

the animal a small feed at every opportunity. In driving long journeys frequent stops and feeds will greatly help the horses to do easily an extra amount of work.

### ACQUIRED HABITS

It is well known to horse breeders that acquired habits are often transmitted to offspring. This is seen in tricks and peculiarities, both good and bad. It is very specially seen in gait. The walk and gallop are the only original methods of travel. Many wild horses now have only these two gaits. The trot was early added, and then came the pace, and by crossing pacer with pacer, this gait can be bred as the trot. This is, in a measure, also true of the rack, or single foot, and of the running walk. This last has been developed during the last fifty years, and is much prized in a saddle horse. The running walk may be taught to any young, handy saddle colt.

In crossing selected sires and dams, the gaited saddle horse is now bred with natural gaits, and colts fairly beat their parents at facility of movement in these adjuncts of the modern horse. These things plainly teach that acquired habits are transmitted to offspring, though some scientists deny that such is the case. Too little thought is given to this matter by many breeders. If a horse has bad wind or bad legs they may hesitate to breed from him, but few think of refusing to breed from a fine animal because he has a bad temper or an ugly habit. A good tempered, tractable horse is a treasure and a pleasure to the owner, and these things can be bred in an animal as well as a graceful figure and good bone and muscle.—*Farming.*

### FALL FOALS.

With many farmers the fall is the best time for breeding the mares. In raising horses, it is quite an item to manage the breeding and feeding to secure the best results. Nearly all farmers work their breeding mares, and, in order to lessen the cost of keep, the time of breeding should be determined by the work of the farm. Have the mare suckle her foal in the idle season. The fall foal comes at a time when the mare can best be spared from work. Then, during the winter season, when the foal is suckling, more of the mare's food can go to the production of milk than when the mare is at hard work. The colt is ready to be weaned in the spring before the mare is needed for the spring work, and it gets, then, a bite of good grass, and has the summer pasture before it. It requires more than ordinary care to have a mare suckle her colt during the summer, and also to take her share of the farm work. Foaling in the spring, the colt has to be shut up while the mare is at work, at least part of the time, for it is not safe at all classes of work to have the foal running with the dam. There is, at all times, a risk while with the team that the colt may become entangled in the harness or machinery, or be injured by using the milk while the mare is heated with her work. The mare bred in the fall will do more and better work, with less injury to herself and the foal, than if she is bred in the spring.

Another matter of no little importance is that the popular stallions have

in the spring more than they can easily do. When the stallion has fewer fall services, as at present, the colt has a better chance to come strong and good.

Ordinary farm work is a benefit, rather than a detriment, to the brood mare while carrying her foal. It is best to manage so as to get the best foal, as well as the most work, and this at the least cost. If a good colt cannot be raised, do not breed at all. There is an overstock of common horses, and they are difficult to sell at any price. There is a fair price for a first class animal. If you are breeding, see that you use the best mare you can get, and mate her suitably to the best sire you can find. Manage the breeding so as to give you the use of the mare when most needed, and at the same time so as not to impair the growth and value of her foal.—*Farming.*

### REPORT OF MM. G. A. GIGAUT AND J. D. LECLAIR.

If the temperature of the cream is raised too high, or the cooling be done too slowly, the butter may acquire a taste of burnt milk. If bad ferment be used, or cleanliness be neglected, it is very natural that the pasteurisation may turn out to have been useless or even prejudicial.

The degree of ripening depends on the quantity of the ferment added, on the temperature, and the length of time it is allowed to take. Practically, the time is always settled beforehand, so the per centage of ferment and the temperature should be regulated to suit it.

Should the time be long or short? in other words, should the ripening be hastened or delayed? On this point opinions are divided, and dairymen contend vehemently on either side. Many of them prefer a rapid ripening, from noon to evening, for instance, but it is doubtful if this is always the best plan, for in some cases it might turn out quite inefficient.

What per centage of starter should be added to cream when the duration of the ripening is fixed beforehand? Experience teaches that this depends on the temperature of the cream, which, in practice, may vary greatly, according to circumstances, which are sometimes very unfavourable. To make firm butter, churned at a rather high temperature, many creameries, for want of space, employ for ripening  $\frac{2}{3}$  or  $\frac{3}{4}$  of sweet cream with  $\frac{1}{3}$  or  $\frac{1}{4}$  of cream of the previous day; the latter, as a starter, is warmed to such a degree, that it becomes uniform in 24 hours, and, added in such a large proportion, it is able to complete the ripening at a relatively low temperature i. e., from 54° to 57° F. This plan has answered in many places but its practice is not free from risk, and it should not be adopted except where there is no cold water or ice.

The vessels for holding cream should be such as can be easily cleaned. The air in the rooms where they are kept should be pure and as dry as possible. When the air is close and moist, the bacteria develop with ease, especially if the temperature is rather high, and the quality of the butter is not to be depended on because the detrimental bacteria predominate. Moreover, to produce good and long-keeping butter, it is absolutely necessary to get perfect ripening, which should not be checked too soon. When the cream has reached its proper state of ripeness and possesses the desired aroma, it should

be churned at once; if the temperature is too high, it must first be lowered the proper point.

