

# Unit D: Agricultural Equipment Systems

## Lesson 8: Operating, Calibrating, and Maintaining Feed Handling Systems

# Terms



- The following terms are presented in the lesson.
- Forage
- Palatability
- Pneumatic
- Roughage



## Objective #1

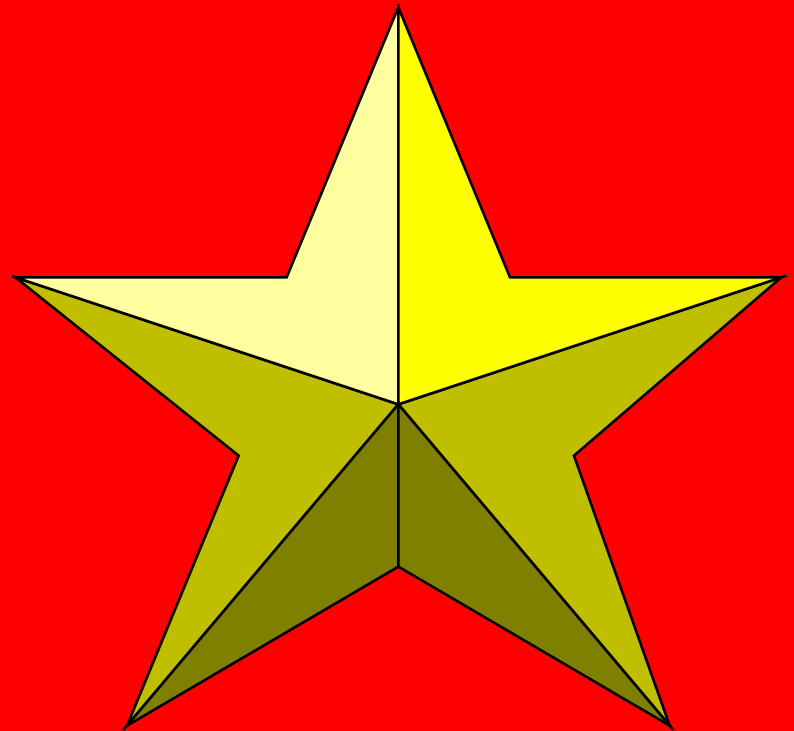
# Describe the operation of feed handling systems

- How are feed handling systems operated?

# Type of feed affects equipment

- ***Roughage or Forage***

- ***bulky***
- ***high in fiber***





# Roughage

- Loose hay, bales and stacks
- fed in self-feeders or spread on ground
- self feeding causes high feed losses
  - up to 50%
- trampling causes mud and kills vegetation
- losses can be as low as 5 - 10% by controlling access



# Silage, Haylage, Dry Chopped Hay

- Require a bunk
- made of wood, concrete, steel, or rubber
- used to hold feed before, during, and after it is eaten



# Fence line bunks

- Located on side of a feedlot
- filled with side unloader from a wagon or truck
- can be filled without going into lot
- requires twice as long bunk as a bunk that feeds from both sides



# Mechanical Bunks

- Allows feeding from both sides of bunks
- can be used to divide lots
- reduces feeding time and labor due to mechanical power
- more expensive than fence line bunks
- need to cover bunks to protect equipment
- need a backup system in times of power outages





# Portable bunks

- Allows feeding from both sides
- movable
- can be pushed around by animals so need to anchor down



# Self-feeding System

- Includes haystacks, silage from plastic bags, rations in bunks and self-feeders
- can be filled with portable mixers wagons, truck mounted feeder boxes, or overhead augers



# Energy & Protein Supplements

- Examples
  - Grain
  - Cottonseed meal
- recommend these be fed in bunk or self-feeder
- can be in the same bunk as the roughage



# Self-feeders & bunks

- Drainage holes need to be present to remove rainwater
- holes can't be too big or will lose feed
- wood or metal structures
- needs to hold enough feed for at least 4 days



# Self-feeders & bunks

- ***Palatability***

- *feed tastes good to the animal*

- feed with greatest palatability is eaten within 4 days
- feed is offered free choice so animal can eat as much as it wants



# Feed Centers

- Provides for receiving, drying, storing, unloading, elevating, and conveying
- provides also for processing grain and additives



