



Ruminant Tech-Line



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Guidelines for Optimal Production of Corn Silage, Earlage and HM Corn

Good forage management involves properly harvesting, storing and then protecting the forages to maximize quality and minimize the dollars lost on spoiled and wasted feed.

Proper Harvesting Techniques for Ensiled Corn and Corn Silage:

A. Moisture:

Moisture level of ensiled feeds is critical for a several of key reasons:

1. When moisture levels are too high, ensiled feed will ferment poorly and also tend to lose valuable nutrients through runoff and seepage. This runoff also has the potential to cause damage to silos and concrete storage areas as well as contaminate water supplies.
2. When ensiled feeds are harvested too dry they tend to be more difficult to pack resulting in feed that is more prone to mold and spoilage.
3. Corn silage that is harvested too dry also tends to be less digestible and contain less sugar as well.

To determine the moisture of corn silage in order to time harvesting a common approach is to chop a sample at full dent stage, just as a milk line becomes visible and determine the moisture content of the silage. From this a typical rate of dry down is .5 to .75 percentage units per day. Use this procedure with the recommended harvesting moisture listed below to come up with an appropriate date to begin harvesting.

Recommended harvest moisture of Corn Silage, HM Corn, and HM Ear Corn.								
Storage Type	Moisture							
	Corn Silage		HM Shell Corn			HM Ear Corn		
	Min	Max	Min	Max	Desired	Min	Max	Desired
Bunker/Pile	65	70	24	35	28-30	26	40	32-36
Upright Silo	63	68	24	35	28-30	26	40	32-36
Bag	65	65	24	35	28-30	26	40	32-36
Oxygen Limiting Silo	55	60	24	32	26-28	26	36	28-32

B. Particle Size and Length of Cut: (Corn Silage)

- Processed: 3/4 inch length with a 1-2 mm roller clearance.
- Unprocessed: 3/8 to 1/2 inch depending on moisture

At 3/4" cut 10-20% should be on the top screen, 50-70% on the middle screen and <30% on the bottom of the Penn State particle size separator. At storage, kernels should be 95% broken but do not have to be destroyed. Cobs should be broken.

Do not over process corn when making high moisture shell and ear corn that is over the desired moisture level. Resulting feeds could lead to acidosis and decreased subsequent performance.

Proper Storage Techniques for Corn and Corn Silage:

1. **ACHIEVE A HIGH DENSITY - PACK, PACK, PACK!!!** Listed below is an example of how packing density influences DM losses in corn silage.

Density (lbs of DM/ft ³)	DM loss at 180 days (% of the DM Ensiled)
10	20.2
14	16.8
16	15.1
18	13.4
22	10.0

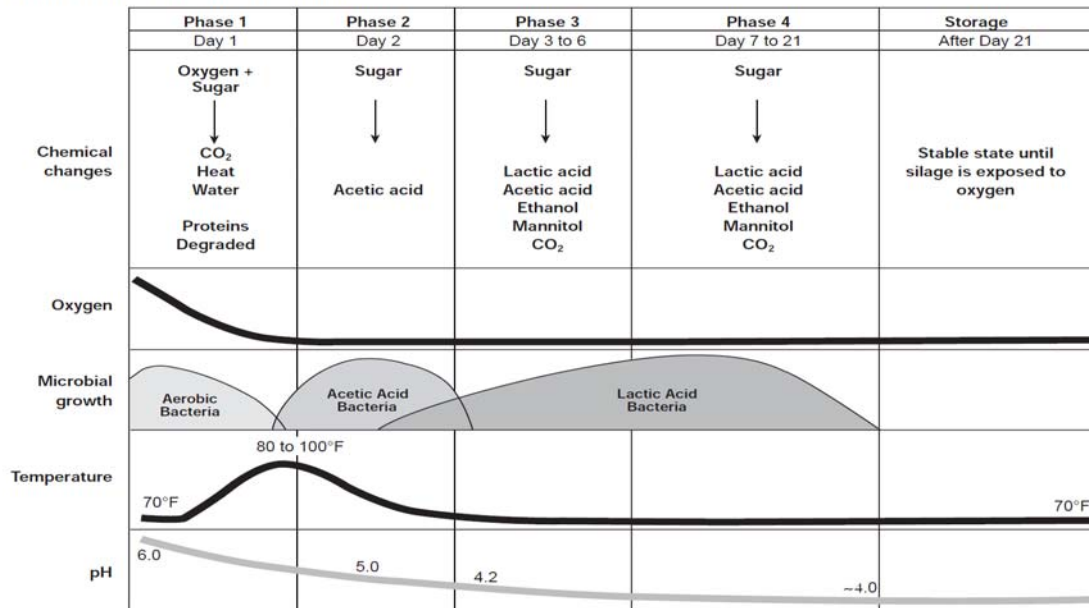


2. HARVEST QUICKLY- Once harvesting has begun make piles and fill silos as rapidly as possible until filled. Do this in order to minimize variation in packing density and prevent soft spots in the piles and silos where mold and spoilage are more likely to occur.

3. USE A FORAGE TREATMENT - (Inoculant or Preservative)

The chart below shows the phases of normal fermentation. If silage has gone through proper fermentation, the expected pH range will be from 3.5 to 4.5 for corn silage. Excessive oxygen, heating and low plant sugar levels can all cause undesirable fermentation. Forage treatments help enhance the fermentation process to ensure the proper preservation of ensiled feeds. This is achieved through optimizing lactic acid production, lowering pH, and minimizing oxygen within the silo.

Figure 1. Phases of normal fermentation.



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4. PROTECT SILAGE FROM WEATHER

- Use black and white 6 mil plastic
- Overlap at least 6 ft between sheets
- Cover plastic with tire or cutouts
- Keep plastic tight, no air pockets
- Double up tires on seams
- Seal around bottom with dirt or something heavy
- Cover the pile if rain delays harvest

5. RIGHT LOCATION AND TIMING OF FEEDOUT - If storing corn in bags keep them away from trees and long grass and keep snow removed from around the bags. Use bagged corn during cooler months since rips, tears and punctures can cause rapid and wide spread spoilage in the summer

6. MANAGE THE FEEDOUT FACE

Corn Silage– Feed 6" or more per day, 12" in hot weather
 High Moisture ear and shell corn– Feed 3-4 inches per day increase rate in warmer months.
 Shave top down, shave from side to side evenly across the face
 Feed all shaved silage before shaving more.

7. DISCARD SPOILED ENSILED FEED – Feeding rotten silage or ensiled grain reduces intake, depresses milk production, and challenges overall cow health.

For more information contact you Hubbard feeds representative or check out the following website:
<http://www.uwex.edu/ces/crops/ufwforage/storage.htm>

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