The vessels for the cream should be made of wood or tin. Some years ago, cream used to be ripened in large oaken casks with wooden lids. If the staves are thick and the wood hard and solid, these casks are useful, for wood being a bad conductor of heat, it maintains the contents at an equable temperature. But the great inconvenience of wooden casks is that it is very difficult, if not impossible, to keep them clean and tidy; so a great step in advance was made when the use of tin vessels was begun. As regards cleanliness, tin should always be preferred to wood, but tin vessels have the disadvantage of not being able to preserve the heat.

In small creameries, the cream jar is placed in a cask and surrounded by hay as an isolating body. In larger establishments it is better to have a special room for ripening cream in which the air may remain pure and the temperature regular.

For the fittings of these rooms, Mr. Burke, some years ago, advised the use of thick woollen wrappers round the tin cream vessels, and this is an excellent plan if these double vessels are solidly built and can be easily cleaned, but, lately, many such have been put on the market that are badly made, difficult to clean, and in which the cream can easily penetrate between the wood and the tin, whence arise bad smells, etc., none like these ought on any account to be used.

In some parts of this country, among others in Schleswig Holstein, cream jars are kept in vats full of water, in which case it is easy enough both to warm the cream to the ripening temperature, by introducing steam into the water bath and to regulate the temperature by means of cold water.

But this method is not always to be recommended, for these reasons:

1. It can only be followed in places where there is plenty of water.
2. The air of the room will become damp through the steam of the lukewarm water, and in a very short time the air, as well as the cream, will acquire a bad smell.
3. The cooling of the cream after its ripening (skimming), and after its ripening, does not perfect itself in very large vessels, and if small vessels are used it is not easy to get the ripening of the cream to be uniform.

In some creameries, larger tubs or vats, like the American cheese-vats, have been introduced; in these the whole of the cream is ripened in a body. With this system, one is liable to do the first churning with rather unripe cream, and the last churning with cream rather too ripe. Still, in certain conditions, this method may be very useful, and it at any rate economises labour; it may turn out, though, that the quality of the butter is not so good: anyhow opinions differ on this point.

When the tin cream-jar is too large to be put into a cask, or when there is no special room for the ripening, the frequent practice is to surround the cream-jar with an envelope of hay. Care must be taken that the hay is quite dry. The ripening-room should have a north aspect, if it can be warmed in winter. The best plan is to have a room large enough to be used for working the butter in as well as ripening the cream, both these operations require a well ventilated room, cool in summer and warm in winter.

To give special rules for the ripening of the cream is a hard task; still,

we here append the method employed by Mdo. Hanne Nielsen, of Havarthgaard (1).

We will first remark that Madame Nielsen practices the ice method, and that the churning temperature varies from 50° to 66°, according to the season, the food of the cows, &c. Here is her method:

At 8 a. m. all the cream is warmed in an enamelled tin cream-pot to a temperature of 84° F., 5 per cent of buttermilk is at once added. The cream is then allowed to rest in the ripening-room, the temperature of which is from 50° to 54° F. and by noon the cream will have fallen to 66° F. The jar is then placed in a cask with hay in it, and the whole is covered with a butter-cloth. At 6 p. m. it will be about 61° F., and at 7 o'clock the cream begins to become uniform; it is allowed to go on ripening till 9. During the whole day, especially at first, when the temperature is high, it is frequently stirred to make it homogeneous.

At 9 o'clock the cream is taken out of the cask and well mixed; the jar is then placed (in a tub of water in summer) on the floor, so that in the morning the cream is about 50° F. In winter the ripened cream is warmed in a tub of water.

Madame Nielsen attaches great importance to the following points:

1. Churning at the proper temperature.
2. Adding the ferment at a high temperature.
3. Allowing the temperature to fall regularly.
4. Allowing the ripened cream to rest a certain time (the whole night) at a temperature of about 50° F.

Madame Nielsen states that by following this method she gets a butter firm, solid, uniform in quality, and with a delicate aroma, always provided that the churning and working of the butter be properly conducted.

### CHURNING.

In Denmark, the Holstein churn is the one chiefly in use. A good churn ought to bring the butter in from 25 to 45 minutes, at a moderate temperature, so that the quality of the butter is not deteriorated. During the whole operation the churner must constantly watch and control the temperature, the pace of the churn, etc. When the butter is come, care must be taken not to keep the churn in motion longer than necessary. The churn must be easy to fill and to empty, to clean and to air, the materials of which it is made should be such as to impart no taste or smell to the butter, and be at the same time bad conductors of heat. The best woods for churns are oak and beech. Never paint the inside of the churn.

Before pouring in the cream, the churn is to be washed with lukewarm water, and in hot weather it must be rinsed with cold water, and the cream put in immediately, the temperature having been suitably arranged beforehand. The quantity of milk whence the cream has been taken must be ascertained, in order to know how much colouring is to be added, that the butter may have always the same tint. The cover is then put on and the churning begun.

*Length of time for churning.*— This depends on the make of the churn, on the pace it is worked, and on the temperature; the last may vary with the food of the cows and the lapse of time since

(1) *Gaard* a Norse word, is the same as our yard or enclosure. cf. Fishguard, Apple-garth.—A. R. J. F.