# Feed Processing

- Involves grinding grain, weighing or metering ingredients, mixing ingredients, and delivery of feed



# Batch Feed Processing

- Involves weighing, grinding, and mixing individual ingredients in batches
- usually not automatic, although some steps may be automated





# Continuous Flow Feed Processing

- Involves milling grain and blending with other rations automatically
- switches stop the mill when supply is exhausted or storage is full



# Portable grinder mixers

- Versatile
- collect ingredients from several locations
- process this feed in batches
- grinding, mixing, and delivery are done by one machine



# Mill with portable mixers

- Uses a stationary or portable mill that grinds the grain into batches as needed
- portable mixer collects ingredients, mixes the ration, and delivers the completed feed



# Stationary mills with mixers

- Offers good control over feed composition
- wagon or truck delivers the completed feed to bulk tank or self-feeder
- ***pneumatic system***
  - ***systems that convey by airstream***



# Stationary mills with mixers

- Large swine operations, feed is delivered by high capacity pneumatic systems or by high capacity overhead conveyors
- Pneumatic systems are convenient but have high-energy requirements



# Automatic electric mills

- Reliable, accurate, low labor and operating costs
- mill meters ingredients into grinding chamber where they are mixed
- grains and other ingredients must be stored close to mill
- separate delivery systems is required



# Hay mills & tub grinders

- Used to process roughage
- processing roughage and mixing with grain allows more even consumption



# Hay Mills

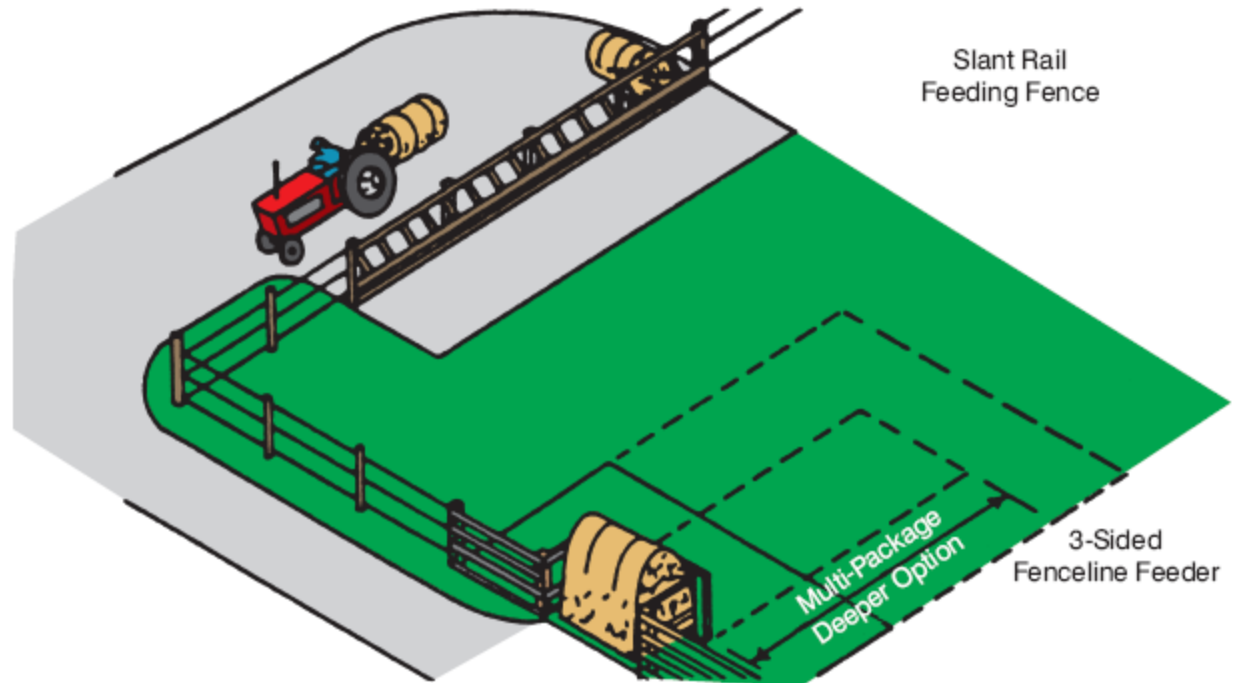
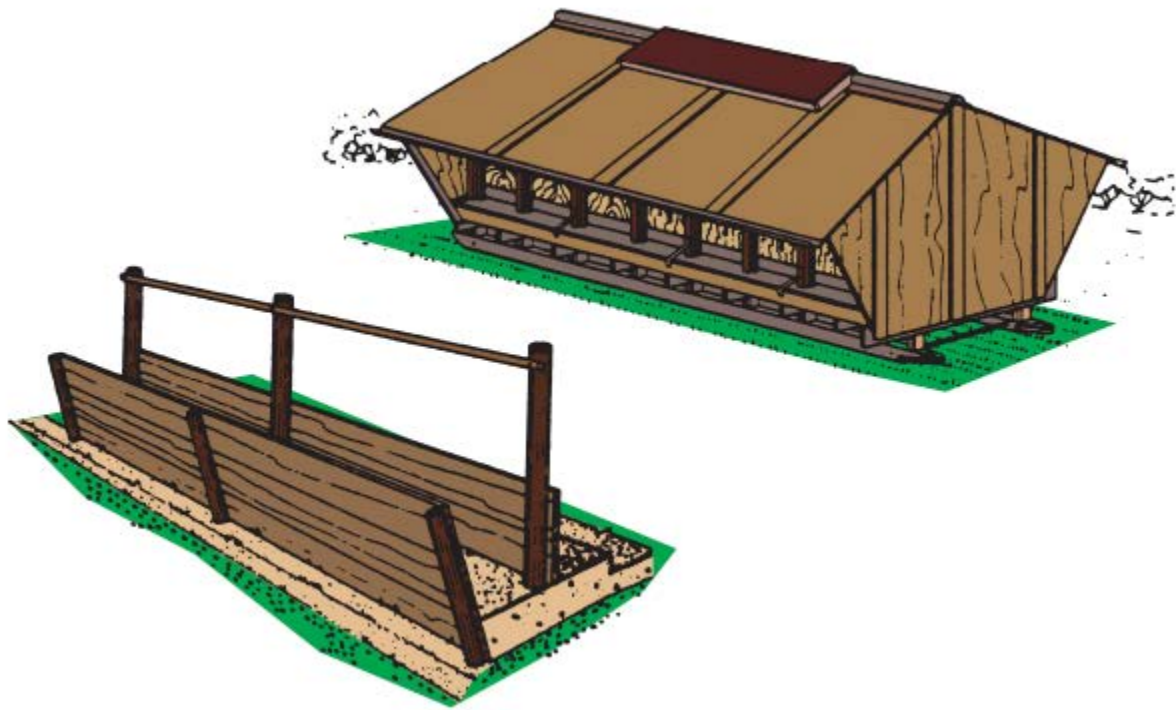
- Shred and screen solid bales





