

The Dairy.

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Rennet.

The dried stomach of the calf, the pig, and the lamb may be included in the definition of the term "rennet," these being the only stomachs here used in cheese-making that we are aware of. The stomach of the calf is the main dependence for curdling milk for cheese, but that of the pig has on times been substituted with good effect. The stomach of the lamb makes a very fine flavored cheese, but is weak compared with the others, and is little used.

The mode of preparing and preserving the stomach, and age of the animal from which it is taken, exert a marked influence on the characteristics of the cheese made with it. The rennet of the young calf makes a soft rich cheese, that of the full grown animal makes a hard and dry one, and between these extremes the effect varies according to the age of the animal. The stomach of the calf four days old makes a better cheese than when four weeks old, and very much softer than when four months old. That age is best at which it will make the most cheese, and that is when one week old or less. It is often supposed that the rennet of a calf four to six weeks old, because it is larger, will curdle more milk than a young one, but experience has proved otherwise. With the pig it is different. The stomach of the pig is good from three to six months old, or even a year. The stomach of the lamb appears to be effected the same as the calf. Our experiments with lamb's rennet have not been extensive enough to determine its efficacy at all ages, but in those made, the younger the animal the better the effect. The stomach of the calf loses its power and quality very rapidly as soon as it begins to eat solid food, and that of the lamb probably does the same.

Calves' and pigs' rennets affect cheese quite differently; that of the pig makes the richer cheese, and is better adapted to milk that is skimmed or partly skimmed. It acts more efficiently in breaking down the tough structure of the curd than calf's rennet. Mixed together they make an excellent preparation for cheese in creameries.

The stomachs only of healthy animals should be used. Like the virus in vaccination, they carry into cheese the influence of every disease the animal may be afflicted with.

To produce the best effect, the calf should be about five days old. It should be kept, at any rate, till its system has undergone a complete renovation, and come entirely under the influence of the good milk, and its excretions assume a natural and healthy appearance. This can be determined by the action of the bowels.

It is best to let it suck two good meals a day, but it should not be glutted. The last meal is better to be rather light and then let it go 18 or 20 hours without food before slaughtering. It is a good plan to let the calf have a light supper and then kill about noon the next day. It is best to go just long enough to get the stomach about empty and free from curd. Some keep them 24, 36, and even 48 hours without food, but this is both cruel and injurious. The stomach becomes affected and injures the quality of the rennet. Some increase may be made in the strength by such starvation, but what is gained in strength is lost in quality. A calf should not be kept so long hungry as to get up any irritation or fever. When slaughtered it should be well bled, and the rennet taken out as cleanly as possible and tanned inside out and carefully cleaned. The contents of the stomach, if there are any, whether solid or liquid should be thrown away, for both give a bad flavor to cheese. The curd is less off than the liquid contents, but this is inferior to the milkings of the membrane, though some, whose tastes are not very acute, do not object to it. But where the best results are sought for, the curd had better not be used. The stomach being turned and emptied, if it

can be cleaned without rinsing, it will be better not to apply any water. But if it can't be cleaned without, rinse it very carefully. The strength is very easily wasted by washing or handling roughly. It will help very much about cleaning, to prevent the calf from taking anything dirty, or licking itself after a wet meal. The curd is best effected by drying. It can be done without the use of salt it will be all the better, and with a little pains it can be done. Tie the stomach tightly with a small cord; insert a tube in the small end and blow it full and tie the end tight. Hang it up to dry, after salting the ends outside of the stomach. The usual mode in this country is to do it thus. When this is done it may be tied into a small crocheted limb, or over a bow, and dried in it, and out. Then hung up where it will dry quickly. It must not, however, for the sake of drying rapidly, be put where it will get too warm. It should be kept below 120°, otherwise the strength will be injured.

After having been thoroughly dried, if the skins are occasionally moistened and then dried again, they will be made stronger by so doing. It is a singular fact which is generally recognized by dairymen, but which has not been fully accounted for, that rennets gain strength by the simple fact of drying. The oftener they are wet and dried the better, provided they are not allowed to get so wet as to drip. The green vells have only about half the strength of one that has been dried and kept a year. There is more or less of offensive smell about the fresh stomachs which injures the cheese if used when new, but which mostly disappears when dried.

The proper way to pack the vells in strong brine, and let them stand that way till wanted for use. Though this is a favorite method with butchers and also a good many dairymen, it is not to be reckoned among the best ways of preserving the vells. That they will keep safely is not questioned. The objection is that they are little, if any, better than green rennets when used. They make little or no improvement in the curd, for they undergo scarcely any change; and what is more, the "animal odor" which accompanies them in their fresh state is allowed no chance of escape. It becomes, as it were, crystallized in and only comes out when they are put to soak for use. Such rennets are found to have but little strength and deteriorate the cheese. It is better to hang them up full of salt to dry.

Preparing Rennets for Use.

