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NOVA SCOTIAN JOURNAL OF AGRICULTURE

Published under direction of the Board of Agriculture of Nova Scotia.

Omnium rerum, ex quibus aliquid adquiritur, nihil est agriculturâ melius, nihil uberius, nihil homine libero dignius.—Cicero: de Officiis, lib. I, cap. 42.

VOL. IV. *HALIFAX, N. S., JUNE, 1884.* *No. 46.*

As by its promptness Baddeck secured this year's Island Exhibition, so we believe by its energy much will be done to bring it to a successful finish. No single locality can be expected to do everything be that place Baddeck, Sydney or North Sydney. The town in which the Exhibition is held is of course primarily responsible for what is done and how it is done, but its hands must be supported by the people of Cape Breton generally. If this is not done with earnestness and practical concert the Exhibition of 1884 will be far from what it otherwise might be. But we cannot see why there should be any holding back. The general principle of an Exhibition is to bring into competition all classes of people having similar aims and purposes. It is therefore an advantage individually and as a whole. The main direct inducement held out is the prizes. These tend to give a certain edge to competition. By means of them, for the outlay necessary to prepare exhibits and get them to Baddeck, each and every one has a chance to be reimbursed. Then there is the greater advantage consequent upon the increased market value of the agricultural and industrial labors of successful exhibitors. We could name many Cape Bretonians who have gained a reputation for themselves at these exhibitions as buttermakers, as stock-raisers, as growers of fruit and special lines of vegetables and cereals. Those who have gained this position should endeavor to keep it, while at the same time their neighbors strive to secure a like advantage. This year the District Exhibition will be thrown open to the competition of the whole province. Formerly only the four counties of the Island competed. The new departure was taken at the last meeting of the Central Board. So now the active people of Pictou and Antigonish will be in a position to send exhibits to Baddeck. The advanced agriculturists of these fine counties do not regard either trouble or expense to secure new markets, as they certainly will, if our Cape Breton farmers do not toe the mark in exhibits both as to quality and variety. We are sounding no note of alarm. We fear no competition for our farmers and artisans, provided our best is shown. Therefore we urge our friends to keep before them the Baddeck Exhibition, and to not fail in putting in an appearance in their best bib and tucker, in exhibits as well as person. Before very long the General Committee at Baddeck will have their Prize List in the hands of the people, when we hope there will be a universal desire and intention to take part in this year's Cape Breton Exhibition.—*N. Sydney Herald.*

Mr. A. H. Sutherland who owns the celebrated Ayrshire cow, referred to in the Eastern Chronicle of a recent date, sends additional particulars of her to the Rev. Mr. McDonald, which, together with information otherwise obtained, we now give.

She was purchased as a calf by Mr. P. Grant of Hastings, from C. P. Blanchard of Truro, being of the best milking strain in his fine herd.

The butter yield from her last season was 218 lbs. instead of 206 as before reported. Mr. Sutherland believes that had proper attention been paid to her feeding she would have yielded 300 lbs. She was also affected with garget (milk fever never troubles poor milkers) for a portion of the time.

Since calving this season she has continued an increased milk flow until it now reaches 28½ quarts per day. Her calf (male) was sold for $40 a few days after it was dropped. Its owner is holding it at $100.

Now, if this cow averages 20 quarts per day the total yield for the milking season of ten months will be 6000 quarts. When the average cow only yields 1500 quarts in the season it is readily seen that this cow will have 4500 quarts to her credit over the average, which makes her invaluable. The fact is that the whole herd in the hands of the Dairymen of Nova Scotia can be developed to produce this yield. Let us aim at it.—*Eastern Chronicle.*

In District No. 2, which includes the Counties of Annapolis, Kings and Queens, permission has been given to hold two Exhibitions, instead of one, in order to meet the convenience of the two divisions of that district that are widely separated and without convenient means of communication. One Exhibition will be held at Annapolis, on September 30th, October 1st, 2nd and 3rd. Total amount of Prizes offered $1337.00. Strenuous

efforts are being made to raise the Prize List to $2000.00.

The Committee for the Annapolis Exhibition are John B. Mills, A. Shearer, Thos. S. Whitman, Geo. E. Corbitt, C. D. Pickles, and A. D. Mills.

FREDK. LEAVITT, *Secretary.*

THE Exhibition for Agricultural District No. 5, will be held at the town of New Glasgow in Pictou County, on September 30th, October 1st and 2nd, three days. This District (No. 5) includes the Counties of Pictou, Antigonish and Guysborough, and is represented at the Central Board of Agriculture by David Matheson, Esq., Pictou. The amount of Prizes offered is $2545.75.

The following Committee has been appointed to carry out the Exhibition:—

EXECUTIVE COMMITTEE.

Allan C. Bell Esq., M. P. P., Chairman.
James D. McGregor Esq., Vice "
Geo. W. Underwood Esq., " "
John Ross Esq., " "

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H. J. Townsend,	John K. Fraser,
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J. R. Porter,	John Murray;
John C. Reid,	John R. McPherson.

A. M. Fraser, Secretary,
J. Northup Cameron, Asst. Sec.

ONSLOW AGRICULTURAL SOCIETY.