# Tub grinders

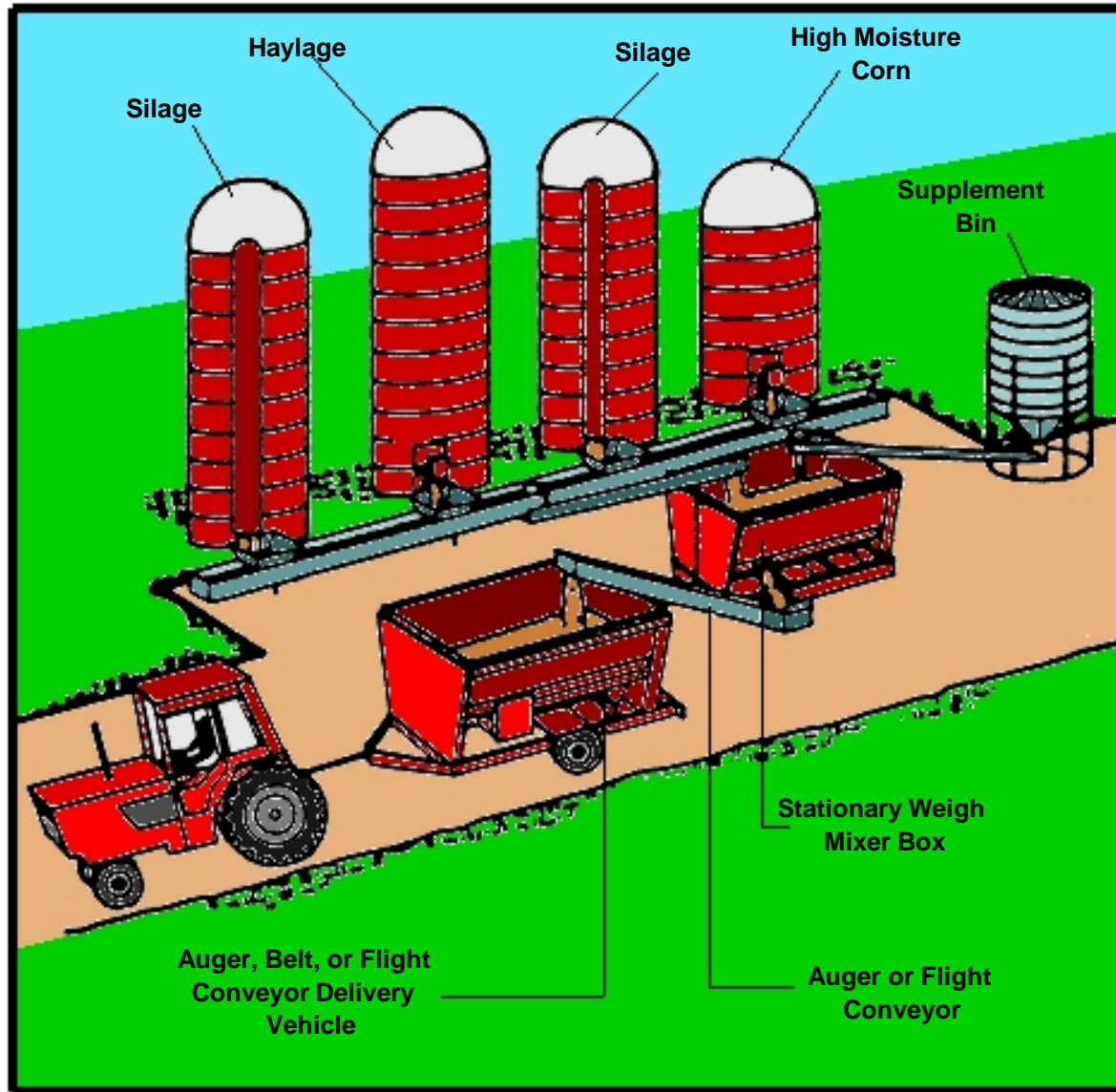
- Have a large tub that rotates slowly and feeds a supply of roughage to hammer mill in the grinder
- after roughage is screened, ready for distribution

