



A SILO GOVERNOR.

Shows at All Times the Temperature and Condition of Silage.

Mr. S. M. Colcord believes he has a device which will make perfect ensilage without heat, fermentation, foul odor, rot, mold or any waste. He declares that cows will eat 75 to 85 pounds a day of ensilage preserved by his invention and leave none. He gave the following drawings, with an interview, to a member of The Rural New Yorker staff.

Mr. Colcord says of the arrangement: "It is really a set of one inch iron pipes, with one-eighth inch holes six inches

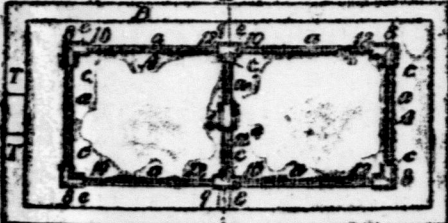


FIG. 1—SILO GOVERNOR.

apart, within three to four feet of every part of the ensilage. These pipes convey the air under the bottom of the silo to the outside. We also put another governor upon a skeleton platform through the center of the forage, with a perpendicular pipe coming up through the forage to the top. It is all shown in the cut. Fig. 1 shows the pipes at the bottom, which are joined in a frame, with an outlet or drip pipe at B. All these pipes are perforated on their underside with one-fourth inch holes.

"Fig. 2 shows the upper governor in place. It shows how both governors connect with the top part of the silo through the pipes in and out. Fig. 3 shows an enlarged section of pipe, as does Fig. 5, while Fig. 4 shows the strainer at the top of the drip pipe. The numerous other letters given in the different figures refer to the manner of joining the pipes. These governors commence to remove the air as soon as the corn enters them, and while the silo is being filled, and for two months while the forage is under pressure.

"We apply a powerful pressure by means of strong jackscrews at the top of the silo. You can see how it works. We

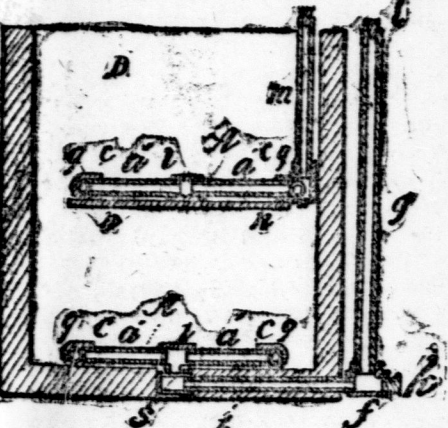


FIG. 2.

fill the silo and put on the pressure. The air and gases are forced out through the pipes, and as the silo is absolutely airtight it is as impossible for fermentation to set in as in the case of canning fruits or vegetables. Capillary attraction is set up. If there is any carbonic acid in the silo, it is absorbed under pressure, and the same with acetic acid.

"Both these acids are healthful and beneficial to cattle and tend to form a vacuum by reason of their absorption, which with the capillary attraction carries the free juice to the very top of the mass, where it is equally distributed through the governors. All the air is displaced by the juice, and we have a solid, wet mass of preserved forage that we can cut down vertically from top to bottom without the juice coming out of the face of the cut or the air getting in."

"This gives a uniform product, doesn't it?"

"Yes; we can absolutely control its fermentation, and the result is a sweet and perfect food closer in composition to the green, growing corn than canned sweet corn is to the natural ear. Everybody knows what a difference there is between corn as it is cut in the field and when taken from the silo. Another point

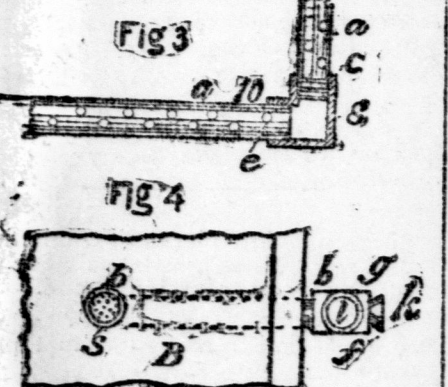


Fig 3

is that there is absolutely no waste about this ensilage. We do not have to caution about taking off but a few inches at a time for fear it will spoil. We cut right down one side without any spoiling or injury. I feed it nine months of the year—right through the summer if need be. How can it spoil when we have all the agencies that might spoil it absolutely under control?"

"Is your silo different from others?"