CENTRAL ONSLOW, *April 12th, 1884.*

In compliance with your request of the 3rd inst. I give the following; Robert Putnam Esq., *President;* Col. W. M. Blair, *Vice President;* John A. Dickson, *Secy. and Treas.;* Thos. Dunlap, E. Fulton, James Lorrain, T. P. Putnam, John Miller, *Directors.*

JOHN A. DICKSON, *Secretary.*

MORE THOROUGHBRED STOCK FOR NEW GLASGOW.—A. C. Bell, Esq., has purchased from John Miller & Sons, Brougham, Ont., a two year old thoroughbred Clydsdale Stallion. He was received here on Tuesday. He is of a handsome bright bay color with black points, and weighs 1300 lbs. His name is "Lord Chancellor," and by imported "Chancellor." Mr. Bell deserves the hearty thanks of all stock raisers in this County for bringing such a valuable animal into our midst.—*E. Chronicle.*

As soon as we receive the completed printed Prize Lists and regulations of the several District Exhibitions, we will publish particulars.

ENSILAGE.

Mr. H. M. Jenkins, F. G. S., Secretary of the Royal Agricultural Society of England, and Editor of the *Journal* of the Society, read a paper on this subject before the London Farmer's Club, from which we take the following extracts.]

CONSTRUCTION.—Silos for the preservation of green food were originally mere pits, like those on many English farms, and in which potatoes, mangels, and even turnips are stored; but they are altogether too risky to be recommended for adoption in our pluvial islands. The same may be said of silos built with the greatest skill and the best materials if they are not covered with a roof. The general result of my information as to the cost of constructing silos as new buildings, including a permanent roof, supposing that the most has been made of local circumstances and conditions, is that £1 per ton of silage capacity may be taken as a fair average. Where old barns can be used wholly or in part, the cost of construction is almost nothing in the former case, because there is nothing to construct, and proportionately reduced in the latter, because then only one or two walls and no roof require to be made. Silos above-ground have a great advantage in not being liable to the percolation of water. One advantage of the underground silo is that its roof may be placed at such height above its upper margin that the intermediate space may be used as a kind of Dutch or Cheshire barn for the temporary storage of hay, straw, &c., until the time arrives when it becomes necessary to use the silage.

Mr. Trepplin, in Warwickshire, uses a number of barns for the preservation of green fodder without any alteration of the buildings, and M. Lecouteux, a neighbour of M. Goffart uses barns for the double purpose of storing his grain in sheaf at harvest time, and then, later in the autumn, for storing his chopped green maize to convert it into silage. It is, of course, to be understood that in the meantime M. Lecouteux's corn has been threshed, and the straw stacked elsewhere.

Of English Fodder Crops, there can be no doubt that ordinary meadow grass is the most universal and the easiest preserved, but clover and artificial grasses present no difficulty. When green rye or oats are intended for the silo, care should be taken to cut them while still sufficiently succulent in the stem, and while the grain is quite milky. This caution is even more necessary in the case of tares, which seem generally to have been allowed to get too ripe before being put into the silo.

Prickly comfrey appears to be the only crop found absolutely unsuitable for ensilage; and green maize, although it makes probably some of the best and most nutritious silage, and almost the worst fodder when preserved dry, has but a limited interest for the British farmer.

The practice of Ensilage may, in my judgment, have this great fact put to its credit--that it enables us to preserve in a state fit for sale that almost intractable product of the land which is termed sewage-grass; and it also enables one to turn to profitable use coarse and wiry grass growing under trees, and in odd corners, the hay from which would be scarcely worth the cost of making.

Two other results of my investigations, being inferences from the evidence I have collected, are, that materials to be preserved in silos should be chopped, and that they should not be mixed with salt. I do not say that chopping is absolutely necessary, or that salting is essentially pernicious; but I believe that much better silage is obtained with chopping and without salting than otherwise.

One special advantage expected from ensilage is that it will enable crops to be cut and pitted in wet weather, when haymaking is impossible; but I must be allowed now to caution that crops cut in that state require careful treatment afterwards, otherwise a strong-smelling mass of pickles will be obtained, which cattle will often eat readily enough, but which require a considerable addition in their food of the stuff that makes the beef. In other words, the process of fermentation will proceed so rapidly under such circumstances that there will be a maximum loss of nutritive matter.

THE PROCESS OF FILLING THE SILO.—The material should be trod in thoroughly as it is put in, and not only by men and women, but also by horses—on the Continent they use bullocks—and in addition by a ram like a pavior's. Perfect consolidation in this stage is much more effective than any amount of weighting afterwards, besides diminishing the expense of the latter proceeding.

The pressure required I have found to vary with the nature of the crop, its comparitive ripeness and dryness, whether it has been chopped or unchopped, and so forth. One and a-half cwt. to two cwt. per superficial foot—which are employed in the North of England, seem to be excess of what is necessary; while the light weighting of 40lb. or 50lb. to the square foot, which is met with in the South of England, seems to err equally on the other side. My impression is that with good treading and ramming, and chopping material, a weighting of 1 cwt. to the square foot should be rarely exceeded.

Concrete blocks, bricks, steel ingots, and iron weights are all more or less costly, so also are the mechanical means of pressure that I have seen at work. I believe that a layer of earth about 1 foot thick, over a covering of boards is almost

better than anything else, because the pressure is uniform and the material is practically costless. If, however, such materials as stones, gravel, slag, &c., are used, they should be put in some kind of a package, such as old guano bags, old flour or oyster barrels, &c., otherwise the weight is likely to be irregularly distributed.

From statements of expenditure which have been furnished me by several correspondents, it appears that the average cost of making silage is about 5s. per ton, including mowing, carting, chopping, pitting, treading, boarding, and weighting, but not the interest of capital on the silo, and of the weighting material.

