Mechanical Feeders for Silage

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Increased acceptance of ensiling as a means of storing forage crops has brought an increase in the amount of hand labor required for winter feeding. An equal feed value in silage weighs 2 to 3 times as much as hay, due to the added moisture. The labor required in feeding this additional weight can be reduced greatly by mechanical equipment.

Commercial Equipment

There are several commercially constructed "silo unloaders" on the market. Some are an integral part of a factory-built silo and others can be installed in a silo already built on the farm. Most of these units can be set to feed down a predetermined amount of silage with automatic shut-off control. On many farms the cost of such units may be justified in the savings in labor and possible savings in feed value.

Silos equipped with self-feeding mangers are being tested, but no commercial units or satisfactory plans for construction are available as yet. Hardware kits for constructing mechnaized feed bunks are available in Oregon. These kits include the chain, cleats, sprockets, bearings, gear-reduction units, and the motor (if desired) for assembly into a standard-type wooden feed bunk on the farm.

Mechanized Feed Bunk - Full Width Conveyor

The mechanical feed bunk equipped with a full-width conveyor in the bottom of the trough has proved very successful. This type of feeder is satisfactory for bunks up to about 50 feet long where the cattle feed from both sides. Where the cattle feed from only one side, this type feeder is considered satisfactory in lengths up to about 75 feet. Longer bunks of this type require heavier chain, sprockets, and shafting and the slow-moving chain is more likely to "jump" or "hunch."

Figure 1. Feed bunk equipped with full width conveyor. (Chain guard has been removed to show drive mechanism.)

Figure 2 shows two ways in which the feed bunk may be constructed. Where a small ration of silage is fed each day, the V-type manger may be desirable. Where the cattle are fed all the silage they will eat and there is little competition for feed, the post-type or even an open-type manger with fewer posts than shown would be satisfactory.
Two methods are shown for applying power to the chain. The jackshaft arrange-
ment shown at the top of Figure 2 may be assembled from similar chain, sprockets,
and gears available on the farm. Auto transmissions often are used as part of the
power train because of the speed adjustments available. The final drive, however,
should be at least as strong as the size of chain shown. The more compact power
train shown at the bottom of Figure 2 consists of a motor belted directly to a dual-
purpose power unit which may be used also as a wagon unloader for silo filling.
These are available from several companies handling silo-filling equipment.

Trough chain speeds will vary with length of feed bunk, methods of feeding si-
lage down, and the level of the feed in the silo. Most chains, however, will run
between 2 and 10 feet per minute to travel the length of the bunk while enough silage
is being fed down from the silo for one feeding. Where the silage is being fed down
by hand, some type of automatic motor shut-off or signal device to the man in the
silo usually is needed to prevent the motor from running too long and dropping the
silage off the far end of the bunk. This may be a buzzer system actuated either as
shown or by a hinged board which just clears the chain cleats near the discharge end.
As the first silage hits the board and swings it back it can actuate a button switch
similar to the type of light switch used on refrigerator or automobile doors.

All chain sprockets, except one of the two conveyor chain idler sprockets, should
be keyed to the shafts and held in place with set screws. Leaving one conveyor chain
idler free on the shaft will allow it to stay always in mesh with the chain and elimi-
nate riding or crowding of the chain.

In spite of the slow speeds involved, chain and sprocket guards should be pro-
vided wherever contact is likely with persons or livestock. When the more compact
dual-purpose power unit is used, the fast-moving V-belt drive also should be pro-
vided with an adequate guard.

It is recommended that bronze-bushed bearings be used on any jackshafts. The
feed chain shaft bearings may be either bronze-bushed or constructed from well-
seasoned hardwood blocks with some provision for positive lubrication.

Silage Conveyor

For silos 14 feet or more in diameter the portable, 10-foot silage conveyor
shown in Figure 3 may be used to reduce greatly the time and labor required for pitch-
ing silage down at each feeding. The unit may be suspended from the roof or rested on
the silage with the discharge end projecting out the silo door. By extending about
9 feet into the silo, the conveyor makes it possible for the operator to pitch mate-
rial from any point in the silo without second handling or without the effort of throw-
ing it toward a door opening.

The conveyor is designed to use standard dimension lumber and standard chain,
sprockets, belts, and pulleys. To secure the sprockets the shafting should be either
milled for keys or drilled for pins. The angle iron cleats should be welded or brazed
to the special conveyor chain links. Conveyors in use have shown that 150 feet per
minute is a satisfactory speed for the chain. If bronze or babbitt bearings are used,
the unit can be driven by a 1/3 hp capacitor or repulsion-induction motor. When well-
lubricated hardwood bearings are used, a 1/2 hp capacitor or repulsion-induction motor
is recommended.
MECHANIZED FEED BUNK

FIGURE 2

SIDE VIEW
(VEE TYPE)

END VIEW

SECTION A-A

BUZZER SWITCH DETAIL

BUZZER TAB POSITIONS

COMMERCIAL WAGON UNLOADER
GEAR REDUCTION UNIT
PLAN VIEW

SIDE VIEW

SECTION A A

SECTION BB

FIGURE 3

SILAGE CONVEYOR