Using Manure Evaluation as a Diagnostic Tool for Feeding Programs

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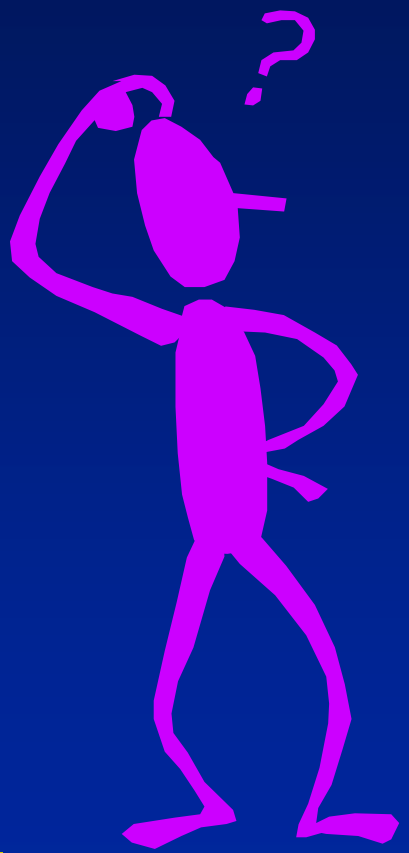
“Normal” is what you get used to.

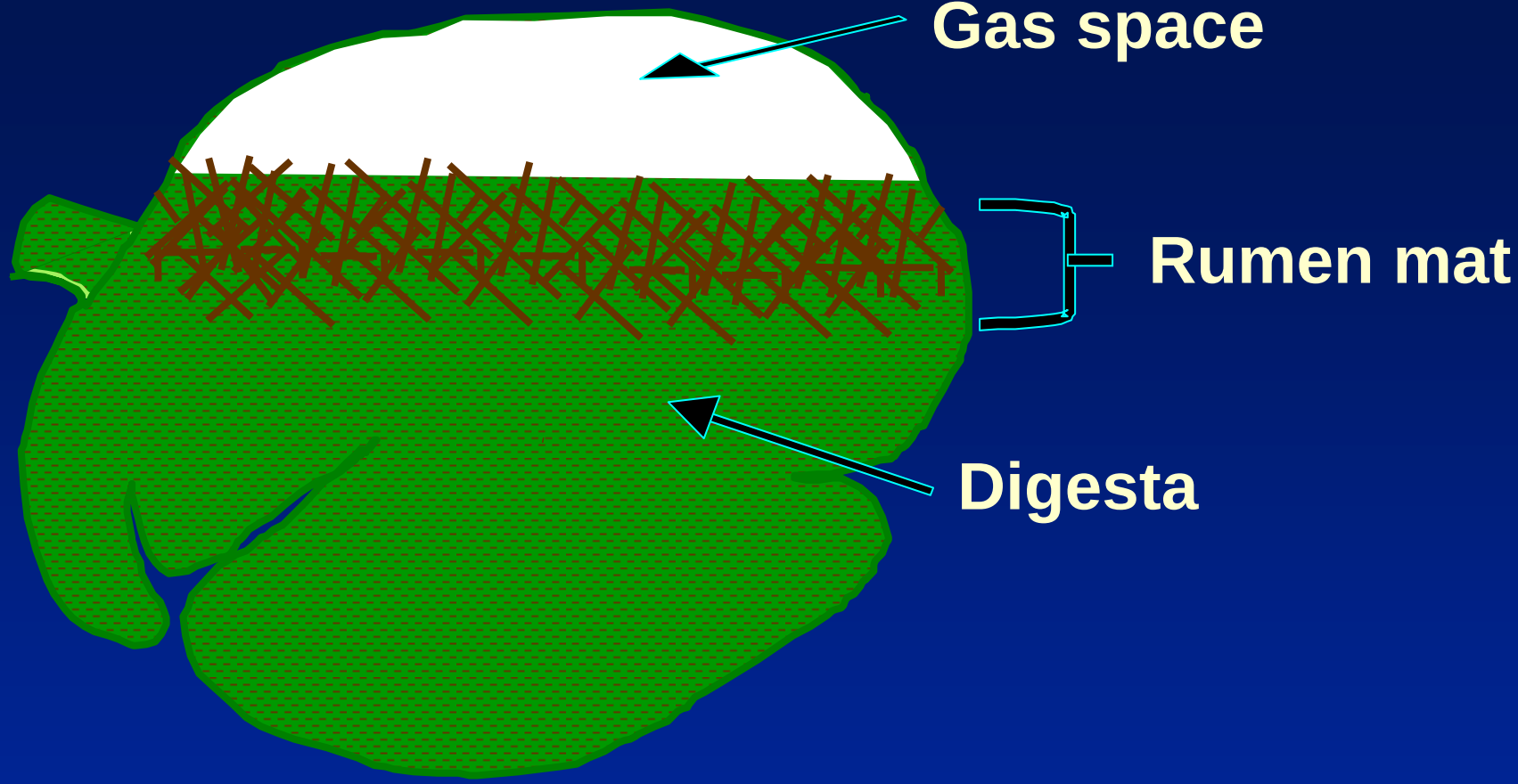


How do we evaluate whether it is really what we want?

Evaluating a Herd

- Cows: BCS, coat, lameness, rumination…
- Feed: Mold/dust, analysis, consistency, mixing, existence….
- Bunk: Mold, clean, fresh, heating, mixing, weigh back…
- Water: Clean, fresh, available…
- Facilities: Comfortable, used, clean, ventilatated…..
- Employees…..


The cows are always right.



The pH and the amount of time feed is retained in the rumen affects extent of feed digestion and fineness of particles in manure, especially for fiber.

Where Does Feed Digest?

Rumen (Fermentation)

Crude Protein
Carbohydrates
(NDF & NFC)

