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DEPARTMENT OF AGRICULTURE.
SPECIAL REPORT—No. 48.

SB 195
N45

SILOS AND ENSILAGE.

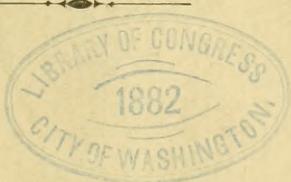
A RECORD

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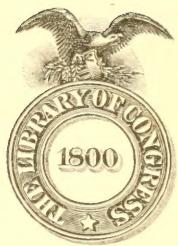
IN

SEVERAL STATES AND CANADA.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1882.





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DEPARTMENT OF AGRICULTURE.

SPECIAL REPORT—No. 48.

Silos and ensilage.

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A RECORD

OF

PRACTICAL TESTS

IN

SEVERAL STATES AND CANADA.

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by David Montgomery
Nesbit.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.

1882.

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Silos and Ensilage.

LETTER OF TRANSMISSION.

DEPARTMENT OF AGRICULTURE,

Washington, D. C., July 27, 1882.

SIR: I have the honor to submit herewith a report on Silos and Ensilage.

Copies of a schedule of questions and an accompanying letter are appended, in response to which the materials for a record of *practical tests* of silos and ensilage in several States and Canada were kindly furnished. These statements of men who have built and filled silos and fed ensilage, and a summary prepared for the convenience of readers, constitute the report.

It was found necessary, in preparing the statements for publication, to bring them into the smallest compass that would admit plain answers to the questions proposed, and on some points, where the testimony was uniform throughout, much was omitted. Theoretical discussion, while in many cases deeply interesting, has been generally left out.

The several topics treated in the statements and summary are arranged in the same numerical order as in the schedule of questions, which will serve to indicate the meaning where it is not fully apparent.

Very respectfully,

D. M. NESBIT.

Hon. GEO. B. LORING,

Commissioner of Agriculture.

SILOS AND ENSILAGE.

UNITED STATES DEPARTMENT OF AGRICULTURE,

Washington, D. C., June 10, 1882.

SIR: A growing interest among farmers and dairymen in the preservation of green fodder prompts me to ask the results of your experience and observations in the matter of silos and ensilage. I will thank you to give, in responding to the accompanying questions, as full a statement of the results of your experiments as you conveniently can, including any points of interest not embraced in the specific enquiries, which may have come within your observation or knowledge.

Will you also please give the names and addresses of any persons you may know who have experimented with ensilage?

I shall be glad to reciprocate your courtesy in any way that may be open to me, and in the event of the publication of a report upon the subject above indicated a copy will be forwarded to your address.

Very respectfully,

GEO. B. LORING,
Commissioner.

QUESTIONS RELATIVE TO SILOS AND ENSILAGE.

1. Location of silo with reference to feeding-rooms.
 2. Form of silo.
 3. Dimensions of silo.
 4. Walls of silo—materials, and construction.
 5. Cover.
 6. Weight—materials used for, amount required, and how applied.
 7. Cost of silo.
 8. Crops used for ensilage.
 9. Method of planting and cultivation.
 10. Stage of development at which fodder is most valuable for ensilage.
 11. Weight of fodder produced per acre.
 12. Kind of corn best for ensilage.
 13. Value of sweet corn as compared with field varieties.
 14. Preparation of fodder for silo—machinery used.
 15. Filling the silo.
 16. Cost of filling per ton of fodder put in.
 17. Lapse of time before opening the silo.
 18. Condition of ensilage when opened.
 19. Deterioration, if any, after opening.
 20. Value of ensilage for milch cows.
 21. Effects of ensilage on dairy products.
 22. Value of ensilage for other stock.
 23. Quantity consumed per head.
 24. Method of feeding—alone, or with other food.
 25. Condition of stock fed on ensilage, both as to gain or loss of weight, and health.
 26. Profitableness of ensilage, all things considered.
-

SILOS AND ENSILAGE—A SUMMARY.

The following is a summary showing the general drift of practice and opinion on the several points enumerated in the schedule of questions, of those who have responded to the enquiries of the department. It is intended here to give a comprehensive view of the whole subject in the combined light of the statements which appear separately in the appendix :

1.—LOCATION OF SILO.

A few have been built at a distance from the stables, but generally the silos are located with reference to convenience in feeding, in, under, or adjacent to the feeding-rooms. Local considerations will determine whether the silo should be below the surface, or above, or partly below and partly above. This is not essential. Where the stables are in the basement of a bank barn, the bottom of the silo may be on the same level, or a few feet below, and the top even with the upper floor. This arrangement combines the greatest facilities for filling, weighting, and feeding.

2.—FORM OF SILO.

With rare exceptions the silos described show a rectangular horizontal section; a few have the "corners cut off," and one is octagonal.

(The cylindrical form, of which there is no instance in the accompanying statements, seems to have obvious advantages. If under ground, a cylindrical wall is self-supporting against outside pressure, and may be much lighter than would be safe in any other form. If of wood and above ground, the walls may be stayed with iron bands. In any case, for a given capacity, the cylindrical form requires the least possible amount of wall.)

A given weight of ensilage in a deep silo requires less extraneous pressure, and exposes less surface to the air, than it would in a shallow silo. For these reasons *depth* is important. If too deep there is danger of expressing juice from the ensilage at the bottom.

Where the ensilage is cut down in a vertical section for feeding, a narrow silo has the advantage of exposing little surface to the air.

3.—CAPACITY OF SILO.

The silos reported vary in capacity from 364 to 19,200 cubic feet. If entirely full of compressed ensilage the smallest would hold 9.1 and the largest 480 tons, estimating 50 pounds to the cubic foot. Practically, the capacity of a silo is less to the extent that the ensilage settles under pressure. This should not exceed one-fourth, though in shallow silos, or those filled rapidly and with little treading, it is likely to be much more. A temporary curb is sometimes added to the silo proper, so that the latter may be full when the settling ceases.

4.—WALLS OF SILO.

For walls under ground, stone, brick, and concrete are used. The choice in any case may safely depend on the cost. In firm soils that do not become saturated with water, walls are not essential to the preservation of ensilage. Above ground, two thicknesses of inch-boards, with sheathing paper between, (the latter said, by some, to be unnecessary), seem to be sufficient, if supported against lateral pressure from the ensilage.

5.—COVER.

A layer of straw or hay will serve in some measure to exclude air, but is not necessary. Generally boards or planks are placed directly on the ensilage. The cover is sometimes made in sections 2 feet, or more wide; oftener each plank is separate. The cover is generally put on transversely, having in view the uncovering of a part of the silo while the weight remains on the rest. Rough boards, with no attempt at matching, have been used successfully. A little space should be allowed between the walls and cover, that there may be no interference as the settling progresses. (*See Remarks.*)

6.—WEIGHT.

Any heavy material may be used. The amount required depends on various conditions. It will be noticed that practices and opinions differ

widely. The object is always to make the ensilage compact, and thereby leave little room for air, on which depend fermentation and decay. In a deep silo the greater part is sufficiently compressed by a few feet of ensilage at the top, so that there is small percentage of waste, even when no weight is applied above the ensilage. Screws are used by some instead of weights. The objection to them is that they are not self-acting, like gravity.

7.—COST.

The cost of silos, per ton of capacity, varies from \$4, or \$5, for walls of heavy masonry and superstructures of elaborate finish, and 50 cents or less for the simplest wooden silos. Earth silos, without wall, can be excavated with plow and scraper, when other work is not pressing, at a trifling cost. (*See Remarks.*)

8.—CROPS FOR ENSILAGE.

Corn takes the lead of ensilage crops. Rye is grown by many in connection with corn—the same ground producing a crop of each in a season. Oats, sorghum, Hungarian grass, field peas, clover—in fact, almost every crop used for soiling has been stored in silos and taken out in good condition. There are indications that some materials have their value enhanced by the fermentation of the silo, while in others there is loss. The relative values for ensilage, of the different soiling crops, can only be determined through careful tests, often repeated, by practical men.

All thoughtful farmers would be glad to get more value from the bulky "fodder" of their corn crops than is found in any of the common methods. There are accounts of plucking the ears when the kernels were well glazed, and putting the fodder into the silo. The value of such ensilage, and the loss, if any, to the grain are not sufficiently ascertained to warrant positive statements.

9.—PLANTING AND CULTIVATION.

Thorough preparation before planting is essential. Corn, sorghum, and similar crops should be planted in rows. The quantity of seed corn varies from eight quarts to a bushel and a half for an acre. A smoothing harrow does the work of cultivating perfectly, and with little expense, while the corn is small.

10.—WHEN CROPS ARE AT THEIR BEST FOR ENSILAGE.

The common practice is to put crops into the silo when their full growth has been reached, and before ripening begins. Manifestly, one rule will not answer all purposes. The stock to be fed and the object in feeding must be considered in determining when the crop should be cut. On this point must depend much of the value of ensilage.

11.—YIELD OF ENSILAGE CROPS.

Corn produces more fodder per acre than any other crop mentioned. The average for corn is not far from 20 tons—which speaks well for land and culture. The largest yield from a single acre was 58 tons; the average of a large area on the same farm was only $12\frac{1}{2}$ tons.

12.—KIND OF CORN BEST FOR ENSILAGE.

The largest is generally preferred; hence seed grown in a warmer climate is in demand.

13.—SWEET CORN FOR ENSILAGE.

It is conceded by many that the fodder of sweet corn is worth more, pound for pound, than that of larger kinds, for soiling. Some hold that the same superiority is retained in the ensilage, while others think that the advantage after fermentation is on the other side. The sweet varieties generally do not yield large crops.

14.—PREPARING FODDER FOR THE SILO.

The mowing-machine is sometimes used for cutting corn in the field—oftener the work is done by hand. Various cutters, having carriers attached for elevated silos, are in use and are generally driven by horse, steam, or water power. Fine cutting—a half inch, or less—is in favor. It packs closer, and for this reason is likely to keep better than coarse ensilage. Fodder of any kind may be put in whole, and, if as closely compressed as cut fodder, will keep as well, if not better; but it requires much greater pressure.

15.—FILLING THE SILO.

During the process of filling, the ensilage should be kept level, and well trodden. A horse may be used very effectively for the latter. Some attach much importance to rapid filling, while others make it more a matter of convenience. With the packing equally thorough, rapid filling is probably best.

16.—COST OF FILLING THE SILO.

The cost, from field to silo, is variously reported, from 35 cents—and in a single instance 10 or 12 cents—for labor alone, to \$2 and upwards per ton; though the higher amounts include the entire cost of the crop, not the harvesting alone. There is a general expectation that experience will bring a considerable reduction in the cost of filling.

It is probable that, with a more general adoption of ensilage, the best machinery will be provided by men who will make a business of filling silos. This could hardly fail to lessen the cost and bring the benefits of the system within the reach of many who otherwise would not begin.

17.—TIME FROM FILLING TO OPENING SILO.

The ensilage should remain under pressure at least until cool, and be uncovered after that when wanted.

18.—CONDITION OF ENSILAGE WHEN OPENED.

In nearly all cases the loss by decay was very slight, and confined to the top and sides where there was more or less exposure to air.

19.—DETERIORATION AFTER OPENING.

Generally the ensilage has kept perfectly for several months, showing no deterioration while any remained in the silo, excepting where exposed for a considerable time. It is better to uncover a whole silo, or compartment of a silo, at once, and thus expose a new surface each day, than to cut down sections.

20.—VALUE OF ENSILAGE FOR MILCH COWS.

Ensilage has been fed to milch cows more generally than to any other class of stock, and no unfavorable results are reported. There can be little doubt that its greatest value will always be found in this connection. Several feeders consider it equal in value to one-third of its weight of the best hay, and some rate it higher.

21.—EFFECTS ON DAIRY PRODUCTS.

There is a marked increase in quantity and improvement in quality of milk and butter after changing from dry feed to ensilage, corresponding with the effects of a similar change to fresh pasture. A few seeming exceptions are noted, which will probably find explanation in defects easily remedied, rather than in such as are inherent.

22.—VALUE FOR OTHER STOCK.

Ensilage has been fed to all classes of farm stock, including swine and poultry, with results almost uniformly favorable. Exceptions are noted in the statements of Messrs. Coe Bros., and Hon. C. B. Henderson, where it appears that horses were injuriously affected. It should be borne in mind in this connection that ensilage is simply forage preserved in a silo, and may vary as much in quality as hay. The ensilage that is best for a milch cow may be injurious to a horse, and that on which a horse would thrive might render a poor return in the milk-pail.

23.—DAILY RATION OF ENSILAGE.

Cows giving milk are commonly fed 50 to 60 pounds, with some dry fodder and grain.

24.—METHOD OF FEEDING.

Experiments have been made in feeding ensilage exclusively, and results have varied with the quality of ensilage and the stock fed. It is

certain that ensilage of corn cut while in blossom, or earlier, is not alone sufficient for milch cows. It is best to feed hay once a day, and some grain or other rich food, unless the latter is supplied in the ensilage, as it is when corn has reached or passed the roasting-ear stage before cutting. Ensilage, as it is commonly understood, is a substitute for hay and coarse fodder generally, and does not take the place of grain.

25.—THE CONDITION OF STOCK FED ON ENSILAGE,

both as to health and gain in weight, has been uniformly favorable.

26.—PROFITABILITY OF ENSILAGE.

There is hardly a doubt expressed on this point—certainly not a dissenting opinion.

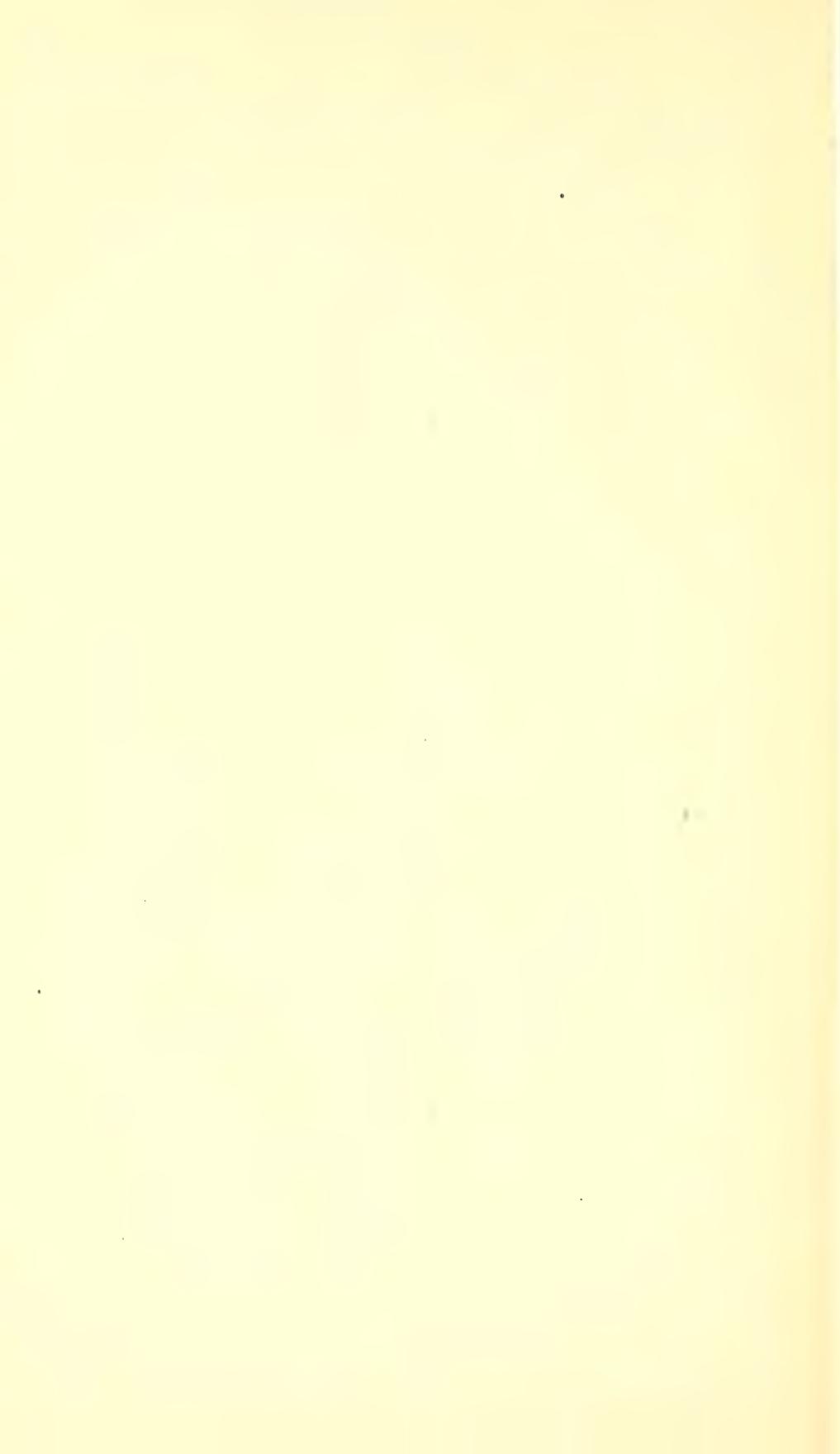
REMARKS.—The general use of ensilage must depend largely on its cheapness. Costly silos and expensive machinery must always be insurmountable obstacles to a majority of farmers. For this reason, experience tending to show what is *essential* to the preservation of fodder in silos, is of the first importance.

Especial attention is invited to the *earth silos* mentioned in the statement of Francis Morris, esq., of Oakland Manor, Md. Mr. Morris is a pioneer in ensilage in America, his first silos having been built, and filled, in 1876. These were in the basement of his barn, walls of masonry. The next year he made a trench in sloping ground so that a cart could be backed in at the lower end for conveying ensilage to the feeding-room. The sides are sloping and the average depth does not exceed six feet.

The cost is simply the cost of digging a ditch of similar dimensions. This trench was filled in 1877 and regularly since, and has kept its contents perfectly. Mr. Morris has several silos of the same kind, in different places, for convenience in filling. He uses a large cutter driven by a steam engine, and packs in the silo by treading with horses. The filling is carried several feet above the surface of the ground, and rounded up at the center, the excavated earth serving to confine the ensilage. The covering is first roofing-felt, then earth for weight.

Mr. Morris has put in whole fodder and it has kept perfectly. He cuts it fine, mainly for convenience in handling and feeding. Whole fodder should be laid across, rather than lengthwise in the trench, so that it can be taken out easily.

In order that the extent of Mr. Morris' operations may be understood, it is proper to add that his estate of Oakland Manor comprises about 1,700 acres. His wheat crop this year, 1882, was 5,000 bushels, and his corn is expected to reach the same figures. The meadows yield upwards of 200 tons of hay annually. The stock consists of 50 horses and mules, 100 cattle, 500 sheep, and 50 hogs. And as the whole is managed on business principles, Mr. Morris very justly esteems his earth silos of primary importance.



APPENDIX.

The following statements have been furnished, in response to enquiries of the Department, by men who have built and filled silos and fed ensilage. The numbers indicate topics which are arranged in the same order as in the schedule of questions:

SAMUEL ADAMS, Coldbrook Springs, Mass.:

1. Adjoining barn.
3. 36 x 16 feet; depth, 12 feet.
4. Stone wall faced with cement.
6. 900 pounds stone to the square yard.
7. About \$300.
8. Corn.
10. When the blossom begins to fall.
11. 25 tons.
12. Prefer Blount's on account of quantity.
14. Cut $\frac{3}{4}$ inch. Used steam.
16. About 75 cents.
17. Two months.
18. Color changed to brown, but in good condition where properly weighted.
20. The most economical feed we can raise; value one-third of good hay.
21. I saw no bad effects on stock or product.
23. 60 pounds per day.
24. For milch cows I should feed 50 pounds ensilage, 10 pounds hay; if shorts were not too high, would feed two quarts per day, and if the dairy product was in demand would give a little meal of some kind.
25. Oxen and young stock showed a good gain in growth and health.
26. I wintered 43 head of stock where I usually had 35. Have sold \$200 worth of hay and still have 5 tons left; but I am convinced we have something yet to learn.

E. ALLEN, New Brunswick, N. J.:

1. Adjoining and opening into.
2. Rectangular, with 6 inches of corners cut off from top to bottom.
3. Two compartments, each 13 x 19 feet, and 19 feet deep.
4. Concrete, one part Rosendale cement to four and a half of sharp, gravelly sand, wet with heavy white-wash, made by slackening quick-lime under water two days previous to using. All the field stone that can be put in are embedded in the cement in the well.
6. Field stone, 150 pounds to square foot.
7. About \$250, exclusive of roof.
8. Corn.
9. Sow with grain drill, two rows at once, three feet four inches apart. Cultivate to keep ground loose and free from weeds.
10. When the kernel is in the milk.
12. Blount's Prolific. Further trial necessary.
14. Cut $\frac{3}{8}$ inch. Cutter run by a two-horse tread-power.

15. Carried from cutter into silo with elevator, two men in silo to level and tread.
16. About 75 cents per ton, including cutting in the field and carting.
17. Six weeks.
18. Top, $\frac{1}{2}$ to 1 inch imperfect; below appeared like cooked fodder; smell of New Orleans molasses; seemed perfect.
19. Think it better than any other kind of fodder. Cows prefer it to brewer's grain.
21. It makes rich milk, more wholesome for children than grass milk.
23. 40 pounds per head per day.
24. Mix with 5 or 6 pounds of mill-feed, or 3 pounds of corn, or cotton-seed meal with 2 or 3 pounds of wheat shorts or bran.
25. Cattle take on flesh rapidly; keep in good condition as to health and flesh.
26. Believe ensilaging the best and cheapest mode of preparing or preserving corn-fodder.

JASON ALLEN, *Coldbrook Springs, Mass.:*

1. Opening into basement of barn, 4 feet above bottom of silo.
3. 28 x 12 feet, mason work 11 feet high, with 4 feet of wood on top.
5. Plank.
6. Six inches of stone.
7. \$321.51, including everything.
8. Corn.
9. Light soil; inverted sod; on one acre 15 loads of barn-yard manure, and 250 pounds of phosphate. Drilled seed half bushel per acre; rows 3 feet apart; harrowed twice with smoothing harrow, after this went through with horse-hoe once in seven or eight days until corn was 4 feet high. Two acres more had same cultivation without barn-yard manure.
10. When the latest is in full bloom, and the most forward has ears well formed.
11. On three acres 47 tons; on the one acre with barn-yard manure, 20 tons, and on the other two acres, 27 tons.
12. The largest kind of southern corn.
14. Cut three-fourths of an inch long; used a one-horse tread-power.
16. Cost of raising and storing three acres (47 tons) of ensilage corn.