Rennets may be soaked in either whey or water. If whey is used, it may be sweet when the weather is cool, as in spring and fall, but in hot weather it should be sour, and it should, before using, be boiled, skimmed and cooled. Very little salt will be needed with sour whey. When water is used, the liquor must be saturated with salt, if the weather is warm, to prevent tainting. Use one gallon of either whey or water for each vell. It is considered best, by most dairymen, to use sour whey, especially in hot weather. It has several advantages. First, it requires less salt, a circumstance which is of considerable importance. The material in rennet upon which its usefulness depends is a specific gravity about the same as milk. It floats on brine and sinks in water. By putting a little salt in whey which is lighter than milk, it will be kept about the right specific gravity to have the strength of the rennet suspended in the liquor, and thus keep evenly mixed. If water is used in the warm season it must be made so salt that the coagulating agent will float, and is therefore liable to be tipped off, leaving the remainder too weak, and always necessitating a thorough stirring before using.

In the second place boiled sour whey with a little salt, is a better safeguard against taint than the strongest brine alone. Acid and taint are opposed to and counteract each other.

Third, when there is trouble from tainted milk, or when milk is liable to taint, acid is a valuable aid in curdling the milk. If the rennet is not soaked in sour whey, sour whey should always be kept on hand to counteract the inclination to taint whenever it occurs.

Seasoning Rennet.

It is a good plan to flavor rennet while soaking with aromatic seasonings. They modify favorably the flavor of the cheese; they increase, to a moderate extent, the action of the rennet; and they are all antiseptic in their nature and help to preserve the rennet sweet. Any aromatic that will improve the flavor will be appropriate. Cloves and lemons are most frequently used. The cloves are tied in a cloth and put in whole, and the lemons are sliced thin and shoes put into the liquor with the vells. But this is not a good way to use the lemons. There is a bitter and unwholesome extract that soaks out of the rind of lemons which had much better be left out. Lemons produce a finer effect to cut them up and press out the juice, as is done for making lemonade, then soak-

ing a few minutes to take up all the acid, and then turn the acidulated water into the pickle with the rennets.

Rennet Jars.

Dairymen are now generally using 15 gallon jars to soak rennets in, and there is nothing any better. If the stomachs are soaked in salt and water only, the stone jars are almost a *sine qua non*. It is almost impossible to prevent rennets that are more or less tainted from finding their way into the steeping vessel, and when once a taint has made its impress upon the staves of a cask it is very difficult to eradicate it entirely, and if undertaken is seldom accomplished. The stone vessels can be purified and kept in use. But if sour whey, boiled and cleansed as directed, is used, and the salting done with Liverpool salt, or something equally pure, then wooden vessels will answer. There is scarcely any danger in tainting the cask when sour whey is used, because a tendency to taint and even incipient tainting, will be destroyed by the acid in the whey. Before a wooden vessel is used for this purpose, it should be prepared the same as for keeping butter. The sap should be taken out of the staves by soaking in boiling hot brine, and it should stand long enough to saturate the pores of the wood well with salt. If this is not done the sap will gradually work out and affect the rennet.

Selection of Rennets.

There is no absolute standard by which to measure the strength of a dried stomach. Size is not here the measure of power. The large stomach of the calf six weeks old, will not curdle so much milk as the less one from the calf six days old. But there are some indications which may be used in judging of the value of a rennet before it is used. The readiest means is smelling, though not a very agreeable one. The rennet has its own proper smell as much as anything else. When that smell is once learned it is a good guide in selecting. The sack which has any other than its natural odor should be rejected. The taint from decay, and that from disease can readily be distinguished by the use of the olfactories by a very little attention. Whatever odor a rennet may have will be carried with it into the cheese, and care should be taken that those having offensive odors be avoided. The appearance of a rennet will often be enough to condemn it. Those cured with salt should be white, or at least light colored. Those having a dark and reddish hue are usually diseased. They occasion huffing and bad flavor in cheese, and often spoil while soaking. Skins which have been well spread before drying are better than those not stretched. The greater exposure to the air improves both strength and flavor.

In purchasing, it is necessary for the dairyman to make the most judicious selection possible, remembering always, that the characteristics of his coagulating agent will be expanded in his cheese, either to improve or injure its quality. Much of the premature decay complained of in cheese is occasional by faulty rennets.

Uniform Strength

In the liquid rennet is always desirable to ensure uniform results in curdling. To secure this two or more jars or casks are necessary. Three are preferable. Soak one batch and have it ready to begin with. While this is being used, soak a second batch in another jar, which will be ready for use before the first is exhausted. The strength of the second mess is liable to be different from that of the first. To prevent any mishap on this account, begin using the second with the first, taking part of each till the strength is determined. A third mess will be soaking while these are being used, to be treated in the same way. Rubbing and stirring the skins while in the liquor will greatly facilitate the steeping and are necessary to the perfect extraction of all the strength.

Another advantage results from getting all the strength out of the skins before beginning to use the liquor. The first strength that soaks out of some rennets makes a better coagulation than that which comes out last. It acts upon the cream more effectually, uniting it more firmly to the casein and occasions less waste. By using the liquor while steeping, the first strength is all dipped off, and the last strength is used alone with less advantage. By not beginning to use till the soaking is completed, the benefit of the first strength is carried through the whole mess. All rennets do not show this peculiarity, but most of them do. It is a circumstance which we have never seen noticed, but one which we have made available for many years. The cause of this difference is susceptible of a reasonable explanation, but our article is already too long to attempt it here. This, and the nature of rennet, and how it is formed in the stomach, and how its strength may be increased, and other modes of preparing and using, must wait for some future occasion to appear.