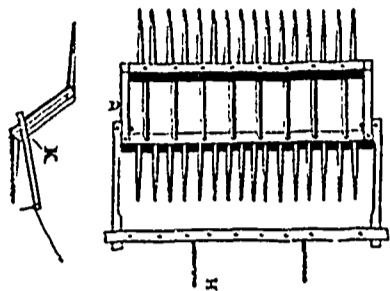




A Family Journal, devoted to Agriculture, Internal Improvements, Literature, Science, and General Intelligence.



HORSE-RAKE.

We submit the above cut of a horse-rake to our readers, with a good deal of confidence in its simplicity and efficiency. We hope some ingenious friend will take the trouble to construct one and give us an account of its operation. It consists as the reader will see of two heads, and two sets of teeth. The heads are connected together with rods and two end pieces, one of which is marked at D. In the end bars there is a groove, or piece cut out of the middle extending within 14 or 2 inches of each head. The pins (K in the end view) which hold the frame to which the horse is attached (H) slide in this groove, moving from one head to the other as the rake revolves. K represents the end view, with the angle of the teeth. The fine line below K shows the line of draught. As the rake is drawn forward the hay collects on the teeth and against the rods connecting the heads; the teeth answer for handles. When the windrow is reached you have only to raise the upper teeth, when the rake is thrown over and ready for work without stopping. We have never seen one constructed on this simple plan, but believe that will answer a better purpose than those in common use. As to the utility of a good horse-rake, where the ground will admit of its operation we need not say a word.

ON THE MAKING OF CHESHIRE CHEESE.

It has sometimes been a matter of dispute amongst Englishmen which particular county or district is the most famous for the making of cheese. I think, if quantity is to be taken into account as well as quality, the decision must be in favour of Cheshire, as there cannot be less, upon a moderate calculation, than 12,000 tons made in that county annually; a considerable portion of which is of excellent quality.

It is scarcely necessary to premise that milk, from which cheese is made, consists of three distinct parts—*cream*, *curd*, and *whey*—into which, by repose, it spontaneously separates; but the process of separating the whey from the other bodies may, as in cheese-making, be accelerated by infusing a small quantity of simple acid extracted from cured and dried maw-skins, which have been previously dissolved in warm water. This infusion is commonly called "steep" but more properly *rennet*.

The art of cheese-making consists in the complete extraction of the whey, and in the proper compacting and curing of the curd. The richness of the cheese depends upon the quality of the milk, or, in other words, on the proportion of cream which the milk contains. The cheese of Cheshire is professedly made from new milk, or milk from which no cream has been taken. It is, however, well known that in many dairies in the morning before cheese-making a small quantity of cream is skimmed off the previous evening's milk; this cream is either churned by itself, or mixed with whey cream, by which there is obtained

a better quality and greater quantity of (so called) whey-butter. It may appear singular to some, that any portion of cream should be found in whey, but such is the fact, and the means used in Cheshire for extracting it are very simple.

Number of cows kept, and produce.—The number of cows kept for the purposes of a cheese dairy is seldom less than 8 or 10, or more than 70 or 80; and is of course regulated by the size of the farm—these average about 90 or 100 statute acres, upon each of which about 15 or 18 cows are kept. From 18 cows a cheese of from 36 lbs. to 54 lbs. weight is made daily during four or five months of the summer. The annual produce of cheese per cow depends both upon the quality of the animal (with the mode of keeping her) and of the *land*, or rather the *herbage*. I have known many farmers sustain great loss by not feeding their cattle sufficiently well in winter. With judicious management, about 3 cwt. of cheese (of a 112 lbs.) may be considered as the average amount made per annum upon land let for 30s. a statute acre; but in a few instances 5 cwt. per cow, and even more, is sometimes made. This can only be from a small and choice stock.

The season.—It is the practice amongst farmers in this country to arrange so as to have most of their cows calving in the months of March and April; and so soon as the calves are fed or disposed of, the cheese making commences, and continues (excepting in small dairies) to nearly the end of the year. In January and February the quantity of milk obtained is often so small that the farmer prefers selling it in the neighbouring towns or making it into butter. There are however instances, in large dairies (of 70 or 80 cows), of cheese being made throughout the year.

Milking.—The operation commences about five o'clock in the morning, and five or six in the evening. In this country it is the practice for most of the servants, both men and maids, to assist, and for the cows to be milked in the cowhouses (called here "shippens") all the year round. When, as is usual, there is one milker for every six or seven cows, the milking seldom exceeds an hour and a quarter.

The milk of new-calved cows is not mixed with the other until about four or five days calving.

Offices and utensils.—As the evening's milk is seldom made into cheese until the following morning, and sometimes in small dairies (where four "meals" are used) not until the second morning, a cool "milk-house" is necessary; on which account it usually occupies that side of the farm-house least exposed to the sun. The utensils in which the milk is kept are usually portable shallow earthenware vessels called "pan-mugs," and in some dairies leaden or zinc coolers. Most of the milk-rooms have lattice or wire windows for the circulation of air, and the floors are laid in a sloping form for the free escape of the cold water with which they are daily swilled throughout the summer months. If precautions of this nature be not attended to, there is a risk of the evening's milk becoming *sour*; in which case, whatever quantity of new milk be added to it in the morning, the cheese will be *sour* also. I am led to believe that a temperature of so near 50° Fahrenheit as could be maintained, would be best for a milk-house throughout the year.