Silage is generally removed from the silos by cutting it vertically, as hay is cut out of a stack. By this means only two or three of the covering boards and the superincumbent weights need be removed at a time; and if the thickness of the cut is at all proportional to the needs of the farm, the face will not be exposed to the air long enough for the silage to deteriorate. Some samples can be kept for months in that manner, others go mouldy or putrid very rapidly. One learns in course of time to predict the keeping qualities of silage with a certain amount of accuracy; for instance, the brown aldehyd-smelling silage, reminding one of honey-dew tobacco, will keep good for a long time if it is dry, but rapidly goes mouldy if it is wet. Green silage smelling distinctly of vinegar—what may be termed the pickle stage—does not generally go mouldy, but it turns putrid if very wet, and is not soon submitted to a kind of haymaking process.

For the purposes of the ordinary farmer, I do not know that it is of importance that the silage should keep good for more than a few days; but to the managers of sewage farms, or rather to their employers—the ratepayers of urban districts—the subject is one of immense interest. If sewage grass can be preserved in silos so perfectly that, after having been cut out, it can be sold off the farm for consumption in quantities that will last the purchaser two or three months, keeping good the whole time, it seems to me that a greatly enhanced return from sewage grass will be the result, and the most difficult problem connected with sewage farming will have been solved. From this point of view I beg to commend to your special attention a sample of ensilaged sewage grass which I received from Mr. Garret Taylor last Christmas.

Feeding Value of Silage.—With regard to this, we have heard a variety of statements, some being as wide from others as the poles are asunder. For instance, my very enthusiastic friend Mr. Easdale maintains that the feeding value of grass silage is £2 per ton, that it takes five times as much grass to make a ton of hay as a ton of ensilage, and that therefore hay ought to have a feeding value of £10 per ton to be equal to silage. He also regards 75 lb. of silage to be equal in feeding value to 25 lb. of hay *plus* 95 lb. of turnips. On the other hand, Mr. Gibson tells me that "the result of feeding cattle on pitted fodder in my case has been that 2 bush. of ensilaged rye mixed with 1 bush. of swedes produced the same quantity of milk as 1 bush. of ensilaged rye and 2 bush. of swedes, both being used in conjunction with 3 lb. of cotton cake per day." In other words, Mr. Gibson finds a bushel of ensilaged rye to be equal in feeding value to a bushel of swedes grown in Essex. Mr. Trepplin, however, who makes about 3000 ton of silage a year, asserts that the same quantity of grass of the same quality is at least twice as valuable for feeding purposes, if made into silage, as it made into hay; while Mr. Kenyon, who began the practice of ensilage in 1881, but on a much smaller scale, says "that a ton of grass preserved by ensilage will go as far in the maintenance of stock as (at a low estimate) would 25 cwt. of the same material if made into hay." This latter estimate is practically corroborated by Mr. George Broderick, who informs me that, from experiments he has made, he has "come to the conclusion that a given quantity of grass is worth about 30 per cent. more when made into silage than if made into hay."

Mr. Young, agent to Lord Londesborough, experimented on four cows tied up in the same house. The experiment began on January 1, and the four cows had each 10 lb. of ground oats, 14 lb. of mangels, and 3 lb. of cotton cake, with, for the first ten days, 18 lb. of hay and 3 lb. of chopped straw. During the second ten days the hay and straw were replaced by 28 lb. of silage, and the other food remaining the same. "In five days," he says, "nearly one half the milk had gone off, the bowels becoming very costive, and the faeces dark-colored." Further, "no more cream or butter was obtained from the same quantity of milk than when the cattle were fed on the original food." Subsequently one-half of the silage was taken off, and 14 lb. of pulped turnips substituted. The result was that "in two days the milk returned to the usual quantity, and the bowels became less constipated."

The Rev. Mr. Ford, Mr. Swan, Mr. Fryer, and others, have testified to the good influence of silage upon either the quantity or quality of the milk, especially the latter, while Lord Fortescue found a deterioration, except when the silage was mixed with other food.

In the face of these discordant statements it is wise to be cautious; and I specially wish to draw your attention to the general evidence that silage by itself is not so valuable a feeding material as when used in conjunction with a proportion of other bulky fodder, and a proper allowance of cake or meal, or both. It is the almost universal practice on the Continent to mix the silage with other kinds of bulky food, a very general proportion being one-third of dry food to two-thirds of succulent materials, and the latter being generally composed of silage and beet root pulp.

Mr. Hunting found his silage produce costiveness, but I have been informed that silage more advanced in the fermentative processes produces a certain amount of scouring. Silage, indeed is not a definite chemical compound; and therefore what may be true of one man's experience may conceivably be opposed to that of his next-door neighbor.

A most important question is whether the use of silage for cows and heifers impairs their breeding powers. The experiences of Mr. Bateman with ewes, Mr. Gibson with cows, Mr. Hunting with heifers, and the Vicomte de Chezellaes with both cows and ewes, all tend to show that the judicious use of silage as food does not interfere with the animals' breeding powers. And by "judicious use," I certainly do not mean "exclusive use." Quoting from my recent report to the Royal Agricultural Society:—

"The construction of a debtor and creditor account as between the loss of feeding material occasioned by the conversion of carbo-hydrates into alcohol and acetic acid on the one hand, and the gain of feeding material by the conversion of indigestible into digestible woody fibre on the other, is a question for the chemical accountant, and no doubt such a balance sheet will be shortly forthcoming. To the farmer, however, the 'proof of the pudding is in the eating,' and whatever may be the result of future experiments, it will have been seen that my correspondents are now generally prone to attribute at least as great a feeding value to silage as to hay, and further to credit ensilage with 'safety,' and to debit haymaking with 'risk.'"