"The one I have is very strongly built of concrete and stone. It must be absolutely airtight and strong enough to stand a powerful pressure. The walls must be exactly vertical, so that the cover or press will fit all the way down. I have since devised a plan for making such a silo of wood, thus removing the great objection to the system—viz, that of extra cost."

The Croton aqueduct is 40 miles long, having 16 tunnels and a collecting reservoir of 3,000,000 gallons capacity.

The largest waves are seen off Cape Horn, between latitude 55 south, and longitude 105 west, rising to 45 feet in height and 700 feet long from crest to crest.

SCIENTIFIC FEEDING.

FOR PRACTICAL PROFIT IN THE DAIRY.

The First of Three Articles in Which Prof. Chas. D. Woods Will Explain This Subject So Plainly That Any Farmer Can Comprehend It.

The two chief uses of food are (1) to form the materials of the body, and to make up its wastes, and (2) to yield energy in the form of heat to keep the body warm, and in the form of muscular and other power for the work it has to do. The nutritive properties of all foods are conveniently divided into three classes known as the protein or albuminoid compounds, the carbohydrates, and the fats or ether-extract. The protein, or nitrogen containing compounds, are the principal tissue formers of the food, and especially nourish the muscles and nerves, and furnish material for the casein in milk. Protein is also finally burned in the body and thus gives rise to energy. The carbohydrates (sugar, starch, fibre) and fats (oils, etc.) are the chief fuel compounds of the food, they



PROF. CHAS. D. WOODS.

are mainly used to supply bodily warmth, maintain the circulation of the body, and provide for the other work which the body has to do. They may either be consumed at once in the body, or stored in the form of fat to be used as occasion demands.

The Value of Food as Fuel

whether for immediate consumption or to be stored in the body, may be measured in terms of potential energy and the term which is commonly used is calorie. This is a comparatively new word and one which we must come to be more and more familiar. The calorie is the amount of heat required to raise the temperature of a kilogram of water (2.2 pounds or thereabouts) one degree centigrade. It is practically the same heat that is necessary to raise a pound of water through four degrees Fahrenheit. From practical experiment, it has been found that a pound of protein

of carbohydrates yields when burned about 1,800 calories of potential energy, and that a pound of fat yields 4,230 calories. In other words, the fuel value of a pound of protein or of carbohydrates is about 4,230 calories. It will thus be seen that for purposes of fuel, a pound of fat has about 2½ times the value of the same weight of protein or of carbohydrates.

Since the principal use of foods is to supply protein to build new and repair old tissues and to sufficient total energy for performing the proper functions of the animal, the use of fuel value gives a means of simplifying our calculations. If our theories are correct, the important matter is to provide sufficient protein and sufficient fats and carbohydrates to furnish the necessary demands of the body. It appears to be much more important that there should be enough fats and carbohydrates provided to meet the demands of the animal, than that they should be supplied in any different relations. Hence if we take into consideration the weights of the protein and the fuel value, as measured in calories of any food, we have an adequate measure of its food value.

Just What is Meant by "Nutritive Ratio."

There is a very important relation between the amounts of protein and the amounts of fuel constituents of a food. This is usually expressed in what is termed the nutritive ratio. We have seen that fats have 2½ times the value of carbohydrates as fuel. This is taken into account in finding the nutritive ratio, which is obtained as follows: If the weights of digestible carbohydrates, and 2½ times the weight of the digestible fat, of a feed are added and this sum is divided by the weight of digestible protein, the quotient gives what is called the nutritive ratio. If the quantities of digestible fat and carbohydrates are large relative to the protein, the nutritive ratio will be large, and such a ration is called a wide ration. If the quantities of digestible fat and carbohydrates are relatively small the quotient is a small number, the ration is a narrow one.

When the nutritive ratio is much more than 1 to 6, it is usually spoken of as a wide ration; and if much less, it may be called a narrow ration. Nearly all of the grasses and hays have a wide nutritive ratio. The legumes, clover, peas, vetch, etc., have a narrow nutritive ratio. Of the concentrated feeds, corn products, such as meal, hominy chop, etc., have quite a high nutritive ratio and would tend to make a wide ration when fed. Gluten meal (which is corn from which more or less starch has been removed), brewer's grains, wheat bran, and especially the oil meals, have small nutritive ratios, and feeding them would tend to make narrow rations. From such a table as the following we readily see why certain combinations of food would give wide, and certain other combinations would give narrow rations:

TABLE A.—FEEDING AND MANURIAL VALUES OF STOCK FOODS.