Some cheese-rooms are occasionally found to be in the summer time too warm, in which case the cheese has to be removed for a time to a cooler part of the house. This is more generally necessary where

the building is slated, and exposed to the noon-day sun; but is seldom or never experienced where the roof is of thatch—The size of these offices is of course regulated by the extent of the farm; where 30 cows are kept I find them as follows:

	Yds.	Yds.	Square Yds.
Milk-house	6 by 3	or about	18
Dairy	6 by 5	"	30
Salting and drying-house 4 by 5	"	"	20
Cheese-room over dairy and drying-house	10 by 5	(or 8 by 6)	50

Process of cheese-making.—As the first process—namely, that of extracting the whey and salting—occupies, according to circumstances, from five to seven hours, it is found most convenient to commence it in the morning. This being the case, the evening's milk has to be kept all night in the milk-house. In the morning, the cream having been skimmed off, a portion of this milk is warmed. This is done in a circular flat-bottomed brass or tin pan, floated in the boiler, the water of which has been previously heated for that purpose: the size of this pan is about 20 inches in diameter and 8 inches deep. The quantity to be warmed depends upon the state of the weather; for the first two or three months of the season (say March, April, and May) it is not unusual to heat as much as half the evening's milk to a temperature of 100° Fahrenheit, and this heat is rarely exceeded, excepting by those dairymaids who wish to save themselves trouble in the after process. The "cheese-tub," which is similar to a brewing-tub, having been placed in readiness in the dairy, the cold milk is put in and the warm added. Supposing the temperature of the cold milk to be about 50°, and the warm 100°, and they were in equal proportions, the heat after mixing would be 75°, or something less; but in warm weather it will be sufficient if it reaches 70°. I have known instances of good cheese being made in summer without warming any portion of the evening's milk, indeed such now is becoming the general practice. In very warm weather some dairy-maids think it necessary to reduce even the temperature of the morning's milk. The *cream*, which is diluted either in about double its quantity of warm or new milk, or by being exposed to the heat of the boiler in the same way as the milk, is next put in. I have before stated that it is customary to retain a small part of the cream for butter: when this is the case, it is considered best to skim it off the whole surface of the cream before diluting, as by that means the froth and bubbles, which are supposed to be prejudicial to the cheese, will, for the most part, be taken off. This leads me to the conclusion that *fixed air*, if it gets mixed in the curd, has been found to be detrimental. Since warming of fluids has a tendency to dispel this fixed air, it is perhaps worthy of consideration whether it would not be better to warm the *whole* of the evening's milk to the required temperature, rather than heating a *part* of it so high as 100°. The process adopted with the evening's milk, as above described, is generally finished previous to the time of milking in the morning; but if not, the dairy-maid stops and completes it before the *new* milk is brought in from the cows. This new or morning's milk is then added by passing it through the *strainer* placed upon the "cheese-ladder" over the cheese-tub. When the whole is thus collected, some few bubbles are invariably found floating on the surface; these are skimmed off and passed through the sieve to break them.

One of the most important points now to be attended to is the heat of the milk preparatory to coagulation, as the milk, if at a proper temperature, should now

be ready to "set together," that is, to receive the rennet. This heat is rarely tested by any other thermometer than that of the dairymaid's hand; some may, and I have no doubt do, determine it pretty correctly, but cannot always.

The evening's milk in the tub being at or about 75°, as before stated, and the milk which is brought from the cows 90° or 95°, the temperature of the whole is then found to be somewhere between 80° and 85°; and I am of opinion that the heat at which milk ought to be and is commonly coagulated ranges between those two temperatures.

The *rennet*, or *steep* as it is commonly called, is next added. I have already stated in the introduction, that this is an infusion made from the preserved stomach or maw of sucking calves, thence called *maw-skins* or *bag-skins*. A recipe for preserving the skins will be found in the appendix. To define the quantity of rennet sufficient for coagulating a given quantity of milk is a very difficult matter, as the maw-skins vary so much in quality.—When the farmer is laying in a stock for the year, he generally calculates upon a dozen of skins to a ton of cheese, but the skins vary in size (the price when cured is from 6s. to 9s. per dozen). In using them, it is the practice often to cut two skins at once. Threesquare inches taken from the *bottom* (or strongest part) of one, and one or two inches from the top (or weakest part) of the other, is generally found sufficient for sixty gallons of milk. These two pieces of skin are put into a cup containing about half a pint of lukewarm water, with the addition of a teaspoonful of salt, some part of the day previous to being used. The water thus impregnated with the maw-skin is passed through the sieve into the milk, but the skin itself is generally, though not always, kept out. The rennet cup is well *scalded* before being used again. I have been told that some farmers make a sufficiently large quantity of rennet to last for several weeks, and find to answer better than making a small quantity daily. The question is, will it keep *sweet*?

The coagulation (or "coming") is generally effected in an hour, or an hour and a half. As far as my own observations extend, I am led to think that an average of these two is sufficiently long, if the proper means are used in effecting the formation of the curd: for it is well known that, *ceteris paribus*, the warmer the milk is at the time of setting together, or the stronger the rennet, the sooner will the coagulation take place, but the curd will in consequence be tougher and less in quantity; on the contrary, the cooler the milk, or the weaker the rennet, the longer will the curd be in forming, and the more tender its quality, but its quantity will be greater. By attention to those results the cheesemaker may soon decide when too much or too little rennet has been put in the milk, and correct the quantity the next time. It may be proper here to state, that too much rennet has a tendency to impart an unpleasant flavour, or bitterness, to the cheese.

It may generally be expected that the heat of the curd when formed, will be four or five degrees less than the milk was when set together; and it is desirable, particularly in cool weather, that this difference should not be greater, otherwise the subsequent labour will be more difficult. To determine exactly when the *curd* is in a fit state for what is called "breaking," requires some practical knowledge; with attention this is soon acquired. The point is generally determined by gently pressing the surface of the milk