Plowing three acres.....	\$9.00
Harrowing.....	3.00
Commercial fertilizers	29.60
Fifteen loads of manure, one-half charged to the corn.....	15.00
Planting.....	4.50
Seed-corn.....	5.00
Replanting	3.00
Harrowing twice.....	3.00
Hoeing by hand	6.00
Cultivating by hand	3.00
Use of land.....	8.00
Raising crop	79.50
Cutting and storing in silo.....	47.75
Whole cost.....	<u>\$127.25</u>
Cost per ton.....	<u>\$2.70</u>

17. Six weeks.
18. About 2 inches on top was moldy; below this was very natural in appearance, slightly warm and a trifle acid.
19. The warmth disappeared, and it grew a trifle more acid for about six weeks; after this I could see no change.

20. Three tons of ensilage equals one ton of best English hay.
21. Good.
22. I have had no experience, except with horned cattle and pigs. It is of small value for pigs.
23. 60 pounds of ensilage, with 6 pounds of grain for an average-sized cow per day.
24. From the 10th of November to the 10th of January, I fed 45 pounds of ensilage and 5 pounds of hay; from the 10th of January to the 10th of March, 60 pounds of ensilage and 4 pounds of middlings to dry stock, and 2 pounds more to milch cows; from the 10th of March until May 1, 60 pounds of ensilage, one foddering of oat straw, and 6 pounds of grain to cows in milk.
25. Good, both in weight and health.
26. Very profitable, all things considered.

GEORGE H. AMES, *Dracut, Mass.*:

1. Connected with barn, opposite cattle.
3. 30 x 12 feet, 14 feet deep.
4. 18 inches thick cemented wall, one-third cement, two-thirds sand.
5. Hay and plank.
6. Stone 2 feet thick on plank.
7. \$225.
8. Corn and oats.
9. Plant by hand, grains 2 to 3 inches apart, in rows; cultivate twice.
10. Just as it leaves the milk period.
11. 20 to 30 tons; 30 tons a large yield.
12. Mammoth sweet corn, and southern Dent.
13. Nearly one-half.
14. Cut one-half inch in length. Horse-power. Cut 20 tons per day.
16. 75 cents to \$1 for a farmer.
17. Six to eight weeks.
18. Fermented, and tart smell, nothing unpleasant.
19. Not any, if used daily.
20. About two-fifths the value of good English hay.
21. Are better with hay and grain than without it.
22. About one-third the value of English hay.
23. 40 to 50 pounds.
24. Hay and grain night and morning, ensilage at noon.
25. Fed alone, not as good as English hay.
26. Consider corn a profitable crop to raise for ensilage, and the best and cheapest way to cure it for winter use is to ensilage it. Cattle like it. If good corn meal, or good English hay, or ensilage, is given them at the same time, they prefer ensilage, then meal and hay. It takes the place of roots, and is raised much easier and cheaper. I think all New England farmers should have silos, filled with good ensilage, for winter use.

EDWARD ATKINSON, *Boston, Mass.*:

1. In root cellar, adjacent to feeding room.
3. Two, each 7 x 6½ x 8 feet deep, curb 4 feet above the silo.
4. Stone three sides, one side brick, and partition of brick.
5. Two thicknesses of 2-inch plank.
6. Stone in barrels, 120 pounds per foot.
7. Cost about \$130, but no criterion for others.
8. Corn and clover.
10. In flower.

14. Hand-cutter.
17. Two months.
18. Good.
19. Very little at edges of top.
20. A, No. 1.
21. Increase in quantity, better quality.
24. With some meal and rowen.
25. Excellent.
26. Saving of time, cost, and labor.

A. C. AYER, Lowell, Mass., :

1. Opposite cattle, in bay of barn.
3. 36 x 14 x 12 feet deep.
4. Twenty inches split stone, 4 inches cement.
5. Plank cover.
6. Twenty-five tons of stone.
7. \$250.
8. Corn.
10. When the corn is in blossom.
11. Thirty tons.
12. Southern Dent.
13. No comparison.
14. Horse-power with cutter, corn cut $\frac{1}{4}$ inch long.
16. 75 cents to \$1 per ton.
17. Twenty to twenty-five days.
18. Prime condition.
19. No loss.
20. One half the price of English hay.
21. Improves flavor and color.
22. One half the price of English hay.
23. 60 pounds per head, per day.
24. Good either way; for dairy results, prefer grain with ensilage.
25. Condition as good as those fed on English hay.
26. The cheapest feed for cattle. I do not believe New England farmers can compete with their neighbors who feed ensilage, with any other kind of feed, for either dairy cattle or young stock. There is no substitute for corn ensilage, for economy.

H. A. BARTOW & SONS, Pittsfield, Mass., :

1. Three silos adjoining end of barn and opening on a level with stables.
3. Each 15 x 10 feet, 16 feet deep. Capacity of each silo 60 tons of green fodder.
4. Concrete walls, made of cement, gravel, and small stones; thickness, 20 inches.
6. Stone, from 75 to 100 pounds per square foot.
7. Our three silos cost \$300, \$100 each.
8. Rye, sweet corn, and rowen.
9. We sow 2 bushels rye to the acre; after cutting the rye we plant the same ground with corn in rows.
10. Rye when just ready to bloom, corn in the milk. The sweet corn when taken out to feed was as milky as when put in.
11. The amount of fodder per acre depends upon the richness and cultivation of the soil; from 20 to 30 tons per acre in Berkshire County would be a fair estimate. Rye, 9 tons to the acre.
12. Large evergreen sweet corn.
13. We have not planted any but sweet corn for the last ten years; we keep a dairy

and are satisfied that sweet corn for that purpose is very much the best. We have always fed it with ears on the stalk when green. With the silo we have it all green and no waste.

15. The fodder should be cut and put into the silo as soon as possible after being cut in the field. Our rye was cut with a reaper for \$1 per acre, with two men to bind, one man with team, and two wagons, and three men at silo. We put in 35 tons in two days and the weights on, everything complete.

16. The rye crop, including cost of seed, cultivating, putting in silo, &c., would not exceed, at high prices for help, \$1.25 per ton.

17. About two months; longer might be better.

18. Good condition; our cows enjoy it.

19. Not any; good until used up.

20. We prized it very much; so did the cows.

21. We never had so good a flow of milk in the winter.

22. All stock like it; we fed it to young stock, horses, hogs, and poultry.

23. Twenty-five pounds is a good feed for a cow.

24. As we had a limited quantity, last year, we fed but once a day; should we have plenty of ensilage would feed twice a day, 25 pounds each time, with a little hay at noon, say 5 pounds, and as much grain as, in the judgment of the feeder, is required to put on flesh or produce a better quality of milk for butter.

25. All in a healthy condition; young stock will thrive on ensilage without any grain.

26. We have resorted to root crops for the last five years; we liked them very much, but ensilage is better; it does not cost near as much in labor and fertilizers, and gives better results.

H. R. BARKER, *Lowell, Mass.:*

1. Adjoining feeding-rooms; top on same level as floor.

3. Two silos, 22 x 11 feet, 12 feet deep, and one silo 22 x 15 feet, 12 feet deep.

4. Concrete, four parts sand, 1 part cement; walls 18 inches thick, corners rounded.

5. Hay, or straw, 1 foot thick, a covering of sheathing paper on top of hay, and 2-inch plank laid on that.

6. 25 tons to each silo, (200 pounds per square foot), either stone or grain, laid evenly over the surface. If stone, one foot thick.

7. Three silos cost \$600.

8. Corn, oats, rye, clover, and meadow-grass.

9. Corn, in drills, 3½ feet apart—three pecks to the acre.

10. Cut when in bloom.

11. Corn, 30 tons per acre; rye and oats, 6 to 8 tons.

12. Have used southern white, and Stowell's evergreen sweet.

13. Consider the sweet corn more valuable than field varieties.

14. Fodder is cut in pieces $\frac{1}{2}$ inch long. Cutter driven by a 4-horse-power engine.

15. As the silo is being filled, the fodder is well trodden.

16. \$1.90

17. Four to six weeks.

18. Green, with alcoholic odor; no loss on sides, and not more than half an inch on top.

20. Corn and oat ensilage more valuable than any other feed used, with the exception of grain, for milch cows.

21. Makes more milk and better butter than any dry feed.

22. Valuable for hogs and fowls; have not used it for horses.

23. 45 pounds per day, for cows.

24. Fed with shorts, 6 quarts per day, and from 1 to 3 quarts per day of corn meal, together with 8 pounds of hay.

25. Stock in good condition, with a gain in weight, and good health.

26. More profitable than any feed used. My experience has been most satisfactory with all the grasses except meadow, which I do not consider worth using.

FRED. BARTLETT, *Shrewsbury, Mass.*:

1. Silo 12 feet from barn.
3. 12 x 20 x 12 feet deep; 6 feet below and 6 feet above ground.
4. Concrete, 12 inches thick.
5. Hay, 3 inches thick, and planks.
6. Stones, 200 pounds to the square yard; shall put on 300 pounds the coming season.
7. \$160.
8. Stowell's evergreen sweet corn.
10. As soon as it commences to silk out, but I am not quite sure; it may be as valuable when the corn is in milk.
11. 10 tons.
12. I have planted southern corn this year.
13. There seems to be more acid in sweet corn ensilage than in ensilage of larger corn.
- 14, 15. My corn was cut by two men in the field, who laid it in little bunches so it could be handed to the teamster who was loading, while the other team was at the silo unloading. Used steam-power for cutting; two men in silo leveling and treading.
16. It cost 75 cents per ton to put my corn into the silo.
17. Three months.
18. 2 inches on top, not good, and a little around the edge.
19. The ensilage kept in good condition for about a month, and then the bottom smelt very badly, from a liquid which I took to be the juice of the corn, but found it to be water which had leaked in. I lost 4 or 5 tons in this way.
20. Very good.
21. The milk was rich as June milk.
22. Fed some ensilage to my horses, but do not think much of it for them.
23. From 30 to 60 pounds.
24. Generally, 30 pounds of ensilage, 2 quarts of cotton-seed meal, and what hay they wanted.
25. My stock look as well as ever they did; healthy and in good condition.
26. All things considered, there is profit in ensilage for the farmer.

C. B. BEALE, *Norfolk, Va.*:

1. Silo 30 yards distant from feeding room.
3. 20 x 30 feet, 12 feet deep.
4. 2-inch pine boards, tongued and grooved for sides, concrete bottom; 5 feet above ground and 7 feet below.
5. 2-inch pine boards, two thicknesses.
6. Stones.
7. Total cost of roof, silo, and drainage, about \$500.
8. Corn.
9. Rows 4 feet apart, stalks from 6 to 9 inches in the drill; gave it two harrowings and one plowing.
10. Cut my corn just as it passed the roasting-ear state.
11. Not exceeding 15 tons per acre.
12. Used common southern white flint.
14. Cut from $\frac{1}{2}$ to 4 inches long.
15. Did not fill more than two feet per day.
17. Finished filling August 20, 1881; opened November 14, 1881.
18. I put about 2 feet of millet, rather ripe, on my fodder. The millet was mouldy for 2 or 3 inches; fodder perfectly sound.

19. At first I only removed about 5 feet of the covering, and cut out the ensilage to the bottom. The edges began to decay; I then removed whole of covering and fed from the top, and experienced no further trouble.

20. I estimate that I saved about one-third of the cost of feeding, compared with the old way.

21. The flow of milk was fully equal to the best winter feeding, and the expense much less.

24. Fed always in connection with other feed, mixing with ship-stuff, corn-bran, and corn-meal, morning and night, and giving a good feed of hay at noon. This I regard absolutely necessary to obtain the greatest success, both as to quantity of milk and condition of cows.

26. I believe it to be both cheaper and more profitable than our old style of winter feeding. The best results came from feeding in connection with peanut vines that had a great many peanuts on them. I obtained more milk and of better quality than when I fed corn-meal and ship-stuff.

E. P. BENEDICT, *New York City, N. Y.:*

1. Silo 10 feet below and 2 feet above ground, adjoining cattle-shed.

3. 23 x 12 feet, 12 feet deep.

4. Walls of brick, 12 inches thick, laid in cement; bottom one layer of brick and 2 inches cement over.

5. 1½-inch pine plank in sections of four plank, battened and bolted together, battens extending out 2½ inches to make all settle evenly.

6. Weighted with 50 barrels vinegar, of which we had a large quantity convenient in same building; about 80 pounds to square foot.

7. Cost of brick, cement, lime, and labor, \$275. About \$75 of above amount was for labor in excavating and removing dirt.

8. Corn.

9. Rows 3 feet 3 inches apart, and thinned out to 8 inches in row; manured in row, and cultivated twice.

10. When ears are in silk, but not so far advanced as to have the grain formed on the cob.

11. Sixteen tons to acre, estimated.

12. Have not experimented with different varieties; am satisfied to plant same kind as last year, viz. southern white.

14. Cut in 1-inch lengths.

15. Cutter stands on wall of silo, so that fodder as cut falls directly into silo; cutter run by sweep horse-power; same that we use for cider-mill.

16. No estimate, but about same labor as in cutting up and husking of mature corn per acre.

17. Two months.

18. Somewhat faded in color, slightly vinous in smell, and acid in taste; juicy; no mould or decay.

19. The last section was fed out about 25th of April, and seemed to have improved with age.

20, 21. We fed but two milch cows; both increased materially in flow of milk when we began feeding ensilage, and continued milking well through the winter.

23. Kept no account of weight, but fed them all they wanted.

24. We fed to our young stock ensilage and dry stalks; to milch cows, ensilage and bran; and to one bull, ensilage alone.

25. Our stock never wintered better; young stock came out this spring in good flesh and remarkably smooth-coated; cows came in safely, with a better flow of milk than in former years. Our Holstein bull, "Lord Nelson," was fed from December 1 to February 10, exclusively on ensilage. He gained in weight from 1,385 to 1,445 pounds.

26. Can only answer by comparison. We consider one acre of corn-ensilage equal to 4 acres of husked corn and stalks for feeding young stock and wintering dry cows, (we are not dairymen and cannot say as to milk production). The cost of making corn-ensilage per acre would not differ materially from the cost per acre of growing and husking corn, gathering stalks, and housing the same.

REMARKS.—Although in our first year's experience with ensilage we have failed to realize the wonderful results of Goffart, Bailey, and other writers on the subject, we have also failed to find one single valid objection to the silo as an economical means of preserving fodder, or to ensilage itself as food for cattle. We intend this season to make a few minor alterations in our plans and methods. We will plant very much thicker in the rows, so as to have a greater proportion of leaf to stalk, and will not allow the corn to mature as much as we did last season. We intend to add very materially to the weight, increasing it to 150 pounds to the square foot. We will continue to use barrels for weighting the silo, as we think them by far easier to move and handle than anything else of same weight. We are now filling a lot of condemned cider barrels with sand, to put on our silo, end up, as first layer, and then roll on top of them a layer of cider or vinegar. We propose to use an additional cover made of 1-inch spruce boards, to be put on when the silo is half full, and then fill the silo on top of this. The object of this is, that when we feed out we will only expose to the air a wall of ensilage six feet in height. As the ensilage is fed out from the top section the barrels will be lowered down to second cover, thus continuing the weight.

W. B. BENSON, *Cardinal, Canada :*

1. Adjacent to and connected with feeding rooms.
3. Four silos, each 29 feet 6 inches by 16 feet 3 inches. One 34 feet by 16 feet 3 inches; depth 20 feet 5 inches.
4. Stone wall, with mortar of sand, and water lime, 12 feet 8 inches high, double boards and plank 7 feet 9 inches higher to roof.
5. Plank 16 feet long, 2 inches thick, crossed with short pieces 4 feet long, so that we can uncover 4 feet at once.
6. Loose stones of a convenient size for handling, to the depth of about 2 feet.
8. Corn and sorghum.
9. 3 feet apart, harrowed several times, and cultivated as long as a horse can walk between the rows.
11. About 15 tons.
14. Cut corn about half an inch long. Used steam power.
15. Took about three days to fill each silo, having men and boys spreading and treading it.
16. Cost too much, probably \$1 per ton. Hope to manage better this year.
18. About 8 inches of it damaged near the top, (but the sheep ate a good part of it), and about 4 inches next the boards, above the stone work, was not very good, but the rest was highly relished by the stock.
19. Cut down about 4 feet in width at a time, going from top to bottom, leaving the plank and stones on the rest. No perceptible deterioration.
20. Prefer it to anything I have yet tried.
21. Could not detect any particular taste, either in the milk or butter.
22. The steers that I fattened put on flesh rapidly, as the ensilage seemed to prevent them from getting feverish. The thoroughbred stock also liked it well, and their coats handled well.
23. The milch cows got about 50 pounds per day, the steers 40 pounds, and the thoroughbred stock from 25 to 30 pounds.
24. Fed the milch cows with oat straw part of the time once, and part of the time twice a day, giving them lots of it, and bedding them with what is left. Mixed bran and cotton-seed meal with the ensilage. The fattening cattle had a little hay, but preferred the ensilage mixed with ground oats, cotton-seed meal, and bran.

25. Most satisfactory in all respects.
 26. Am so well pleased with it that this year I have planted 51 acres of corn, and I hope to mix some clover with a part of it; as I put it into the silo.

JNO. P. BENT, *Maynard, Mass.*:

1. The silo joins the barn, with a door opening into the feeding room. About half the depth of the silo is below the floor of the feeding room.
3. 40 x 16 x 17 feet deep.
4. 9 feet of the walls are stone cemented on the inside, and the remaining 8 feet concrete and stones. One side is a bank wall, the ground being graded to the top.
5. 1½-inch plank.
6. Stones, about 1 foot in depth.
7. \$475, including the building above silo.
8. Corn.
10. When in full blossom.
11. 20 tons to the acre.
- 12, 13. I think I can raise twice as many tons of southern white as of sweet corn.
14. It was cut into pieces about $\frac{1}{8}$ of an inch long, using steam power.
16. \$1.25.
17. 60 days.
- 18, 19. It kept well.
20. I think 2 tons of ensilage equal in value to 1 ton of stock hay.
21. The milk is as good as when the cows are fed on hay.
22. Equally as good for other stock as for milch cows.
23. About 40 pounds per day.
24. They had one foddering of hay per day, with brewer's grains.
25. My stock look as well, and are in as good health as they have been for twenty years.
26. If I had not a silo now I would build one as soon as possible.

OTIS BISBEE, *Poughkeepsie, N. Y.*:

1. The top of the silo is even with a plateau, the bank descending 50 feet to the stable, and very steep. The ensilage is taken out by a hoisting apparatus over the top of the stone wall, and carried in a car on a gently descending grade into a small house, built on the roof of the stable, where the bottom falls out, and the ensilage drops to the floor over the stable.
3. Double; 7 and 8 feet wide, respectively, by 24 x 15 feet deep.
4. Stone. Outside walls dry, 30 inches thick at the bottom, and 20 at the top. Division wall 20 inches, laid in cement, and all walls plastered with cement. The walls were built by masons, in accordance with their notions of fitness, with the result of an extravagant cost. Above the silo walls is a curb of matched boards, 6 feet high for settling room—of course, a roof covers the whole.
5. Hemlock planks.
6. Stone, 14 inches thick and earth banked at ends of plank.
7. Between \$700 and \$800.
9. Plant in drills 30 inches apart; harrow when small, and afterwards keep the ground stirred with cultivator.
10. I cut when the blossom appeared on the tassel. I found in the bottom of both silos a large quantity of the juice, which I was obliged to bale out. On this account I think I shall hereafter let the crop go farther towards maturity.
11. Last year I planted in drills 4 feet apart, and got about 14 tons per acre. This year I am planting much thicker. It appears to me that the maximum crop cannot be much greater than 30 tons per acre. Several stalks of my last year's crop weighed $8\frac{1}{2}$ (eight and a quarter) pounds each, and the general growth was quite uniform.

12. I plant the southern horsetooth variety.
 14. The longer bits of stalks are the ones not eaten, if any part is left. Inference—it is best to cut the stalks into short pieces. We cut $\frac{3}{4}$ of an inch.
 15. The corn from the field is cut on the upper grade, and descends into the silo till the top is reached, when the curb is filled with the shovel. It is expedient, when nearly full, to alternate, so as to give time to settle. A covering of six inches will control the surface heat. When packing we tread it all we can, but depend more on the natural settling.
 16. Corn, \$2 per ton. Draw it $1\frac{1}{2}$ miles.
 17. Thirty-three days.
 18. Spoiled 2 inches deep from top.
 19. Exposure to air destroys the surface—slowly in cold weather, more rapidly in warm.
 20. Am now, June 30th, feeding corn ensilage to four cows, and it is the only fodder fed except grain. Cows that ate nothing but ensilage through April and May are in the finest condition.
 21. Not so good as tender grass—better than hay.
 22. For young cattle, good for growth and thrift; for fattening cattle, excellent; for some horses good, and for others not good.
 24. Corn meal and wheat bran, equal parts by weight, or something equivalent, should supplement the ensilage.
 25. My cattle and one horse have sleek coats, look healthy about the eyes, and bear the general appearance of thrift; another horse I never succeeded with.
 26. Must depend on circumstances; where the silo is near the crop, I can't see how it can fail to be profitable. Even with the disadvantage of having the crop raised at a distance, I think I realize returns for all I expend, and more. It seems to me that chemical analysis reaches only a part of the whole question. The vital forces concerned in digestion are more important. A mere boy sees the connection existing between flush, tender pasture, and full pails of milk. Tell the boy that the tender grass is little else than vapor, that such a large per cent. is water, easily procured at the brook, that such a small per cent. is ash, that the parts that go to make fat and muscle and butter, after the water is removed, are an insignificant amount, and he may stare and wonder at your learning, but you will fail to convince him that the dried grass is better for milk than the fresh grass in the pasture. Let me add that a young child fed on the milk of an ensilage-fed cow has no irregularity of the bowels, is good natured, and grows finely.
- D. BOOKSTAYER, *Syracuse, N. Y.:*
1. On level with feeding room, in rear of stable.
 3. Two, each 70 x 16 feet, (depth not stated).
 4. Stone walls, smoothed with cement.
 5. Plank, well fitted.
 6. Bowlders, 500 pounds per square foot.
 7. About \$600.
 8. Corn.
 9. Sowed in drills—ordinary cultivation.
 10. When the corn is in the silk, before the kernels glaze.
 11. About 25 tons.
 12. Mammoth sweet corn.
 13. I prefer the sweet, as it is richer food.
 14. Cut $\frac{3}{4}$ inch long.
 15. Fodder drops directly into silo—spread and tramped by men and horses.
 16. 68 cents a ton.
 18. Capital order; smelled sweet; cattle ate it ravenously.