The first column of this table shows the number of pounds of organic or dry matter in 100 lbs. of each feed; the difference between this weight and 100 being the weight of the water in each article. This dry matter contains certain quantities of the three principal elements of food, or nutrients; but considerable of each of these nutrients is indigestible, and cannot be made use of by animals. But the portion that is digestible is stated in the second, third and fourth columns. Then in the next column the fuel value is given, in calories, and the sixth column shows the nutritive ratio.

Thus, while green barley fodder will vary in composition and food value according to where it is grown, how much water it contains, etc., yet many analyses of American barley show that on the average 100 lbs. of it contains 22 lbs. of dry matter, of which 2.6 lbs. are digestible protein, 0.4 of a lb. is digestible fat, and 13.8 lbs. is digestible carbohydrates. In 100 lbs. of green barley, therefore, 16.8 lbs. out of the 22 lbs. of dry matter are digestible and available as food for cows, while the other 5.2 lbs. are indigestible and of little if any value as food. These 16.8 lbs. of digestible matter contain or will furnish 320 calories of energy, and therefore have a fuel value of 320 calories. These 16.8 lbs. of digestible nutrients contain one pound of protein to six pounds of carbohydrates and fat, and therefore have a nutritive ratio of 1 to 6, or, as it is usually expressed, 1.6.

This dry matter in green barley and in other green fodders contains certain quantities of nitrogen, potash and phosphoric acid, which constitute the manurial value of a fodder. At the price that these elements cost to buy in commercial fertilizers, the quantity of them in 1,000 lbs. (half a ton) of barley or other green fodder would cost about one dollar, so that we say their manurial value is \$1 per 1,000 lbs. or \$2 a ton.

This explanation applies to all other fodders and feeds in the table, so that it should be distinctly understood by every one.

Kinds of feeding stuffs. 100 lbs. of each have the following composition:	Total organic matter Lbs	Protein Lbs	Fat Lbs	Carbo- hydrates Lbs	Fuel value Cal	Nutritive ratio 1 to	Manurial value Per 1,000 lbs. \$
GREEN FODDERS AT CUTTING.							
Barley fodder,	29	2.6	0.4	13.8	320	6.0	
Hungarian fodder,	26	2.2	0.5	16.9	375	8.2	
Corn fodder (dent),	17	1.5	0.4	11.0	250	8.5	
Corn fodder (flint),	19	1.5	0.5	12.3	280	8.9	
Corn fodder (sweet),	13	1.0	0.2	8.0	175	8.5	
Oat fodder,	23	1.3	0.3	16.1	335	12.9	
Rye fodder,	18	1.4	0.9	11.4	275	9.6	
Wheat fodder,	24	2.1	0.6	13.7	355	8.1	
Orchard grass,	27	2.1	0.7	18.2	405	9.4	1.00
Pearl millet,	25	1.6	0.3	17.5	370	11.4	
Redtop,	33	1.7	0.5	22.2	465	13.7	
Timothy,	30	1.9	0.5	20.5	440	11.4	
Clover,	19	2.6	0.3	10.0	255	4.3	
Cowpea vines,	15	1.9	0.4	8.1	205	4.7	
Oat and pea fodder,	18	2.4	0.5	10.0	250	4.6	
Vetch and oats,	22	1.8	0.5	13.4	305	8.1	
CURED FODDERS AND HAYS.							
Blue (June) grass,	85	6.3	1.8	42.3	975	7.5	
Corn stover (stalks),	76	2.7	0.9	45.0	925	17.4	
Fowl meadow,	80	5.7	1.6	39.6	910	7.6	
Hungarian,	70	3.9	1.2	36.3	800	10.0	
Hay (mixed grasses),	81	4.3	1.6	42.2	930	10.9	
Oat hay,	84	4.3	1.5	42.7	935	11.0	2.00
Oat straw,	81	1.9	1.0	39.6	815	22.0	
Orchard grass,	82	4.7	1.8	41.8	940	9.8	
Redtop,	84	4.4	1.5	44.1	965	10.8	
Timothy,	83	3.6	1.5	45.1	970	13.5	
Timothy and redtop,	82	4.0	1.3	43.0	930	11.5	
Alfalfa,	82	8.1	0.9	38.4	905	5.0	
Clover (alsike),	81	8.3	1.5	37.0	905	4.9	
Clover (red),	89	8.1	1.0	36.4	925	5.1	5.00
Rowen hay,	79	8.4	1.5	40.7	975	5.3	
ROOTS, ETC.							
Carrots,	10	0.8	0.2	8.0	170	10.5	
Mangolds,	60	1.1	0.1	6.8	150	6.4	
Ruta-bagas,	10	0.9	0.2	7.9	170	9.3	
Turnips,	69	0.8	0.2	6.8	150	9.3	0.75
Potatoes,	20	1.2	0.1	15.6	315	13.2	
Pumpkins,	13	2.7	1.9	6.8	255	4.0	
MILLING AND BY-PRODUCTS.							
Corn meal,	84	7.0	3.5	60.8	1410	9.8	2.50
Corn and cob meal,	85	6.6	3.1	58.7	1345	9.9	3.50
Pea meal,	87	16.8	0.6	51.8	1300	3.2	6.00
Hominy chops,	86	7.4	6.8	55.3	1450	9.5	3.50
Buffalo gluten feed,	91	17.8	10.0	49.6	1675	4.0	6.00
Chicago gluten meal,	91	26.8	8.3	44.9	1670	2.4	
Wheat gluten meal,	91	31.4	13.0	35.9	1800	2.1	9.00
Oat feed,	89	13.9	6.2	56.1	1565	5.0	
Malt sprouts,	84	18.8	1.2	49.7	1215	2.5	
Brewers' grains (dried),	88	13.7	4.5	36.8	1130	3.2	5.00
Wheat bran,	83	12.0	3.0	41.8	1130	4.0	6.50
Wheat middlings,	85	12.2	8.0	45.0	1190	4.3	6.00
Cotton seed meal,	85	37.6	18.1	17.8	1580	1.3	13.00
O. P. linseed meal,	85	28.3	7.1	32.7	1485	1.7	11.00
N. F. linseed meal,	84	28.6	2.7	35.4	1305	1.5	12.00