"It will be gathered, therefore, that I regard the system of ensilage as a valuable addition to the resources of the English farmer, but not as a complete substitute for the old haymaking process. In the North of England, where autumn rains, and even early winter snows, render it almost impossible that clover aftermath can be made into hay for winter use; the process of ensilage enables it to be preserved almost without considering the state of the weather. On clayland farms, where turnips are notoriously difficult and expensive to grow, but where, nevertheless, some succulent winter food must be

obtained, ensilage supplies the solution of the difficulty. On such land tares can be grown profitably; and, with care, but not without, they can be preserved for winter use as an excellent and very nourishing substitute for turnips. Again, take a suburban dairy farm, practically all grass, and up to the present time dependent upon purchased mangels, cabbages, and other succulent food, which will enable the cows to be kept profitably through the winter; now the system of ensilage enables the suburban farmer to make a portion of his grass into a succulent and stimulating food, yielding more milk and costing far less money than the roots he was formerly obliged to purchase. Lastly, I will indicate an arable farm in the southern and south-eastern counties, where feeding a large head of stock is the great object. On such a farm, immediately after harvest, a portion of the stubbles can be sown with rye or winter vetches, reaped in April or May, and preserved in silos; then a crop of roots, tares, or even maize can be sown, the roots to be used as hitherto during the winter, and the other green crops after having been pitted in the autumn. In all these cases it seems to me that the loss of nutritive matter, which is one result of the processes of fermentation, is of very small importance in comparison with the practical advantages of ensilage, and the element of security which it contains."

I will take the liberty of summing up the practical side of the question by a quotation from one of my correspondents —Mr. Arthur H. Grant, of Abbotswood, Romsey, Hampshire, as it exactly expresses my views in terms that I could scarcely improve:—"Ensilage is good, very good indeed, as a system, but it is not an easy and universal mode of salvation to the farmer; and it demands common sense, care, and attention, but it saves in money, time, and anxiety."—*Agricultural Gazettt*

The *Amherst Gazette* reports that Warden Wilson has subscribed $25 and J. T. Smith, Esq., for the Southampton Woollen Co., $20, to the Amherst Exhibition fund; that the committee has selected an admirable site for the exhibition building, which will be about 80 ft. square and 30 ft. posts; that tenders are called for erecting the building, etc.; and that the premium list now under consideration, is of wide scope, and will give our farmers and manufacturers a good chance.

An Arbor Society has been formed in Charlottetown, and the streets and squares planted with maples, birches, elms, oaks, chestnut, ash, butternut and black walnut trees.

SIMPLE RULES IN BUTTER MAKING,

As Recommended by Professor Sheldon, of the College of Agriculture, Downton, Salisbury, England, and demonstrated by him at the Working Dairy in the Centennial Show, St. John, N. B., October, 1883.

It appears to me that good butter can be made almost anywhere by almost any person, providing natural facilities are at hand, proper utensils are provided, and ordinary attention is paid to the details of the process. I do not say that the finest butter can thus be produced at ease, for to specially excel seems to be the reward of genius in butter making as in everthing else; but good butter, butter that will win approval wherever it goes, can certainly be produced where now only an inferior article appears, if due care be taken. And I may say, further, that the volume of care required is not by any means difficult to learn or irksome to practice, but that, on the contrary, it is just as simple and easy as the careless ways of unsuccessful people. Butter has to be made somehow, by everyone who makes it, and the difference in the "how" makes all the difference in the butter. Bearing in mind that the work has to be done, it is well to remember that everything that is worth doing at all is worth doing well, and specially is this true when to do it well is just as easy as to do it badly, and far more satisfactory.

It is a slight on good milk that bad butter should be made from it; it is an insult, too, to the cow that gives the milk—the cow who has done her part of the contract well; it is anything but complimentary to the public who are invited to eat the butter, as if to say they have no such thing as delicacy of taste; it is, also, anything but creditable to any one to turn out such stuff, and a loss to the producer as well as to the consumer. Many butter-makers wonder how it is that they realize poor prices for the butter they have to sell; yet it is at the same time true that the public never object to pay good prices for a good article.

The best butter-makers in America command from 70 to 100 cents a pound all the year round; the worst of them are down to the 'teens, or in the twenties at most; and the difference is the reward of the careful man or the careful woman as the case may be.

The first thing to do is to take proper care of the milk. Assuming that it is cleanly taken from the cow into a clean pail, it should be put into clean pans, in a clean room, whose temperature should not vary beyond reasonable limits the year round, say from 50 degrees to 70 degrees. The room should be clean, I say, and it should be outside the influence of impure odors; the last because milk absorbs such odors and reproduces them in the butter. I may mention here that cows should have food which does not communicate an unpleasant taint to the milk they give; should there be any such taint in the milk or odor in the room, a pinch of saltpetre in the milk will go far to checkmate them. But in any case, taint or no taint, odor or no odor, it is of the first importance that milk rooms should be kept clean, should be limewashed occasionally to sweeten them, and should be swilled tolerably often to remove dirt and other "matter out of place" from the floors. The utensils should be scalded each time after being used for milk, scalded with boiling water, rinsed with a solution of soda, and afterward with clean, pure water. The room should be well ventilated, and only with pure air, and the windows should be screened so that no strong ray of light shall fall on the milk—this last because light develops the fermentive organisms which lead to the chemical decomposition of milk. Thus in milk-rooms cleanliness, ventilation, and regulation of light, are matters of importance.