19. No deterioration after opening.
20. Two tons of ensilage equal to a ton of good timothy hay.
21. It caused an increase of milk, from 1 to 3 quarts, after three days' feeding.
22. Equally good for horses, colts, sheep, &c.
23. About 60 pounds a day.
24. I prefer to feed dry corn, or barley meal, or linseed meal, with it; it does well without this by feeding hay once a day.
25. Perfect health, bright eyes, smooth coats, and soft skins.

26. The most profitable food ever used. I made some experiments last winter in feeding a heifer, cow, mare with foal, weanling colt, and an old trotting horse. Cut timothy and clover hay, mixed in a large box with an equal amount of ensilage, adding a little corn meal, coarse bran, and shorts, and allowing the feed for the morning to remain over night, and again preparing in the morning for night. All were wild for their feed, and never left a spoonful to waste. A colt of the same age of mine, larger, and by many considered the best of the two, was fed from the time of taking up, in the old way, with hay given whole, and oats. This spring my colt looked like a two-year-old compared with the other, and at a less cost. The cow and heifer did equally as well. The old horse came out looking like a colt—his coat was never so fine as now, and the mare with foal never did half so well before.

H. E. BROWN, *Thetford Centre, Vt.:*

1. Door opens to feeding room. Bottom of silo 4 feet below basement.
3. 13 x 18 feet, 11 feet deep.
4. Stone, pointed with cement; shall continue with wood to upper beams of barn.
5. Plank, 2 inches thick.
6. Did not weight, owing to pressure of business.
8. Corn and clover.
9. Drills 3 feet 4 inches; cultivated but little.
11. 20 to 25 tons on land not manured.
14. Cut some $\frac{1}{2}$ inch, some $\frac{3}{4}$ inch. Used one-horse power.
17. Two months.
18. Good; to my surprise only 3 or 4 inches of top damaged.
19. Very little.
20. Two tons better than one ton of good hay.
21. Especially good.
23. Being short of ensilage, only fed 30 pounds per head per day, with hay or grain.
24. Stalks or hay at noon.
25. Stock did well every way.
26. Decidedly profitable.

J. B. BROWN, *55 Beekman street, New York City.:*

The following answers are the sum of practical experience, collected from examination of many silos :

1. Preferably on sloping ground, so that the discharge door may be on level with feeding room, and so that a car may be used from silo to manger.
2. Oblong or elliptic, but not important.
3. Inmaterial, but economy in depth.
4. Concrete is better than stone, which is liable to be damp; wooden walls above ground sufficiently strong to bear pressure, not necessarily air tight, and do not need to be double, or lined; earth pits, well surface-drained, are in some soils as good as is necessary.
5. Inmaterial, so that there be continuous pressure on the whole.
6. Whatever is cheapest; cord-wood, sacks of earth or grain, barrels of earth, casks of water, or stone.

7. From 20 cents to \$1 per ton of contents. Cheap silos preserve as well as expensive ones; it is only a question of durability.

8. Maize and grass for cattle; also rye, oats, and peas for horses and sheep, even Canada thistles and salt meadow grass.

9. Corn, in double rows, space 2 or 3 feet; space between kernels in rows not yet settled.

10. Not, as the French advise, in the flowering, but to have the sweetest and greatest nutriment when the fruit is in the milk; this is a point of great importance; must be careful to anticipate any fading of the leaves.

11. 86 tons of maize have been raised on an acre; 100 tons may be raised on an acre; average of good seasons, 40 tons; average of bad seasons, 20 tons.

12. Southern seed produces much the larger crops, and the more tropical the greater the growth.

13. Sweet corn, having been cultivated for the grain, is not best for ensilage, as the stalks is not large enough.

14. Three-eighths to three-fourths inch is best length to cut, and as keenly as possible, not shredded or mashed as is best for dry stalks. Cutting-machines should not be liable to injury from stones, and the revolving apparatus should not turn towards operator; elevators or carriers may be used to convey cut stalks to silo, and uncut stalks to feed rollers of machine, if it is important to economize labor.

15. Not important to be in a hurry when filling silo, except to save cost; if trampled every morning it will not heat sufficiently to injure it, even if the process of filling consume a month, with intervals of days.

16. Thirty-six cents per ton is the lowest cost as yet by hired labor; in this case the silo was convenient to the crop, and the machinery was powerful and efficient—strong engine and large cutter, with high speed.

17. Two months at least; the longer the better.

18. Always good when the crop is good, and when it does not get wet in the silo by leakage; the silo improves the quality of the material by increasing its digestibility.

19. Does not deteriorate if the face is changed every day or two; 24 hours' exposure diminishes acidity.

20. Nothing so good as good ensilage.

21. Improves color of butter, increases quantity and richness of milk, where ensilage is good.

22. Oats, peas, and rye or maize, in moderate quantities, for horses; also fattens sheep, and is economical for hogs, steers, and bulls.

23. 25 to 75 pounds per day, or 5 per cent. of weight of animal; for horses $2\frac{1}{2}$ per cent. is sufficient.

25. Good ensilage in proper quantities and varied with dry food at times makes healthy, thrifty animals; it must not be too sour; animals will fatten on it alone that cannot be fattened with hay or dry stalks alone.

26. For cows, steers, sheep, and hogs it has been found, without exception, profitable; New England cannot do without it. It is a protection from drought in Nebraska and elsewhere; it is a safety from fire, grasshoppers, and worms, and, more than all, is valuable in Texas.

Col. LE GRAND B. CANNON, *Burlington, Vt.:*

1. On the same level.

3. 14 x 45 feet, 15 feet deep, divided by a wooden partition.

4. Stone, 10 feet; wood, 4 feet.

7. About \$450.

8. Corn.

9. Planted in drills, and cultivated three times, the land being well manured.

10. After the grain has formed on the ear.

11. By actual weight I harvested on 3 acres 23 tons to the acre; and on 10 other

acres about 12 tons to the acre. I think a fair average crop would be 15 tons to the acre.

15. The harvesting, chopping, and filling, should be done as rapidly as possible. If convenient the silo should be filled, covered, and weighted in two days.

16. Assuming \$15 per acre for manure, \$15 per acre for planting and cultivating, with a crop of 15 tons to the acre, 75 cents per ton for cutting, drawing, and packing, ensilage would cost \$2.75 per ton.

17. Six weeks.

18. Temperature on opening, about 90°. Condition apparently perfect; fermentation vinous, and apparently stopped at that point.

19. Remained perfect until all had been consumed—about 100 tons.

22. More than the equal of hay, considering the cost of each.

23. An average of 85 pounds per head for 3-year-old steers, daily, for five and a half months.

24. With three pounds of grain daily.

25. Cattle fed as stated in 23 and 24 made a greater gain and were in better health and condition than others fed on 20 pounds of chopped hay and 3 pounds of grain.

26. I consider ensilage profitable, and believe it is entirely healthy, taking the place of roots. It is easily digested, as is shown by the uniform temperature of the animals and the condition of the skin and hair.

OBSERVATIONS.—The claims made by many writers in regard to ensilage are extravagant; that it has certain advantages cannot be denied.

First. Not more than 15 to 25 tons can be depended upon per acre.

Second. It is more certain as a crop than hay.

Third. Twice as many animals can be kept on the same acreage.

Fourth. It is largely a substitute for roots.

Fifth. The labor of feeding ensilage is much less than hay.

Sixth. The space required to store ensilage is not one-quarter that required for hay.

EXPERIMENT.—I fed 90 three-year-old steers, divided in three lots; cattle and feed weighed monthly.

First lot. Fed 20 pounds hay with three pounds grain daily; run in yard with shelter.

Second lot. Kept in warm stable and stanchions; fed 17½ pounds hay, 1 peck mangolds, and 3 pounds grain.

Third lot. Fed 85 pounds ensilage with 3 pounds grain; this lot gained one-quarter pound a day more than No. 2, and one-half pound more than lot No. 1. The cost 5 per cent. in favor of ensilage.

JAMES S. CHAFFEE, *Wassaic, N. Y.:*

1. By the side of and parallel with barn, and so arranged that the ensilage comes from the silo to the floor directly over the animals to be fed—the barn being built against a side hill, and the silo placed on the upper side.

3. 50½ x 12½ feet, 16 feet deep.

4. Concrete, of hydraulic cement, gravel, and cobblestones.

5. 1½-inch spruce plank placed crosswise, and fitting loosely to sides of silo.

6. Stone, 75 pounds to square foot.

7. \$350, including roof.

8. Corn.

9. Drills, 3 feet apart.

10. When fully tasseled, and before any of the juices dry up or are gone for the formation of the ear.

11. I have produced from 16 to 30 tons of green corn per acre; should call 20 tons an average yield.

12. Blount's Prolific best; White Southern next.

14. Cut one-half inch in length; cutter driven by a five-horse steam engine.

15. Distribute the ensilage evenly in the silo, and pack as thoroughly as possible, putting in from 25 to 30 tons per day. After it is full put on a few inches of straw and place the planks.

16. 80 cents per ton.

17. Two months.

18. The ensilage loses its green color, but retains form and consistency, with no appreciable loss of moisture; has a slightly acid taste and alcoholic smell, with sometimes a very small loss at top from mould and decay.

19. None.

20. It effects a saving of grain and forage, and cows thrive better.

21. The milk is richer and much pleasanter to the taste—more like that produced from pasture than from hay and grain.

23. 50 pounds per day to each cow.

24. Sometimes alone, but usually in connection with hay and grain.

25. A decided gain in flesh, appetite better, hair sleek and glossy, and eyes bright. The excellent condition of my stock has attracted the attention and admiration of numberless ensilage visitors.

26. The profitability of ensilage lies mainly in the fact that it can be made to double the stock-carrying capacity of our Eastern farms, and that too at a very small comparative cost. Its advantages to the sale-milk dairymen are incalculable, and I see no reason why they should be less to butter and cheese producers. Dairy farmers who have used silos two years have already added 50 per cent. to their former stock.

VICTOR CHASE, Ballouville, Conn.:

1. In end of stable.
3. 10 x 14, 10 feet deep; 8 feet underground.
4. Stone.
5. Plank, matched.
6. Two cords of stone.
7. \$50.
8. Corn.
9. Planted in drills.
13. Sweet corn is best.
14. Two-horse tread-power.
16. Four men, and two boys, with horses, in one and a half days filled the silo and put the stone on.
17. Two months.
18. It was of a brown color, with a little acid taste.
19. Color changed to a green after being exposed to the air a few hours.
21. One-quarter more milk from ensilage than from hay. Good butter, well colored.
23. Two bushels each.
24. Two quarts shorts and one of cornmeal.
25. Cows came out well. Sold three for beef in the spring.
26. It will pay; I have three times as much this year.

GEORGE L. CLEMENCE, Southbridge, Mass.:

1. In basement of barn, rising 4 feet above floor of cattle stalls.
3. 40 x 15 x 17 feet deep; divided into three compartments, each 15 feet long and 12 feet wide.
4. Walls and floor concrete.
5. One-and-a-half-inch plank, fitting closely.
6. Cobblestones to a depth of 18 inches.
7. \$400.

8. Rye, corn, and clover.
 9. Corn planted in drills 3 feet apart, $3\frac{1}{2}$ pecks per acre, kernels about 4 inches apart in the drill, cultivated with smoothing harrow at intervals of four or five days, and once with a horse-hoe.
 10. When in full bloom.
 11. Rye, 10 tons; clover, 8 tons; corn, 25 tons. Owing to severe drought the corn did not attain the growth it would in a more favorable season.
 12. White Southern corn.
 13. On account of the immense size of the above-named variety, I consider it worth at least one-third more than any of our variety of sweet corn.
 14. I consider it of importance that the crop to be ensilaged should be free from dampness, as too much dew or rain will cause putrefaction. Cut into $\frac{3}{8}$ inch length; cutter driven by a one-horse sweep power. I let clover wilt one day then put into the silo without being run through the cutting machine.
 15. The labor of filling my silos is performed by four men and three horses. One man cuts the standing crop, another man with two horses loads and carts the fodder to the barn, one man feeds it to the cutter, while the fourth man is in the silo treading it down.
 16. Careful accounts of the cost of ensilaging my corn and rye make the average 40 cents per ton; clover, not being cut into short lengths, cost 25 cents per ton.
 17. Depends on the condition of my pastures and the lateness of the season.
 18. There is a change in the color, yet even this is often very slight; as to feeding qualities, I can perceive no loss.
 19. I keep all but one section of the ensilage covered; there is no perceptible loss.
 20. I have never known it to fail to increase the flow of milk over dry hay of the best quality.
 21. As a natural consequence it imparts a taste to the milk and butter analogous to that produced by the green grass of our pastures. The milk and butter have more body and are richer and better than from the best of English hay.
 22. I cannot speak in too high praise of its excellence as food for young stock, poultry, and swine.
 23. I fed 70 pounds per day to an ordinary sized cow.
 24. My practice is to feed immediately after the morning milking, 25 pounds corn ensilage and one quart cotton-seed meal; second foddering, 4 pounds of English hay; third foddering (12 m.), 20 pounds of clover or rye ensilage; fourth foddering, 4 pounds English hay; fifth foddering (directly after milking), 25 pounds corn ensilage and 1 quart cornmeal.
 25. Without exception my stock thrived on ensilage. It gives a vigor and healthy appearance not seen in hay-fed cattle.
 26. It enables us to make milk and butter in winter as well as in summer, and to keep our stock at one-half the expense of dry fodder. We can keep, on the same amount of cultivated land, a much larger stock of cattle, thus increasing our supply of manure and the fertility and value of our farms.
- A. R. CLEVELAND, *Dalton, Mass.:*
1. Attached to end of cow stable.
 3. 30 x 15 feet, 16 feet deep; one-half above ground.
 4. Concrete, of cement and gravel.
 5. Straw 6 inches deep; planks $1\frac{1}{2}$ inches thick.
 6. Weighted with large stones 2 feet deep.
 7. With the exception of my own work and team, the cost was \$308.75.
 8. Corn and Hungarian grass.
 10. When in bloom.
 11. From 20 to 35 tons per acre.

16. About \$1 per ton.
17. Two months.
18. The top was 6 inches of Hungarian grass, 2 inches of which was a little mouldy. The corn smelled sweet and good; after standing twenty-four or forty-eight hours, the odor was similar to that of new bread.
19. It was all uncovered, and being exposed to the air, it smelled and tasted rather sour at the last, but the cattle always ate it with a relish.
20. I think 3 tons of ensilage equal in value to 1 ton of the best timothy hay.
21. After feeding ensilage one week my six cows gained 12 quarts in their milk per day; did not gain any more, but held their own. The milk and butter were as good as that obtained in June on good pasture.
22. Young cattle and sheep ate it with a relish, and in preference to good hay.
23. 60 pounds per day to each cow.
24. It was fed at morning and night, 30 pounds at a feeding, with a small foddering of hay at noon. I seldom fed it alone, using wheat middlings and cornmeal, half and half, 4 quarts a day.
25. As I fed it, my stock improved in flesh and looks, being in poor condition when I commenced feeding.
25. It enables one with a little land to keep a large amount of stock. Last year I bought \$180 worth of hay; this year I have wintered five more cattle on the same land and sold \$100 worth of hay.

COE BROS., West Meriden, Conn.:

3. Our two silos are each 33 x 14 x 16 feet deep.
4. Walls 18 inches stone and mortar, lined with cement.
5. 1 foot straw, and boards.
6. 100 pounds stone per square foot.
7. \$500.
8. Have ensiloed corn, and grass corn and cow peas mixed, with equal success.
9. Corn sown with grain drill on sod, plowed immediately after mowing. Cultivated with smoothing harrow.
10. When the ear is in the milk, or earlier.
11. Largest yield (ascertained by weighing an average square rod), 16 tons per acre.
12. We have planted the large Southern White corn.
14. Cut with reaper in field, and used water-power to cut it in one-third-inch pieces.
16. Estimate, \$1 per ton.
17. One to three months.
18. Always in good order.
19. No deterioration after opening.
20. Cows have thriven exceedingly well, whether fed with it alone or with grain, in about the quantity used when feeding hay.
21. Butter and milk from cows fed upon it have the appearance and quality of the same made from grass.
22. Sheep thrive. Have fed to horses but once. Last fall we fed a mare and weanling colt from the same ensilage that we fed to other stock. The colt died after three or four days, and the mare after five or six. Symptoms were inability to swallow, chewing food and dropping it, holding mouth in water without drinking; and in the mare's case, excessive scouring. We attribute it to the ensilage, as our other horses, hay and grain fed, were perfectly healthy.
26. We estimated that our silos paid their cost the first year, though only half filled, notwithstanding loss of valuable blooded mare and colt. We have found ensilage better feed for cows than clover-hay cut before bloom and "mow browned," which was the best fodder that we had ever used before.

P. H. CONANT, *Smithland, Ky.:*

1. Silo located in a side hill—was formerly used as a cistern. During feeding season we hauled from silo to barn cellar and stable each day's feed the night before using.
3. 12 x 13 x 10 feet.
4. Stone cemented, 2 feet thick.
5. Two thicknesses of 1-inch plank, laid so as to break joints.
6. Rocks, 1½ feet deep over whole surface.
8. Corn.
9. Drilled, ordinary cultivation.
10. Half-grown fodder, and ears in or just out of the milk, mixed about half of each; cannot estimate value of either—was obliged to cut to save it on account of drought.
12. Large white Southern.
- 14 and 15. Cut in half inch pieces. Having a grist mill run by steam power we cut corn there, with ensilage cutter, and hauled to the silo.
17. 90 days.
18. First class—except about two inches around the outside and over the top.
19. None at all.
20. Good.
21. Three family cows doubled quantity of milk in two weeks; increase of cream in proportion to quantity of milk.
22. Equally good for mules and horses.
24. Mixed ten per cent. of mill offal—meal, bran, and shorts. Filled rack with good timothy hay. Stock ate ensilage in preference.
25. Condition good.
26. Paid well. We believe stock can be kept for one-half the cost of any other feed, and will fatten as much as during months of May or June on grass.

CHARLES T. CROMWELL, *Rye, N. Y.:*

1. I selected a side hill for my first silo, and have a door on the level yard where the cows are fed.
3. 9 x 15 x 15 feet deep; intended to store fodder for four or five cows.
4. Both of my silos are built under ground. Walls of stone, 18 inches thick, laid up and faced with cement. Bottom, concrete. A blind drain extends around the sides.
5. 2-inch plank.
6. 8 inches of soil, but don't use sand. Cattle and horses like a little clean soil.
7. The cost of my silos is not a fair criterion for others who seek utility only. The silo I have just finished is built in the field where my cows pasture, for the purpose of supplying them with green fodder in the months of July, August, and part of September, when the grass is dried up. This silo is 6 x 8 x 9 feet deep. This silo will cost me about \$150. The one constructed last year cost almost \$350. Both are covered by ornamental buildings, which add about half of the cost.
8. My experience leads me to believe that everything of vegetable nature that animals will eat, will make useful ensilage. For example, last year I cut up and packed away in my silo, 1st, 18 inches of green oats; 2d, 6 inches of red clover; 3d, 6 inches of Canada peas; 4th, 2 inches of brewer's grains; 5th, 2 feet of corn, sowed broadcast, more rag-weed than corn in the crop; 6th, 5 inches of common full-grown grass; 7th, a foot of sorghum; 8th, corn planted in drills. I spread over every 6 or 9 inches a light sprinkling of salt, not so much to preserve the ensilage as to make it more palatable. The cattle and horses ate all, including rag-weeds, greedily.
9. The more manure and the better the tilth, the greater the product. My preference is for drill-planting; I think it wise to sow corn in drills very thick. This gives a greater number of stalks, but not so heavy and big as thin planting.
10. Rye, oats, or corn should, I think, be put to the machine when the grains first begin to be in milk; then they are most succulent and most nutritious.

12. The Mammoth Southern corn is best.
13. Not equal to the above.
14. My view is that the finer it is cut the more closely will it pack, and it requires less mastication.
15. Tread it while filling, closely as possible, to keep out the air. The ensilage after being in a day became quite warm, so it was not pleasant to keep the hand immersed in it. The warmth is only the commencement of fermentation, is arrested as soon as covered, and does more good than harm.
17. Two months.
18. Excellent, fresh and sweet; it had changed its color from green to a brownish hue.
19. The last of it moulded slightly on the surface, from want, I think, of keeping the silo shut, but my cows ate it all; the mould didn't penetrate a half inch into the ensilage.
20. One cow increased her milk from 3 quarts to 7, and was in good condition for the shambles all winter.
23. A cubic foot each per day.
24. My custom was to cut out with a hay-knife, each day, enough ensilage to feed the cows the next day; shake it up so as to disintegrate it, and mix a quart of bran or ornmeal for each cubic foot.
25. My cows were never so healthy or in so good condition as when fed on ensilage.
26. I look upon ensilage as of the utmost importance to the whole country.

Dr. L. W. CURTIS, Southbridge, Mass. :

1. Should be so located as to open into the stable where cattle are fed.
3. 20 x 12 feet; 10, 18, and 22 feet deep.
4. Sand, gravel, and cement, if out of doors; in a barn, double-boarding with tarred paper between, will do.
6. One and a half feet deep of stone.
7. Much depends upon how accessible the materials are. As I have sand, gravel, and stone near, it enables me to build cheaply. My three silos, with capacity of 250 tons, cost \$300.
8. Corn, rye, clover, Hungarian, oats, rowen, and corn stover.
9. Sow rye in fall after taking off corn; and corn again in June after cutting the rye; cultivate corn with harrow and horse-hoe.
10. Clover when just coming into blossom; rye just after heading; corn and Hungarian when in blossom; my rowen I put in without cutting; I also pick my corn just as it is glazed, cut the stover and put into silo. It makes good fodder if careful not to let it dry.
11. 40 tons of corn to the acre, and on the same ground 5 to 10 tons of rye.
12. Large Southern kinds.
14. Cut corn and rye three-quarters of an inch long—if longer, more pressure is required; I use horse-power.
16. Fifty cents per ton will do it.
17. Four to six weeks.
18. Good; rowen cut when dew was off was very fragrant.
19. If fed slowly it may become acid on top, nothing more.
20. Three tons are worth more than a ton of hay. Cattle eat it in preference to hay, and give more milk.
21. Milk is better while feeding ensilage and cotton-seed meal than with hay and meal. The butter is like June butter.
22. All stock like it, and with a little meal, bran, or hay they do better than on the best of hay. They do not have to undergo the change from green to dry feed, and do nearly as well as at pasture.