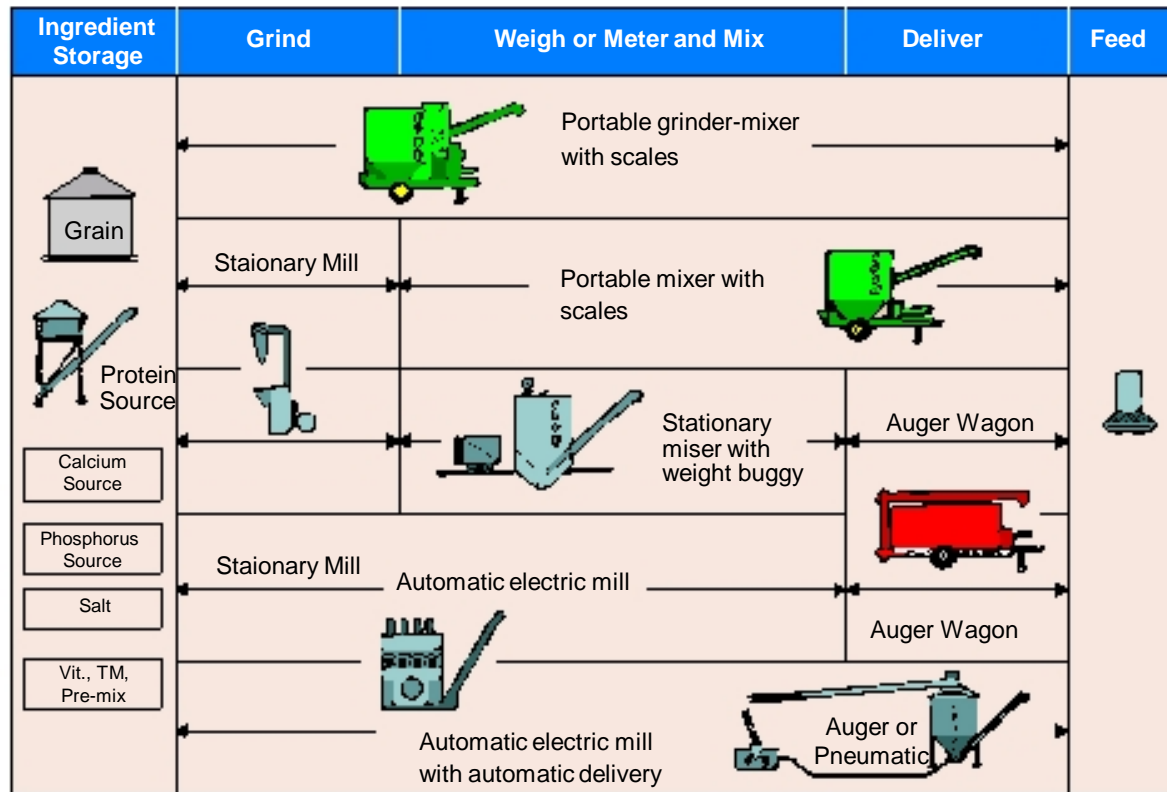


Slant Rail Feeding Fence

Multi-Package Deeper Option

3-Sided Fenceline Feeder

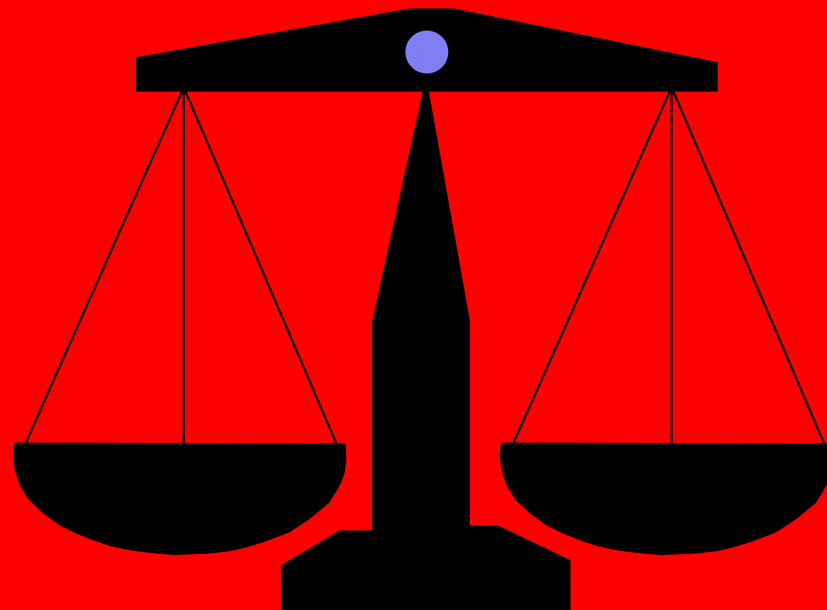




## Objective #2

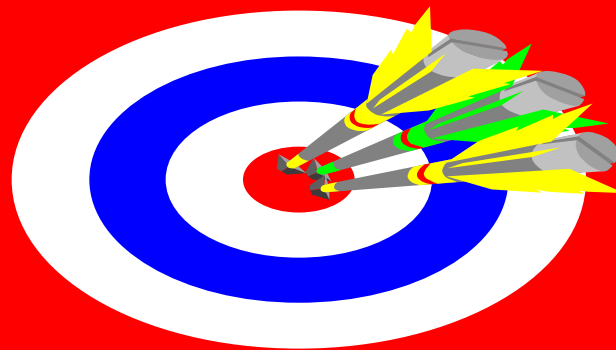
Explain the calibration of feed handling systems .

- How are feed handling systems calibrated?



