Mr. Stiles—Do you think the silage fed now is better than it used to be?

Mr. Rowlands—It is certain we know how to make it better than when we first started the silage proposition. The trouble was done in feeding cows where there was not a good system of ventilation and when they fed the cows the odor was kept in at milking time and it is possible that the milk was contaminated. The early silage was sour and had a more acid odor.

A Member—The best time to feed ensilage is after milking. There is always a lot of dust gathers around the windows and doors of the building before milking and that drops off on the cows and it will get into the milk and I believe the feeding time is best after milking, for both silage and hay.

Mr. Rowlands—I thoroughly agree with you that it is just as well to feed after milking, but as for dust falling on the milk, it cannot in our barn, you must not have it in the barn. The chutes are always closed and the hay is brought in as needed.

Mr. McKerrow—You have nothing in that barn to make dust.

Mr. David Imrie, who, with his brother and some other Institute workers, first began the planning of a concrete silo on a little different scale from what they found it in the central part of the state, will talk on the concrete silo, and he can talk to you from experience.

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THE CONCRETE SILO

DAVID IMRIE, Roberts, Wis.

Mr. McKerrow has asked me to be brief. It is rather hard to make a form and build a silo in about twenty minutes.

The silo which I am to describe is a single, reinforced, concrete wall six inches thick with continuous doors crossed every two feet with seven-eighths-inch steel rods, which lock into the reinforcing wire. The door frame used while building the silo is taken out, so there is nothing to rot.

I will say we have nothing to sell, the forms are free for any one to make, we do not want to discourage the building of any kind of a silo. If you cannot build a concrete silo, build some other kind. We advocate them because they are permanent, will last forever, and as silage is not an experiment, the question then is, what kind of a silo can we build and build it the cheapest.
That is all there is to it. Brick is good, stone is good, concrete blocks, anything that will be lasting, and we know of nothing that is more lasting than concrete. It is cheap, it will last forever and it keeps silage perfectly. All that is necessary is to have it air-tight, then the silage will keep; if we build a concrete silo right, it will hold water. Washed with a cement wash, it will be air-tight, so it must be a good silo.

They have been in use in our county for the last four or five years; I lost track of the number last summer. There are forty or fifty in our part of the county and Mr. Bradley says there are just as many in the northern part of the county. They built twenty-eight along the edge of St. Croix county this summer, I do not know how many there are. People are coming from Minnesota to buy silo forms up in Polk county, so perhaps there are from one hundred and fifty to two hundred of these in the counties right around.

I only know of two that cracked and those were built by a contractor and not by farmers. It was claimed he only used about forty bags of cement when he should have used forty barrels. I asked him what proportion of cement and gravel he used and he said he didn't know; I also asked him how much reinforcing was put in and he said he didn't know, but he noticed a good deal of reinforcing showed inside after it was built. So the silos cracked on account of faulty construction, they were not built right.

For the building of these silos, we must have a form. I have a silo model here. You can take the Farmers' Institute Bulletin No. 24, 1910, and on pages 136-142 you will find a description telling how to build a silo, but, as Prof. Bliss said this morning, it is a great deal easier to explain to the people while they are looking at the thing to be described, especially a farmer who is not a mechanic. There are drawings showing how to cut the pieces, how to put them together, how to raise the form, how to reinforce it, everything is there, but if you will just listen to me, I will explain it as briefly as possible.

As a rule, the farmers make the forms, or have them made. There is no one manufacturing these forms, some hire a carpenter to make them. Perhaps that is the best way, so they will be correct. If not well built, it will make a rough looking silo, it is unsightly, and we want a building that looks well, as well as one that will keep the silage.
You can make these any size you wish. A good size is fourteen or sixteen feet. You can make it larger if you like, but I would rather have it sixteen or eighteen feet. If you have a large herd, you had better make two. Do not make them too wide, then you can build them high. This silo has only a six-inch wall. The silo I will describe is sixteen feet in diameter.

