

off flavored milk. The exceptions are, viz.:

1. From leaky cream vats, which allow foul water to pollute the cream.
2. From an unclean churn.
3. From tainted salt.
4. From improperly prepared butter color.
5. From foul well water used for soaking tubs and washing butter.

In some instances the milk has become tainted from the food consumed by the cows. However, I have concluded from careful comparison of my many discoveries of foreign flavor of butter, that by far the larger number of foreign flavors found in fresh made butter is due to the milk becoming tainted after it has been drawn from the cow, from numerous causes with a few of which I am very familiar.

However, allow me to explain before proceeding farther, that my term, foreign flavor, does not include any off flavor brought about by over ripe cream, cream insufficiently ripened or from stripper milk.

Case 1—Off flavored milk caused from feeding turnips:

I handle the product of a certain creamery outside of our own line, and several times last summer I noticed a rather sickish, sweet flavor to the butter. I drove out to the creamery and examined for cleanliness the separator, the churn, the milk pump, the cream vat, the well water and the steam from the boiler. All were clean flavored. I then questioned the maker about the flavor of the patrons' milk. He seemed to think one or more of his patrons brought milk the flavor of which did not compare with the balance, so that I requested that he take particular pains in examining the milk in question. He did so the next day and found that he could very readily detect the flavor that he had mentioned to me as not comparing with the balance of the milk. On questioning the patron who furnished the milk, as to the possible cause, he could not explain further than the fact that he was feeding turnips freely which might cause the flavor. The maker requested that he discontinue feeding turnips, which he did and immediately the sickish-sweet flavor disappeared from the butter.

Case 2—Happened at the same factory and upon investigation we found several patrons were again feeding turnips freely. In a paper written by Mr. O. J. Vine, of Canton, Ohio, I noticed he claimed turnips, cabbage, onions and cotton seed meal would always show their effect in the flavor of the milk if fed in liberal quantities before milking. Some claim that by feeding these flavor imparting foods herein mentioned just after milking that no objectionable flavor is imparted to the milk.

However, this maker tells me that his patrons tried this idea, but the off flavor showed in the milk just as marked as otherwise fed.

Case 3—Off flavored milk caused from weedy pastures. This flavor is rather hard to describe to one not familiar with it. However, it is detected in the milk by the sense of smell as readily as the turnip flavor. The flavor imparted to butter made from such milk is of a coarse, weedy smell, such as is sometimes encountered in the hayfield when weeds are plenty in the cured hay. This flavor

(1). Turnips, as all our readers know, indisputably give a bad flavour to the milk of cows fed upon them; but, as our readers also know, the cure is very simple.—Ed.

is quite frequently found in ladle butter from northern Minnesota and from the Dakotas and western Iowa. Some creameries from these localities show the same flavor, presumably due to so much wild pasture.

Case 4—Off flavored milk caused from free use of boiler compound, used one-half pint of compound daily.

This case happened and in one of our own creameries and very recently. In examining the butter for three weeks I discovered a coarse, brackish flavor, which seemed to have killed that rich sweet which goes to make up what is known to the commercial butter trade as "extra creamery," or in other terms, an Elgin. I made several examinations of the well water, churn, cream vat, milk pump and milk pipes at the creamery, always finding them clean and sweet. However, the flavor above described was still noticeable in the butter. Butter maker had also examined each patron's milk for foreign flavor, failing to find any which might cause the taint in the butter. Finally it occurred to me—as after all this investigation we were still in the dark as to the origin of the coarse, brackish flavor in the butter—that there was one source from which the flavor might originate which we had not examined, i. e., the steam which we used direct for heating the milk. By smelling of the steam as it escaped slowly from a half inch pipe through which it was conducted to a tempering vat for heating milk, I could plainly detect a similarity to the brackish flavor in the butter. Questioning our butter maker regarding the use of the boiler compound, he stated that he had for three weeks past been using about one-half pint of the compound daily, as he had discovered that the flues of the boiler were heavily coated and he determined to loosen it and to that end had used an extra quantity of the compound. We at once concluded that the off flavor was due to the flavor imparted to the milk by heating same with live steam direct from the boiler. The butter maker emptied his boiler the same day and discontinued the use of the compound and by the third churning after the cleaning of the boiler, the brackish flavor had disappeared from the butter. I wish to state that this compound has been used for three years, and never before caused us any trouble with off flavored butter. However, in this instance, an extra quantity was used every day consecutively for three weeks, which I think accounts for the bad results we experienced. I would state for the benefit of any one who might ask the question—"Are you in favor of heating milk with steam direct into the milk?"—No, I am not, and calculate another season to put in heaters which avoid bringing the steam in direct contact with the milk.

Case 5—Off flavored milk caused from unclean milk pump and gas pipe conducting milk from receiving vat to separator.