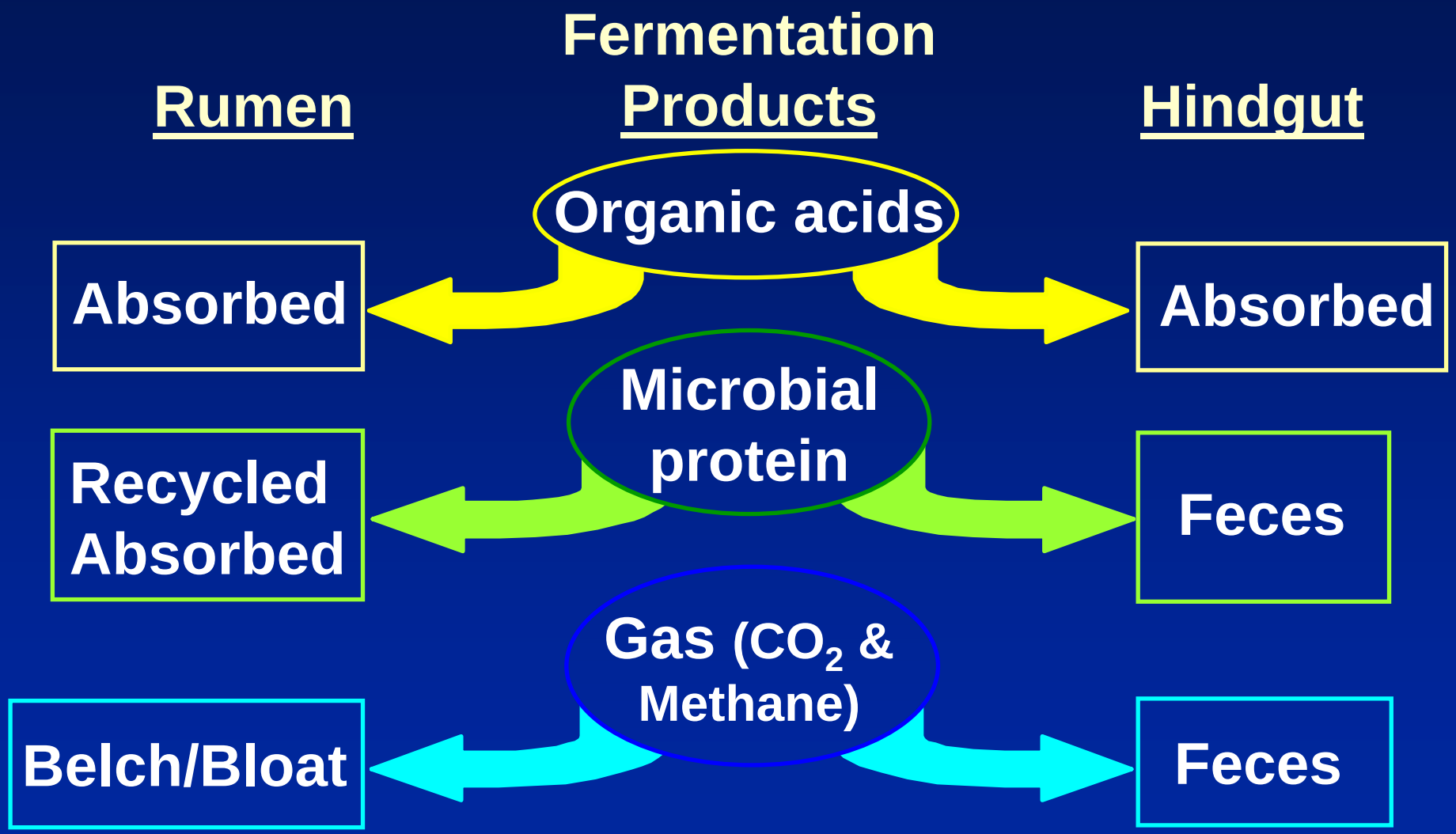
Small Intestine (Enzymic)

True Protein
Starch
Lipids

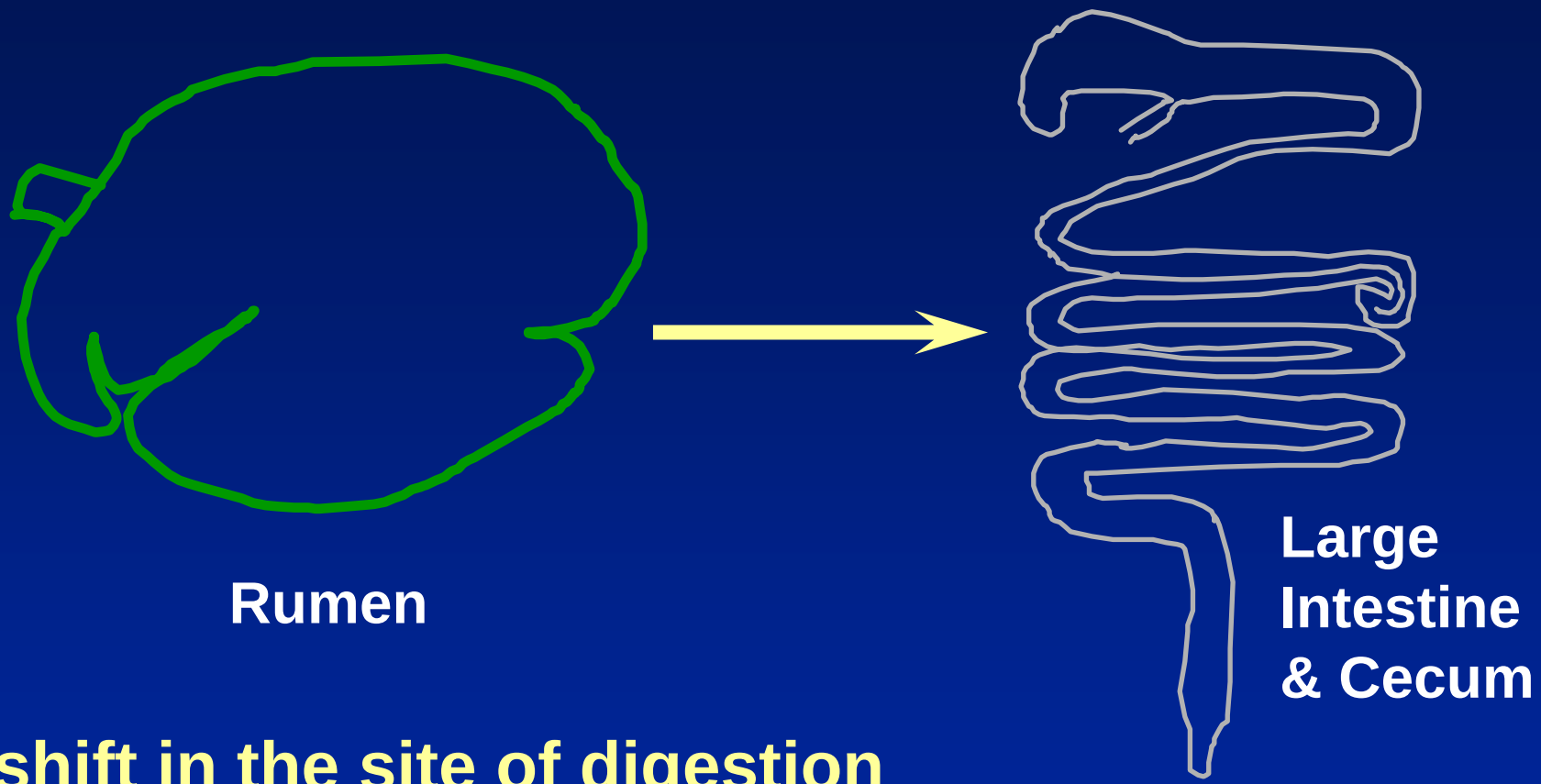
Cecum & Large Intestine

Crude Protein
Carbohydrates
(NDF & NFC)