To make inside form of a sixteen-foot silo, draw a circle on the barn floor fifteen feet, ten inches in diameter, spacing this off into eight equal distances. Take a two by twelve plank twelve feet long, lay this down on the line drawn, mark the circle and length required on plank (one plank will make two ribs). Using this for a pattern, saw out sixteen of these ribs to make eight sections. Place two of these ribs two feet apart from center to center, nailing strips one by two or three, three feet long, covering the outside with light galvanized iron (28-gauge). Connect the sections with two by six two feet long, also cut to the same circle (this last is important as it holds the form to a true circle), putting two bolts in each end. The form as you see has two wedges, one on each side, or every four sections, made of two by four three feet long, to tighten and loosen the form. After bolting the form together, drive down the wedges.

The way we support the inside form you see by this model; also by holes in ribs, using a two by four studding to each section running through holes in the plank ribs. These holes must be cut two and one-half by four and one-half inches. Bore a hole in studding and after raising the form put in a one-half inch bolt just under the lower rib.

The outside form is made of heavy galvanized iron (18 or 20-gauge) three feet wide. This form is made in two pieces connected with one-half-inch bolts threaded twelve inches long, to admit of loosening or tightening the form when raising. Rivet on each side of joint three strips of heavy band iron with two inches at the end near joint turned out at right angles, with holes through which to run the bolts. You now have your forms.

Dig the hole for the silo, going down where there is no danger of water, from four to eight feet below the feeding floor. Make it seventeen feet in diameter. If the soil is clay, dig under the bank, commencing up about a foot and slanting it in so that at the bottom it is under the bank eight or ten inches to give a wider footing. Use the earth for the outside form. Place the inside
form in the bottom so it is six inches from the bank on all sides. Be sure to get the form level.

Mix the concrete, one part best Portland cement, two parts clean sand and four parts gravel or crushed rock. Make this quite thin and pour in one foot all around, then lay in a No. 2 wire, letting the ends lap about two feet, then another foot of concrete, then another wire, until the forms are full. Let this stand over night to set. In the morning raise the forms by knocking out the wedges, take off the pieces that join the sections together only where the wedges are, leaving the form in two pieces, and three or four men can lift each half. To hold these in place when raised, put a two by four through each of the mortises in the form. There will be eight two by four's. These should be of different lengths, so the splices will not all come at the same place. Put a piece of plank under the bottoms of the two by four's, so they will not settle in the ground when the weight of the forms comes on them. Raise the forms two feet, eight inches, so they will be inside of the completed wall two inches. Bore a hole in each two by four and put a pin in just under the forms. Next put in the staging. Nail four pieces of eight-inch boards seven feet long to the two by four's, close under the forms, to lay a plank on for the staging.

When level with the feeding floor, commence the door opening, which is continuous from there up. The opening should be two feet, six inches wide. For the door jamb molds, nail two pieces two by four together by nailing one on the edge of the other. Place these two feet, eight inches apart, see that they are plumb and cut some pieces two feet, two inches long and toe nail between them to keep them in place. Cut notches in the outside edge of these two by four's, first one two feet above the feeding floor, and every two feet to the top of silo. Make the notches one inch wide and two and one-half inches deep for the rods that cross the door. The rods are of seven-eighths steel, extending into the wall about eight or ten inches each side of the door opening, with a hook on each side to receive the No. 2 wire. The first two rods above the feeding floor should have turn buckles on them, so they can be removed, making a door six feet high.

For the door simply use two by six or two by eight pieces cut to the right length and place a piece of tarred felt or roofing felt across the door, letting it extend a foot on each side of the opening.
When you get to the surface of the ground, put on the outside form. As the silo gets higher, make eight brackets. These brackets rest loosely on the top of the inside form and slide up when the forms are raised. They should stand out over the outside form, so a rope attached to this form can be brought over the point of the bracket and tied to the post to keep it in position until it is tightened up and the small pieces put on.