23. 25 pounds per feed twice a day.
24. With five pounds of hay. When nearly done eating mix some bran or meal with it, and they never leave any. The hay is given at night. A change is desirable.
25. Cows always gain unless in full flow of milk. Stock always does well.
26. Silos are profitable. 40 or 50 tons of fodder per acre may be grown, which is worth more than 15 tons of hay. I can cure my clover and have it as good as when cut, and am not afraid of rain.

W. A. DODGE, *Post Mills, Vt.:*

1. Door opens into feeding room. Top even with barn floor.
3. 24 x 10 x 16 feet deep.
4. Walls of stone laid in cement 8 feet below floor of basement, and brick above.
5. Plank 3 inches thick and 8 inches wide.
6. Cobblestones, about fifteen tons. We rolled them on, and when we wanted to remove them rigged a set of "falls," and lifted them with a horse in a short time.
7. \$300.
8. Corn.
9. Planted with drills, $3\frac{1}{2}$ feet apart, cultivated the same as for any corn crop.
10. Fodder is the most valuable when it begins to ear, or the ear is in the milk.
11. From 20 to 35 tons per acre.
12. I used the dent or horse-tooth.
13. Sweet corn is better than common field varieties.
14. Used a one-horse power; cut $\frac{3}{8}$ inch.
15. Put in about 15 tons per day. Kept it well trodden.
16. 50 cents per ton to put into silo.
17. 7 weeks.
18. The straw and about 2 inches on top was damaged; the remainder in splendid condition. My stock ate it as though it was so much meal.
19. None.
20. A great advantage to milch cows.
21. No bad effect on butter.
22. Good for young stock.
23. 60 pounds to the head. Large cows take more and small ones less.
24. I fed ensilage and meal to milch cows, and ensilage to heifers and dry cows last year, without any other fodder; but I think it better to feed dry fodder once or twice a day.
25. My stock never looked better than when fed on ensilage. It lasted till the 1st of April; after that stock fell off in flesh.
26. All things considered, I am satisfied that it is the most profitable way of wintering stock in this part of the country.

WM. B. EAGER, *West Point, Nebr.:*

1. Our silos, four in number, requiring five side walls, are located about 1,600 feet from the barns, and ensilage is conveyed in wagons.
3. 40 x 12 feet, 19 feet deep each, inside measurement.
4. Upright pine timbers 12 inches wide, lined inside with 2-inch plank; outside with inch boards. Space filled with dry clay tamped solid. Floor, 2-inch plank, over 4 inches of broken brick.
5. $1\frac{1}{2}$ -inch plank.
6. Earth in boxes. We use 35 tons to each silo, or about 146 pounds to a square foot.
7. The four cost complete, \$2,400—all above ground, painted.
8. Corn.
9. We have tried two methods, viz., in drills 3 feet 10 inches apart, five to seven

grains to each foot. Our other method is similar to the first, but we run the planter back between the two rows just planted, making the drills about 23 inches apart. We do not plow the ground until we are ready to follow with the harrow, and this with the planter. As soon as planted we harrow the ground again to level track of planter, and when corn is high enough to see the rows, we again harrow. This is all the cultivation we give to what we call the "double drill," and is applicable only to land free from weeds. The "single drill" we treat precisely the same to the harrowing after corn is up, then keep the cultivator going until too large. We average three cultivations. We are still in doubt which yields most.

10. When in bloom, and before the ear is fully developed.

11. In 1881 the highest yield was 58 tons from one acre, lowest 10; average about 12 $\frac{1}{2}$. The highest and lowest are by weight, from measured ground. Our average was much above 12 $\frac{1}{2}$ tons upon all but 80 acres of poor sandy land.

12. We have used only the western dent.

14. Cut in field with reaper; loaded by 3 men upon flat hay-rack. At silo, cutter run by a 10-horse engine.

15. Requires 2 men to feed cutter, and one man and 2 lads in silo to keep it level.

16. The cost for 1881 was 92 cents per ton, including preparation of ground, seed, cultivation, cutting in field, hauling, cutting at silo, placing the weight, putting up doors, fuel, and housing engine.

17. 4 months.

18. Good, not one pound spoiled.

19. None whatever.

20. Not equal to good green pasture, but much better than any dry feed alone.

21. Increases quantity and quality of milk; improves the flavor of the butter.

23. We fed 40 pounds per day per head.

24. The midday feed was of cut dry corn-fodder, or cut millet-hay, with ground feed. Occasionally for trial we fed meal upon the ensilage, but abandoned it and fed ensilage alone, and meal upon dry food, or cattle would not eat it.

25. Our herd of over 300 milch cows was acknowledged by all the best conditioned in the county, and in better flesh than when taken from pasture.

26. We believe it the most profitable feed for winter dairying. The dry fodder last year cost us \$1.10 per ton (taking average as above to acre) in stock in the field; and it had to be hauled to barn and cut afterwards. To put up prairie-hay cost us 75 cents per ton, and it alone will not make milk, neither will it keep cattle from losing greatly through the winter. We tried feeding ensilage exclusively to one barn of 55 head; saw no ill effects, but used one feed per day of dry fodder because our supply was too small for exclusive feed to our herd.

The above answers for the West Point Butter and Cheese Association of this place, of which I am vice-president and manager.

JOHN R. FARNUM, *Waltham, Mass.:*

2. In a steep bank, at the end of barn, and a space left open nearly to the bottom for taking out the ensilage.

3. 35 x 16 x 22 feet deep.

4. Field-stone, pointed with cement, and plastered.

6. Stone, 2 $\frac{1}{2}$ feet deep.

7. Soil being blue gravel the digging was quite expensive, making whole cost about \$550.

8. Corn and rowen—principally clover.

9. The ground was heavily manured, and planted with early potatoes, 4 feet apart. After the potatoes were hoed the second time, about the 25th of June, the corn was planted between the rows with a planter which distributes fertilizer at the same time. When the corn was 1 $\frac{1}{2}$ or 2 feet high, the potatoes were dug and the corn hoed.

10. When the tassels begin to dry, and the ears are a little past the milk.

11. The land I planted last year was very dry. It produced 16 to 17 tons per acre.
12. I planted 3 varieties last year; have planted the Southern White this year.
13. Not equal to the above. I had 1½ acres sweet corn last year.
14. Cut from $\frac{3}{4}$ to $\frac{5}{6}$ inches. Used steam-power.
15. Leveled by 3 or 4 men, and trodden by a horse.
16. The whole cost of raising the corn and putting in was \$1.49 per ton.
17. 2 months.
18. The ensilage was bright, and the cattle ate it readily.
19. I could not see that there was any deterioration of the ensilage in the silo. After being taken out and laid on the barn floor it would heat, but the cattle ate it as readily as ever.
20. The best they can have, coming nearer to green fodder than anything else.
21. It produces milk of as good quality as any other food, and more of it.
22. Fully as good for dry stock, or horses and colts, as for milch cows.
23. From 55 to 75 pounds per day for cows, according to their size, and young stock in proportion.
24. I prefer to feed the stock one or two feeds of other food per day, but have had good results from feeding ensilage alone.
25. I fed 20 head yearlings and two-year-olds, nearly 3 months on ensilage and a quart of wheat bran per day for each animal. They came out in the spring better than any stock of the same age I ever wintered.
26. Ensilage can be produced ready for use for \$2 per ton, and 3 tons are equal to a ton of English hay. The hay in our market is worth, on an average, \$20 per ton, making the ensilage worth, on that basis, \$6.67 per ton—a net profit of \$4.67 per ton. Ensilage was sold in our market last year and year before for \$6 and \$8 per ton, and the purchaser considered it cheaper at those prices than anything else he could feed to his milch cows.

N. S. FISH, *Groton, Conn.*:

1. Adjoining feeding room.
3. 12 x 13 x 14 feet deep. The ensilage was 8 feet deep after pressing. I have now carried the walls up, and it is 24 feet deep for use in 1882.
4. Below frame of barn, concrete, plastered with cement. Above the frame, hemlock boards, 2 thicknesses, with paper between. The more perfectly the air is excluded the better; but by pressing you obtain that, though the sides are not entirely tight.
5. Cut straw about 6 inches thick when loose, and boards 2 thicknesses, taking care to cover joints.
6. Stone, 18 inches deep; the more weight used the better, except the cost of putting on and taking off.
8. Corn.
9. Planted in rows, 2 grains in a place, about 18 inches apart.
10. My corn was right for roasting ears. The corn (grain) was quite acid when we used it, much more so than the stalks; shall put up this year before it is so far advanced.
11. 20 tons estimated.
14. Cutter driven by 2-horse tread power.
15. We filled in 2 days. If put in fast it is done with, but will settle much more if more time is used. If space is important, I think 2 or 3 feet per day fast enough.
16. Mine cost \$1.50 per ton. The larger the silo the less cost per ton.
17. 10 weeks.
18. Very nice.
19. None, unless it was left for several days after being moved.
20. Was much pleased with it.

21. No bad effects on milk or butter; better color than on dry feed.
22. It is good food for any neat stock; have not used it for horses. Hogs will eat it well. Hens are fond of it.
23. 60 pounds per day for cows.
24. Hay or corn-fodder at noon.
25. My stock kept in fine condition while feeding, and when it was used up, about April 1, they missed it, and milk decreased. Have no tests of gain or loss, but judge from general appearances.
26. The cost of keeping animals is much reduced, compared with any former way of keeping. When you can feed well 2 cows 12 months from 1 acre, the profit is well established.

C. H. FRISBIE, *Killingly, Conn.:*

1. Silo on one side of thrashing-floor, stock on the other.
3. 47 x 12 x 12 feet high; this is divided by a wall, making one 30 feet long, and one 15 feet.
4. Stone laid in mortar.
5. 2-inch pine plank, plowed and matched, in sections of 3 feet each.
6. Barrels of stone, 150 pounds to the square foot.
7. Entire cost, including cover, \$300.
8. Sweet corn.
9. Drills 3½ feet apart, cultivated with a horse hoe.
16. When in full blossom.
11. About 30 tons.
- 12 and 13. Filled the silo only once, and that with sweet corn; do not think we shall use sweet corn again, although it worked well. Our ensilage was not as dry as some we saw of different kinds of corn.
14. 2-horse power and cutter.
15. 18 inches per day, trod well and wet as often as we saw any signs of heating [Perhaps this accounts for condition noted in 12 and 13.—Ed.]
16. About 50 cents per ton.
17. 12 weeks.
18. Very much as when put in, excepting it was more juicy and had a slight smell of alcohol.
19. None whatever.
20. Our cows never looked so well.
21. Nearly doubled.
23. Forty pounds per day.
24. 5 pounds of bran to 50 of ensilage.
25. Improved in every respect by the ensilage.
26. We have very limited experience, but are entirely satisfied with it as a paying investment.

C. W. GARRETT, *Enfield, N. C.:*

My experience with ensilage has been of a general nature. I have made no special experiments, such as to weigh fodder produced on an acre, the best kind of corn, &c. I have used pea-vines chiefly, because in my first experience I found stock preferred them to any other material I had used, and they were easily and cheaply produced. With the system of ensilage, I am feeding my stock at much less cost and trouble than ever before; they do their work and keep in much better condition than when fed on hay and fodder.

WILLIAM H. GILBERT, *Richland, N. Y.:*

1. My silos are built at end of barn and extend into side of hill. The bottom of silos are 1 foot below stable floor with doors extending from top of silo to level of stable floor.
3. Each 36 x 16 x 19 feet deep.
4. Stone, 2 feet thick, plastered with water-lime. Bottom paved with stone and plastered.
5. 2-inch plank, plowed and matched.
6. Last season I used common field-stone, estimated at 30 tons on each silo. This season I intend to use barrels filled with sand, from 150 to 200 pounds to the square foot.
7. Not far from \$800. Stone cost \$2 per cord delivered; paid 50 cents a perch for mason work; \$100 for labor on building; excavation \$30; got sand for mortar out of silo pit.
8. Corn.
9. Planted with drill, 30 inches apart, and cultivated same as field-corn.
10. When the ears are large enough for roasting.
11. I think 20 tons per acre a good average, one season with another.
15. I like the Southern corn best. It grows large and is sweet and juicy.
15. I place the cutter on wall, so that the feed falls directly into silo; cut $\frac{1}{2}$ of an inch, and from 8 to 10 tons an hour; keep 2 men in silo to level and pack.
16. 35 to 40 cents per ton for cutting, drawing, and packing.
17. 3 months.
18. Good.
19. As good in April as in December.
20. 5 tons will keep a cow as long as 2 tons of the best hay.
21. 25 per cent. more milk than from hay. The butter was No. 1; flavor nearly as good as that made from grass.
22. My horses and hogs eat ensilage greedily; did not feed enough to ascertain value.
23. 40 pounds or 2 bushels to each head per day.
24. I fed 2 pounds of bran night and morning, not with ensilage.
25. I never had stock do as well on any other feed; they gained in flesh and health. Never had cows do as well after calving.
26. I have put in 50 acres of corn for ensilage that has cost me, when ready for cultivating, \$433.10, including \$5 per acre for fertilizer and cost of seed, and 30 cents per hour for team; cost of cultivating will not exceed \$30; should I have an average crop it will not cost more than \$5 to winter a cow. I think with good management that a farm will keep 2 cows the year for every acre cultivated. I consider ensilage profitable.

D. H. GOODELL, *Antrim, N. H.:*

1. 2 silos, side by side; doors open into feeding rooms.
3. Each 40 x 12 x 19 feet deep.
4. Stone walls, cemented.
6. Cobble stones, about 1 foot deep.
7. \$1,000, for both silos.
8. Corn.
9. Planted with planter and cultivated with smoothing harrow.
10. When the ears are fully formed, just before the corn begins to glaze.
11. 30 tons per acre.
12. Southern White corn.
13. No better than any other.
14. Cut $\frac{1}{2}$ inch long.
15. Put in about 30 inches in depth per day.
16. About 90 cents, but can do it for 75 cents.

17. 6 weeks.
18. Excellent.
19. None at all.
- 20 and 21. My cows produced more than 20 per cent. more milk on ensilage than on best hay. Quality of milk as good as on any other feed.
22. For fattening oxen it proved the best feed, in connection with corn and cotton-seed meal, I ever used.
23. Cows in milk ate 60 pounds per day, with 2 to 4 quarts of meal.
24. With other food.
25. Young cattle fed chiefly on ensilage, with a small quantity of poor hay, no meal; were fit for the butcher in spring.
26. Exceedingly profitable, all things considered.

J. P. GOODALL, Peabody, Mass.:

1. My silo is located at the northwest corner of, and opens into, the barn. Half the depth is below the barn floor.
3. 40 x 15 x 18 feet deep.
4. Stone, faced with cement.
5. Planks, crosswise.
6. Stone on the planks.
7. About \$500.
8. Corn principally.
10. When the corn is beginning to grow on the ear.
11. About 30 tons to the acre, on the average.
12. The best kind of corn for ensilage is the largest.
14. A 7 to 10-horse-power engine and cutter.
15. The fodder should be well trodden, as you fill, by man or horse.
16. From 50 cents to \$1 per ton, according to the distance to haul it.
17. 2½ to 3 months.
19. None.
20. 3 tons of ensilage as good as 1 ton of good hay.
21. Good milk and good butter.
22. Good for any stock.
23. 60 pounds per day for a milch cow.
24. About 30 pounds morning and night with grain thrown on it.
25. Better than on hay. They look sleek, drink less, and are happy.

JACOB GREEN, Wappingers Falls, N. Y.:

1. 8 feet from cow-stable at end of the barn, which forms one side of silo. Is on side-hill, the top level with the roadway.
3. 30 x 20 x 20 feet deep, divided by a partition.
4. The walls are 13 feet high and 3 feet thick, of limestone laid dry and faced with cement; above this it is of matched boards. The partition is also of matched boards, double and filled with earth.
5. 1½-inch plank.
6. 1½ or 2 feet of stone.
7. \$600, exclusive of farm labor.
8. Corn.
12. Dutchess County White.
14. Cutter run by a 5-horse-power engine; cut $\frac{1}{2}$ -inch length, fast as 2 men could handle the fodder.
15. 2 boys leveled it in silo.
17. 1 month.

18. Was hot and smelled like a brewery.
19. Last was good as the first.
20. Cattle were very fond of it.
21. The milk was superior to any I ever tasted.
22. Young calves ate it readily, but also had milk until 6 weeks old; then only had ensilage with a few oats; they grew and looked well.
23. 1 bushel of ensilage twice a day for cows.
24. Small quantity of hay at noon with meal.
25. All seem to be correct.
26. So far, with 1 year's trial, ensilage is a perfect success, and equals all our expectations.

N. GRIDLEY & SON, Wassaic, N. Y.:

1. Cows are stabled in basement of barn, and door opens from the middle of back side (bank side) into the silo. Floor of silo about three feet lower than floor of stable.
3. 32 x 12 x 10 feet deep.
4. Concrete, 14 to 16 inches thick. Posts set in the ground and lined with 2-inch plank, put in as wall is built. Any kind of stone used. One part cement to 5 parts sand, mixed while dry, then wet so that it will pour from the pails in which it is carried. After the posts and planks are taken down the walls are plastered with cement, made with less sand. Bottom covered about 2 inches with gravel.
5. Plank.
6. 12 to 15 inches of stone.
7. \$200, including light frame building over it.
8. Corn.
10. Cut when "nubbins" are formed.
11. Estimated at 10 to 15 tons.
12. Any kind that produces a large growth.
15. Set the cutter over the silo, and drew the corn alongside, cut about $\frac{1}{3}$ of an inch long, and packed by pony and boys.
16. 75 cents per ton.
17. 3 months.
18. Changed color somewhat; a slight odor.
19. None.
20. They like it, and do well on it.
21. The milk is reduced at condensing factory without complaint.
22. They all eat it.
24. Both.
25. Good.
26. We are now building one that will hold more than 400 tons. Milk is the important product in this region. The "limit" formerly was the amount of hay that a farm could produce. Any farm can grow from 5 to 10 times as much green corn-fodder as it can of hay. With the silo the "limit" is not the hay but the ensilage. The value is caused by the increased product of food per acre.

L. A. GUERBER, Monsey, N. Y.:

1. We cannot speak of elaborate constructions or well-digested plans, having simply dug a cellar under a part of our barn, with stone walls on three sides, and the earth held up by boards on the fourth side. The floor is earth.
3. To be convenient, a silo should be long and narrow with an opening in the narrow side on a level with the floor. The exposed surface, while consuming the contents of a silo, should be as small as possible. The opening should be directly accessible from the stable. Silos 8 or 10 feet wide, and long and deep in proportion to the requirements, would be the most convenient and serviceable.

5. We covered ours with clean straw about 6 inches, then common hemlock boards.
 6. Stones 1 foot deep. This weight was amply sufficient for 8 feet of ensilage.
 8. Corn mainly. We have found that straw (rye, wheat, or oats) could be advantageously mixed with green corn in the proportion of $\frac{1}{2}$ of straw to $\frac{1}{2}$ of corn. The straw will absorb a part of the juice of the corn, and becomes equally palatable. There is no doubt that clover, rye, and probably bog and salt-meadow grass will prove great resources for the farmer if properly ensiled. We have experimented satisfactorily with clover and rye.
 9. In rows 3 feet apart and the stalks 6 to 8 inches from one another in the rows.
 10. As soon as tasseled.
 11. We have had fine crops of corn, planted as above stated, the yield of which has not exceeded 20 tons per acre. This weight is reduced fully one-third after 3 months in the silo. A safe estimate would be an average of 8 to 10 tons of ensilage from an acre of good, well cultivated land.
 12. Corn of rank and quick growth is the best.
 13. The giant varieties of sweet corn we esteem preferable to common corn, as growing more quickly and giving stalks more juicy and of softer texture.
 14. Our machine cuts the corn $\frac{1}{4}$ of an inch long, and crushes the stalks so every part is eaten.
 16. The cost of cutting the corn green, carting it to the silo, and preparing suitably, we have found not to exceed the cost of cutting and curing in the ordinary way.
 17. 3 to 5 months.
 18. From 1 to 3 inches at the top is all the loss we have experienced.
 21. Cows give as good milk on ensilage as they do in grass, and the butter has the same color.
 23. A cubic foot is sufficient for one cow.
 24. We have never fed it exclusively. Animals require a variety of food to keep in appetite and good health.
 26. There is great economy in the system; how much we are not prepared to state. The exaggerated accounts published are very prejudicial. With the primitive arrangements described, our success has been so fair that we cannot hesitate to recommend even the poorest of our farmers to use silos; to build them as best they can. A simple trench in the ground, well covered, will answer. Structures made for the purpose are more durable, more convenient, and may save the fodder better, but all cannot afford the expense, while all can select a dry spot, dig a trench, fill with green fodder, cover it with the earth dug out of the trench, and have juicy, palatable food for their stock in winter.
- GARD'R G. HAMMOND, *New London, Conn.:*
1. Silo located 100 feet from cow stable on account of lay of land, so that ensilage has to be brought in in cart daily; if one has a side-hill barn, silo built adjoining cow stables would be proper plan.
 3. 50 x 15 x 15 feet.
 4. Stone wall laid in mortar without regard to thickness, one-half below level of ground, other half graded up to level of sill by stone and rocks excavated.
 5. 2-inch plank.
 6. Rocks, 200 pounds to square foot.
 7. \$800, including superstructure.
 8. Corn.
 9. Planted with corn-drill, 2 rows at a time, which, with man, boy, and 1 pair horses, marks, drops, and covers 1 acre per hour.
 10. At fullest growth, when ears are forming.
 11. Whole crop averaged 15 tons per acre, 4 acres of which was swamp, very poor; on good corn-land had 21 tons per acre.
 12. The largest southern corn.

14. Large cutter run by pair of mules; not power enough; this year shall use a steam engine.
15. Ensilage leveled when put in and rolled with a heavy garden roller.
16. \$2.45 per ton.
17. 6 weeks.
18. First rate.
19. None.
20. Excellent.
21. Milk much richer, and an increase of 30 per cent. in quantity.
22. 55 pounds.
23. Fed twice a day, with 1 pint cottonseed meal and 3 quarts bran; nothing else in addition to ensilage.
24. Milch cows about held same weight; heaviest milkers lost; dry cows, heifer, and bull gained steadily; 2 latter at rate of 1 pound per day.
25. Cost of feeding on ensilage as against hay, roots, and meal, 1 to 3.

