Stock and Dairy.

Effect of Heating Milk to Different Degrees.

A correspondent asks the difference in effect of heating to 130 degrees, or to the boiling point. In the time of keeping sweet there will be considerable difference. The boiled milk will keep sound the longer. Heating to 130 degrees drives out the animal odor, and kills most of the germs which the milk may contain. Heating to 180 will kill still more, and cause the milk to keep sweet a little longer. Boiling kills all, and makes the milk keep longer still. In the last case it would keep indefinitely if protected from the contact of air in which spores are floating.

The spores which float in the air are very minute and dry. As they fall into liquids or upon moist substances, they gradually absorb moisture and expand in size, and after a time, like other seeds, they begin to grow and multiply. In their growing stage they are very tender, and, like other germinated seeds, are killed by a little heat. A hundred and thirty degrees might be sufficient to destroy them. If they are only swelled it would require a higher heat to kill them; if they are dry, or have made but a trifling progress, nothing short of a boiling heat will wipe them out. When all the germs in milk are thus killed, it will not spoil till a new seeding of spores fall into it from the air, and have time to develop and multiply. If the heating has been so moderate as to kill only a portion of the spores which have started in it, decay will occur sooner than if all had been killed. The effect of the different degrees of heating upon the keeping quality of milk, may be thus accounted for.

When from any cause a cow becomes feverish, or her health so affected as to make her cream flecky, heating to 130 degrees will obliterate the tendency to flecks if the tendency is but little developed. If it is stronger a higher heat will be required; and if very strong, a boiling heat only will stop it. The same is true where milk is so affected that the butter comes with difficulty, or not at all.

For all ordinary cases of milk varied from its normal condition by the food or health of the cow, heating to 130 is sufficient to preserve the milk sound and in wholesome condition till it is consumed, or made into butter or cheese.

To facilitate the rising of cream, low scalding is best. A moderate heat—130 to 140 degrees—thins the milk and swells the butter globules, and makes them rise rapidly. Upon milk so heated, the cream rises so perfectly as to leave a blue skim-milk. A boiling heat cooks the milk and thickens it so much as to hinder the ascent of the cream, and leaves a white skim-milk, indicating that the separation of the cream is not perfect.

EFFECT OF HEATING UPON FLAVOR.

There is always in milk a small per cent. of flavoring oils derived from the essential oils of the herbage consumed by the cow. These, according to the herbage derived from, become ethereal, and escape at different degrees of heat. As the number of species of herbage which a cow usually consumes is pretty large, these oils are escaping all the way from the blood heat to boiling. The oils from some plants, like clover, become ethereal and escape at a very moderate heat; others, like turnips, require a little higher heat, while the flavoring from onions and garlics is not removed by even a boiling heat. But, in general, the higher milk is heated, the more of flavoring oils, whether good or bad, are driven off, abating the flavor of the milk and butter made from it. From the above reason it often happens that while the flavor of milk and butter will be improved by a moderate heat which is sufficient to pass off objectionable flavors, a higher heat will depress flavor by driving off desirable ones. And this same reason may explain why some milk is better not to be heated at all. Milk which is made from pleasant-flavored herbage, and is in all respects perfect, is better for butter making not to be heated, but the best butter I have ever had the pleasure of tasting, was made from milk which was moderately scalded.

If heating is to be done at all, whether high or low, it should be done quickly. The longer it remains hot, and the more evaporation from its surface, the thicker and tougher will be the skin which forms on its surface, into which both fat and casein enter and are rendered useless for either butter or cheese. The thicker the skin which forms on the top, the more butter and cheese there is wasted. The pellicles which enclose the butter globules, which, by testing with nitrate of silver, I have recently shown are not casein, but in all probability are membraneous, become softened and adhesive by cooking, and require constant stirring while heating to keep them from forming into a tenacious scum by the rapid evaporation from the heating milk. The quicker, therefore, the heating is done, the less loss there will be in this direction. —*L. B. Arnold, in Buffalo Live Stock Journal.*

Extract from Willard's Butter Book.

THE BUTTER CROP.

The annual butter crop of the United States has been variously estimated at from 700,000,000 to 1,000,000,000 of pounds. But enormous as these figures are, the leading butter merchants of New York believe the product to be larger. During the summer of 1864 the New York Butter and Cheese Exchange appointed a committee of eminent merchants to consider the subject of classifying and grading butter, in order to facilitate trade in this important staple.

The committee, in its report, states that the census returns of dairy products are incomplete and defective; and it is affirmed, further, that the latest, the most analytical and reasonable estimate in regard to the present butter crop of the country is the following, which was prepared by an experienced and careful statistician, who estimates the annual product to be over 1,400,000,000 lbs. If the average price be put at 30c. per lb.—a sum which would not be considered excessive for a fine quality of butter—we find the total value of the product to be $420,000,000.

CONSUMPTION INCREASES AS QUALITY IMPROVES.

It has been observed—and, indeed, the fact seems to be beyond question—that as we improve the quality of our dairy products, the consumption *per capita* increases; and this has been especially so in regard to butter since the improvement in its quality on account of the introduction of the creamery system.