To keep the lower edge of the outside form just six inches from the inside form, cut some six-inch boards three feet long and place between the two forms two or three feet apart and as the concrete is put in, these can be drawn up and they will not be used again. Make twenty or twenty-four pieces from two by four just six inches from the shoulder to where sawed in, the shoulder to rest on the inside form, and where sawed to catch the outside form.

You can put thirty or forty per cent of small stones in the silo wall if you wish. Place them in the center of the wall, tamp down into the soft concrete, and pour more concrete on them. The concrete needs no tamping if made thin enough. Take a spade and churn along the sides of the forms, so as to drive the gravel stones back and let the thin concrete down beside the forms.

After raising the forms, to make a nice finish, where the joints are, take a trowel and point up any holes and rub down with a piece of board or a brick, using water with it.

To raise the concrete as the silo gets higher, use a mast staid to the barn and raise it with a horse, taking four or five pails at a time.

When the walls are high enough, finish off level and while the concrete is still soft, shove into the top of the wall some three-eighth by eight bolts every three or four feet, putting the head down into the concrete, leaving the thread end above the wall two and one-half inches. This is to fasten the plates on and you will have a silo that will last forever.

Now take the inside forms and lower them over the wall on the outside, also the outside forms. Before taking out the staging, give the inside at least two good coats of wash made of cement and water of about the consistency of cream.

You can put on any kind of a roof you may desire.
DISCUSSION.

Mr. McKerrow—Any questions?

Question—What is the mixture?

Mr. Imrie—It would depend a great deal on the gravel which you have. Two of sand, one of cement and six of gravel. If your gravel is two of sand to four of stone, then you can put one of cement and six of gravel.

Mr. Scott—if you have more than that proportion, what would you do?

Mr. Imrie—Put in more cement.

Question—What is the cost?

Mr. Imrie—The forms will cost twenty-five dollars. The making will cost perhaps ten dollars. The first man need not figure that cost, because there are men waiting for every form as fast as they are used. I only know of two that are left in the county. I have one and no less than four want it. I cannot state what it will cost to make the silo after you have the forms, that will depend on what it will cost to get the gravel on the ground. After it is on the ground, counting everything, it will cost somewhere between one hundred and fifty and two hundred dollars built, sixteen feet in diameter and thirty-five feet deep.

Question—How much do you build a day?

Mr. Imrie—Just one form full.

Question—What do you do to stop a cement silo from cracking?

Mr. Imrie—It has never cracked.

The Member—you have only had it four years. I am a cement contractor and I was never able to stop cement from cracking. I do not believe the man lives who has.

Question—Doesn’t the cement crack as you put it up?

Mr. Imrie—Not if they are worked right. If you will take a piece of brick and rub the joint you won’t have any trouble.

A Member—in our locality there has been one of these silos for about ten years. The owner was well satisfied with it. There is not a crack in it anywhere. There are twenty-five in that section.

Mr. McKerrow—I saw a silo in Canada of this class with a ten-inch wall that had been up twelve years and it was perfect, had no cracks.

Question—Does the silage freeze in it?
Mr. Imrie—I never saw a silo in which it didn’t freeze, but it isn’t as bad as in a stone silo, it thaws out quicker.

Question—Wouldn’t you consider that detrimental?

Mr. Imrie—No.

Question—Don’t you think the acid will eat through the cement?

Mr. Imrie—I do not know. It was washed with cement when it was built, and it is just as hard as it ever was.

Mr. McKerrow—I know of a silo in Dodge county that I think has been built twenty-eight years, a stone silo, plastered up with cement, and it has been whitewashed three or four times in that time.

Mr. Imrie—We just whitewashed ours inside, using pure cement and water.

Question—How far from the outside do you put your reinforcing wire?

Mr. Imrie—An inch or an inch and one-half, so it will be covered well.

Every time you raise the forms, grease them with axle grease, just smear it over. It only takes less than a fifty-cent pail of axle grease and it will slip off so it is perfectly smooth.

