

# Digestion Analyzer Decision Tree

## TOP SCREEN

Goal of < 10% (< 20% Early Lactation)\*

Long forage particles

Whole/partial corn kernels,  
cottonseed, or soybeans

### Forage Analysis

Possible Causes

- Poor rumen mat formation
- Poor quality forage
- Sudden ration changes
- Inadequate degradable protein
- Inadequate fermentable NFC
- Excess unprotected fat
- Rumen acidosis

### Concentrate Analysis

Possible Causes

- Inadequate processing of grain
- Excess grain feeding rates
- TMR sorting
- Poor rumen mat formation
- Rumen acidosis

## MIDDLE SCREEN

Goal of < 20%\*

Excess medium  
forage particles

Partial corn kernels or grain;  
seed hulls

## BOTTOM SCREEN

Goal of > 50%\*

- Good rumen efficiency
- Optimal rumen nutrient balance
- Evaluate rapid byproduct passage
- Evaluate cow performance



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# Digestion Analyzer Instructions



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1 carrying pail, 22 quarts

3 clear PETG body rings

1 white base unit

1 pistol spray nozzle with 5 patterns

1 white flat-bottom measuring scoop, 2 quarts

1 manure screen with 3/16" dia. holes (top)

1 manure screen with 1/8" dia. holes (middle)

1 manure screen with 1/16" dia. holes (bottom)

1 box disposable gloves

1 sample ladle

# DIGESTION ANALYZER INSTRUCTIONS

## I. ASSEMBLY

- Place bottom screen (1/16" dia. holes) in the bottom of the white base (with feet) and insert clear body rings with tabs on top. Handle rods facing upwards.
- Place middle screen (1/8" dia. holes) in the top of the clear bottom ring and press into tabs.
- Place on top of bottom screen assembly.
- Place top screen (3/16" dia. holes) into the bottom of the top clear body ring and press into tabs.
- Place on top of the middle screen assembly.
- Make sure all screen sections are secure, and tighten one thumbscrew into each side of the top white ring to finish the assembly.

## II. SAMPLING DIRECTIONS

Using the sample ladle and 2-quart measuring scoop, collect manure from cows that are on the same diet. Sample and sieve manure from each group of cows separately.

- Collect "fresh" manure only.
- Do not allow contamination of the manure sample by feed or bedding in the pen.
- Take samples to represent at least 10% of the cows in the pen.
- Collect samples of all types of manure. Balance the proportion of loose and tight manure in the pen if inconsistency exists.
- Collect approximately 2 quarts of manure for the screening.

## III. BIOHAZARD REDUCTION

Be aware that biohazard risk is a concern when working with manure. It is important to minimize biohazard exposure when working with the Digestion Analyzer. It is also important to minimize biohazard transfer between facilities. The following are biohazard risk recommendations specific to use of the Digestion Analyzer:

1. Carry a container of disinfectant to each site. Products such as Amphyl<sup>®</sup>, Novasan<sup>™</sup>, Virkon<sup>®</sup> S, Tek-Trol, or other broad-spectrum disinfectants may be used. These are available from local veterinary farm supply stores or distributors.
2. Use gloves that are disinfected or disposable. Included in the kit is one box of disposable gloves. An acceptable alternative is the use of elbow-length rubber gloves. The elbow-length gloves provide extra protection over disposable, short gloves and are easier to use.
3. Use boots that are disposable or disinfected. If rubber boots are worn, bring a brush, bucket, and disinfectant to the site. Boots should be clean when you arrive or should be cleaned with disinfectant before entering animal facilities. Wash boots with disinfectant and brush before entering your vehicle.
4. No smoking, chewing tobacco, or eating while on the facilities. The key concern is fecal to oral contamination. Wash hands with soap before making any contact between hands and mouth. A paper facemask would further reduce the chance of fecal-oral transfer, but it is not required.
5. Perform manure screening away from feed or feed-preparation area.
6. Clean and disinfect all manure-contaminated equipment after use.

## IV. WET SIEVING

- Attach pistol spray nozzle to a garden hose. Use the "SHOWER" position to minimize difference in water pressure at different locations.
- Hold the 2-quart sample scoop at a 30° angle over the top of the Digestion Analyzer. Using the pistol spray nozzle, wash approximately 25% of the sample out of the scoop.
- Wash sample until the top screen is free of all small particles.
- Repeat steps 1-3 until entire sample is washed through the screens. If the middle and bottom screens plug while washing manure through the screens, do the following:
  - Fill the 22-quart container approximately 3/4 full with water.
  - Pulsate the Digestion Analyzer past the level of the lowest plugged screen until all water is removed, then proceed to the next screen.

**CAUTION:** When pulsating the Digestion Analyzer in the 5-gallon pail, the pressure in the downward thrust will force air through the top screen, potentially splattering the sample out of the screener.

## V. OBSERVATIONS AND INTERPRETATION

Interpretation of what is observed on each screen is subjective. Amounts of undigested materials on each screen may be affected by a number of factors including dry matter intake, level of effective fiber in the diet, rumen pH, and others. Utilize the Digestion Analyzer Decision Tree for general observations. Document date and results of each screening with a digital camera. Observe screening results over time to assess the impact of ration changes on diet digestibility.

1. Large particle size grains on the top screen. The significance of this depends on the effective fiber content of the diet and rumen pH generated for the ration. For example, if fiber content is adequate and rumen pH is good, you may want to process the grain to a smaller particle size to increase the energy content of the diet.
2. Cottonseed on the top screen. The amount of cottonseed retained on the top screen is not necessarily correlated to the production. However, it does seem to correlate with effective fiber content of the diet. The expected positive effects of a good rumen fiber mat on digestibility of linted cottonseed could explain this.
3. Large fiber particles on the top screen. Again, this does not necessarily correlate with low production. However, in combination with other observations such as foot problems, high levels of grains and NFC in the diet, and low rumen pH, you might conclude that this is consistent with acidosis.
4. Weed seeds on the middle or bottom screens. This is simply an indication that weed contamination is present in the diet and may alert you to a substandard source of forage. If you have experience in microscopic analysis of feedstuffs, you may want to examine the materials retained on the bottom screens with a magnifying glass. By doing this, you may be able to identify which dietary ingredients are apparently least digestible.

## VI. CLEANING AND SANITIZING (DISASSEMBLE COMPLETELY)

1. Tap screens lightly on their edges to remove excess manure residue.
2. Rinse and scrub all equipment until free of manure residues.
3. Place disassembled Digestion Analyzer back in the pail.
4. Fill pail with water (all parts completely submersed).
5. Add disinfectant at manufacturer's recommended rate and let stand for 10 minutes.
6. Dump out solution, rinse parts with water, and reassemble for next use.