The foregoing paragraph refers to dairies in which the centrifugal cream-separator has not yet found a place, and to the shallow-pan system of milk-setting particularly. To the deep-can system, and specially to the Cooley system, they refer only generally, as I would have them refer to any dairy whatever. I may say here that the best of butter may be made on any of the three systems of cream-raising—the shallow-pan, the deep-can or Cooly, and the centrifugal separator—providing care and intelligence are employed. The Separator is, of course, adapted only to large dairies of fifty cows or so, or to creameries; and it requires either steam or water as the motive power. A horse will drive it, and I have seen one drive it, but a horse is not to be depended on for a steady, sustained, and regular supply of power. The chief advantages of the Separator are that the cream can be got from the milk while both are new and sweet, that less of it is left in, and that fewer utensils are required in the dairy. Perfectly fresh butter from perfectly new milk may be thus obtained, if desirable; but the best authorities now consider that we get better butter from cream that has had time to mellow and ripen, rather than from fresh cream, because the latter is more or less insipid. But in any case, cream should be skimmed whilst it is quite sweet, and, no matter how long it is kept before churning, it should not be allowed to go sour. To let cream go sour is to injure the flavor and quality of the butter, if not to diminish its quantity. To churn it while it is too young, as one may say is to produce a pure flavored,

but an almost tasteless butter; yet will such butter improve in flavor by keeping, though the flavor is better secured by keeping the cream to ripen—keeping it at a temperature of 50° or 52°, putting in a bit of saltpetre or glacialine to prevent acidity, and stirring once or twice a day to have it all exposed to the air, and to prevent the formation of a crust on the surface. Glazed earthenware crocks are as good as anything to keep cream between skimming and churning; while pans of the same material, or the seamless ones of enamelled iron answer well for milk-setting.

Of churns there is a great variety, but I have found none better, or easier to keep clean, than the improved barrel churn. There is also another churn, called the "Victoria," an end-over-end churn, which has no blades inside, and, by opening at the end, affords greater facility for taking out the butter, as well as for seeing that the interior is perfectly clean. I do not say that those churns are better than any other, but I do say that they are good enough for anybody, and that the finest butter can be made in them.

Assuming that the cream has remained free from sourness during the time it has been kept for ripening, and that it is not more than a week old, I may say that the principle of acidity, artificially introduced when the cream is put into the churn, will be found to do good in helping the cream to relinquish its butter, and in making the butter firmer in body and brighter in tint. And this is attained by simply adding to the cream about five per cent. of its volume of sour buttermilk from the previous churning. The cream of different days should be all mixed together an hour or two before churning, so that it may be all old alike, as it were. Fifty-seven to sixty degrees Fahrenheit is the normal temperature which it is best to have the cream when it is being churned, but it may well vary from 55° to 65°, according to the time of the year and the temperature of the room. These points set right, the churning should be done at a regular speed which is slowest at the start.

When the butter is forming in the churn, and resembles grains of mustard seed, which are just beginning to coalesce together, it is a good thing to drain the buttermilk out of the churn through a fine sieve, and to pour in clean, cold water; the churn should then have a few turns, the water be taken out as the buttermilk was, and fresh water put in; this process should be repeated several times, until the water comes clear of buttermilk out of the churn. This system of washing buttermilk out of the butter may be regarded as the simplest and most effectual that can be adopted; and as it is of the utmost importance to the keeping quality of the butter that all the buttermilk should be got out of it, so is it necessary that it should be carefully got rid of. Butter that is ridded of its buttermilk, which to a great extent is composed of caseine—nitrogenus matter which is addicted to early decay—will keep well for some time, providing the other preliminaries I have mentioned have been properly attended to.

The butter, well washed in the way described, requires little or no purification from buttermilk after it is taken from the churn, simply because there is little or no buttermilk left in it. But it requires to be worked in order to compress and consolidate it, to compact it into a solid and coherent body, and to mix with it the proportion of salt which is thought to be desirable. If, however, the butter has not been well washed, or has been only partially washed, inside the churn, it must be washed outside of that machine; and for this purpose, as well as for compacting the butter, and for mixing the salt with it it is always desirable to use a butter-worker, and not to touch the butter with the hand. The butter-worker, properly used, does its work much better than the hand; it does not soften the butter as the hand does, and it does less injury to its grain and texture—matters which are of no little importance to the appearance of the butter. During the process of working the butter, pressure, not friction, should be employed, for friction injures the grain of the butter. The quantity of salt to use will be governed by taste, and by the length of time the butter has to be kept, but it will vary from one to five per cent. of the weight of the butter.

The points, then, to be attended to in butter-making are these: cleanliness, temperature, and regularity in the performance of details; especially with regard to washing the butter in the churn.

ENSILAGE OF PARTLY CURED FODDER.

Too Much Moisture Avoided.

Eds Country Gentleman.—I made my first trial of ensilage last fall, but under what I then regarded such unfavorable circumstances that I felt considerable misgiving as to the result. My necessities at the time have given me what I believe to be some good hints, which I intend to take advantage of this year. My experience is sufficiently at variance with the practices of some of your correspondents to induce me to give it to your readers.

The drouth of last year not only retarded the growth of my corn a full half but it partly cured it while standing. When I was about to procure a cutter, an old genius came along with a home-made affair, run by a one-horse tread power, and agreed to fill my silo, of 1,500 cubic feet capacity, within twelve hours (which he did). The knives of this machine were so imperfectly fitted that the corn stalks came through in lengths varying from two to twelve inches, while the foliage was not cut at all. After the silo was filled I had no straw to place under the planks, and not wishing to use fine hay, I sent the men to the woods for a load of leaves. The ensilage was so coarse and dry that it could not be trodden with any satisfaction. Stone were put on the planks, however, to the depth of three feet, which pressed the ensilage into two-thirds its original bulk in four days. My silo is perfectly constructed with stone, laid in cement, and plastered smoothly on the inside.