Dr. Kutchin—I would like to say that this last summer I put up a single wall concrete silo, sixteen by thirty-two, without a stick of wood in it, excepting the doors, the chute and roof being concrete, and it cost me five hundred and eighty-two dollars.

Mr. Imrie—You let it to a contractor?

Dr. Kutchin—Yes, I did.

Mr. Stiles—you spoke of the necessity of having a good, solid foundation, and if you go down to a sand foundation, why wouldn’t it do to put in old iron to keep it from settling?

Mr. Imrie—the sand is just as good a foundation as you can get if you have base enough there.

Mr. Stiles—in regard to the cost, I will say Mr. Michels built twin silos which cost him one hundred and twenty-five dollars each. His neighbor built one which cost fifty-four dollars. They had the gravel on the ground.

Mr. Imrie—These men did not count the work.

Mr. McKerrow—the twin silos cost him three hundred and sixteen dollars; one hundred and sixty-eight dollars apiece. He paid for the work, but he had the gravel right there.

Question—Didn’t he use different forms?
Mr. McKerrow—Yes, a form he hired.

A Member—They are less work than this and you can build five feet a day. They rent for twenty-five dollars for a silo.

Mr. McKerrow—We have a model silo on the State Fair grounds, built by the Chicago Construction Co. It is a little different, and they put on a concrete roof.

Question—I would like to ask about the cement block silo, compared with the cement. Can it be constructed so it will not crack?

Mr. Imrie—It costs more and must be reinforced more; the joints are weaker.

Mr. McKerrow—I think the committee on resolutions is ready to report.

The resolutions were read by the chairman of the committee on resolutions, Mr. C. I. Brigham, of Blue Mounds, and after considerable discussion, were unanimously adopted as follows:

Whereas, It is of the greatest importance to all the people of the state that our dairy and food laws be thoroughly enforced:

Resolved, That we commend the able and fearless work of our present dairy and food commissioner and urge his reappointment.

The convention of the State Board of Agriculture assembled at the city of Madison, Wisconsin, on the 9th day of February, 1911, and representing the farmers and stock raisers of the state of Wisconsin, adopts the following resolutions:

Whereas, One of the largest and most important of Wisconsin Agricultural interests is represented by its live stock and by the income therefrom which income is estimated to amount to more than one hundred million dollars annually and whereas we believe that the state of Wisconsin should, in the improving of the character and increasing the production of the domestic animals of this state move forward as it has in other lines; and

Whereas, The Wisconsin Live Stock Breeders Association is organized for the advancement and protection of the live stock interests of the state and is limited in its accomplishments only by reason of lack of sufficient funds to properly carry forward the large interest of the live stock industry in this state and is unable without larger financial support to properly protect interests of such magnitude and of such value to the state of Wisconsin; therefore,
Resolved, That we do hereby express our unqualified endorsement of the proposal to appropriate out of the state treasury an adequate sum for said association and its work and we do hereby particularly endorse and urge the legislature to pass bill No. . . . . now pending before the Wisconsin legislature relating to said matters.

Whereas, It is now a thoroughly accepted fact that bovine tuberculosis is spread from herd to herd mainly through the introduction of animals having the disease in such a form that it is not revealed by physical examination, and whereas, the tuberculin test is the most feasible and practicable way to determine whether our herds are diseased or not and is the most efficient means whereby it has been possible to carry on the campaign against bovine tuberculosis; therefore be it

Resolved, That this convention endorses the principle of the law requiring that cattle offered for sale shall successfully pass the tuberculin test, and be it further resolved that the law be so amended as to make it more practicable in its enforcement.

Prest. McKeever: This concludes the program of the Convention of the Wisconsin State Board of Agriculture. We trust that those who have been in attendance have found these two days both pleasant and profitable. We feel sure, that the farmers of Wisconsin who will read this report in their homes will receive profit and pleasure therefrom.

I wish to thank all those in attendance for their presence here, and I hope that you will be able to work into your own business many of the methods outlined in this meeting. We will now stand adjourned.

29—Ag.