Fates of Fermentation Products



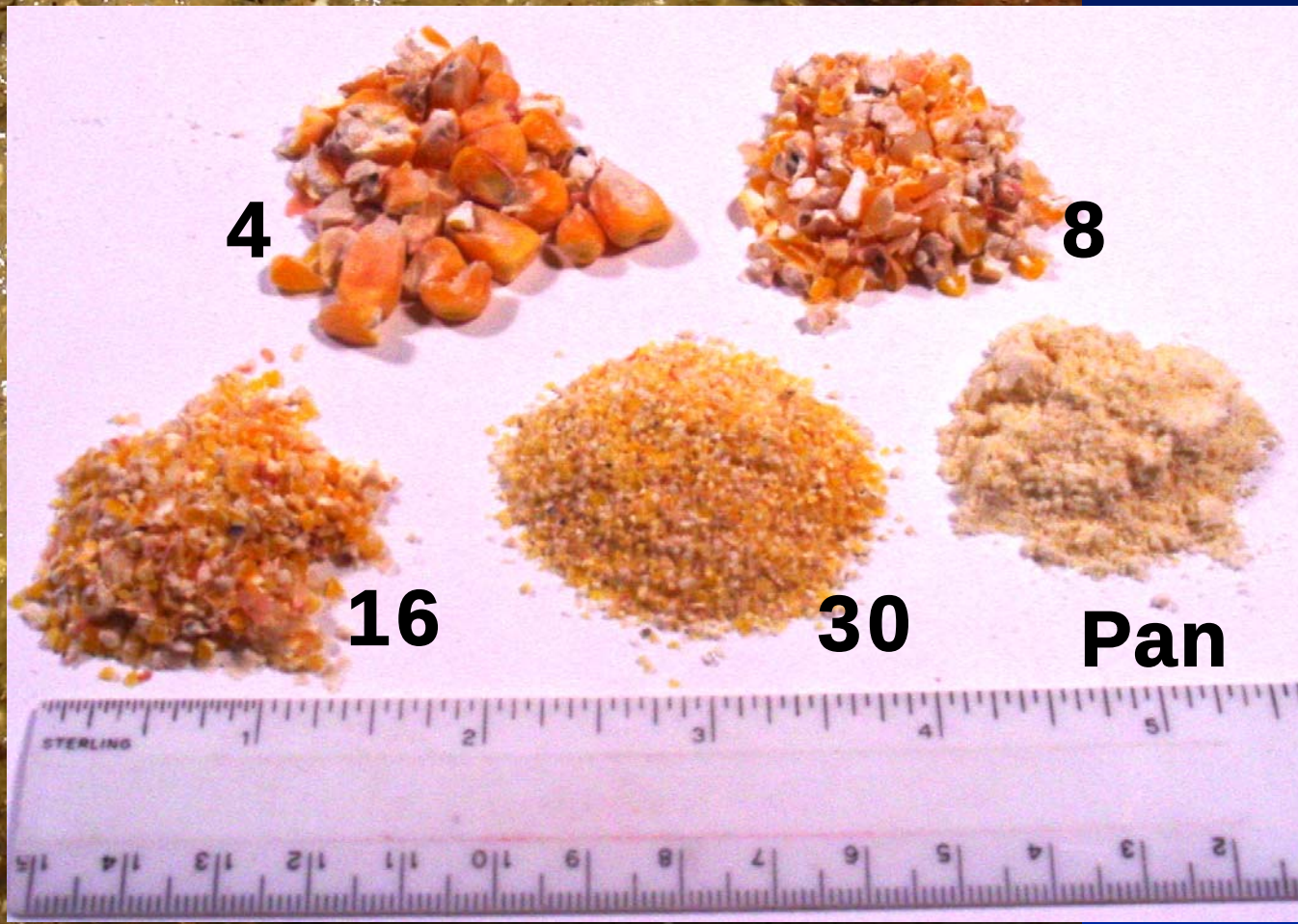
Where Does The Feed Ferment?