HAMPTON NORMAL SCHOOL, S. C., ARMSTRONG, Principal, Hampton, Va.:

1. In one corner of barn, door opening into feed alley.
 3. 14 x 17 x 23 feet deep.
 4. Bricks and cement.
 5. Boards and straw.
 6. Dry fodder.
 7. About \$175.
 8. Corn.
 10. At the time of tasseling.
 11. 10 tons.
 12. Southern white corn.
 14. Cut in lengths of $\frac{1}{2}$ inch.
 16. Cost, \$1 per ton.
 17. 4 months.
 18. No change in color; condition good.
 19. None.
 20. Does well as a change.
 21. Increased the flavor of milk somewhat.
 23. About 60 pounds per day.
 24. Fed with other food—about 3 quarts of wheat bran.
 25. Fed 1 month only. There was no perceptible change in the condition of the stock.
 26. Works well with other food; does well as a substitute for roots.
- The experiment was made with 30 tons ensilage only. This was used in feeding for 1 month; hence the limited opportunity for observation.

J. HARRIGAN, Foxborough, Mass.:

1. Doors open from silo to feeding room.
3. 60 x 11 x 12 feet deep.
4. Rough stone, lined with concrete.
5. Boards.
6. Rocks, to the depth of 15 inches.
7. \$75 for cement. I did the work with my men in spare hours, during stormy weather.
8. Corn.
9. I plant in rows, and cultivate with smoothing harrow and cultivator.
10. When in tassel.

12. Southern White corn.
14. I cut the fodder $\frac{3}{4}$ inch long; cutter driven by a two-horse power.
17. A month.
18. But slightly changed in color, and was perfectly preserved.
19. No change after opening.
20. 2 tons equal to 1 ton of English hay.
21. The best.
23. 60 pounds per day.
24. Mixed with cottonseed and cornmeal.
25. The condition of the stock was good. A cow that was old and poor, and gave but one quart of milk per day, was fed 60 pounds ensilage, 2 quarts cob meal, and 2 quarts cotton-seed. She gained six quarts of milk per day, and was in good condition for the butcher in three months. In all cases I find that the cows prefer ensilage to hay.
26. I think ensilage is profitable for any man having 6 head of cattle, but not for less.

Hon. C. B. HENDERSON, *Boston, Mass.*:

1. Silo sunk in gravel bed in back part of barn cellar. The top on level with feeding room in front part.
3. Length, 12 feet; breadth, 8 feet; depth, 8 feet.
4. 2-inch plank, tongued and grooved.
5. Same.
6. Barrels filled with small stone, 90 pounds per square foot.
7. Between \$50 and \$60, less value of gravel.
8. Rowen in September, 1881, and winter rye in June, 1882.
9. Rye sown broadcast early in October.
10. Rye cut just after heading.
11. Estimated weight of rye from $\frac{1}{2}$ acre, 12 tons.
14. Rye cut three-quarters of an inch in length.
15. Cutter on platform over silo, one man mowing and hauling in hand cart, one cutting, some feeding and cutting, all three spreading and trampling at intervals. Time employed in filling silo 3 days.
16. \$1.15 per ton, including mowing and hauling.
17. Silo closed and weighted June 8; opened July 17.
18. Excellent. In sugar fermentation stage; about one inch at top and sides mouldy.
19. No deterioration perceptible on July 28.
- 20, 21. 1 cow dry, coming in in August, in good healthy condition. Another milking in similar condition, giving same quantity, but richer milk than when grazing up to July 17.
23. About 50 pounds per day.
24. 4 feeds per day alone, 1 and 2 feeds respectively of meal or shorts, given separately.
25. Condition and health very good. Relative weight not tested.
26. No exact estimate made as to profitability, but advantage of feeding ensilage in winter as well as late in summer, when grass is parched and scanty, incontestable. Ensilage apparently not adapted to horses, 2 which were given about 8 pounds a day each having within a few days suffered from acute inflammation of the intestines, which could not be traced to any other cause.

JOHN WINSLOW JONES, *Portland, Me.*:

1. The best location for a silo is in the building where the cattle are fed, or connected with it.
2. As near square as possible if of wood, or round if of stone or brick.

4. I have recommended lining up the inside of a bay in an ordinary barn with one thickness of rough, straight-edged boards, nailed up and down.
5. Cover with any old boards—a layer of straw under the boards, if convenient.
6. Weight with stones or bags of sand, 3 tons to every ten square feet or more if the silo has not been filled slowly, or is less than 20 feet high.
7. To bring silos into general use they should be made in stables already built, and not cost over \$25 to \$30.
8. Corn is best. Rye is good, and can be cut and corn planted on same ground. I raise sweet corn for packing, and ensilage the fodder.
9. Drills 3 feet apart, $1\frac{1}{2}$ to 2 bushels to the acre.
10. Before it begins to dry.
11. 25 tons per acre is a good yield. Rye 5 to 8 tons.
12. The Virginia White corn is good as any.
13. There is very little if any difference where both are raised especially for fodder. You can raise a crop of sweet corn and the fodder is very nice for ensilage, but after raising a crop of other corn the fodder is of little value.
14. Machine should be set to cut $\frac{3}{8}$ of an inch. A large cutter and steam power are best. An ordinary hay cutter will do the work, but it is slow.
15. I think it best to be 3 or 4 weeks filling a silo, or even longer, if it is 20 or 25 feet high. If you are filling several, fill all a foot or so a day, and if a day intervenes it is all the same. The fodder should be kept level and trod very hard, and every morning before any new is put in it should be thoroughly trodden. If high the weight of ensilage helps to make it solid.
16. It requires 4 men to run the machine and pack from 6 to 8 tons a day.
17. From 3 weeks to 6 months or more.
18. A little on top and next to the boarding mouldy, the other is moist, has a yellowish color, a smell resembling brewery grains, and a slight acid taste.
19. None, if well packed.
20. Cattle like it, and thrive on it, better than on the best early-cut hay.
21. In some instances people have complained a little of the taste of the milk and butter; I do not think it injures either.
22. It is more valuable than the best hay, in fact when fed with this, cattle will not eat hay. I fattened 100 head last winter.
23. 3 tons will go as far as a ton of hay.
24. I fed twice a day and gave a little hay at noon. For fattening cattle cotton seed meal or cornmeal on the ensilage.
25. I never saw cattle fatten as fast on anything else.
26. I think a stock of cattle can be kept for one-fourth the expense of any other method.

N. P. JONES, *Melrose, Mass.:*

1. Silo adjoins side of barn.
3. 30 x 14 x 12 feet deep.
4. Two courses of hard-burnt brick laid in cement, bottom cemented.
5. Planks fitted across silo.
6. Stone, as many as can conveniently be placed on plank.
7. \$250; but I had everything to buy or hire; under favorable circumstances as good a silo could be built for \$125.
8. Corn fodder.
9. Planted in drills, and cultivated with horse-hoe or plow.
10. When stalk and ear are full grown, but before commencing to ripen.
11. Our best yield is estimated 30 tons per acre.
- 12, 13. Use Western or Northern yellow corn, but think a variety of sweet corn like Stowell's Evergreen better.

14, 15. Cut from $\frac{1}{2}$ to $\frac{3}{4}$ inches long, with large fodder cutter, run by horse power. Two men are employed in the field cutting, one hauling, one tending machine, one leveling, and one tramping in silo, and we cut up and pack from 30 to 35 horse-cart loads a day.

16. It costs me \$1.50 per ton.

17. Eight weeks.

18. $1\frac{1}{2}$ to 2 inches at top was mouldy and unfit to feed; underneath this it was a brownish green, with an alcoholic odor.

19. Not noticeable.

20. Cows eat with relish and apparently do as well as when fed good English hay.

21. Milk as good as when feeding English hay, giving rich cream of a nutty flavor.

22. Calves while fed ensilage wholly, grew well, and were apparently healthy.

23. One and a half bushels a day.

24. Feed hay at noon; also feed grain, three pints corn meal and three quarts shorts.

25. Do as well and are as healthy as when fed upon hay.

26. I think ensilage is profitable. In the spring of 1880, the season being dry, and the hay crop promising to be light, we plowed and planted from two to three acres, a part as late as June 22, which made upwards of forty tons of ensilage, besides what was fed green. This gave, with a moderate outlay for manure and labor, an amount of fodder in every way equal to ten tons of English hay. It is hauled from the field and packed in the silo without the labor and delay of curing, and whether the sun shines or not. It is a valuable addition to our supply of fodder; which can be relied upon when the hay crop is light.

HENRY LAPHAM, Oconomowoc, Wis.:

1. The intention is to build more barns and have them joined to the silo.

3. 2 pits $12 \times 30 \times 16$ feet deep.

4. Against the bank, stone; all others of concrete.

6. Stone, 125 pounds per square foot.

7. \$520.06.

8. Clover and corn.

9. Rows 3 feet 8 inches apart, about $\frac{1}{2}$ bushel to the acre.

12. The native, or that which grows best.

14. A large straw cutter, run by a steam engine.

18. Good, except about 3 inches on top, and an inch along each wall about 3 feet down. I think this was owing to the silo being filled before the cement was dry.

19. None, unless shaken up and left for a day or two.

21. The flow of milk was increased.

22. Excellent.

24. Mostly alone, but to milch cows gave bran and oil meal.

25. Health and condition good.

LEONARD BROS, Grafton, Mass.:

1. Top of wall on level with feeding floor.

3. Silo No. 1, $24 \times 12 \times 13$ feet deep. Silo No. 2, $24 \times 7\frac{1}{2} \times 13$ feet deep.

4. Granite, laid in cement. Walls grouted inside..

5. Plank running crosswise of silo, cut 2 inches shorter than width of silo.

6. Cobbles; about 150 pounds to the square foot is necessary and sufficient.

7. Cost of both silos \$500.

8. Corn, rye, and clover.

9. We plant corn in drills about $3\frac{1}{2}$ feet apart, and 3 to 5 kernels to the foot.

10. When the ears are well set, not before.

11. About 20 tons.

14. We cut corn $\frac{5}{8}$ of an inch in length; rye and clover $1\frac{1}{2}$ inches. Use 3-hores steam engine.
15. Keep 3 or 4 men tramping down the fodder constantly while cutting.
17. 4 weeks.
18. Slightly acid, and of a brown color.
19. Loss very slight.
20. About one-third of that of the best of hay, pound for pound.
21. The milk made from ensilage seems to be fully equal, if not superior, to that made from best hay.
22. For fattening, we think it superior to anything in the shape of coarse fodder.
23. 50 pounds for milch cows.
24. With 1 feed of poor hay and 6 to 7 pounds cotton seed and cornmeal, 3 of former to 1 of latter.
25. Better than ever before, perfectly healthy to all appearances.
26. The best food for cattle, and most economical ever produced.

LINCOLN BROS., Woodstock, Vt.:

1. Away from barn, connected by a track with car. There was no chance to join to the barn.
3. Two silos, each $30 \times 15 \times 22$ feet deep.
4. 18 feet of concrete, and 4 feet of frame work.
5. Boards, crossways.
6. One foot in depth of stone.
7. \$300 for materials, superstructure included; did the work ourselves.
8. Corn.
9. Our corn was planted in drills $3\frac{1}{2}$ feet apart, one kernel every 5 inches, but it did not come up well, and some were three or four feet apart, so there was not as large a crop as we hoped for; cultivated as long as we could.
10. Some of our corn was in the milk when cut, and some just well tasseled out. We could not see much difference in feeding; stock ate the whole readily.
11. We had about 120 tons, calling one cubic foot 40 pounds, from eight acres. The yield would have been more if it had not been so dry.
12. Think the Southern the best as we get a larger yield, and being cut, all is eaten readily.
- 14, 15. The corn was drawn to silo as fast as cut, and cut $\frac{5}{8}$ of an inch long, with a cutter run by a four-horse power steam engine, and elevated by carrier to top of silo. We did not quite fill our silo.
16. Counting interest on engine and cutter for one year, it cost us less than 85 cents per ton.
17. One month.
18. The ensilage had a light brown color when opened, with a slightly acid taste. Our cows did not take to it the first feeding, but it was all eaten up before the next feeding, and after that most of them would eat it in preference to hay, if both were fed at once; two or three would scarcely eat hay if put before them, but would wait for ensilage.
19. Ours kept about the same until fed out, the 15th of May. If any change, a little more acid smell.
20. For milch cows, we think it ahead of any feed we ever tried.
21. The cows gave nearly or quite as much milk as in summer when on grass. The effect on butter was as marked as in the yield of milk, making full as much from the same amount of milk, and being nearly as high colored as summer butter. We have regular customers for our butter; all said that it was the best butter we ever made in the winter, and nearly as good as the best of June butter.

22. Good for all horned cattle. We fed a few sheep, ensilage twice and hay once a day (no grain), and they did well; with some grain would do full as well as on hay.

23. From 75 to 90 pounds per head per day. We gave what they would eat clean.

24. We fed three quarts of cotton and linseed meal mixed, per day, per head to our milch cows. We tried the different kinds separate, but for milk the mixed feed was best. We fed our cows dry corn fodder once a day part of the winter, but they liked ensilage better. Our calves had ensilage morning and night, and hay at noon; no grain. They did as well as we ever had calves do.

25. Our stock came out looking well, some of the neighbors said as well as they ever saw. We fatted an old cow that was so thin that we expected to lose her; she dressed 650 pounds good beef; was milked all the time.

26. We think ensilage is profitable. Have put in more corn this year.

JAMES LIPPINCOTT, *Mount Holly, N. J.:*

1. Silo 200 hundred yards from cow barn.
3. $19 \times 10\frac{1}{2} \times 9$ feet deep.
4. Brick walls, eight inches, pointed with cement, cement bottom.
5. Two inch plank.
6. Sand, put on loose.
7. \$90.
8. Corn.
9. Cultivated same as field corn.
10. When fit for boiling.
- 12, 13. Sugar corn the best.
- 14, 15. Use a two-horse power, and cut in $\frac{1}{2}$ inch lengths; get it into the silo, pack firm, and cover—all as soon as possible.
17. Two months.
18. Ensilage in splendid condition.
19. Kept in good condition until all fed.
20. The best for milk of any feed that I ever used.
21. Good.
22. My colts did well on it.
23. One bushel per cow.
24. Fed twice a day, adding three quarts bran and corn meal at each feeding.
25. My stock did well; never had a cow to get out of fix while feeding ensilage.
26. I consider ensilage the cheapest, best, and most profitable feed that a dairyman can use.

S. LITTLE, *Georgetown, Mass.:*

1. Opens into the feeding-room of side-hill barn.
3. 26×30 (depth not stated), divided by wall in center.
4. The earth being very retentive, plastered on the earth with cement up to the frost line; and then laid a concrete wall for the rest. Covered the bottom with 10 inches of stones and cemented over the whole.
5. Plank.
6. Stones 15 inches thick over the entire surface.
7. \$450.
8. Corn.
9. Planted in drills 3 feet 9 inches apart, and one or two kernels 8 to 10 inches apart in row.
10. Cut when the fullest of sap, before any bottom leaves have turned yellow.
12. Blount's prolific. It is very full of leaf to the ground.
14. Cut in $\frac{3}{8}$ -inch pieces. Used horse power but steam is very much better.

16. From \$1.75 to \$2 per ton, with steam power; another year will do it for \$1.50.
17. 3 months.
18. Succulent, sweet, and nice.
19. Better when it came out than when it went in.
20. Better than the grass in our wornout pastures.
21. Much the same as turning cattle to pasture.
22. Had complete success in feeding cows not in milk on nothing but ensilage. They were fat and nice, and satisfactory to our butchers to kill.
23. Fed 50 pounds per day to cows in milk; to cows not in milk, 65 to 70 pounds.
24. Fed the same grain as when feeding hay, and hay once a day.
25. Stock fed on ensilage during the winter; came out this spring in fine condition, hair indicating perfect health. Never had stock look and appear better, if as well.
26. The profitability of ensilage depends in a great measure on the amount of green fodder raised per acre. It is the enormous crop which can be raised per acre which settles the whole question.

Prof. J. M. McBRYDE, Knoxville, Tenn.:

1. 2 silos, adjoining, on upper side of hill-side barn, the top being level with first floor and bottom level with floor of basement, with doors between.
3. 21 feet 3 inches x 10 feet 6 inches each; depth, 11 feet.
4. Brick wall 12 inches thick, each long side at middle strengthened by buttress 16 inches thick; sides and bottoms lined with cement.
5. Planks 2 inches thick, placed transversely on layer of cut straw.
6. Old bricks, stones, or anything. Too much weight is frequently applied. We used 100 pounds per square foot, (too much); floor of silo covered with expressed juices of forage.
7. The 2 silos and extension of roof of barn over them, cost \$350.
8. Corn, clover, millet, dhurra, sorghum.
9. Thinly drilled in rows 3 feet apart; 200 pounds compost drilled in with seed, thoroughly cultivated.
10. The corn beginning to silk, grain just forming. This is a practical question. If allowed to stand longer the lower leaves become fired and valueless, with consequent loss of weight.
11. Red Honduras sorghum, 11,886 pounds; gourd-seed corn, 6,327 pounds; orange sorghum, 7,916 pounds.
12. Honduras sorghum is a forage plant of great promise. I think much better than corn.
14. Cutter driven by a one-horse power. This sliced up a cart load—500 pounds—into $\frac{1}{4}$ -inch pieces in five minutes.
15. The corn fell directly into the pit and was heavily tramped.
16. 68 $\frac{1}{2}$ cents per ton; where mower could be used and horse rake it was less.
17. 3 months.
18. Sound and fresh, but slightly changed in appearance; the edges and top alone to the depth of an inch being somewhat damaged. One silo was not opened for fifteen months after it was filled, and with the exception of the outermost layers was found in very fair condition, somewhat more acid, but in other respects equal to the other silos opened the previous winter.
19. Continued sound to the last and equal in quality.
- 20, 21. All our milch cows receiving ensilage showed a notable improvement in milk. Butter made from milk of cows fed on ensilage of excellent flavor.
- 22 to 24. Three yearling steers fed exclusively on long forage; one weighing 428 pounds received a daily ration of 20 pounds of hay; gained 22 pounds in 28 days. Another, weighing 457 pounds, received 10 pounds hay and 20 pounds ensilage; gained 28 pounds. A third, weighing 442 pounds, received 40 pounds ensilage and gained

38 pounds. Two pounds ensilage gave better results than one pound hay. It is plain that animals should be fed on mixed rations of ensilage and matters rich in albuminoids.

25. In all experiments the animals were hearty; bowels open, but not too loose, and their digestion good.

26. Of decided value, especially in South where hay is scarce. Economy of space is an important consideration. An immense amount can be packed away in small space. Again, in nine seasons out of ten, it is difficult to cure fodder. The least rain moulds it and it will mould if stacked; without weeks of exposure to cure it, ensilage can be put down without regard to weather.

W. W. MERRIAM, 61 *Liberty street, New York, N. Y.*:

1. Distant 20 feet from feed alley.

4. Exterior wall 2 feet thick and 16 feet high; partition-wall $1\frac{1}{2}$ feet thick, of stone and cement, forming 2 pits, each $14 \times 15 \times 16$ feet. On this wall I built a frame, 9-foot posts, sided up with grooved and tongued boards, covered with building paper, then clapboarded. Inside of studding, lined up with $1\frac{1}{4}$ inch grooved and tongued spruce, well painted, and flush with inside of silo wall, so that the covers may run down without an impediment, making a total height of 20 feet. The floor is grouted with gravel and cement, 8 inches thick, and inside of walls plastered with cement.

5. Covers 15 feet long and 3 feet wide, made of 2-inch spruce plank, grooved and tongued; cleats of same bolted on.

6. Stone are piled on these covers to extent of 300 to 350 pounds per square foot.

7. \$1,000.

8. Corn and clover.

9. Corn drilled in rows 40 inches apart, 8 to 10 kernels to the foot, or a bushel of seed to the acre.

10. Corn should be cut when in full bloom, and just as the silk is showing. It is then full of sap from root to peak. Clover in full blossom.

12. Southern gourd-seed corn.

14. My men cut the corn with corn-hook, laying it immediately upon the platform or wagon shelfings, when it is taken directly to the silo. The sooner the stalk is run through the cutter and in the silo after leaving the hill the better. With a two-horse power I cut a ton of stalks $\frac{1}{2}$ inch long in 12 to 14 minutes easily.

15. The cut fodder is kept leveled off and tread moderately each 2 or 3 loads. There is no need of covering the ensilage each night.

17. Not less than 60 days.

18. When silo was opened the odor was much like a whisky still; 2 months later it was more like a molasses cask.

19. None; on the contrary much improved. I remove one cover at a time and take out the ensilage in a perpendicular line to the bottom of pit, then another cover, and so on.

20. Nothing so exactly suits the purpose. When cows are first fed with ensilage, they do not eat it with relish, but after a few days they eat it in preference to good hay.

21. When the ensilage was exhausted my cows fell off in milk fully one-quarter; even the addition of more grain with hay would not prevent it. The cream did not make so much butter, nor were the color and flavor equal.

22. The past winter I bought some 3-year old western steers, thin in flesh, but healthy, and fed them for 90 days. The ration per day was 44 pounds ensilage, 6 pounds corn-meal, and a bushel of cut corn-stalks. They showed marked improvement in 30 days, and continued to thrive beyond the experience of feeders in the old old way. At the end of 90 days, my ensilage being exhausted, I shipped the steers to New York, where they showed a gain of over $1\frac{1}{2}$ pounds per day, and that after a cold night's ride in open car.

23. Cattle should be fed on ensilage as upon any other food, viz, all they will eat clean. A ton a month of ensilage is a full ration for an animal, and few will eat as much if properly housed, regularly fed, and well cared for.

24. I prefer a midday ration of dry feed, and feed cows in milk, and fatting oxen, more or less grain.

25. Every animal I have fed on ensilage has improved in condition and enjoyed the most perfect health. Jersey calves eat ensilage with great relish at four weeks of age, and I show as much improvement in a calf dropped in October as I could possibly if raised on the best pasture.