The silo was opened on the first of December. The contents were simply perfect—just what I have conceived ensilage should be. The oder was fragrant and agreeable, and with perceptible alcoholic or acetic fermentation. It was the first specimen I have ever seen in which a considerable portion of the sugar was unchanged. On splitting any of the long pieces th pith was as sweet as when the corn was standing in the field. The whole mass was much less acid than I have before seen. Now, inasmuch as the result was so satisfactory the conditions must have been correct. It will be noticed that I have made six points: viz., a perfect silo, filled in one day, with partially cured corn fodder, cut very coarse, covered with forest leaves and heavily weighted. I might add another, that there were no feed rollers on this rude cutter, so that the stalks were not crushed and laid open to the air.

This year if I am not so unfortunate as to be overcome by another such drouth as has blasted New England for the last two years, I shall cut my corn one or two days before running it into the silos, and leave it in the field to cure partially. I think those who advocate the wet cutting, and even of wetting in the silo make a mistake. I have seen accounts of ensilage so wet or juicy that water ran in streams from under the silo. I suppose it is such ensilage, put into such silos, that has brought some discredit upon the system. I have seen many silos opened and it has always seemed to me that the more succulent and wet the corn at the time of cutting, the more intensely acid has been the ensilage, and the more liable to rapid fermentation after exposure to the air. A sufficient natural moisture (sap) in the stalk to generate a vapour during the period of heating, to soften the woody fibre and render it more digestible, is all that is required. More than this means labor in handling and a retardation of the heating process.

If it is true that the destructive fermentation in ensilage is due not only to oxidation but to the generation of organic germs not dependent upon oxygen for their vitality, and that a definite high temperature can be attained, the less will be the loss and the more natural the product. At any rate, I am determined to suffer as little loss from oxidation as possible. I am not afraid that I shall not get heat enough and soon enough, to kill any organic germs, real or imaginary, without the aid of atmospheric oxygen. I believe that the silo should be filled as rapidly as possible and weighted very heavily. If the fodder is partially cured it will receive any amount of weight without pressing out the juice to settle at the bottom of the silo, as I notice some persons have complained about.

There is another point in connection with partially cured ensilage worthy of consideration. Many small farmers, especially in New England, are in the habit of raising from one to five acres of corn as a rotation crop. Their field of corn is generally a measure of the amount of manure they make. They seldom buy fertilizers or much grain. It seems to them a great loss to cut this corn green, only a few days before the ears will give them the golden harvest which alone they have been in the habit of regarding as of much value. If they could have the ensilage and the grain too, they would be speedy converts to the silo. Now, I believe this is just what they can do. In New England varieties of flint corn are generally raised. The ears are small in comparison with the large dent varieties of the West. Where such small areas are planted, the ears could be plucked as soon as the kernels are "glazed," and proper facilities provided for curing with small additional cost. All small immature ears could best be left on the stalks.

The stalks and most of the foliage are yet green and full of sugar, starch, gums, etc., just in condition to make excellent ensilage, every pound of which would be eagerly eaten. Nothing is lost for food. The yards and manure cellars are not filled in the spring with long, coarse stover, which usually amounts to a large portion of the crop. And even in the West, where the difference in varieties of corn requires it to stand longer in the field, I think the large, heavy stalks will be found to contain sufficient juice after heavy frosts to make an excellent quality of ensilage. Under high culture, such as will produce a hundred bushels of corn per acre, it is possible that this method of food production will be thought by some to be the most economical. Those who raise sweet corn for market or canning certainly can find no better place than the silo for their green stover.

There are several facts in connection with the feeding of green fodder in the summer, which all persons who practice the soiling system must have observed, and which I think may have some bearing on the subject of partially cured ensilage. It is well known that animals are more fond of green forage which has been cut several hours before feeding and allowed to wilt. They eat more of it, digest it better, and of course give a larger return. In rainy weather, however, when forage is not only unwilted, but covered with water, it is not eaten with so much relish, is digested with discomfort, and the yield of milk falls off a tenth. Wet clover we know is specially liable to produce acute indigestion. I will not say now that the conditions of wet ensilage and wet soiling crops are exactly analogous, but I have an impression that too much water in the silo is a violation of one of the proper conditions requisite to perfect ensilage. Without further experience, I should say, keep all water, whether from the heavens or the earth, out of the silo.

Weighting and other Considerations.

Coarse cutting I think of some importance. It facilitates rapid work, it requires less power, and it gives the minimum exposure of surface to the air. It does not admit of solid treading, and hence it diminishes somewhat the capacity of the silo, unless a crate be used. Heavier weighting should be used than with finely cut ensilage. Forest leaves make a most perfect covering before placing the planks. They pack down very closely, and are as impervious to the air as anything can be. They cost nothing, and make good bedding for the stock.

Much ado is made about the labor of weighting a silo. This is unnecessary. It can and should be done, not only without extra labor, but with a positive gain; *i. e.*, in a manner to utilize another necessary labor. Dry earth is needed as an absorbent in the stable all the year round, but it is seldom used in the winter, partly from neglect and partly from scanty storage room. Farmers who buy shorts and chemical fertilizers have many sacks about the premises. These can be rapidly filled during summer with dry loam, and placed under cover near the silo. At the time of weighting they can be handled rapidly, and piled up to any height over the planking. Thus storage room is found for a large quantity of good loam in the proper condition and place for winter use. In absence of bags, boxes or barrels can be used, or the earth can be dumped in a mass over the silo. Fortunately rocks are not accessible on all farms, but earth always is.

