in the barn above, and if the odor is so strong it must affect the breath of the cow and cause disease.

Mr. Cheever addressed the meeting. Chemists tell us grass is a perfect food for animals. Corn fodder should be fed with oil meal rather than with innutritious food, like straw. There is much complaint among farmers about garget. In many cases the disease is caused by injuries occasioned by cows being chased by dogs, stoned by boys or hooked by other cows. Butter or milk may remain in foul air without taking the odor, but it is never safe to risk it as it is liable to be affected by bad air. The speaker said he once thought he could make butter by keeping the temperature right, but he once churned two days with no effect on the cream, with the temperature just right. He took the contract from a lady, who, he afterward learned, had churned it off and on, nearly two weeks. In reply to a question, the speaker said that butter never came—it went. Farmers do not come down as they should to business principles. Cows should be fed in some cheaper way than by keeping them in barren pastures.

Mr. Cheever spoke of his method of soiling cows. The first food fed in the spring is winter rye sown after corn or potatoes have been harvested. It should be sown four bushels to the acre, thus making a thick growth. The next crop may be oats or barley, which should be cut before the stalk is hard and woody. Later in the season, Southern or Western corn may be sown broadcast at the rate of eight or ten bushels to the acre. If sown as late as June, much less seed should be used, and the corn should be sown in drills. There is no need of using the hoe in cultivating fodder corn. Millet should be sown later in the season. The surplus of all these crops should be cut when in blossom and cured for winter use. Green fodder should not be cut and fed in wet weather, or when there is dew or moisture on the crops.

Orchard grass and clover are specially valuable for forage crops. Last year, the speaker cut orchard grass on the 5th of June. One great advantage of the soiling system is the large amount of fertilizing material made from the animals in the stables. One field was sown with winter rye the fall previous, which was harvested by the middle of May. The land was then ploughed and sowed with oats, which were harvested the 10th of July. The land was then sown with barley, and a third crop was taken from the soil in ample time for sowing rye for the next year. Barley can be sown as late as the first of August and make a profitable crop. Farmers cannot afford to raise a single crop per year on their land. In reply to a question, the speaker said he should keep his young stock in pastures and soil his milch cows. Hay should be cut before the grass comes in bloom. This frequent cutting of grass tends to keep weeds down; they have no time to go to seed.