26. There is no fodder for winter use like ensilage, and I am thinking of adopting it for summer as well.

FRANCIS MORRIS, *Oakland Mills, Md.* :

1. Feed must be carted, therefore ensilage it where it is grown.
3. 11 feet wide at top, 7 feet at bottom, deep as convenient, any length required.
4. Earth.
5. Earth.
6. Earth, 20 inches depth.
7. \$10 to \$25.
8. Corn.
9. Drills, 20 inches apart; work twice.
10. Cut it in tassel.
11. 10 to 20 tons.
12. White corn.
14. Cut it with mowing machine, haul it on wagons to cutter, which delivers it in the silo.
16. 10 to 12 cents per ton, for the labor alone.
17. 60 days.
18. It should be taken out of silo, thrown into a heap, and kept a day before used.
19. No loss whatever.
20. Half the value of timothy hay.

21. Ensilage with Indian meal makes the best butter that has been made. Ensilage is free from the noxious weeds that frequently poison milk.

22. Good for all animals.

23. Cows will eat 10 per cent. of their weight.

24. Meal and oil-eake may be fed with it.

25. All animals improve on it.

26. Timothy hay is worth here \$20 per ton. Corn-fodder is worth half as much. This makes a crop of corn-fodder of 20 tons per acre worth \$200 for feeding stock.

I am clearly of opinion that silos should be put in the field where the corn is grown. My fodder was analyzed by the New Jersey Agricultural Experiment Station, and took rank as No. 2 out of nine samples. This shows that the earth silo is equally as good as the wood, brick, or stone silo, and is made at a trifling expense.

The turnip doubled the grain crop of England. Ensilage will change the agriculture of all maize producing countries, and increase their products probably in a much greater ratio.

There appears to be an inclination to argue side issues. The New Jersey Agricultural Experiment Station has made an elaborate trial to prove that there is as much feed in dried fodder as in ensilaged fodder. I have no doubt of the facts, but I have forty acres in corn fodder, and I expect to ensilage it, and shall do so (without hiring extra hands) at the rate of 100 tons a day. If I had to cure the same I should require an additional population on the farm, and then where to put it after it was cured would be hard to say.

Capt. G. MORTON, *Essex, Vt.:*

My first silo was simply a trench in the ground, covered with a few boards and weighted with 2 feet of earth and stone; fodder put in without being cut came out perfectly preserved. The next year I built a stone silo 60 x 12 x 8 $\frac{1}{2}$, and last year a wooden silo 15 $\frac{1}{2}$ x 19 x 20.

5. Boards.

6. One foot depth of stone, or 100 pounds per square foot. (See 19.) The more the better.

7. Stone silo cost \$100. Wooden silo, \$30.

8. Corn.

9. Drill with planter 2 bushels to the acre, cultivate with a smoothing-harrow until a foot high, then use horse-hoe.

10. As soon as in tassel.

11. Average 20 tons.

12. Southern white and Blount's prolific are the kinds I have used.

14. One horse-power.

15. With three men and two horses put into silo 10 tons per day; cut $\frac{3}{4}$ inch.

16. 40 cents per ton.

17. One month.

18. Warm and slightly acid, but cows liked it and increased in milk.

19. As I used it I moved the stone until I had 2 feet, or a weight of 300 pounds per square foot, and the ensilage improved in quality all the time; better on 1st of May than in October.

20 to 25. The past winter I fed nothing but ensilage for 4 months to all stock; when cows began to come in, 1st of February, fed 4 quarts of meal and bran, reducing the quantity of ensilage from 60 pounds to 40 and 30, until 1st of May, when it was gone. I then increased grain-feed to 7 quarts, but cows fell off in milk as soon as I commenced to feed hay. I wintered 37 head of horned cattle, a large horse, 6 hogs, and 50 fowls; cows were fat all winter.

J. G. MOTT, *Lansingburg, N. Y.:*

1. At one end of and opening into a barn floor, from the opposite side of which start the feeding alleys for 48 head of cattle.

3. 15 x 20 feet; mean height, 17 $\frac{1}{2}$ feet.

4. Walls at the bottom are of brick laid in cement 1 foot thick, 3 feet high; on this wall is a plank laid in cement for a sill; the remainder of the wall is of studding and 2-inch plank, with two thicknesses of tarred paper; and over the paper, boards. The floor is of brick, laid in and covered with cement.

5. 1 $\frac{1}{4}$ inch boards, 15 feet long, laid down edge to edge.

6. Barrels of sand, should be 300 pounds to the square foot.

7. About \$150.

8. Corn.

9. Drills 3 feet apart, 12 kernels to the foot.

10. When corn is in tassel, ears just forming.

11. 14 tons.

12. Southern horse-tooth.

15. Pack closely in silo; ought to fill at least 4 feet each day.

16. \$1.

17. 70 days.

18. Sweet and juicy, of a light-green color.

19. Not any.

20. Next to good pasture.

23. 50 pounds per day.

24. Ensilage twice a day, hay once; for fattening, two quarts of meal with the ensilage.

25. Cattle, fed meal with it, sold readily for beef, which equaled any grass beef; was sweet and juicy.

26. One acre of ensilage will keep 8 head of cattle 100 days. I will build three more silos this year.

JAMES NEILSON, New Brunswick, N. J.:

2. A long, narrow, deep, pit is preferable; then, if a hay-knife be used to cut down smoothly at the end, there is but little loose fodder exposed to the air, and consequently a minimum of waste.

3. 40 x 14 x 19 feet, half under ground.

4. Concrete walls 1 foot thick.

5. Loose boards.

6. 400 pounds stones per square yard.

7. \$1,320, including, a deep underdrain, which cost, perhaps, \$150.

8. Corn.

9. Sowed with wheat-drill; rows $3\frac{1}{2}$ feet apart.

11. $6\frac{1}{2}$ tons per acre in dry season.

12. Large Dent. Charging every expense, including \$3.50 for manure, ensilage cost \$8 per ton.

21. Milk exceedingly rich in cream and of remarkably pleasant flavor.

24. 50 pounds ensilage, 30 pounds brewers' grains, and 2 pounds cotton seed meal for a 1,000-pound cow.

25. Cattle gained in weight and appearance.

NOTE.—I have just contracted for a new silo 40 x 20 feet, x 18 feet deep, to cost \$500; to be built of chestnut posts set in the ground 3 feet apart, with double lining of hemlock boards, with tarred paper between. All above ground.

Capt. JOHN PHILLIPS, Hudson, Mass.:

1. Connected with cattle barn.

3. 25 x 15 x 18 feet.

4. 4 feet thick; stone wall laid up dry at bottom; 3 feet thick at 12 feet high; the last 3 feet rubble and cement, 18 inches thick; lined from 2 to 4 inches thick with cement, bottom and sides.

5. 2-inch spruce plank 12 inches wide; close fitting.

6. Stones; at least 100 pounds to the square foot.

7. \$350.

8. Corn, Hungarian grass, and Rowen.

9. Drills 3 feet apart, cultivated with smoothing-harrow and horse-hoe. I prepare my ground very thoroughly.

10. When the corn is in the milk.

11. 20 tons. The height of corn would average about 12 feet, some as high as 14 feet.

12. Southern white.

14. I used a 4-horse-power steam engine, and cut my ensilage $\frac{3}{4}$ inch.

15. I employed 2 men cutting in field, 2 2-horse teams to haul from field, 1 man to help load, 2 men at cutter, an engineer, and 2 men in silo to pack.

16. Owing to inexperience it cost me 75 cents per ton for filling silo, and I estimate 62 $\frac{1}{2}$ cents per ton for raising the corn. Shall do better this year.

17. Eight weeks.

18. Very satisfactory; the cattle took to it at once.

19. I could perceive no deterioration.

20. My experience leads me to set a high value upon ensilage for milch cows.

21. It not only improves the quality of milk and butter, but increases the quantity 15 per cent.

22. Valuable for young stock and fattening cattle. All improved greatly in condition and appearance. I found it excellent for horses, and my hogs ate it with a good relish. The poultry were fed with it every day with good effect.

23. 60 pounds to an average size animal, in some cases more, and with young stock less, per day.

24. Two rations of ensilage with a small portion of shorts, and either cotton-seed or Indian meal, and a feed of loose hay at night. Sometimes the hay was omitted and cut roots fed in its place. The ensilage was the stand-by.

25. In no case was there a loss either in weight or health, but rather a decided gain in all the stock.

26. I found it profitable. It saved me from 35 to 40 per cent. in cost of wintering my cattle.

GEORGE A. PIERCE, Stanstead, Canada:

1. Should if possible be in the end of barn. All the better if a bank barn. The bottom of silo should be on level with feeding floor.

2. Oblong, and height greater than width.

3. Last season my silo was 32 x 14 feet, and 12 feet high; have added 10 feet to the height and built another the same size. The whole capacity is now 1,000 tons.

4. Stone and brick laid in cement is preferred; believe wood will answer if carefully constructed.

5. Planks across the silo singly.

6. 150 pounds of stone to the square foot.

7. \$250.

8. Principaly corn; some clover.

9. Drills $2\frac{1}{2}$ feet apart, seed 5 inches in the row.

10. When in the milk. Perhaps more weight can be grown by letting it stand longer, but the ensilage would not keep as well as when the cells are full of the natural juice, and not replaced by air.

11. Best acre, 35 tons. Average, nearly 30 tons.

15. The cut corn was well trodden by men and horses.

16. Cost last season somewhat less than \$2.50 per ton.

17. Was filled and closed September 15, and opened December 8, 1881.

18. Good.

19. None: not more than 5 bushels loss out of more than 100 tons.

20. Very valuable for dairy stook, entirely taking the place of roots and largely that of hay.

21. Immediately on feeding the ensilage the butter gained in quality and quantity. No fault was found by the purchaser.

22. Fed a few steers on ensilage and they did well; calves and young stock did remarkably well.

23. 60 to 70 pounds per day.

24. With meal.

25. Very good. They commenced to gain as soon as they were fed ensilage; formerly had hay, roots, and some grain.

26. A great advantage over the system of feeding hay and roots in winter.

GEORGE T. POWELL, Ghent, N. Y.:

1. Silos form part of barn; all above ground, and opening into feeding-room.

3. 75 x 16 x 16 feet, and divided into 4 apartments.

4. Concrete.

5. 2-inch plank.

6. Press with screws; the higher silos are made the less pressure required.

7. Cost of walls of barn including silos, 8 cents per cubic foot.

8. Corn and millet.
9. Drilled and cultivated with harrow.
10. Just after blossoming.
11. 10 tons of corn, 4 tons of millet; the season being unfavorable we had but half a crop.
12. I use southern horse-tooth, Blount's Prolific, and sweet corn.
13. Think sweet the best.
14. Cut $\frac{3}{4}$ of an inch; the fine-cut fodder preserves better.
15. Fill rapidly as possible, tramp the edges well, and weight as soon as filled.
16. One silo filled with millet, put in whole length, cost 25 cents per ton; corn cut cost 50 cents per ton.
17. 3 months.
18. Condition excellent; except millet around edges a little moulded.
19. The uncut millet continued to mold a little after opening; corn remained unchanged to the last.
20. Excellent for milch cows.
21. A larger and far better product than the best hay gave.
22. Fed 350 sheep, ewes for early lambs, wethers, and lambs for fattening. A severe drought brought my sheep up in bad condition for wintering, but they improved steadily and came out in good condition to sell, with unfavorable circumstances all through the feeding season.
23. Cows, 50 pounds per head daily; sheep, $2\frac{1}{2}$ to 5 pounds; horses, 20 pounds; hogs, 2 to 5 pounds.
24. Fed ensilage morning and night with grain upon it, and hay or straw at noon.
25. All stock fed on ensilage improved in condition and appearance steadily.
26. I am keeping four times the quantity of stock with my silos that I have been able to keep heretofore. Its advantages will be great in the preservation of clover, which is often nearly ruined by wet weather in the attempt to cure it; the same is true of millet. A silo filled with green food in time of protracted drought is invaluable. In Northern States warm buildings should be provided for stock; ensilage should not be fed where it will freeze before the stock can eat it.

JACOB PUGSLEY, *Wassaic, N. Y.:*

1. Silos should by all means open directly on feeding floor.
3. 25 x 16 feet, 14 feet deep; six, side by side.
4. Concrete—one part cement, five parts coarse sand, five parts small stones; built between planks supported by studding in such manner that the planks can be raised after being filled with concrete. A wedge driven lightly between studs to spring them apart, say $\frac{1}{2}$ inch, allows the planks to slip upward easily and without cracking walls, which are still soft.
5. Two or three inches of straw, if cheap, will save a little ensilage at top; common hemlock boards, laid on so they can settle with the ensilage and not bind on the walls, have proved perfectly good; no harm is done by their lapping anywhere that is convenient.
6. Stone, 18 inches deep, if convenient; earth would serve equally well.
7. About 6 cents per cubic foot of contents, having to haul sand, cement, and lumber 3 miles.
8. Grass—Hungarian-grass and corn.
9. I have so far preferred corn raised as for ears; cutting ears and stalks together.
10. Everything except corn should be cut before full blossoming; corn has proved equally good with me when cut before the ears were all in the milk, and when ripe enough to harvest in ordinary manner for ears.
11. Everything depends upon quality of soil, amount of manure used, and cultivation. Land that will yield a ton of hay per acre will, of course, give 5 or 6 tons of

green grass, and should yield 8 to 10 tons of Hungarian, or 10 to 12 tons of corn in hills; perhaps 15 or 18 tons of southern corn can be grown as easily; this is supposing the ground to be fairly manured.

14. Cut about an inch in length; used a one-horse power. An engine would be more efficient.

15. No harm seems to ensue if silo is two weeks or more in filling, providing ensilage is well trodden and packed as put in. Putting in 25 tons per day there should be three men in silo to spread evenly and pack thoroughly. If I were building again, should make openings at bottom large enough to admit horses and tread with them, leaving them inside until silo was filled.

16. 75 cents per ton.

17. Not less than a month.

18. Good in every case except one silo filled with grass last year; this was put in the middle of July, two weeks too late, and molded 2 feet deep on top; the remainder was good.

19. None in my experience.

20. Entirely satisfactory.

21. Milk plainly of better quality than when feeding hay with 6 quarts meal per day.

23. 60 pounds per day; cows of small size.

24. Part of the time with 1 pound cotton-seed meal per day, then with 3 pounds wheat bran.

25. As good as in other seasons when feeding 20 pounds of hay and 6 quarts of meal per day.

26. Ensilage can be put up here quite as profitably at \$3 per ton, as average hay at \$12 per ton; 60 pounds ensilage at that price would be 9 cents; 3 pounds wheat bran, 3 cents, making 12 cents per day. My cows have done fully as well upon this feed as upon 20 pounds of hay, at \$12 per ton, 12 cents, and 6 pounds corn meal, 6 cents, making 18 cents—50 per cent. more than ensilage. Five tons of green grass make a ton of hay, at \$3, would be \$15. There is not \$3 difference between cost of harvesting 5 tons of ensilage and 1 of hay. In maize the showing is better.

ALFRED A. REED, *Providence, R. I.:*

1. Silos join cow barn at each end at right angle. Ensilage is conveyed from silos to feeding-troughs in a box, open at both ends, running on a single iron track, attached to the ceiling of barn and silo.

3. 20x12x12 feet, 5 feet above ground and 8 feet below.

4. Stone and cement. One silo built of stone laid dry 18 inches thick, faced with 6 inches of grout (cement and small stones) and one thin coat of cement to make a smooth surface. Bottom of silo grouted and smoothed, superstructure of wood to shed water. Second silo constructed of small stones, and cement made thin, and poured between the stones. In constructing this wall, 2x4-inch studding was placed plumb, 2 feet 1 inch from face of excavation, and 3 feet apart. Inch boards placed horizontally on inner side of studding, between which and face of excavation the stones were laid. When completed, the boards and studding were removed and the face of the wall pointed with cement to make a smooth surface. Cement mortar used was in proportion of one of cement and two of sharp sand.

5. Two-inch plank laid with close joints.

6. In one silo 1,200 pounds of stones, packed in 21 oil barrels, equal to 50 pounds per square foot of surface. In second silo 4 cast-iron screws attached to beams overhead.

7. Cost of silo No. 1.—Excavation, \$112.63; laying walls and cementing, \$143.31; lumber and labor, \$87.55; 40 barrels cement, \$47.20; total, \$390.69.

Cost of silo No. 2.—Excavation, \$42.90; laying walls, \$87.77; cementing, \$20.50;

cement and freight, \$159.95; iron-work for press, \$37.96; lumber and labor, \$132.09; screws and freight, \$50.24; total, \$531.41.

8. Rye, orchard grass, clover, Hungarian grass, sorghum, and corn.

9. Hungarian grass usually, as a second crop, after rye; corn planted in drills $3\frac{1}{2}$ feet apart; cultivated frequently.

10. When in bloom.

11. Considerable variation in the past 2 years; rye, about 5 tons to the acre; orchard grass, from 7 to 9 tons; Hungarian grass, from 6 to 8 tons; corn past season (very dry), 14 tons to the acre.

14. Cut from $1\frac{1}{2}$ to $\frac{3}{4}$ inches, and also packed uncut, excepting corn, which has always been cut, quality of ensilage the same. A large quantity can be stored when cut, and requires less weighting. A steam-engine and cutter, with elevator.

15. Continuous (excepting nights) as fast as can be drawn and cut. A delay of two days in filling will not injure it. Have continued filling silo during a rain without injury to the ensilage. While filling, the fodder is constantly tramped by one man, especially around the edges of the silo. When filled, or partly filled, with one crop, it is covered at once and weighted.

16. Varies with different fodders. Rye, \$2.50; corn, \$1.50; grass, \$1.82.

17. Earliest time, six weeks.

18. Good; a slight alcoholic smell, with a trace of acidity.

19. If surface of ensilage is exposed for one or two weeks, a mould forms varying in depth according to time exposed. If surface is removed daily no appreciable change occurs.

20. Ensilage is cheaper than hay.

21. Cows previously fed on hay give better milk when fed on ensilage. Butter nearly as high-colored in winter as in summer when fed on grass.

22. Oxen on heavy work last winter gained in flesh when fed on ensilage and a mixture of 3 quarts of corn meal and 3 quarts of middling (shorts) per day.

23. All they would eat clean (about 50 pounds).

24. Fed to cows three times per day, with 2 quarts of middlings at each feeding.

25. Oxen a material gain, cows a slight gain, health of both excellent.

26. Considering freedom from loss by storms, amount of fodder obtained per acre, cost of silos as compared with barns for storage, and quantity and quality of milk and butter, I consider that ensilage reduces the cost of feeding about one-half.

Professor ROBERTS, *Cornell University, Ithaca, N. Y.:*

1. On same level; about half should be under ground.

2. Twice (or more) as long as wide.

3. 32×16 feet, by not less than 20 feet deep. This should be divided into four sections by 3 matched plank walls, secured to upright oak posts.

4. Grout for the first 12 feet, 18 inches or more thick. Last 8 feet double studded, cheaply boarded inside and out.

5. Of 2-inch matched light wood as long as silo is broad, less two inches; width of each section of cover, 4 to 6 feet.

6. From 100 pounds to 150 pounds per square foot, a few stones on corners, balance of weight applied by a single central screw, anchored in bottom. Diameter of rod, 1 inch to $1\frac{1}{2}$ inches for 30 tons pressure.

7. If well and durably built, of a moderate capacity—175 tons—about \$2 per ton capacity.

8. Rye, corn, oats, grass, clover.

9. Rye follows corn on same ground, and corn rye. Both drilled; corn cultivated.

10. Corn just after tasseling, rye before or just at blossoming, clover and grasses same, oats when in the milk.

11. Rye 15 tons per acre; corn, 20; clover, 6 to 8; oats, 10 tons.

12. White Southern.

13. No experience.
14. Engine; cutter with carriers; rack 25 feet long, on trucks; fodder is drawn from the rear of rack, about 600 to 800 pounds at a time, by the lead horses of a 4-horse team. Two tons can thus be loaded by two men, in ten to fifteen minutes.
15. If well tramped may be three or four days in filling.
16. 50 to 75 cents per ton.
17. From four to six weeks.
18. Light colored and somewhat acid; acidity largely disappears when exposed to the air for a time, and color returns.
19. None perceptible if not loosened.
20. Very valuable for milch cows, young cattle, horses, and fattening animals.
21. Milk sold, well liked, no complaint.
22. See 20.
23. 50 pounds per head.
24. Always with other food.
25. Gain satisfactory, health perfect.
26. With skill it is certainly profitable, especially as it enables the farmer to tide over the hot, dry months.

J. B. Rogers, *Binghamton, N. Y.:*

1. Opens to feeding-alley in basement.
4. Wall 15 feet below sills of barn, 7 feet below stable floor; stone laid in cement except between silo and stable. Bottom and face of wall cemented. Between silo and barn above sills the wall is of double boards; space filled with coal ashes.
5. 2-inch plank.
6. Stones, 75 to 100 pounds per square foot. Am arranging to use iron rods and screws.
7. About \$300.
8. Corn.
9. Drills three feet apart; cultivated.
10. That was best which had just come into blossom.
11. Small crop; only 10 tons per acre.
12. Stowel's Evergreen, Mammoth Sweet, Blount's Prolific, and Southern White.
13. Evergreen Sweet is best to feed green, but not equal in yield to the others.
14. Cut by hand in field; used fodder cutter at silo with two horse-power; cut three eighths of an inch; shall cut three quarters of an inch this year.
15. Had two men tread in silo; filled in three days half full, which used all our fodder.
16. Cutting corn, hauling, paying for machine, teams, and men employed, \$1.28 per ton. This can be reduced by larger crop and better knowledge.
17. Two months.
18. Mouldy for 3 to 5 inches next to cover.
19. The weight was removed soon after silo was opened, but cover was removed in sections as used. Any part exposed to air after being opened was somewhat damaged.
20. Two tons ensilage better than one ton of hay.
21. Increased the quantity about one quart of milk per cow daily, and improved the quality.
- 22, 23, 24, 25 to 30 pounds per day in two feeds, morning and afternoon; also gave two light feeds of hay. Fed about half as much hay as should have done without ensilage. Hope to have ensilage enough this year to feed 50 or 60 pounds daily, and little or no hay.
25. My cows gained in flesh and health, and it was remarked by many farmers who came to see, that they looked and seemed to feel better than any cows in the vicinity.
25. So profitable that I have more than doubled the capacity of my silos and size of my stables, and expect to fill the stables, and feed on ensilage.

H. G. ROOT, *Remington Vt.:*

20 tons per acre is a large yield of corn; I weighed mine—did not guess. Horses not worked can be wintered on ensilage for half the cost of hay.

E. K. SEABURY, *Walpole, N. H.:*

1. In corner of barn which has a cellar 9 feet below the floor and 9 feet above; a door in the cellar and a door on the barn floor; feed cows, &c., from the barn floor; sheep and hogs from cellar.