—Prof. C. D. Wood, in American Agriculturist.



WHAT TO DO WITH OLD COWS.

An Ancient Cow Slaughtering Company Might Be Formed.

What do milk dairymen do with their old cows when no longer profitable in the dairy?

What to do with old and worn out cows in many of the dairy regions is becoming quite an important problem of late years. Before the days of Chicago beef, when each town had its quota of butchers who slaughtered for the local trade, there was no difficulty in disposing of them at fair rates, but all that is changed. In very many communities the slaughter house has become a thing of the past. There are no longer any butchers. We have in their place vendors of meat, who simply buy and cut up carcasses slaughtered in the west and sent east in refrigerator cars.

In Orange county, N. Y., there is a considerable trade in old, worn out or undesirable dairy cattle. Cattle dealers who sell dairy cattle to farmers have found it an advantage to their trade to help the farmers in the disposition of the old cows. It is safe to say that in an average dairy of 30 cows about one-sixth of them must go to the shambles every year, either from old age or from being found to be unprofitable specimens. As a rule the farmer will slaughter one or two of these for his own use and for his neighbor's, but that leaves a large number yet to be disposed of.

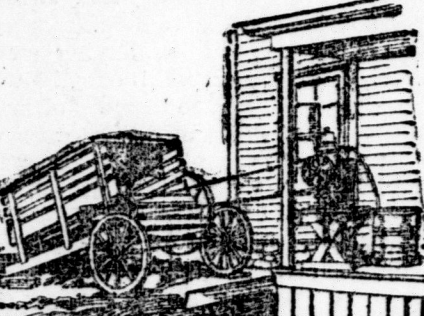
The dealers in Orange county buy of the farmers, rarely paying more than \$10 per head, and ship them to Paterson, N. J., or New York, where they are sold for cheap beef. One Paterson concern slaughters 25 per week. There is room for a good business in this line, it would seem to The Rural New Yorker. Parties with ample capital could buy up all these cattle and ship them to a central point where they could be slaughtered, and, as can be done in large plants, the offal could be more profitably utilized. It would be a convenience to dairymen, that of having a ready market for this stock, even if prices were low.

Most of the dairy cattle of Orange county—probably nine-tenths of them—are not raised there, but are brought in by cattle dealers. Formerly these dealers used to go about the country, notably in the counties of Sullivan, Delaware, Chenango, Broome and Otsego, and pick them up wherever found for sale. But of late years, owing to the extension of the milk business, this has not been practicable. Today the dealers go to Buffalo and Chicago, where they select carload lots from the cattle yards, where they are shipped in by dealers from all over the country.