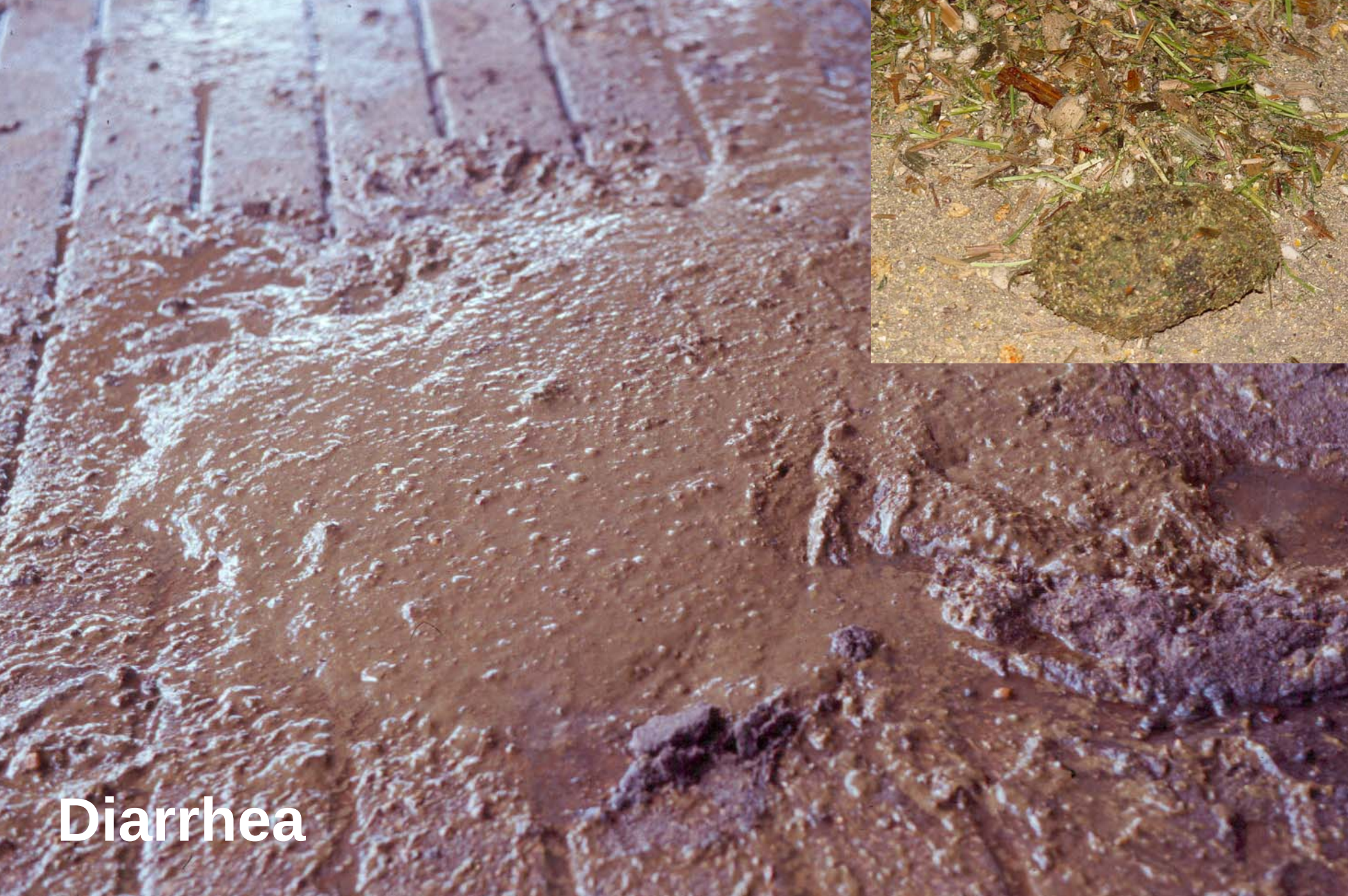


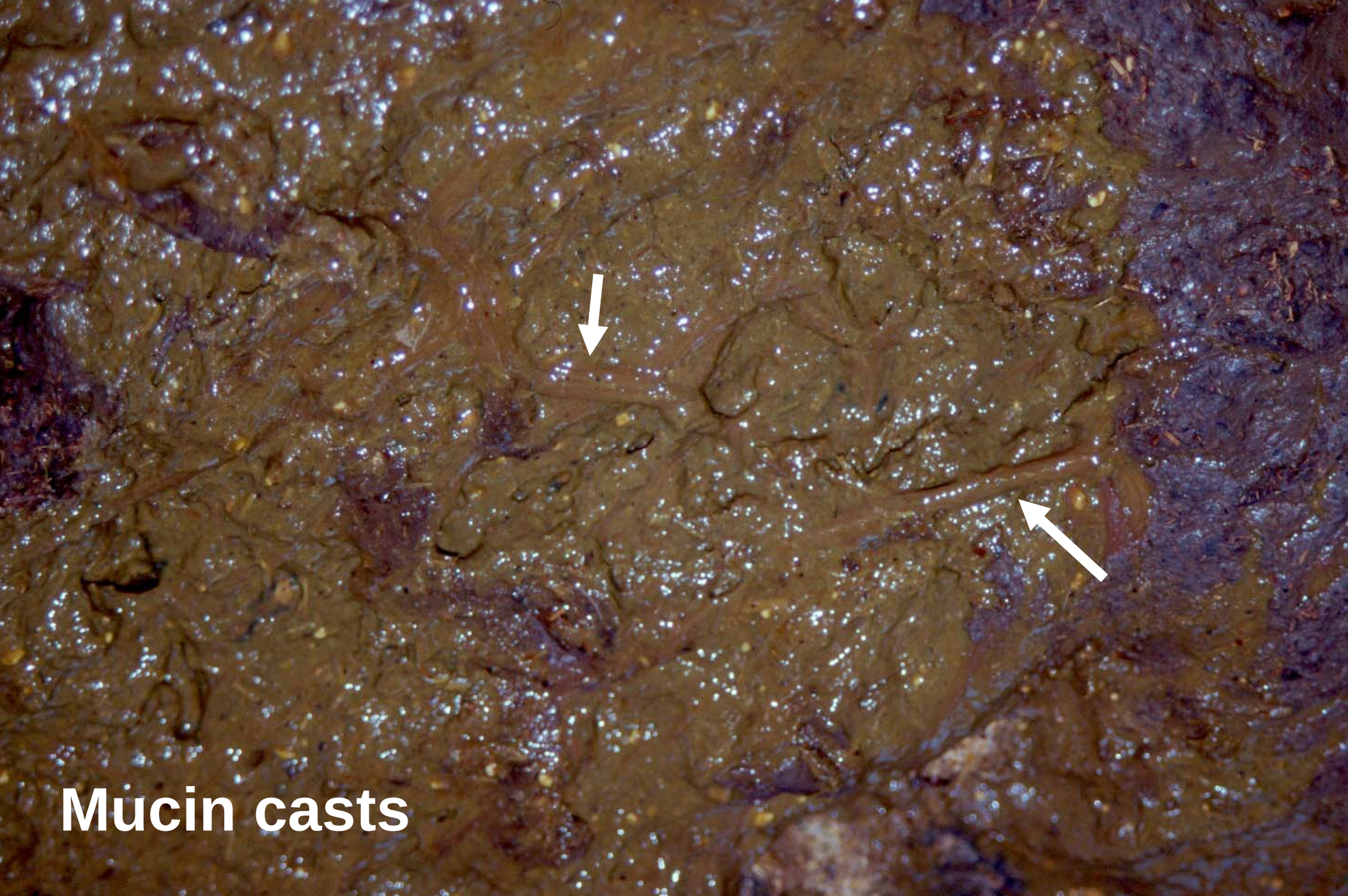
A shift in the site of digestion changes nutrient supply & causes some of the symptoms of ruminal acidosis.