3. 11 x 14 feet, 18 feet deep.

4. Walls below the barn floor—on two sides cellar-wall cemented; on the other two sides brick and cement. Above the barn floor, two thicknesses of boards with tarred sheathing paper between.

5. Plank.

6. Iron rods with threads, set in stones at the bottom; a timber across and followers; press it with these screws instead of weights.

7. \$84.

8. Corn.

9. In drills, 3 feet apart.

10. Just ready to ear.

11. A square of the average of Southern corn weighed at the rate of 36 tons to the acre; sweet-corn not half so much.

12. I like the White Southern. It grows large, and in the silo I think it just as good as smaller sorts.

13. Yield too small.

14. Cut $\frac{3}{4}$ of an inch; used a 2 horse-power.

15. Filled in $2\frac{1}{2}$ days.

16. Cost 90 cents a ton to cut and put in.

17. Two months.

18. All right, except a little on the upper outer edges.

19. None.

21. Makes as much and as good butter as grass, and as much milk as the average pasture; butter of better color and texture than from dry fodder.

22. Very good for young cattle.

23. 40 pounds per day. A common cow will eat 60 or 70 pounds per day, and do well for a short time without other food.

24. One feed of dry fodder. Have made several experiments, and find it is not a proper feed alone.

25. Stock did well on two feeds of ensilage and one of hay per day, with the same amount of grain I should feed with all dry fodder. Never had stock do better.

26. I regard ensilage as a success. I can winter more stock at less expense than any other way I know of, and have them come out in the spring heavier and healthier.

Experiment No. 1.—White cow gained 40 pounds in twenty days, on 40 pounds of ensilage and 4 quarts of meal.

Experiment No. 2.—Yearling steer just out of pasture (weight 640 pounds), on 40 pounds of ensilage per day, lost 5 pounds in three weeks; I then added one quart cotton-seed meal and a very little hay, and he gained 50 pounds in two months.

Experiment No. 3.—A heifer two years old, on 40 pounds ensilage and one quart cotton-seed meal and a little hay, made $6\frac{1}{4}$ pounds very nice, hard, yellow butter in a week. On 60 pounds ensilage alone made 5 pounds, as good color, but not quite as firm, in the same time, and the cost was less per pound. Various other experiments have brought me to the conclusion as stated.

SEARS BROS., *Worcester, Mass.:*

1. Adjoining barn; ensilage carried on a car to cattle.

3. 40 x 13 feet and 13 feet high to the sills of the building covering it.

4. The walls are 16 inches thick, made of concrete. A gable-roofed building with sills bedded in top of cement walls, increases depth of silo 5 feet.
5. 2-inch plank.
6. Stones, $1\frac{1}{2}$ feet deep, or about $\frac{1}{2}$ ton to the square yard.
7. \$400.
8. Corn.
9. Planted in rows $3\frac{1}{2}$ feet apart, and hills 18 inches apart in the row; 4 seeds in a hill.
10. We had one field just tasseled out, one forming ears, and in one the corn was hardening when we filled the silo. We found, when we came to feed, that first field was too watery and the last too dry and woody, but the second was about right.
11. The weight of fodder per acre last year was much less than it would have been if the corn had come up better. June was a very cold month, and much of the seed rotted, not more than a third coming up, but we had 20 tons per acre, silo measure, 50 cubic feet per ton.
12. We prefer the most prolific southern corn to sweet corn or northern varieties, as it contains much more foliage.
13. As a dry forage crop I have used sweet corn and like it very much, but it becomes more sour when made into ensilage, than other corn.
14. We used a portable steam engine of 10-horse power, and could cut easily 30 tons per day into $\frac{3}{4}$ inch pieces.
15. The fodder was evenly distributed over the silo and trodden by two men, the outside and corners being specially attended to. At the close of each day all of our men trod about twenty minutes.
16. The fodder cost, ready for use, about \$1.00 per ton.
17. Two months.
18. We found $1\frac{1}{2}$ inch of the top spoiled; below that it was in fine condition, bright, and of a pleasant acid flavor.
19. In opening our silos we took the stones all off; this was a mistake as we lost about a ton apparently from the want of sufficient pressure to exclude the air.
20. Our business is making milk for market, and we have experimented to ascertain its value compared with the best early cut hay. We find that 1 ton of ensilage is worth from \$8 to \$9, or 3 tons ensilage are worth more than 1 ton of best hay for making milk.
21. We have had no experience in making butter or cheese, but have eaten both made from ensilage, and found them very good.
22. We fed 60 pounds of ensilage per cow, with 7 pounds of meal and 5 pounds of hay.
23. We fed twice a day half of the ensilage and meal each time. Our meal was 3 pounds of cotton seed meal and 4 pounds of a mixture of coarse shorts and middlings. We believe that cattle thrive best on a variety of food.
24. Our cattle were never so well as they were the past winter; we had but one cow on the sick list, and she only for a day. They gained steadily in flesh through the winter.
25. I think feeding ensilage in American farming is yet an experiment; that its place in the future will be a very important one, I verily believe. Our experiment of the past year enabled us to keep 30 cattle, where before we only kept 17, and to make 230 quarts per day, where before we only made 130, at a cost then of $3\frac{1}{2}$ cents per quart, but now of only 2 cents.

B. F. SKILLINGS, *Gray, Me.:*

1. Door opens from feeding room floor.
2. 17 x 12, x 14 feet deep.
3. 8-inch brick wall, laid in cement.

5. 1½-inch plank, jointed.
6. I prefer stone; have tried sand, but it is apt to get into the feed.
7. \$250.
8. Corn.
9. Drills; kernels, 6 to 8 inches apart.
10. When the corn is well tasseled out.
11. From 25 to 30 tons.
12. Cut one-quarter inch long; cutter operated by horse-power.
13. While filling silo I kept three men treading the fodder. I think it necessary to have it well trodden.
14. Last year it cost me \$1 per ton. Think it can be put in for less.
15. Three months.
16. Excellent.
17. The first year I did wrong by removing the stone all at once. By removing a third and cutting to the bottom, then removing another section, there is no loss.
18. More milk; butter of better color, and flavor more like June butter.
19. My stock consists of cows and sheep. My sheep never did better.
20. 60 pounds per day to cows.
21. Feed three times a day, with 1 quart of cotton-seed each time, and a little hay at night.
22. My cows never were in so thriving a condition as now.
23. It is altogether out of my line of business to write on any subject, but I have been called upon quite often to express my opinion in regard to silos and ensilage, and I am most happy to do so, for I believe that this new method of preserving corn fodder, &c., is *the thing* that will help the farmers of our country. Am sorry that some of the leading men of the agricultural interests of Massachusetts should take such a decided stand against silos and ensilage.

FRANCIS H. SMITH, *Hyattsville, Md.:*

1. Separate building.
2. 12 x 10 feet, 12 feet deep; all below ground.
3. 9-inch brick, laid in cement, except wood partition from root cellar adjoining.
4. 4 inches straw, and loose boards on top.
5. 400 pounds stone per square foot.
6. About \$150.
7. Corn and rye.
8. Corn planted in drills 3 feet apart; cultivated between drills three times.
9. When the ears are getting into milk. Rye in blossom.
10. Any large, strong-growing variety.
11. No material advantage; would not use it.
12. Cut by hand, and hauled to silo immediately.
13. 14-inch power cutter. Engine hired at \$5 per day; belonging to thrashing-machine. Corn cut about 1 inch long; tramped thoroughly as it is put in. Filled in one day.
14. About six weeks.
15. Perfectly free from rot or mould; strong alcoholic smell.
16. After weather becomes warm it will heat and mould soon after being exposed to the air. The best plan is to take out enough for a week's use, and spread so that the air will circulate through it, and cover the exposed silo surface with straw, or some loose material. This precaution is not needed in cold weather.
17. I see no difference, in the effects on milch cows, from good pastureage.
18. Excellent, both as to quantity and quality, during the six months when good pastureage is not available. I should say 50 per cent. advantage.
19. My horses eat it with avidity, and excellent results.
20. I mix with it a small quantity of bran and corn meal.

25. Both horses and cows improve in condition over any other method I have tried, and keep in excellent health. I give the horses dry feed once a day.

26. My impression is that ensilage from a given area of ground will keep at least double the stock, during the winter, that hay, corn fodder, or any other crop cured dry in the ordinary way will keep. You observe my experiment has been on a very small scale. I keep two horses and two cows, and my observations will not be valuable to large producers. Last year I used corn only, and the drought reduced the quantity so much that my supply only filled the pit about two-thirds full, and to avoid the difficulty of having to throw out the stones from so low a level, I cut hay and oats in the sheaf and filled to the top before putting on the cover. The dry cut feed came out as bright and in as good condition as when put in, and proved a very economical method over the slow process of cutting by hand. This year I have filled the pit half full of rye, cut in blossom, and when the corn is ready shall remove the cover and fill to the top.

N. T. SPRAGUE, Brandon, Ft.:

1. On one side of barn floor, stable opposite.
2. 50 x 15 feet, 18 feet deep.
3. Stone and cement 4 feet to basement floor, brick and cement 10 feet to feeding floor, double matched boards 4 feet above floor. Bottom and walls below floor cemented.
4. Inch boards 15 feet long, fastened together with cleats, each cover 3 feet in width.
5. Boxes 12 inches square, 18 inches deep, with hand holes near the top, each box holding 100 pounds gravel.
6. \$521, which is much more than necessary. Mine was the first one built in this vicinity, and I wished to avoid a failure.
7. Corn.
8. Sod ground well worked by harrow, rows 2 feet apart, 280 pounds of phosphate to the acre, 30 kernels to the foot, after covering phosphate with half inch of dirt.
9. When the stalk has tasseled and before any part has turned to woody fiber.
10. Mine last year averaged 31 tons per acre, estimating 50 pounds to the foot after being pressed.
11. The southern white. It yields well, and is of good quality.
12. More sugar in sweet corn, but not enough to make up for the difference in yield.
13. One man with scoop or 6-tined fork throws feed as it comes from cutter evenly over the silo, and another treads it compactly. I find that if we fill one foot per day, each layer protects that beneath and excludes the air from it.
14. The whole cost per ton, not reckoning interest on the land, was \$1.50. I am in hopes of lessening the cost this year 20 per cent.
15. Six weeks.
16. Sweet as when put in; no signs of mould on top.
17. Not any. I took out enough each evening for the next day, exposing it to the air that it might turn slightly acid, thinking it better for the animals.
18. Equal to green corn or grass.
19. Increases flow of milk from 10 to 15 per cent.
20. I feed cows 18 pounds three times daily, adding 10 pounds when in new milk; two-year olds 12 pounds; yearlings 10 pounds.
21. Cows $1\frac{1}{2}$ pints cornmeal per day, and proportionately less to young stock.
22. My cattle looked better and felt more playful on ensilage than when fed on the best of dry fodder. They drank but little water during the winter. The excrement was in the same condition as when on pasture, denoting that the system was in a healthy condition.
23. It is a good grass crop that will yield $2\frac{1}{2}$ tons of hay per acre; this would all be required here, with six months' feeding, to winter one cow; 5 tons of ensilage winters the same animal in a better condition; but with 30 tons per acre an acre of land will winter six cows and produce 10 per cent. more milk.

ALONZO STEBBINS, Vernon, Vt.:

1. Located 50 feet from feeding-room.
3. 40 x 12 x 15 feet deep (10 feet below surface of ground).
4. Concrete 17 inches thick below the surface, and 12 inches thick above ground, cemented so the sides were perfectly even.
5. Covered the ensilage with thin layer of hay, then put on 2-inch plank and covered the plank with about 2 inches of heavy loam.
6. 1,500 pounds stone to the square yard.
7. Cost, 65 barrels cement, \$100; excavating, \$25; hauling stone, \$75; labor, \$110; whole cost, \$310.
8. Corn.
9. Planted in drills, $3\frac{1}{2}$ feet apart; cultivated the same as other field corn.
11. 22 tons per acre.
14. Cut and draw immediately to cutter, which is run by 4-horse engine. Cut one-half inch long, and carried to center of silo by means of carrier attached to cutter.
15. As fast as deposited in the silo spread and tread down by a horse; 4 quarts salt to ton.
16. Cost, \$1.45 per ton.
17. Finished filling middle September; opened November 29.
18. Good.
19. No deterioration.
20. Cows thrived well, increasing in flesh.
21. Quality and quantity of milk and butter equal to that produced from the best June pasture.
22. Young stock thrived well.
23. Fed an average of 60 pounds per cow.
24. Fed cows 4 quarts cob meal and same of wheat bran per day, mixed with ensilage.
25. Gained in flesh and were healthy.
26. Am perfectly satisfied with the experiment, and shall continue to use ensilage. My cutter was not large or strong enough; have now purchased another, with carrier, which I expect will greatly reduce the cost of filling the silo.

W. C. STRONG, Brighton, Mass.:

As my trial of ensilage is somewhat exceptional, I will omit answers to the questions, and only state a few facts which may be of public interest. Having a cemented tank which had been used as a reservoir for water, I tried the experiment of using it as a silo in 1880. Ten acres of Hungarian grass (about 130 tons), very foul with pig and rag-weed, so that it would have been unmerchantable in a dry state, was cut fine and packed in the usual way, and sold during the winter to milkmen at \$7 per ton, they doing the carting. They reported that the cows sought the ensilage with avidity, ate it clean, and seemed to thrive and give an improved quality of milk over that produced from hay and brewers' grains. Last season the silo was filled with corn of excellent quality, and the bulk of it sold to milkmen at \$7 per ton, they coming for it, in loads of 1,500 to 2,000 pounds, about once a week. The reports have been emphatic from purchasers that it was an economical and excellent fodder, the quality of the milk exciting the notice of consumers as more like June milk than they had ever had before. A smaller allowance of hay and brewers' grains was used with the ensilage. I fed my own cows from a silo at my home farm, and made June butter in January—a new era in my experience. That ensilage of corn is the cheapest and most wholesome food for milch cows, if supplemented with a small allowance of shorts and hay, I entertain no doubt.

Capt. A. H. SWEENEY, *West Troy, N. Y.*:

1. My silos are away from feeding-rooms; they should open into them.
3. 36 x 12 feet; 12 feet deep each; two under one roof. This size is better than larger ones.
4. Stone, laid in mortar and cement.
6. About 20 tons to each silo: of barrels filled with sand and stones.
7. Cost \$500.
8. Corn, rye, and clover.
9. Corn plaited in rows, one bushel to the acre.
10. When the most juice is in, for cows and pigs. For horses, colts, and brood mares, I prefer it a little riper.
11. From 15 to 60 tons of corn to the acre; 8 to 10 tons of rye.
12. Southern White for strong clay land.
13. Sweet corn for sandy loam.
15. Filled all we could each day; rye about 4 feet, cut in 1-inch lengths; corn about 2 feet, cut very fine. Three-eighths inch I think best.
2. About \$1 per ton, including cutting in field; cost \$2.10, including interest on land, cultivation and everything.
17. Two months.
18. Splendid, with slight smell like sour-mash whisky.
19. None whatever, provided you keep weights on what you are not feeding.
20. No feed equal to it in any way.
21. Increase; no other effect.
22. Fed all my brood mares and colts last season with perfect success; never gave a particle of hay as long as the ensilage lasted—three months.
23. Gave horses 40 pounds of ensilage and 4 pounds fine feed, which is more than enough.
24. Some I gave nothing but ensilage, 50 pounds daily; they did well, but did better with 40 pounds ensilage and 4 pounds fine feed.
25. Too fat, if anything; in splendid condition and very healthy.
26. Profit is very large, consider my two silos worth \$10,000; would rather pay interest on that than give them up.

Dr. W. H. TANNER, *Wassaic, N. Y.*:

1. Silo directly back of basement and opening to it.
3. 36 x 15 x 20 feet deep.
4. Concrete.
5. 2-inch plank, well fitted.
6. Stones; about 18 inches deep.
7. About 10 cents a cubic foot of masonry. Wall 18 inches thick at bottom, 10 inches at top, sloped outside.
8. Corn.
9. Plant in rows, feet apart, about 4 grains to the foot.
10. When the bottom leaves begin to turn yellow.
11. 15 to 25 tons.
12. Blount's Prolific or Southern White.
14. I use a cutter driven by an 8-horse power engine and cut the fodder about $\frac{1}{2}$ inch long.
15. The ensilage drops from cutter to the center of silo.
16. Cost of cutting in field, drawing, cutting, and packing about 50 cents per ton.
17. Any time after a month.
18. Condition when opened good, with a slight acid taste.
19. No deterioration after opening.
20. Two pounds equal to one pound of the best hay for cows.

21. I have used ensilage largely for two years and have had no complaint.
22. Value about one-half that of hay for all stock.
23. A good strong cow wants about 50 pounds a day.
24. I like ensilage for two feeds each day, and hay once, better than either alone.
25. Condition of stock good; a very healthy nutritious food.
26. Ensilage I believe to be the dairyman's anchor, on the expensive lands of the East; I would as soon think of doing without a barn as without a silo; I farm for profit, not for pleasure, and have found a silo by far the best investment I ever made.

CHARLES P. TARBELL, *South Royalton, Vt.:*

1. 20 feet distant.
3. 12 x 18 inside, 15 feet deep.
4. 10 feet of stonewall, then a sill and studs 5 feet to plate, sheathed, flush with wall.
5. 1½-inch boards, 11 feet 10 inches long.
6. Stone, 75 pounds to square foot.
7. \$100.
8. Corn alone last year; am now growing corn, oats, and Hungarian grass.
9. Corn in drills; should be dressed with smoothing harrow at first; later, with horse hoe or cultivator.
10. Just before the ear is fully grown, to make sure it is full of juice.
11. 40 tons; estimated.
13. Cannot give comparative value. Think it much richer in sugar and starch.
14. Corn cut last year five-eighths inch; should be cut shorter, say three-tenths inch; cut in the field by hand.
15. The ensilage should be thoroughly packed—if convenient, with a horse—and the whole work done and weights put on without unnecessary delay.
16. \$1.25.
17. Mine had fully settled in two weeks, and might have been opened without hurt. I left it ten weeks.
18. Fresh and clean; no unpleasant smell or taste, excepting that in spots, owing to uneven filling, it was somewhat mouldy.
19. No change.
22. Fully equal to good hay.
23. Three large cows were fed three full bushels per day each; a two-year old heifer, 2 bushels per day.
24. I think it profitable to feed grain with ensilage.
25. All the stock, except colts, gained in flesh on ensilage alone. Their health was perfect. The cows did unusually well in calving.
26. All things considered, I believe every stock farmer should have a silo and feed ensilage. I have no doubt of the success of the system. Beef and butter can be made much cheaper from ensilage than from hay.

REMARKS.—Ensilage of corn should not be fed to colts to any great extent; the result will not be satisfactory. The walls of silo should be plumb and smooth, and, however constructed, it is much better to make it warm, so ensilage will not become frosted. My experience is that stock kept wholly on ensilage, in cold weather, drink no water and require none. I do not think the first cut of grass should be ensilaged unless the weather is very bad.

A. T. THOMAS, *Franklin Park, N.J.:*

1. Door at bottom of silo opening to feeding passage. Small car used to load with ensilage and run in front of cows.
2. Silo all above ground and was one end of a hay barn, new timbers being thrown across barn to constitute one side of silo, the other three sides being sides and end of

barn. I should build above the surface, on level ground. It is easier to get out the ensilage from above ground than to pull it out of a pit, and the carrier will just as well put it up 12 or 16 feet, when securing the crop, as to drop it in a hole.

3. 10 x 18 x 16 feet.

4. Upright 2 inch plank nailed to girths of barn, the plank coal-tarred, building paper put on, and 1-inch boards nailed on, to break joints with plank, and the boards coal-tarred. No bad taste imparted to ensilage by the tar.

5. Inch boards doubled.

6. Stone, about one-half ton to the square yard; shall put on one ton this fall. The greater the pressure the more perfect the preservation.

7. Had to plant heavy timbers at two sides of silo, and tie them together to keep silo from bulging; cost, including four extra iron rods and extra timbers, \$114.

8. Corn and sorghum.

9. Broadcast and in rows, the latter cultivated with smoothing harrow until too large, and finished with plow.

11. Seven tons; severe drought; one hundred and eighteen days without rain to wet two inches.

12. Think Southern white corn of large growth, which will not ripen in this latitude, best.

13. Sorghum and sweet corn well preserved, but too much acid, arising, no doubt, from excess of sugar.

16. 70 per cent. per ton.

17. Filled September 7, opened November 5.

18. A little brown in color; taste, a mild acid. Stock very fond of it.

19. Not any.

20. Cows did well.

21. Milk of good quality, and quantity liberal.

22. A Holstein heifer, thin in flesh, was fed ensilage exclusively for two months, and gained steadily.

23. 50 pounds.

24. Shall feed a little meal and dry stalks this winter.

25. Cattle kept well; health perfect.

26. It pays well.

AARON S. THOMPSON, *Maynard, Mass.*:

1. 100 feet from the barn, with a track from the silo to the barn.

3. 36 x 15 x 16 feet deep.

4. Stone and concrete.

5. Plank 1½ inches thick.

6. Stone, estimated twenty tons.

7. As I was very particular about it, the digging and all, including frame building over silo, cost \$500.

8. Corn.

9. Eighteen loads of barn manure to the acre, planted in drills 3½ feet apart; run a cultivator through it twice.

10. When the ears begin to form.

11. Average a little over 25 tons.

12. Southern corn is the best.

14. A portable engine and large cutter.

15. Cut in pieces ½ inch long; very important to keep it level and tread thoroughly.

16. 75 cents to \$1.

17. Eight weeks.

18. It was good and bright, a very little acid at first.

19. Not any.

20. Cows were in better condition than when fed on all hay.

21. The milk is richer and better, and more of it.
22. Fatted 11 head and never had any gain so fast on other food. Fed it also to shoats, and they thrive well.
23. 40 to 45 pounds.
24. Fed twice a day, morning and night, with a feed of hay in the forenoon and one in the afternoon.
25. I never had stock gain better, or in better health.
26. Saved me 25 tons of hay, and the cattle did better than when fed hay only.