# Feed handling systems

- Designed to be efficient and convenient
- all steps in feed handling and processing operations require close monitoring





# Initial Settings

- Rations require accuracy in metering, processing, grinding, and mixing ingredients
- initial settings for equipment can be found using tables provided by equipment manufacturer



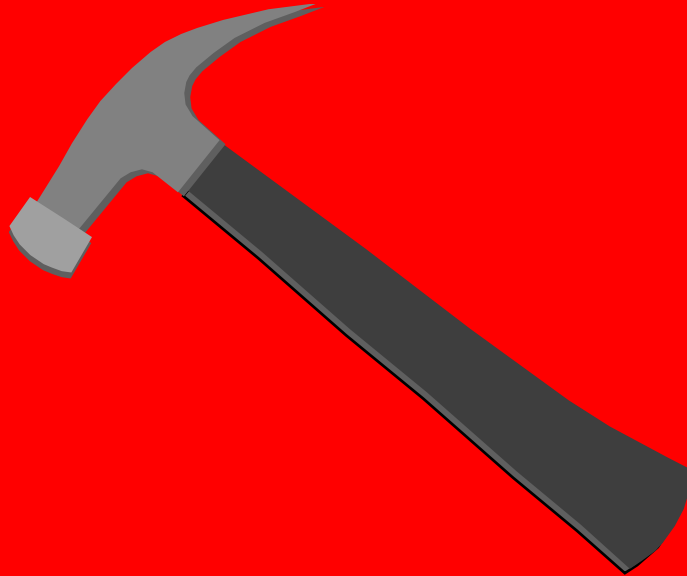
# Testing to insure quality

- Send in samples to test that the feed contains proper quantities of nutrients and additives.
- If feed is not ground sufficiently or ground too much, change the screen in the mill



# Dispensing Feed

- Dispensing feed in bunks, effort and care must be taken to spread the material evenly throughout the entire bunk





# Feeder Settings

- Daily observations can tell if the feeders are set properly
- excess feed around feeder the setting is open to much
- if feed is completely cleaned up, not enough of an opening is present

## Objective #3

# Describe the maintenance of feed handling systems.

- How are feed handling systems maintained?





# Feed handling systems

- To function properly, proper maintenance of equipment must be followed
- adequate and timely adjustments, repair, lubrication, protection from weather, and proper clean-up determine life of equipment



# Lubricant

- Important to select proper lubricant for the different parts of the machine
- should consider the function of each part has to perform
- daily inspection is essential to prolonged life of equipment

# Repair

- Any loose, bent, or broken parts



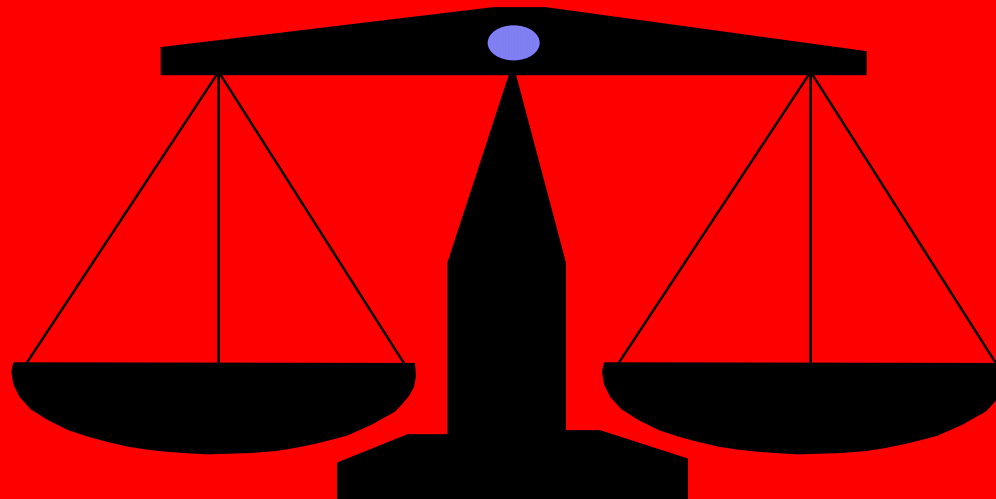


# Consult Operator's Manual

- Lubrication instructions
- locations of parts needing to be lubricated
- locate a lubrication chart and follow its directions
- use proper equipment and follow guidelines

# Numerous types and varieties of equipment used

- Maintenance guidelines found in operator's manuals should be used as a guide for determining maintenance







# Review

- How are feed handling systems operated?
- How are feed handling systems calibrated?
- How are feed handling systems maintained?