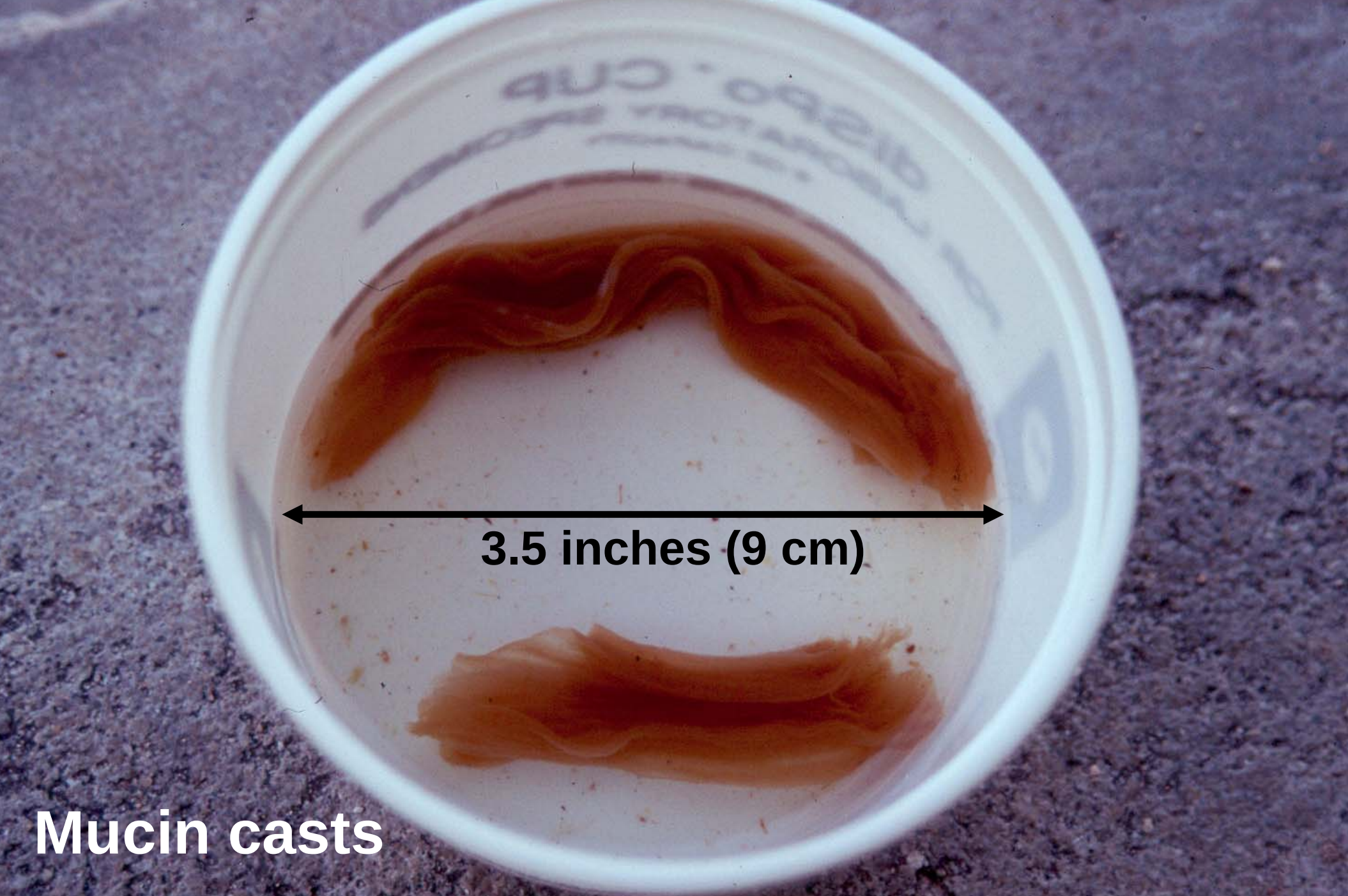
Foamy manure with ground grain

Coarsely ground grain in manure

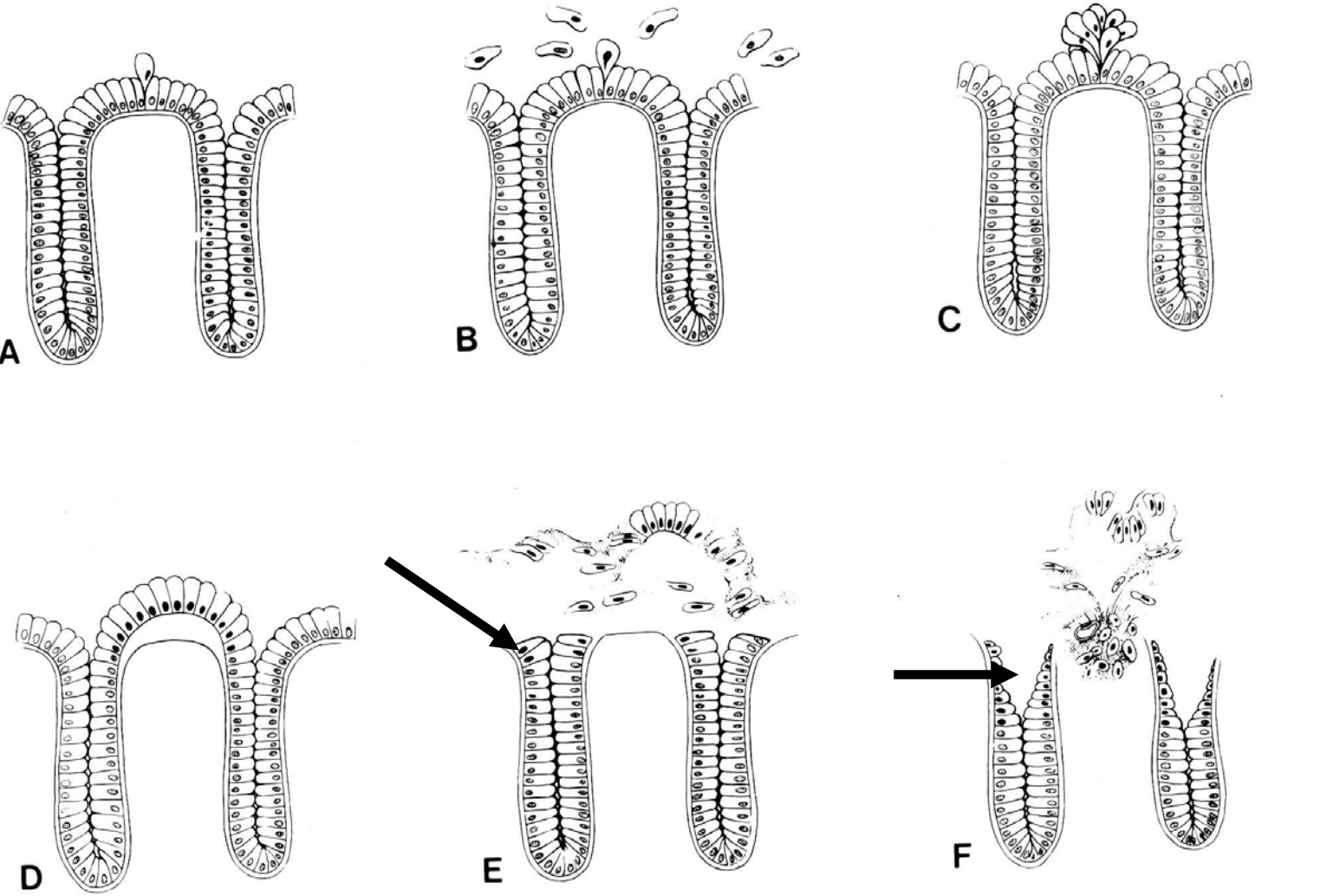



Diarrhea


Mucin casts



Mucin casts



Damaging the lining of the large intestine creates mucin casts.

This can happen due to too much hindgut fermentation.