A. H. THOMPSON & SON, *Woodville, Mass.*:

1. Outside of barn connected with feeding-rooms.
2. 30 x 12 feet, 13 feet high, one-half under ground.
4. Concrete, 15 inches thick.
6. Stone, 100 pounds to the square foot.
7. \$300.
8. Corn.
9. Rows 4 feet apart, hills 18 inches in the row, 4 stalks to hill.
10. When corn is nearly in milk.
11. 10 to 30 tons.
12. Southern grows largest.
14. Cut three-eights of an inch long, with fodder cutter and portable engine.
15. Well trodden while filling.
16. One dollar.
17. Ten weeks.
18. Slightly acid.
19. Do not see any change.
20. Better than dry feed.
21. No bad effects; milk pronounced good.
22. Good for young stock.
23. 60 pounds for full-grown animals.
24. Cottonseed meal twice a day.
25. Condition good, gain in weight, health good.
26. A farmer can keep more stock than with grass and hay. Have fed ensilage two years. Shall continue to use it.

S. N. THOMPSON, *Southborough, Mass.*:

1. Under barn, extending up and opening into driveway in front of cattle.
3. 21 x 11 feet, 18 feet deep.
4. Concrete 15 inches thick up to floor of driveway (9 feet) and matched boards above (9 feet).
5. 2-inch plank.
6. Stones to the depth of 15 inches.
7. \$75 or \$80. I used a part of my barn cellar, therefore had no excavating.
8. Corn.
9. Planted in drills 10 or 12 kernels to the foot, (about four times too thick).
10. When the kernels are in the milk.
11. My crop was light (27 tons per acre) on account of planting too thick; a few acres planted about 3 kernels to the foot yielded one-half more.
13. I have not tried sweet corn for ensilage; for feeding green from the field I consider it worth one-third more than other varieties.
14. Cut by steam power three-fourths inches long.
15. Prefer to fill the whole in two or three days.
16. Cost of cutting in field, carting, preparing, and putting into silo \$1 per ton.

17. 7 weeks.
18. Good, being but slightly acid, with a pleasant smell.
19. But little change while feeding.
20. I consider it worth two-fifths as much as the best hay.
21. Increased the flow of milk 23 per cent. and quantity of butter fully as much; with 2 quarts meal (one-half the quantity given when feeding hay); no unpleasant flavor in milk or butter.
22. I fed to horses, cows, and young stock; all showed decided improvement except the horses.
23. 50 pounds per day to milch cows.
24. I used no hay while feeding ensilage; 2 quarts cottonseed meal to cows.
25. A decided gain in weight and improvement in appearance.
26. Oxen, cows, and calves can be kept on ensilage at one-half the expense of keeping them in the same condition on hay. Not as desirable for horses.

L. P. TRUE, *Hope, Me.:*

1. My silo is 8 rods from feeding rooms; should be as near as possible.
3. 17 x 24 x 10 feet deep.
4. I used the cellar of an unoccupied building, cementing the walls and bottom.
6. Stone, 40 to 50 pounds to square foot.
7. \$50.
8. Corn and rowen.
9. Planted in drills 4 feet apart, cultivated the same as common field corn.
10. When in blossom.
11. 17 tons.
- 14 and 15. I cut my fodder a half inch long by horse power and kept two men constantly tramping it down.
16. Cost of planting, harvesting, and filling silo was \$2.25 per ton.
17. 2½ months.
18. It was in a good state of preservation. The rowen and leaves of the corn had changed to a light brown, the stalks light green. It had an alcoholic odor and taste near the top, but lower down it was sweet.
19. Not any.
21. My cows give a larger flow of milk fed on ensilage than on hay, with same amount of grain. I do not see that it affects the quality either way very much.
23. 50 pounds per day.
24. 8 pounds hay each morning; 2 quarts corn-meal daily, with ensilage noon and night.
25. They had good health, held their flesh, but did not gain.
26. Very profitable at the present prices of hay.

UNIVERSITY OF WISCONSIN, *Madison, Wis.:*

1. Near stock barn; ensilage raised in a box by means of a hay-carrier arrangement to a car which carries it to stock barn.
3. 27 x 12 x 15 feet deep, with 3 feet curbing around the top.
4. Walls of rubble sandstone 18 inches thick; inside made smooth with cement.
5. 2-inch plank running crosswise.
6. 112 pounds of boulders per square foot.
7. \$413.42, including superstructure costing \$119.40.
8. Corn.
9. We drill and cultivate as common corn.
11. 2.22 acres yellow dent gave 53,762 pounds; 2.6 acres white flint gave 86,570 pounds; 0.15 acre southern white dent gave 6,420 pounds.

15. Filled silo slowly because of poor machinery.
16. Total cost for 75 tons \$1.68 per ton.
17. 3 months.
18. Good, except a few inches at top.
19. A good deal of waste by moulding in spring; over 10 per cent. lost in April and May in this way.
20. For reasons which I cannot give here, we have no accurate results on this point.
22. Calves and steers on trials of ensilage alone showed a small gain when fed all the ensilage they would eat; calves made as good gain on this and plenty of rich food as with hay and rich food.
23. 900-pound steers, fed this alone, would eat about 69 pounds per head.
24. Fed both with and without other food.
25. Condition of stock was fair at least.
26. May pay well at East, but doubt it for Wisconsin, where the product is butter and cheese; near our cities, for milkmen, it may pay. With a good season I think we can show the value of ensilage, its cost, &c., in a satisfactory manner on our farm this year.

W. M. VILAS, *Burlington, Vt.*:

1. Silo is a lean-to to bank barn. Cow stables for 60 head are about the level of bottom of silo.
3. 40 x 25 x 25 feet deep.
4. Wall on bank end 22 feet high and 3 feet thick. Is partially walled on two sides where earth is. I used matched spruce 1½-inch plank everywhere else. Walls pointed and plastered with cement.
5. Plank or boards (rough).
6. Stone, 12 to 18 inches deep.
8. Corn.
9. Plant in drills 3½ to 4 feet apart, about 25 quarts to acre. Harrow with smoothing harrow until 10 to 12 inches high, then cultivate.
11. About 10 to 15 tons; say 12 for an average.
14. Cut fodder one-fourth and three-fourths inches long with two-horse power; cut very little one-fourth inch; too slow work.
15. It is important to have fodder spread evenly and well packed as it is put in. 6 inches to a foot in depth put in each day will do.
17. About two months.
18. Ensilage was in good condition; had a sweet, honey smell.
19. Where the ensilage has been cut down and stands three or four weeks it will mould 2 or 3 inches into the fodder; but the cows eat it. It will freeze solid in very cold weather for 2 or 3 inches into the wall of ensilage, but thaws as soon as it is a little warmer without injuring the ensilage.
20. Ensilage is better than anything else, in my experience, to winter cows on, and perhaps to summer them; but that remains to be tried.
21. Fed ensilage from middle of November until about the 10th of April. In a day or two after, my men complained that the cows were not giving enough milk for the customers, so I had them double and then triple, the quantity of grain but we were not able to keep up the flow of milk.
22. All my stock were eager to eat ensilage.
23. From 50 to 80 pounds.
24. Have fed ensilage once a day with from 4 to 6 quarts bran, and hay twice; shall feed ensilage twice and hay once when I have enough.
25. Stock never looked as well; 75 per cent. could have been sold for beef (had no grain but bran); most of them were milked all winter.

26. Whatever is grown for ensilage should be near silo; is too heavy to haul a long distance. Will pay better on a large than a small scale. Silo I used last year only held about 160 tons. I have enlarged this year to about 500 tons.

WILLIAM D. WARREN, *White Plains, N. Y.:*

1. As convenient as circumstances will admit.
3. 24 x 12 x 12 feet deep.
4. Wood, as wood affords less moisture than stone or brick. (This is for silos under ground.)
5. Thin layer of rye straw and 2-inch planks. Care should be taken that the planks are not so long as to rub on the sides in settling.
6. Anything most convenient, stone, boxes of sand, barrels, &c. One ton of weight to 10 tons of feed I have found sufficient.
7. All depends on the cost of labor and lumber. I build them for 100 tons at a cost of \$50.
8. Corn.
9. Plant in "hedges" with grain drill, 6 inches between "hedges," and 30 inches between rows. Cultivate with horse hoe.
10. When the ear is fairly formed.
11. From 10 to 40 tons; all depends on soil and cultivation.
12. I prefer White Southern.
13. No advantage over common field corn.
14. Any machinery that will cut the corn into one-half or three-quarter-inch pieces.
15. Keep the cut corn evenly spread in silo and well trodden along the edge in course of filling; the middle portion will naturally get plenty of treading.
16. Depends on circumstances. I have good, easily worked corn ground, and can put in for \$1.50 per ton (labor and material only).
17. Thirty days; forty or fifty about the rule.
18. Slight acid taste and odor.
19. None.
20. Valuable, if not carried to extremes.
21. If properly used will increase quality and quantity.
22. Same as for cows.
23. 30 to 40 pounds per day.
24. With other food.
25. Good as to health and weight if fed properly.
26. The cheapest feed a farmer can produce.

L. W. WEEKS, *Oconomowoc, Wis.:*

1. Feeding rooms at the end of silos; doors opening into silos.
3. Two silos side by side, each 30 x 12 x 17 feet deep.
4. Stone and cement with sand and gravel, all smoothly plastered with cement.
5. 2-inch plank.
6. Stone, 100 pounds to square foot.
7. Cost of the silos, including superstructure, \$550.
8. Corn and rye.
9. I plant corn in drills 3 feet 6 inches apart, about 3 pecks to the acre, and cultivate thoroughly with harrow and cultivator.
10. Cut when ears are in silk and pollen from tassels falls freely.
11. 15 to 30 tons, depending on condition and fertility of land, cultivation, and season.
12. Southern White Dent.
14. Cut by hand, placed on dump carts, and dropped in front of cutter. I use a 2-horse power, and cut from 30 to 40 tons in 10 hours, $\frac{3}{8}$ -inch long.

15. I use about twelve men, two in silo to distribute and tramp next to wall, and a boy with a horse to tramp the middle.

16. From 60 to 80 cents per ton, depending wholly on price of labor.

17. I have opened after 30 days, but prefer 60 days, that it may be wholly cooled off.

18. Always bright, sweet, and good; sometimes a half inch or so decayed on top, but this, if mixed in, is eaten.

19. None whatever.

20, 21. Good ensilage produces more and better milk and cream, if fed in connection with a proper albuminoid ration, than I have ever been able to get from any other food. No better butter can be made with any feed I know of, except sweet, young grass.

22. I have only fed cows, calves, and young stock, and I have fed, when I could, once at mid-day of hay or other dry feed.

23. According to weight of animal; a cow of 900 or 1,000 pounds, 65 to 70 pounds, if fed on ensilage alone.

24. I take off two or three plank next stable end of silo, cut with hay knife, and pass it out in baskets until the door is reached; that is removed and the ensilage taken with a ten-tined fork and thrown into a barrow, which is wheeled in front of stable. I feed milch cows from 40 to 50 pounds at two feedings, morning and night, mixed with 2 pounds corn meal each feed, and same weight of some nitrogenous food, as oat meal, barley meal, or mill feed. At noon I feed hay, oats in straw chaffed, or barley straw chaffed.

25. Stock always gaining in condition, coming out in spring in high flesh, and healthy. Since feeding ensilage I have had no trouble with garget or other unhealthy condition of udder.

26. In my experience ensilage has proved a gain in profit of certainly 40 per cent. over any method of dry feeding that I know, besides enabling one to carry three times the amount of stock possible on same amount of land with dry feeding.

CHARLES E. WEST, *Dalton, Mass.:*

1. In barn cellar, near cattle stanchions.

3. 16 x 9½ x 9 feet deep.

4. Stone and concrete for 6 feet, balance of wood.

5. Plank.

6. Stones, say 125 pounds to square foot.

7. Adding value of stone and sand on hand, the total expense was about \$100. I used 16 barrels of cement.

8. Corn, Hungarian grass, and clover.

10. Corn, when beginning to ear.

12, 13. Evergreen sweet-corn.

14. Cutting-machine, run by horse-power.

15. Cut half-inch.

16. \$2.50 per ton; another year I could be prepared to do it cheaper. A small silo costs more per ton than a large one.

17. Ten weeks.

18. The layer of clover and weeds thrown on top were all spoiled. Next, the Hungarian grass, which has a strong tendency to ferment quickly, was rotted around the sides of silo, edges of the plank, and in contact with the clover. The balance was good. My corn-fodder, except on sides of silo, was in good condition. This season, I shall allow a little more play between the ends of the plank and sides of the silo, and place a narrow strip, lengthwise the silo, on top of the plank's end, to act as a follower, and exclude the air. I threw in some large sugar-beets; they came out shrunken one-half in size, and well pickled.

20. My milch cows were very fond of the ensilage. I have some left in the silo

at this date, July 15; they will leave green grass and eat the ensilage, seeming to prefer it.

21. I think, when past a certain stage of fermentation, although relished by cows, it has a tendency to flavor milk and butter like cabbage.

23, 24. 2 bushels a day, with 3 quarts shorts, and one feed of dry hay.

26. Profitable in economy of labor, room for storage, and saving food.

JNO. D. WHITMAN, *Dallas Centre, Iowa*:

1. In the center of a circular barn, with two rows of cows arranged outside.
2. Octagonal.
3. 22 feet across, (four sides 13 feet, four of nearly 8 feet;) depth, 20 feet; capacity, 200 tons.
4. Concrete.
5. 2-inch plank.
6. Gravel in boxes, 100 pounds to the foot surface.
7. Cost, \$250, roof not included.
8. Corn.
9. In drills; about 5 kernels to the foot.
10. Corn as soon as the ear is in the milk; millet when in bloom.
11. 15 to 30 tons.
12. Sweet corn of the large variety.
13. Have tried only field corn.
14. The silo is 12 feet above the floor; the feed is carried by a 32-foot elevator from the cutter.
15. Cost last year 60 cents per ton. I hope to reduce the cost this year.
16. Nearly 2 months.
17. Sweet and good, except a fraction of the top immediately under the planks.
18. Some, when exposed to the atmosphere.
19. Fully equal to half its weight in hay.
20. Very similar to that of green grass.
21. Same as No. 20; extra good for calves.
22. If on full feed, 70 pounds per day; a less amount with some grain and hay is better.
- 23, 24. My experience is yet too limited to determine.

ARTEMAS WHITNEY, *Maynard, Mass.*:

3. 40 x 16 x 16 feet deep.
4. Stone and concrete, faced with cement.
6. Stone, 200 pounds to the square foot.
7. \$600, including roof, &c.
8. Corn.
9. I plant 3½ feet apart, and cultivate with a horse hoe.
10. When the ears begin to form.
11. 22 or 23 tons.
12. I cut some five-eighth inch, some three-eighth inch, and see little or no difference in the ensilage.
13. 75 cents per ton.
14. Two months.
15. It opened well; was sweet.
16. The cattle ate it as well up to June as when it was first opened. I did not notice any great change.
17. I do not think it quite as good as English hay for milch cows, but better than common stock hay.

21. The milk sells well; no fault found with it.
22. Calves and young stock did well on it, with very little grain.
24. Ensilage alone to dry cattle, but to milch cows hay and grain every day.
25. Stock fed on ensilage kept in good health, and looked well in the spring.
26. There is great profit in it. I can keep double the stock on the same farm. I should not want to be without a silo.

GEORGE W. WHITE, No. 349 Canal street, New York City:

1. On basement floor, but not under ground.
3. 18 x 22 feet; 20 feet deep.
4. Walls of matched hemlock boards with three-ply roofing felt between; timbers 3 x 10 inches, running horizontally; the lower six being 12 inches from center to center; then increasing in space 1 inch until the top is reached. There is a row of doors, one for each division between the timbers.
5. Boards, 1 inch thick.
6. Sand; 500 pounds to square yard.
8. Corn and millet.
9. Corn planted in drills; millet broadcast.
10. When the ear is in the milk.
12. Sweet corn.
13. One-third more valuable.
14. Cut into three-inch lengths at top of silo, with gang of saws running up and down; saws 3 feet long, gang 12 feet wide. The fodder is drawn from the field and discharged upon an endless apron, the movement of which carries it through the saws.
16. Estimated at 56 cents per ton.
17. Eight weeks.
18. Good.
19. None.
20. Nothing superior to it.
21. Good.
23. 60 pounds per day.
24. Mixed with grain.
25. Improved condition in every respect.
26. Most economical method of storing heavy crops; it insures safety.

WILLIAM W. WHITE, Canaseraga, N. Y.:

1. Silo in and under barn.
4. Stone and cement.
6. Stone, 1 foot to 18 inches in depth.
7. Cost of a cellar with roof.
8. Corn.
9. Drill and cultivate, 28-inch rows.
10. In flower.
11. 10 tons—possibly 15 tons.
12. Southern White.
16. 30 to 50 cents.
17. Three months.
18. Perfect; slightly acid.
19. None.
20. Good as June pasture.
21. Adds one-third or more.
22. Equal to grass.

23. 30 to 100 pounds per day.
24. Both ways.
25. Improve in both.
26. Doubles the value of food over drying.

J. A. WOLLMER, *Turner, Me.:*

1. In the barn about 10 feet from the stalls of the cattle.
3. 13 x 12 x 8 feet high.
4. Hemlock boards, double walls, space between filled with sawdust.
5. 2 inch plank.
6. Stone, 100 pounds to the square foot.
7. \$30.
8. Corn.
11. 12 tons per acre.
15. The cut fodder was simply run into the silo from the cutter, leveled, and the cover laid on, and weighted. It was not trodden.
16. The entire cost of the fodder was \$2.75 per ton. The cost of cutting, hauling to the barn, and filling the silo, was \$3½ cents per ton.
17. 54 days.
18. Fermented just enough to make it very agreeable to the cattle. A little around the outside was spoiled.
19. No deterioration.
20. There was a gain in the quantity of milk.
23. Part of the time we fed one bushel per day, and part of the time two bushels per day to each cow.
24. While we were feeding one bushel of ensilage each, per day, we gave them one feed of hay or straw; when we fed two bushels per day, we fed on ensilage and shorts.
25. The stock fed on ensilage gained in weight, and were in good health.
26. I think it is much more profitable than hay.

E. WRIGHT, *Pleasant Mills, N. J.:*

1. Two silos near feeding alley, and connected by rail tracks.
3. Each 12 x 40 x 16 feet deep, 8 feet in the ground and 8 feet out.
4. Stone, 18 inches thick, laid in cement at bottom and lime-mortar higher up; partition wall 20 inches thick.
6. Cement barrels filled with sand, as many as can lay side by side.
7. Cost of two silos \$400, besides the wood-work.
8. Corn.
9. Drills, 3 feet apart with a common grain drill.
10. When in full tassel and silk, with ears well set. If allowed to turn yellow air takes the place of sap and the crop is injured in the silo.
11. The first year 15 tons per acre; the second, because of drought, 10 tons in light, sandy soil and poor condition. I believe 20 tons can be averaged.
12. Have planted the Jersey seed and southern whites; latter I think may be best, but am not sure.
- 14, 15. As fine as I can, three-eighths to five-eighths inch; machine run by steam-engine; average 10 tons per hour.
16. 35 cents per ton last year; the year before was much more, probably by delays and breakages, reaching \$2 or more.
17. If I required the stuff for feed I should open as soon as well settled, say two or three weeks, though I have never opened under two months.
18. Sour, apparently a vinegary acid. I think this is not right, and may be avoided by putting in when in full sap with no yellow stalks or leaves, putting in quickly and weighting heavily 200 to 400 pounds per square foot.

19. I do not think it deteriorates after it is opened. Have never seen any opened in warm weather, but am fixing for it.

20 to 25. Of my first year's ensilage I fed milch cows without mixing with other food, and concluded that its tendency was to dry them up. This year I mixed one quart of meal with each feed of 20 or 30 pounds twice a day, and once with dry hay. On such feeding the cows grew fat and gained slightly in milk.

26. If any profit at general farming can be extorted from the poor sandy soils of South Jersey, it can only be done by feeding cattle on ensilage.

J. C. WHITIN, Whitinsville, Mass.:

1. Convenient.

3. 44 feet long, 22 deep, 17 wide. Have two silos.

4. Built into a bank; 18-inch walls of flat stones, laid in cement; drain under the bottom of wall, constructed in most perfect manner with best masonry work.

5. Two-inch chestnut plank, laid crosswise, pointed so as to fit closely.

6. Stones, convenient to handle, weighing from 80 to 100 pounds apiece; not less than 200 pounds to square foot.

8. Corn and rye. Would not use rye again.

9. Sweet corn planted in rows with planter, $3\frac{1}{2}$ feet apart, 5 kernels to the foot. When 3 inches high go over it lengthwise with smoothing harrow—do that frequently, as long as you can without breaking it over—then use the common cultivator between the rows as long as practicable.

10. When the ear is half grown.

11. About 20 tons.

12. Sanford's, or Stowell's Evergreen.

13. Consider it better than any field variety.

14. Cut three-fourths of an inch long.

15. We cut at the upper door, at top of silo. Men level and trample it.

16. Think it may be done for \$1 per ton.

17. About 2 months.

18. Perfectly good condition, except on top.

19. Not any. About 3 inches on top next the planks is moldy, below it is not affected. We always commence to cut on one end, and never remove the weights faster than we cut.

20. One-third of a ton of ensilage is equal to a ton of best English hay.

21. Think milk and butter are improved by the feed, both in quantity and quality.

22. Should use it mostly for ruminant animals; good for fattening.

23. 40 pounds on an average; fed twice a day, 20 pounds at a time.

24. Have never fed it alone. Put two quarts of some kind of meal with the ensilage each time it is fed, and give two or three pounds of hay to each animal just after the ensilage. At night we give middlings, or roots and hay.

25. Always a gain and good health.

26. Consider it profitable for every one who keeps cows.

CHARLES B. BALLARD, White River Junction, Vt.:

1. Silo parallel with cow barn.

2, 3. 20 x 64 x 26 feet deep.

4. Stone and cement; the floor of stone, each 4 x 6 feet, and laid in cement.

5. Planks, with cobble stone about one foot in thickness.

7. About two thousand dollars.

8. Virginia corn.

9. Planted with a one-horse planter and fertilizer. Harrowed when the corn was about one inch high. After that cultivated it three times, about once in ten days.

10. About the time it begins to silk out.
11. About 20 tons per acre.
12. Maryland and Virginia corn.
13. No earthly comparison.
- 14, 15. Cut up about one-fourth of inch, carried into silos by stationary engine.
16. \$1 per ton.
17. About thirty days.
18. Perfect, and will never change.
19. None.
20. \$5 per ton.
21. Increases quantity and quality.
22. \$4 per ton. Effects are good.
23. Seventy pounds per day, with two quarts of cotton-seed meal, or corn meal, per head.
24. Feed alone.
25. Condition good, with perfect health.
26. Worth much more than hay or any other dry feed.





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