The whole subject of ensilage is one of great importance. On the whole, it appears to me to mark the greatest step in agricultural progress which has been in any age. The approval it has received, in spite of the many trials made by persons little accustomed to exact processes, indicates its very general adoption at no distant day. People will soon learn how imperative are the conditions of success, simple though they be, and a poor sample of ensilage will no more be charged to the system than a worthless jar of preserved fruit is now charged to the canning system. Poor Dr. Bailey has been made the butt of much ridicule and censure. His honest extravagancies have hardly been realized yet, but I do not feel so certain that they may not yet be very nearly so. His book has done no harm, to say the worst of it. Nothing short of such enthusiasm would ever awake the dead. I believe he is more nearly right than that other Beamerges, at the opposite limits of Massachusetts, who denounces ensilage, early and late, in no mere moderation.

There may be no objection to making hay a unit of feeding value, since every farmer, no matter how limited, has from experience more or less knowledge of its value; but it should not be forgotten that even in the strongest corporation there may still be preferred stock. In the much exhausted regions of our country, hay is no longer a free gift to the agricultural plunderer. As a cultivated crop, on land adapted to varied products, it is generally regarded as a relatively expensive forage. Progressive farmers have long felt the need of some economical substitute. There appears to have been nothing so generally adopted as the maize plant. It more certainly resists the accidents of climate than any other plant; it is a great cropper; it can frequently be worked as a second crop; it is greatly relished by all animals; it is raised with moderate manuring, and it is easily cultivated. Its use as a summer soiling crop is universal in all milk-producing districts. And yet, when its cultivation for this use began to be so general as to attract public attention, it was hardly less vehemently denounced on theoretical grounds than is ensilage today. Green corn the year round! That is what captivated the minds of the dairy people.—o. o. w. *Providence, R. I. in Country Gentleman.*

BUTTER MAKING.

W. H. Lynch, whose dairy apparatus in the Machinery Hall at the late Exhibition excited so much attention and called forth so many favorable comments from competent judges, was yesterday at the Royal. He has lately been in Truro assisting in organizing the Dairymen's Association of Nova Scotia, and has de-

livered some lectures since last fall in Westmoreland as to butter making. The Government of Nova Scotia are considering the desirability of republishing a work which W. H. Lynch wrote for the Quebec Government on dairies and butter making, and which was issued in the form of a blue book. Directly the work was published, copies of it were eagerly sought for by the farmers of Quebec, and the edition is now exhausted.

W. H. Lynch yesterday had an interview with Hon. A. G. Blair and other members of our Government who, it is understood, are also considering the advisability of republishing his work, so as to enable the farmers of this Province to obtain some practical information on this important subject.

The untensils used by W. H. Lynch are very simple and the *The National Live Stock Journal* of Chicago, in its April number, thus describes them:—

"The set consists of a covered milk-pail set in a frame attached to a stool, with a strainer attached, through which the milk must pass to enter the pail—an admirable device to secure clean milking; next a cooler pail for setting milk—has double sides arranged for cooling with water, ice or air, with a new and convenient device for skimming and handling the skim-milk; a cream pail, fitted for airing, cooling or heating and stirring the cream; a churn of the most approved pattern, a butter-bowl, butter-worker, ladle and balance for weighing salt and butter; and finally, a perfect butter-tub, free from soakage and effect upon the butter, a non-conducter of heat and air-tight. Every item is plain and simple, and consequently cheap and durable. The whole thing is a common sense arrangement devised for improving private dairies by reducing labor, improving quality by the use of better apparatus, by making mechanical appliances to a larger extent take the place of skill, and by similarity in modes of operating, to secure a greater uniformity in dairy butter."—*St. John, (N. B.) Telegraph.*

ENSILAGE.

By Sir J. B. Lawes, Bart., Ll.D., F.R.S.

[In Agricultural Gazette.]

Before I go into the question of the relative value of ensilage, as compared with other succulent foods, I think it will lead to a better understanding of the subject, later on, if I commence by making a few remarks upon foods generally.

I do not propose to treat the matter with scientific accuracy, but to speak in such general terms as may be understood by any practical farmer, who wishes to know some of the arguments which may be brought forward in favour of, or against, this new system of preserving green crops.

The most valuable ingredients contained in the foods we grow are oil, sugar and starch, and digestible cellulose. None of these compounds contain nitrogen. Those which do contain that substance are albumin, legumin, and amides. As soon as we know the amount of these substances contained in any food, it is easy to make a rough estimate of its feeding value; just as we can roughly value a manure, when we know how much ammonia, potash, and phosphoric acid it contains.

In the crops we grow, oil is found in such small quantities that it may be passed over, and I will proceed to the consideration of sugar and starch.

It is now many years since we established the fact—by experiments upon pigs that starch and sugar were of equal value as foods. A pig fed upon barleymeal will increase at the rate of 1 lb. to each 5 lbs. meal consumed; and by far the largest part of barleymeal consists of starch. Barley meal contains about 2 per cent. of nitrogen, while lentils and beans contain more than twice that amount. Our experiments at Rothamsted at the same time showed that while very little, if any, more increase in the live weight of the pig, was obtained by the substitution of a given weight of these highly nitrogenous foods for barley, the quality of the pork was materially injured.

Just as a substance of the composition of barley may be considered the type of a proper food for a fattening pig; so, the grass growing in a permanent pasture of high quality may be considered the type of the proper food for a fattening ox, or sheep.