Henrikson et al., 1989. Laboratory Investigation 60:72-87

Walking the pens

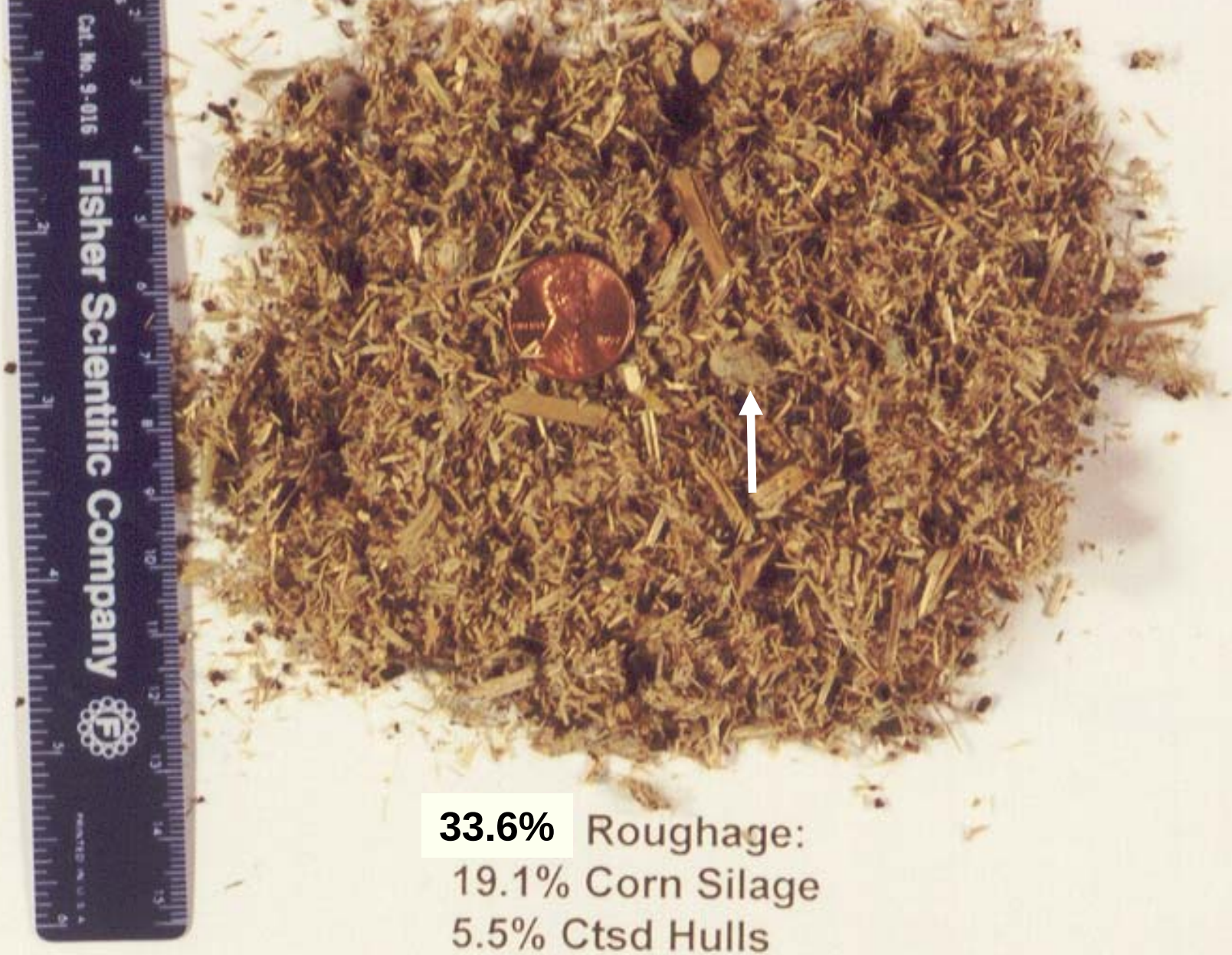
- Get an idea of the variation
  - In groups
  - Between groups
  - Between rations
- Sample 4-6 pies/group for particle size

Qualitative Not Quantitative

- Manure probably varies somewhat over 24 h.
- No way to know amount produced to precisely quantify what you sampled.

Good

Bad

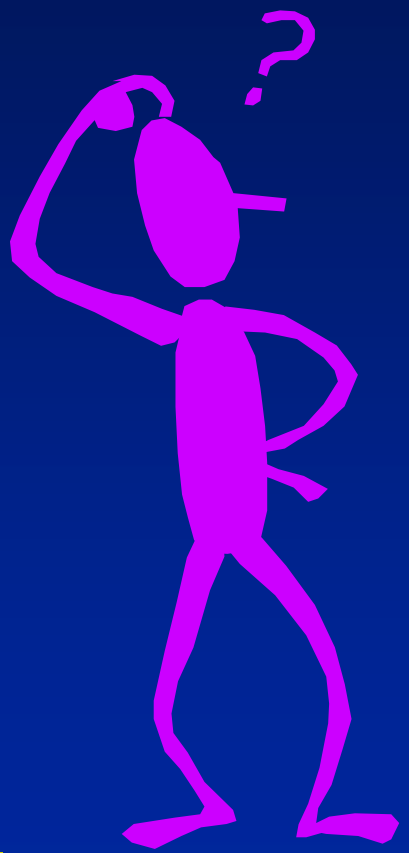


33.6% Roughage:
19.1% Corn Silage
5.5% Ctsd Hulls
9.0% Alfalfa Hay

Large Particle Passage

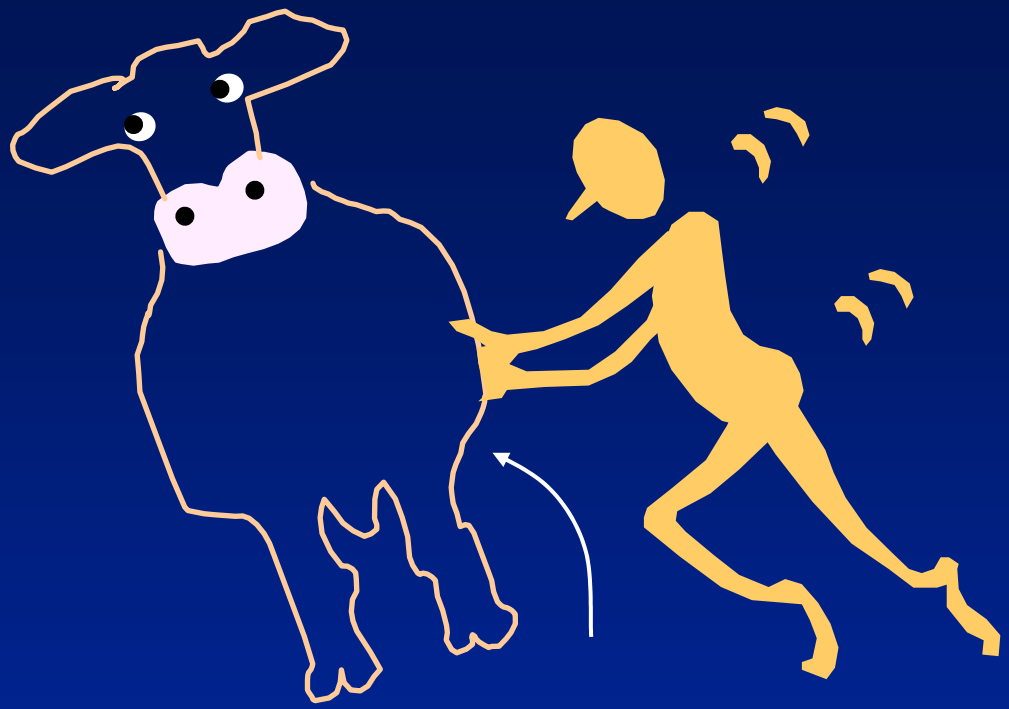

LIBERTY

Differences in the amount of solids in a set volume reflect differences in the amount of gas or liquid in the manure.