I will first endeavor to describe this flavor, so that if any of you ever notice it in the butter, my description of it may assist you in locating the cause of it. The flavor of a very foul dish rag is a very close resemblance, also the flavor of putrid milk, as you sometimes find it in gas pipes used for conducting milk from the receiving vats to the separators. This flavor just described is the exact flavor found in the butter, only that you find it somewhat milder in the butter when fresh made. However, it develops very rapidly in the butter and where it stands in a temperature of 55

to 60 degrees, it will show the flavor before described very prominently. I have had no less than ten practical cases of this flavor come under my personal observation, and several of them at our own creameries. I was at the time judging and scoring the make of each factory weekly. I discovered this flavor at first in a very mild form, but it gradually became more prominent, and at the expiration of the third week, I determined to go to the factory and make a personal investigation, since the regular maker at this factory and one from another of our creameries, were unable to locate the cause of the off flavor. My first objects for inspection were the well water and the churn, and they being sweet, I raised the end of a gas pipe, which conducted the milk from the receiving vat to the tempering vat through a rotary pump. I assure you I was very quickly and positively convinced that I had located the direct cause of the dish rag flavor in the butter. In questioning the maker as to how he had pretended to clean this pipe and pump, he explained that he had pumped a pailful of hot water through the pump every day when washing up and supposed that it was thoroughly cleaned by so doing. However, let me state for a positive fact, simply pumping water through a milk pump and pipe in hot weather will not keep them clean. You must add some strong grease eradicating agent, such as sal soda or washing powder, and in addition use live steam every day. I have always been able to locate this above described flavor in the milk pump and pipes since my first experience. In fact, I have found this same flavor in our own butter several times since the occasion above mentioned, and have hitched up my horse and driven as far as fifteen miles to one of our creameries to steam out the milk pump and pipes, so as to avoid tainting another day's milk, which would be the case was I to get word to them by letter. I located this same trouble for a neighboring creamery man last summer. He had me examine his butter on the depot platform, explaining that his customers were complaining bitterly about the flavor, and that his maker was handling the cream the same as when the flavor was right. As soon as I smelt of the tryer sample from the tub, I promised him that if he would drive me to his creamery, which was three miles distant, I would agree to locate the cause to his positive satisfaction and place my hand where the trouble was originating as soon as I got inside of his creamery. He immediately drove me to the creamery and true to my word, I located the source of the trouble to be in the first things I examined, viz., the milk pump and the pipes. Notwithstanding that the maker had pumped hot water through the pipes and pump daily, there was a gathering of putrid milk on the inside of the pipes and pump fully one-fourth of an inch thick and it was villainously foul, so much so that when I stepped up to the cream vat and invited the proprietor to taste the cream, he could readily detect the flavor in the cream. We immediately took the pipes and pump apart, steamed them thoroughly and then pumped several pailfuls of scalding sal soda through them and the butter was O. K. from then on. I find that most butter makers are honest in their attention toward cleanliness, but are not careful enough to use their nose where they cannot see. You cannot look very far into a gas pipe 15 or 20

feet long, but you can by putting your nose to it smell its whole length.

I am thoroughly satisfied that there are hundreds of tubs of butter spoiled to a more or less degree every summer from this particular cause of off flavored milk and I would especially caution every creamery man and butter maker who hears or reads this paper, to engrave on the tablets of his memory, this particular cause of off flavored milk and finally off flavored butter, which always means a loss of three, five and possibly seven cents per pound.—Hoard.

GRAIN FOR MILCH COWS.

It is possible in the laudation of the silo, and especially of corn ensilage, as the cheapest feed for cows, that the subject has been discussed on too narrow a basis. It is true that more weight of corn fodder can be grown per acre than of anything else. It is also true that this fodder is so largely carbonaceous that in itself it is not a complete ration, and needs to be supplemented with food that contains a larger proportion of the kinds of nutrition required to build up muscle and bodily strength. This is especially true of cows, whose product, milk, always contains even when richest, nearly four times as much of caseine as of butter fats. Rich corn ensilage which is made from corn when it is in the earing stage supplies the carbohydrates in succulent form. But if a due proportion of nitrogenous food is not supplied to furnish material for the caseine, the yield of milk is lessened and the carbohydrates that cannot be used for milk only fatten the animal and unfit her for milk production.

All milkmen understand that to get the most from corn fodder fed any way, something else must go with it. Wherever clover can be given it makes the best and cheapest accompaniment with corn fodder. But with the milking breeds that have little tendency to fatten, some more concentrated nutrition may be often fed with advantage. This is especially true of some of the deepest milkers, whose product is naturally not so rich in butter fats. Such cows are always thin in flesh after milking a few months, no matter how sleek they have been at calving time. They give all to the milk, even including the fat of their own bodies. If they are fed more concentrated food they can eat more and give more and we believe richer milk.

The great majority of milkmen buy more or less oats, wheat bran, brewers' grains and gluten meal as feed for their cows. They buy because they mostly live where land is too high priced to grow anything except fodder corn, which is too bulky to be brought to the farm, and must, therefore, be grown on it if it is to be had at all. But there are millions of farmers who keep cows for making milk, butter and cheese, and who also grow grain, which, instead of feeding on the farm, they sell. In our opinion, this is nearly always a mistake. It may be that a farmer can better afford to buy grain than to raise it. That will depend on his nearness to a railroad station where he need not carry it far to put it in his barns. But in every case if he has grown the grain in any Eastern State he can better afford to feed it to his cows on the farm where it was grown than to sell it. It is probable that not even the Western farmer can grow oats or corn to sell at present prices. Corn is so cheap in