The percentage of those who raise their own stock is, as we have stated, very small, but it is a notable fact that the most successful dairymen are not those who buy their stock at large. We have in mind one dairyman in Orange county who some years ago bought the farm and stock of a very successful dairyman, as dairymen went in those days. The cows had been carefully selected by a good judge and their average production was about 2,500 quarts per year. The new owner bought a thoroughbred bull, began raising heifers from his best cows and today the average production of the herd is nearly 4,000 quarts. Dairymen must learn this lesson ere they can hope to materially increase their profits.—Rural New Yorker.

A Cream Separator.

Here is a power that beats the hand cream separator all to pieces. It is a cream separating force that has the strength of a steam engine—a small one, that is. The owner of this big, roaring



JERSEY BULL CREAM SEPARATOR.

Jersey makes him work the fat off and strengthen his muscles by vigorous gymnastic exercise on the tread power that turns the wheels of the cream separator. It is good for the bull and cheap for the man. The big Jersey also cuts feed, saws wood and churns.

The Dairy Business Pays.

"We have never seen a period of depression in dairy products that carried the price below profit in production but once in 86 years," says Hoard's Dairyman. "That occurred in the early part of 1879, when cheese, for some unaccountable reason, went down to 5 and 6 cents, but took a sudden rise in the latter part of July to a good paying price, which it has steadily maintained ever since. Every kind of grain raising, meat production, wool growing and the production of hops or tobacco seem to be affected with frequent periods of depression when the price goes below the cost of production.

"This is true at the present time of wool, tobacco and wheat. Indeed both wheat and wool have been in the dumps for two or three years. The production of butter and cheese presents a cheering contrast in this particular. For years there has been a good, steady profit in the production of a first class article. Farmers who are thinking of engaging in dairymen will do well to consider this view of the matter. The dairy business is sure, steadfast and at the same time reasonably profitable. Where the treasury plan prevails, its returns are frequent, so that the farmer has ready cash."

A successful dairymen, Mrs. E. M. Jones of Ontario, Canada, has written a book called "Dairymen For Profit."

James Holroyd of Ormskirk, England, a survivor of the famous Light brigade which charged the Russian guns at Balaclava, is a tall and broad shouldered man of 72, solitary and erect.

"I FEEL LIKE A NEW PERSON."

This is the Testimony of a Prominent Toronto Merchant.

Paine's Celery Compound, a Boon to Business Men



J. C. FROST.

Legislators, judges, doctors, lawyers, bankers, merchants and all prudent and wise people now use Paine's Celery Compound when sickly, weak, run-down, nervous, sleepless, bilious or dyspeptic. The virtues of this great healer of disease are known everywhere, and many of our ablest physicians are prescribing it daily, because they know it to be a medicine of wondrous power.

Mr. John C. Frost, of the well-known firm of Francis, Frost & Co., Toronto, was speedily cured of biliousness, headache and severe neuralgia.

Mr. Frost writes as follows: "I have been subject to severe bilious attacks and headaches for the past fifteen years. During that time I have been doctoring, and have also tried patent medicines, but nothing seemed to give me relief. Last winter, after suffering with neuralgia for about two months, I started to take Paine's Celery Compound, and before the first bottle was finished my neuralgia was completely cured. I have now taken six bottles, and I am very pleased to inform you that my old complaint has entirely disappeared, and I feel like a new person."

BURDOCK BLOOD BITTERS

THREE RUNNING SORES

PHYSICIANS FAILED BUT B.B.B. CURED

DEAR SIR:—After having used Burdock Blood Bitters for Scrofula in the blood, I feel it my duty to make known the results. I was treated by a skilled physician but he failed to cure me. I had three running sores on my neck which could not be healed until I tried B.B.B., which healed them completely, leaving the skin and flesh as firm and whole as when I first began to use B.B.B., and I feel grateful to Providence that such a medicine is provided for mankind.

MRS. W. BENNETT, Acton, N. O.

A SCALY ERUPTION

UNENDURABLE ITCHING Suffered Three Years—Now Perfectly Cured by B.B.B.

CENTLEMEN—I have used Burdock Blood Bitters for Scrofula, from which I have been a sufferer for three years. I have used six bottles and am now entirely cured. I tried other remedies, but all to no good. I do not know of any other person who has been cured of this disease by B.B.B. I feel it my duty to make known the results of my cure.

CEO. TRIBE, Stratfordville, Ont.

PURIFIES THE BLOOD

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JOHN TAYLOR & CO., Manufacturers.