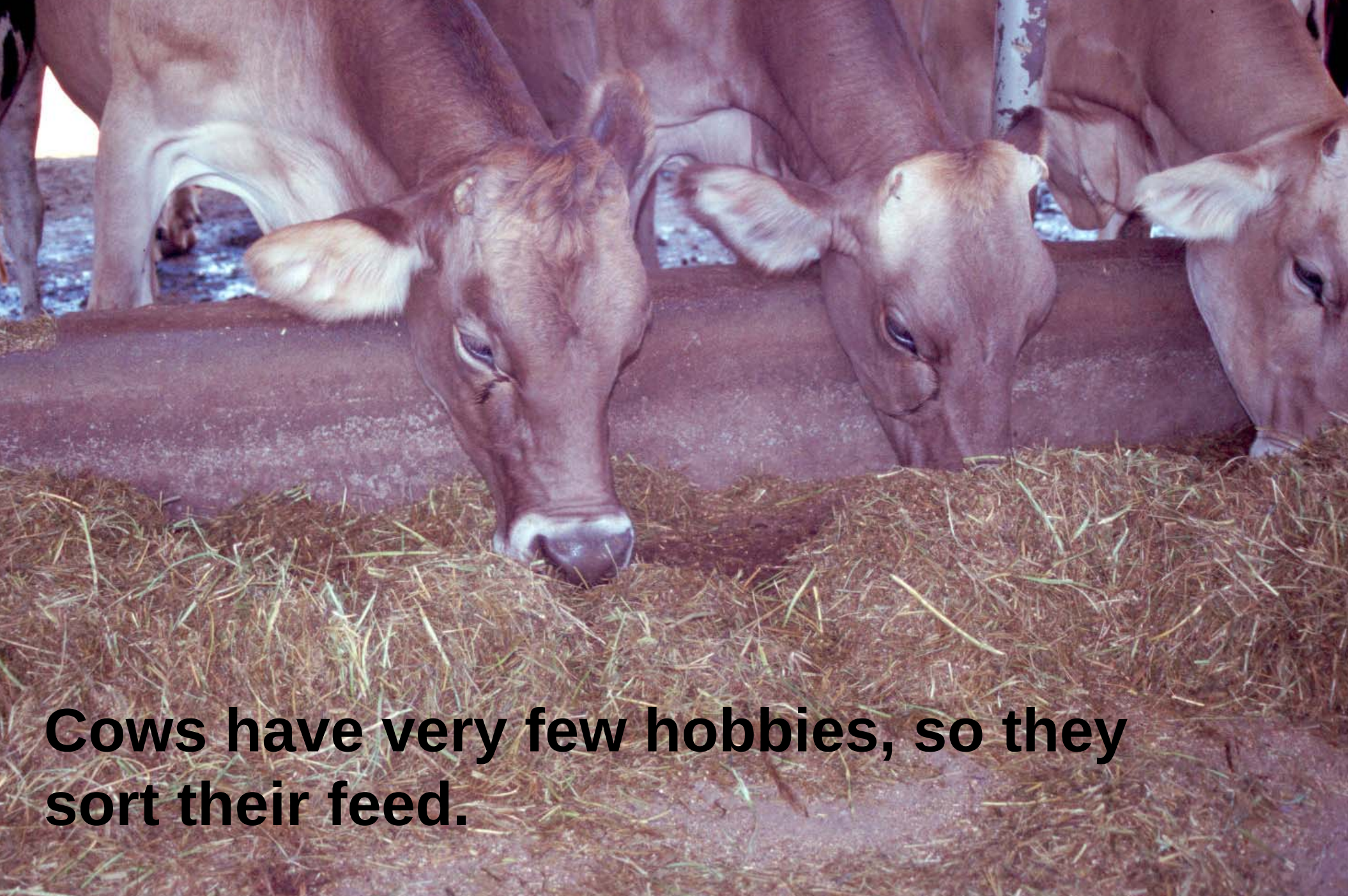


What could cause what we see?

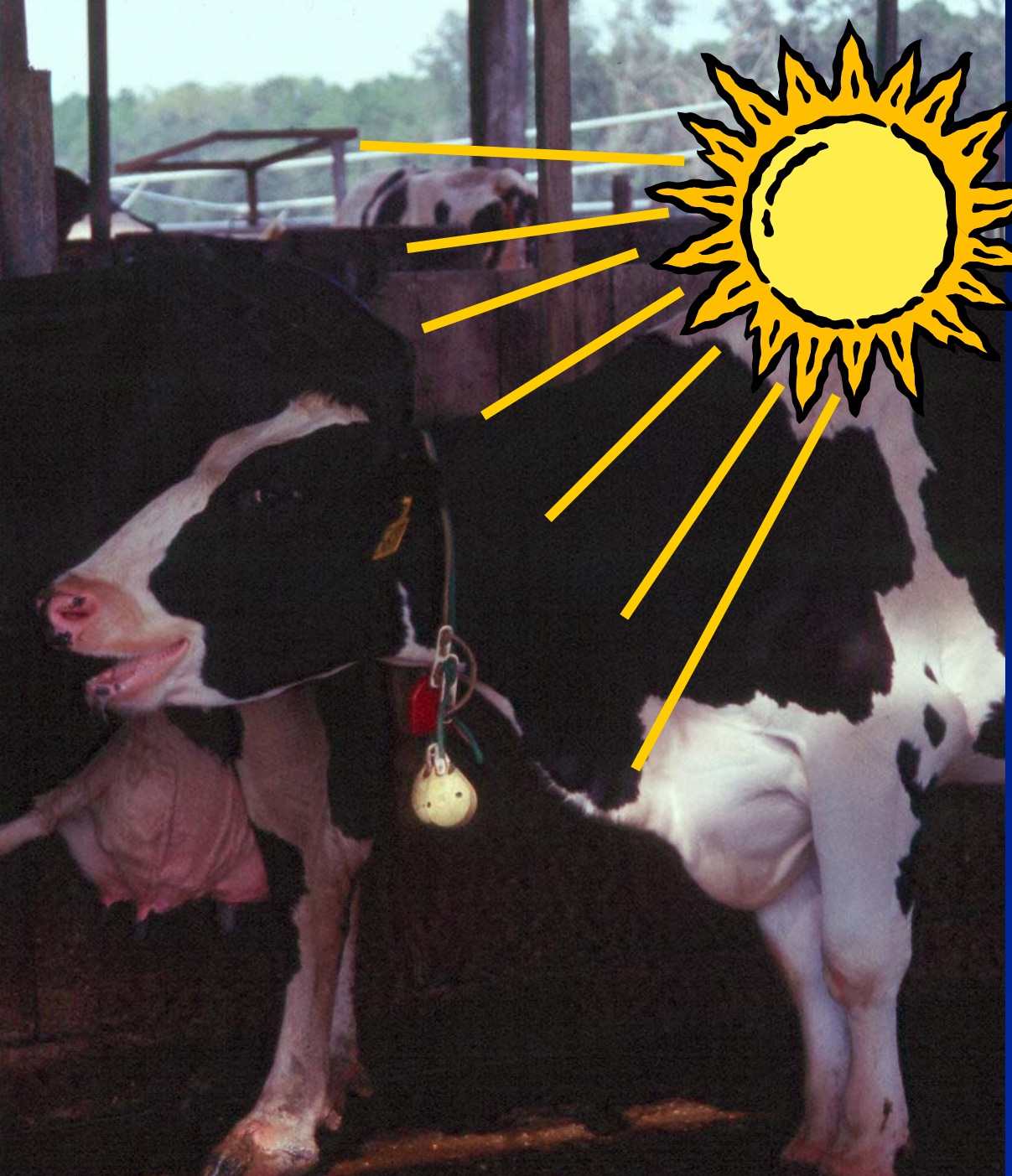
How do we fix it?