PRICE OF BUTTER ADVANCING ABROAD.

Another feature of importance in regard to butter may be mentioned in this connection; the price—though at times liable to fluctuate like that for other commodities—appears on the whole to be gradually rising. The English markets have shown this for several years past. During the last two years, and especially during 1874, the trade in London has complained of the scarcity of a good article. Butter imported into England from the continent of Europe has been quoted as high as 168 shillings sterling per cwt. That is to say, about 36 cents, gold, per pound. High prices in England have a tendency to maintain good prices on this side.

But in addition to this outlet the time is close at hand when the entire demand for dairy products in the West Indies and South America will be supplied from the United States, and will become an important trade. Increased transportation facilities, the use of metallic packages and improved methods of putting down butter, so that it will remain unimpaired during the sea voyage, together with the best methods of manufacture, must add greatly to the prosperity and permanency of this branch of dairying. The estimates presented will be sufficient for dairymen to fully appreciate the situation.

THE BUTTER COW.

On the value of the different breeds for the dairy, it is said :—

Nor can any one breed be recommended for all situations or to best suit the wants of all persons engaged in butter dairying. Farms differ widely in their character. Some lands have a level surface, others are rolling or gently undulating, while others yet are hilly and broken. Soils, too, vary from the richest to the poorest. Again, one farmer desires to make butter and cheese; another wants to get the best returns from his animals in butter, cheese and beef, or in butter and beef, while a third is looking simply for the best butter yield alone. It is evident no one breed will fulfil all these conditions at once and at the same time. As a general principle, it may be affirmed that good butter can be produced from any breed, and not unfrequently a common cow, with no renowned blood in her veins to boast of, will yield as much and as good butter as the boasted cow that has a long record in the herd book.

The dairyman should have a clear understanding as to his situation, the character of his lands, and what he is seeking to realize from his stock, and then choose that breed which is best adapted to his purpose. But in saying this it must not be inferred that we regard a thorough-bred herd as indispensable; on the other hand, the cheapest and perhaps the most practical course to be adopted will be to select the best common cows that are to be had, and cross them with a thorough-bred bull of the breed best adapted to his purpose. Breeding in this way, from year to year, he will be likely to obtain a herd that will yield him the most profit and at the least expense.

THE MILK OF EACH ANIMAL SHOULD BE TESTED.

In choosing stock for the butter dairy, each cow should be tested separately as to the quantity and quality of milk she is capable of yielding. The milk should be accurately weighed or measured and then set aside to cream, and the per centage of cream determined. But this will not be sufficient, for some cows will give a large percentage of cream, yielding a comparatively small quantity of butter. The cream, therefore, must be churned and the percentage of butter obtained. In this way the dairyman will be able to form a true estimate of the amount of butter in each cow's milk, and from such estimate he will learn what animals in his herd are best adapted to butter-dairying, and those that should be discarded as not fit for his business.

Large losses are often sustained by keeping inferior stock. Many dairymen can give no accurate account of the value of any cow's milk in the herd. They know at the end of the year the quantity of butter that has been produced from the whole herd; but if it falls below what would be considered an average product, they are unable to point to the true cause of the deficiency. Not unfrequently the cow that gives a large mess of milk is credited much higher than the one yielding a moderate quantity, and yet the latter, on account of its superior richness, may be altogether the best butter cow. Some dairymen are under the impression that exceedingly rich milk is made by excessive feeding, ignoring the fact that the real butter cows must be sought for in particular animals or breeds noted for this peculiarity. Every cow has a structural limit in the richness of milk which she will yield, and beyond this standard of richness no amount of feeding will increase. Butter dairymen, therefore, should be careful to test the capacity of each cow in this regard, and they should enter her record on a book kept for the purpose, so that they may know what animals are yielding a profit and those that are not paying the expenses of their keep.

The Dairy and Butter Making.

An Essay by Mr. G. Jarvis, Westminster, Delivered at the Forest City Grange.

In these times, when there is so much information disseminated broadcast through our land, on everything pertaining to the farming interest, by means of the agricultural press, it can hardly be expected that I should offer anything new on the subject of butter-making. And here allow me to digress for a moment from my subject, to remark that we cannot sufficiently estimate the blessings and benefits we have realized from journals of agriculture during the last ten or twelve years; there is more general and useful knowledge by far possessed by us, as farmers, at the present time, than there was a dozen years ago, and very much of this is owing directly to the agricultural press; and yet there are many who do not avail themselves of this means of rendering their occupation more pleasant and profitable, their homes more cheerful and attractive, and their families more intelligent and happy. This is to be regretted, as such people do not realize half the pleasure in farming they might.

There has been so much said and written on the subject of butter making, that it would seem that all ought to be good butter makers, and yet we know this is not the case; nothing, indeed, is more common than poor butter. Go where you will, on the market, in the grocery store, at the hotel table, and the fact stares you in the face that one-half of those who make butter for sale make a very poor article indeed, something which is as much inferior to prime butter as a stale egg is to a fresh one. I think the subject a very important one, for while first-class butter is a wholesome and delicious article of diet, nothing is more disgusting to the taste and nauseous to the stomach than the