Some time ago we had under examination a first class pasture in Leicestershire, which was competent—without the addition of any artificial food—to fatten more than one large bullock per acre. We found the herbage was of a very simple character, consisting largely of white clover and perennial ryegrass. As cropped by the bullock it was somewhat higher in nitrogen than barley meal: this would be due to the large amount of white clover.

If we attempt to fatten a bullock upon inferior pasture, we find that the animal will not put on meat, even if it is the sole occupant of an area of several acres. This is caused by the amount of indigestible substance in the poor pasture being so large that the bullock is unable to pass a sufficient amount of grass through its stomach, to supply the waste of its body, and also to produce rapid increase. But by giving the animal daily some rich concentrated food as cake or corn we make up the deficiency of the poor pasture by a supply of starch, and fat. If the dung voided for one day by the bullocks in the two fields were weighed, the much larger weight that would be found in the field occupied by the animal feeding on the poor pasture, would show the large amount of indigestible substance which the grass contained.

I now come to cellulose, which chemists divide into digestible, and indigestible, and some important experiments have been carried out in Germany to show how much of these substances are digested.

Although such experiments are very valuable—as establishing the fact that some substances are more digestible than others—still it is impossible to draw a hard and fast line between the two: and it is further probable that the stomach of an animal short of food would digest much matter which a well-fed animal would avoid.

The deterioration of the feeding properties of our crops by the formation of woody fibre, is well seen where sheep are fed upon rye. As soon as the stem begins to form, an unerring instinct tells the sheep that something has been produced which is not food. The manure ingredients which might have been employed in the production of starch, sugar, or some other feeding substances, have been in fact doing unprofitable work by the production of woody matter.

On one of our experimental fields at Rothamsted, the same artificial manure has been applied for a long period to land under (1) permanent pasture; (2), continuous wheat; (3), continuous roots. The average produce under the same manure has been as follows—

Wheat, 32 bushels; 3696 lbs. straw.
Hay, 2 tons 11 cwt.
Mangels, 18 tons bulbs, 2½ tons leaf.

The absolute amount of dry produce in these three crops is not very different; but there is a very large difference between the amount of indigestible food contained in each. In the wheat crop we have more than 1½ ton of straw, containing a large amount of woodly matter: while in the mangels the woody matter is very small.

In the silos certain valuable food compounds are destroyed, it is however asserted that much of the woody indigestible matter has been converted into digestible food. An investigation in regard to the truth of this statement is I need hardly say of great importance.

Thirty-two bushels of wheat even at 5*s.* per bushel are worth £8, and the starch which forms the bulk of the grain would—if the crop were cut green—add largely to the feeding properties of the straw. It is by no means clear however that, as ensilage, as large a money return could be obtained, as by the sale of the wheat, and feeding the straw with a root crop.

DESCRIPTION

OF THE MODE OF MANUFACTURE OF BUTTER NO. 450, CLASS 32, ENTERED BY HON. D. FERGUSON, AT DOMINION EXHIBITION, ST. JOHN, N. B.

The cattle from which this butter was made are grade Ayrshires, and the feed consisted of clover after-grass, assisted by a cart-load of fodder-corn spread over the pasture daily. Immediately after milking the milk is strained into Cooley cans, and placed in cold water for the cream to rise.

The walls, floor and gables of the dairy are of brick, and the floor is 4½ feet below the level of the ground.

In one corner of the dairy a large zinc tray is placed on the floor, communicating with a drain through which water is carried away. Standing in the tray is a box or tank containing the Cooley cans, and a pipe leads the cold water from the pump alongside the dairy into the tank so as to submerge them. A little ice is added so as to reduce the temperature to about 48 degrees, and the cream is maintained at the same until within 12 hours of churning, when it is raised to 60 degrees, and churned at from 60 to 65 degrees, according to the season of the year. The butter is brought in a Blanchard churn in from thirty to forty-five minutes. When the particles of butter appear about the size of grains of wheat a bucket of cold water is introduced, which is run off with the butter-milk. Cold water is then poured in sufficiently to float the butter, slightly worked with the dash, and run off. This process is repeated once or twice until the water runs off clear, by which time the temperature of the butter is reduced to about 55 degrees. It is then taken out of the churn with a skimmer and placed upon the butter worker and allowed to remain until most of the water runs out of it. Up to this point the butter is in grains. It is now slightly worked so as to expel the water and mix the salt, and allowed to stand for a few hours, when it is again slightly worked and packed. Coleman's salt is used. The butter and salt are carefully weighed, eight ounces of salt being applied to ten pounds of butter.

The firkin is of white oak, and is prepared by slacking a few lumps of roach lime in it, filling it up with water. The lime-water is allowed to remain for twenty-four hours, being occasionally stirred. It is then filled with boiling brine, strong enough to float a large potato, and allowed to stand for twenty-four hours. After this is poured out the tub is rinsed with boiling brine, followed immediately with cold water when it is ready to receive the butter. It is filled to within ⅜ of an inch of the top, covered over with white cotton dipped in brine. The space between the butter and the cover is filled with salt, and the firkin securely headed so as to exclude the air. Where the package is perfect no extra brine is required. The firkin is patented by Henry Coombs, of Charlottetown. Its merit consists in the stave being thick at the bottom and thin at the top. The firkin is wider internally at the top than at the bottom, so that the butter will turn out if required. Externally the firkin is larger at the bottom than at the top, which admits of its being opened and closed with turning it up, which cannot be done without allowing the pickle to escape. Butter cannot be turned out of a firkin with a bilge without slacking all the hoops except the bottom ones. When returned to the firkin the butter oozes through the seams, making the package untidy.—*From New Brunswick Report on Agriculture.*