Aiming for an energy number without due consideration of fiber, effective fiber, and type of energy (starch, fat, sugars, etc.).


Cows have very few hobbies, so they sort their feed.

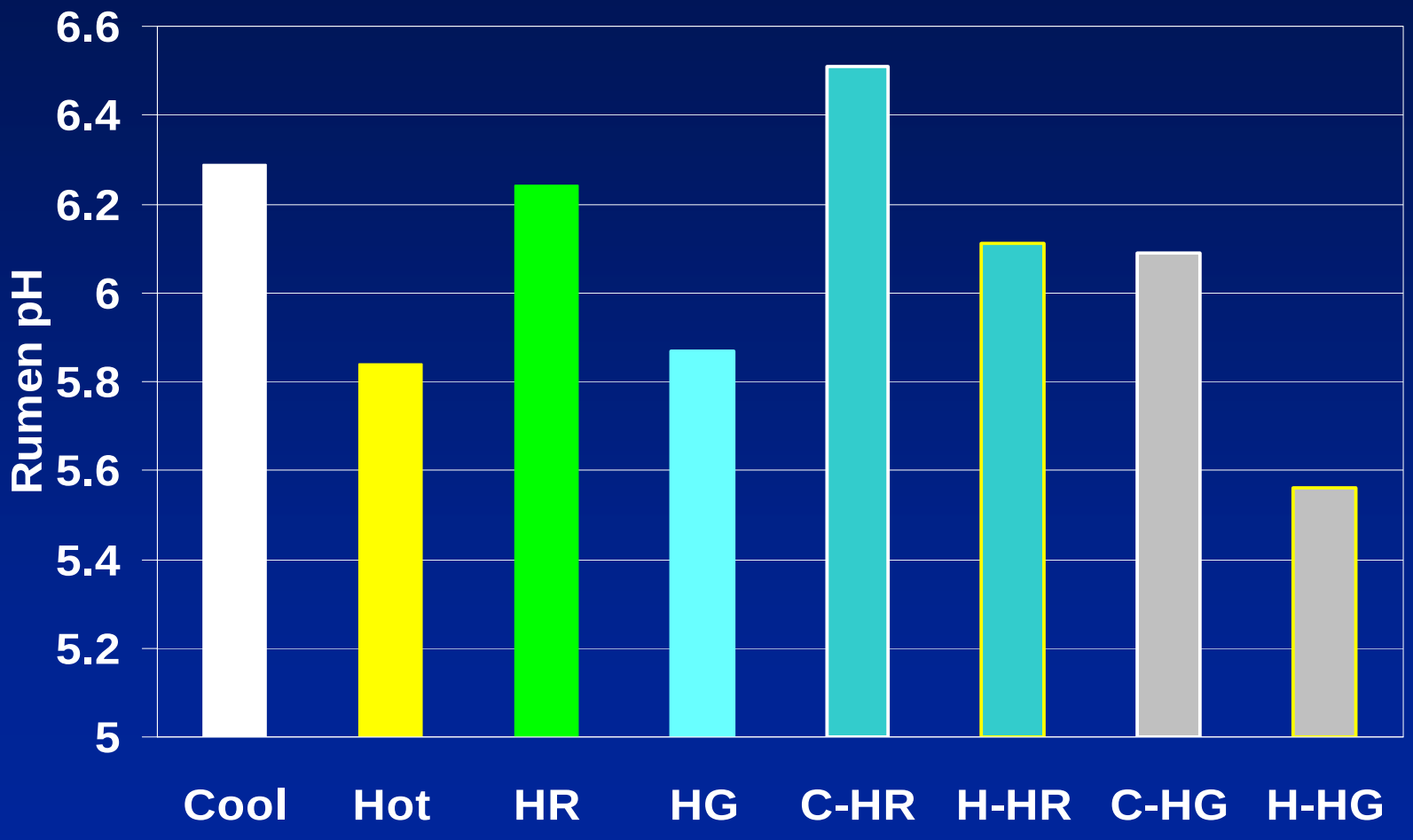

2711
3131



Heat Stress causes ruminal acidosis.

- Panting
- Decreased rumination
- Drooling
- Slug feeding
- Sorting

Ruminal Response to Heat Stress

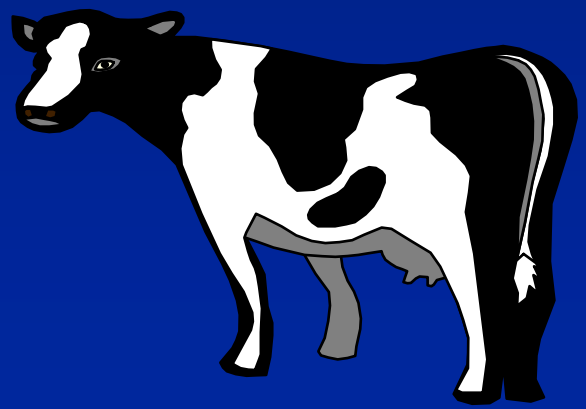


Cool = 18.3C (65F), Hot = 29.4C (85F)
HR = high roughage, HG = high grain

Mishra, et al. 1970
J. Anim. Sci. 30:1023

Things to Consider

- Different NFC may differ in ruminal effects.
- The cow is the only one who knows what effective fiber is and how much is enough.
- You can't evaluate NFC x fiber adequacy / healthfulness without looking at the cow.
- It's got to make sense.



In Context

- Manure appearance
- Fecal particle size
- Undigested feed
- % Rumination
- Eating behavior
- Animal health
- Production
- Environment
- Management
- ……

➢ Use these together to build a case as to what ration or management changes are needed.