

**U.G. (4<sup>th</sup> Year B.V.Sc. & A.H.) Class**

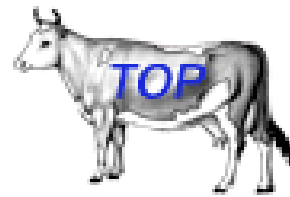
## **Rumen Fluid Examination**

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## **Indication of Ruminal fluid examination**

- ➔ Diagnosis of ruminal diseases**
- ➔ Evaluation of ruminal fluid before use in therapeutic transfusion**

# Methods of collection



**Needle puncture of the rumen (Rumenocentesis)**



**Oral or nasal passage of stomach tube (Orogastric method)**

## Preparation of instrument

- ① Unscrew the suction strainer and see that the perforations at the end of the nylon tube are clean.
- ② Check the suction pump for its working condition.
- ③ Tighten all joints properly to prevent air leakage.
- ④ Check the entire set by dipping the suction strainer into a bucket of water and operating the suction pump.
- ⑤ Apply the liquid paraffin over the stainless steel spiral sound.

# Collection method

Restrain the animal with nose grips



Open the mouth by pulling the tongue to one side



Hold the head of the animal high & introduce the spiral sound



Collect the RF by operating the suction pump

| GOOD PASSAGE                      | BAD PASSAGE                        |
|-----------------------------------|------------------------------------|
| Gurgling sounds heard             | Coughing                           |
| Smell of rumen fluid (sour-sweet) | Air passage thru speculum is noted |

# General precaution for rumen fluid examination

- About 200ml of RF sample is to be collected for various tests
- During collection discard the first collection of RF, so that error in pH can be minimised.
- Samples should be evaluated directly after collection to minimize effects of cooling and air exposure on protozoal activity.

OR

- After collection, RF container should be immediately closed air tight.
- Transportation of ruminal fluid for long distance must be done in double jacket container.
- Estimation of chloride and ammonia conc. can be delayed up to 9 hrs.in room temp. and up to 24 hrs. in refrigerator.

# Examination of ruminal fluid



## Physical Character

- ☞ **Color**
- ☞ **Consistency**
- ☞ **Odor**
- ☞ **Sedimentation activity test**

## Chemical Character

- ☞ **pH**
- ☞ **Cellulose digestion test**
- ☞ **Glucose fermentation test**
- ☞ **Nitrate reduction test**
- ☞ **Rumen fluid chloride**
- ☞ **Methylene blue reduction test**
- ☞ **Volatile Fatty Acids (VFA)**

## Microscopical exam

- ☞ **Quantitative exam**
- ☞ **Qualitative**

# Physical characters

## Color

### Normal :

**Pure green**

- In Grazing

**Yellowish brown**

- In straw feeding

**Grey/brownish green**

- Concentrate and straw feeding

### Abnormal:

**Dark brown/Dark green**

-Simple inactivity of flora

- Ruminant acidosis

**Slightly milky**

- Chronic rumen acidosis

**Milky green**

-Acute rumen acidosis

**Dark green**

- Hydrochloric acidosis

**Greenish black**

- Vagus indigestion



# Consistency

**Normal:** Slightly viscous

## Abnormal:

|               |                                  |
|---------------|----------------------------------|
| Watery        | - Inactive bacteria or protozoa) |
| Excess frothy | - Frothy bloat                   |
| Semiliquid    | - Vagus indigestion              |

# Odor

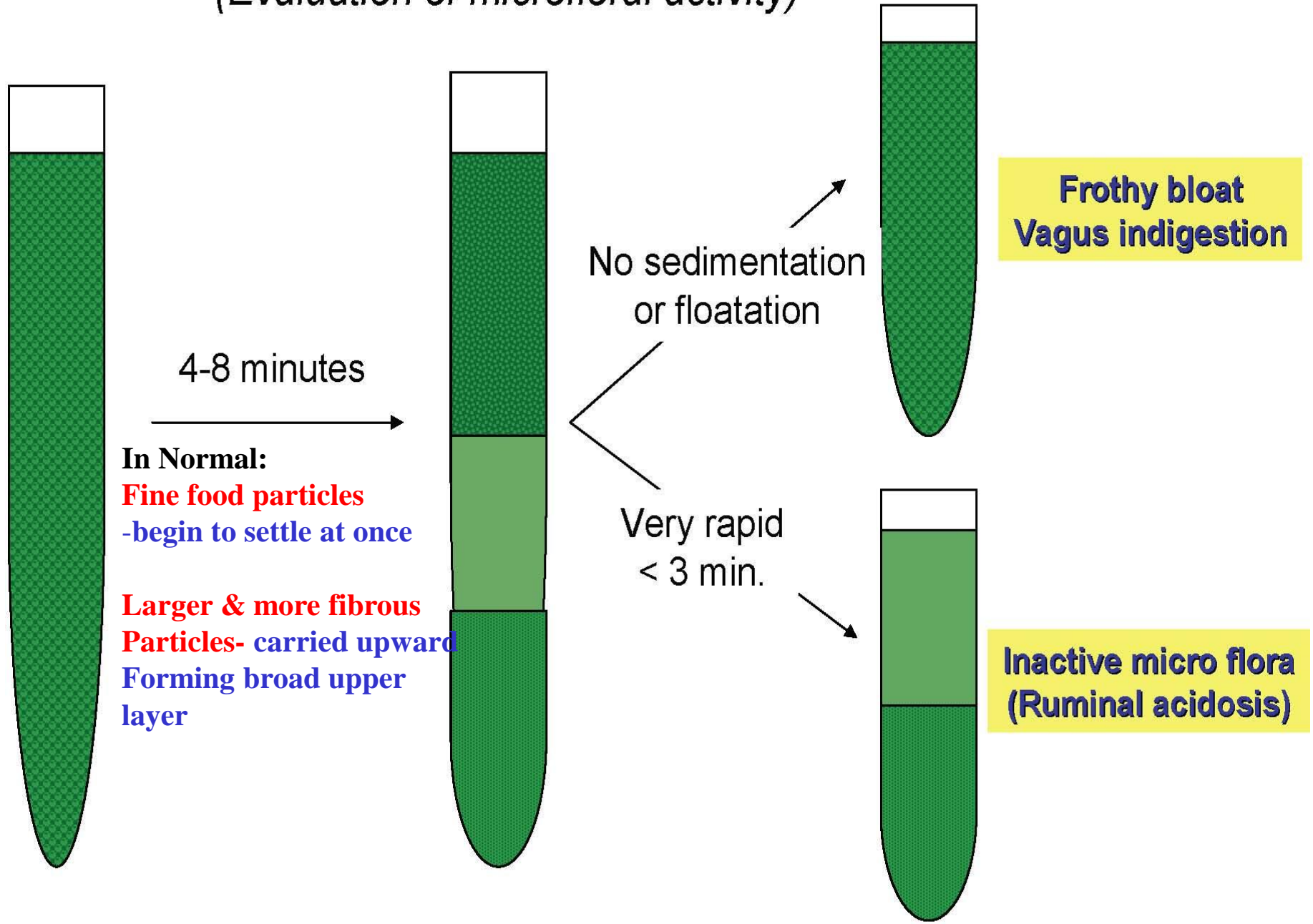
**Normal:** Aromatic odor

## Abnormal:

|               |  |
|---------------|--|
| Ammonia smell | - Urea poisoning                       |
| Moldy rotting | - protein putrefaction                 |
| Sour odor     | - excess lactic acid/grain overfeeding |
| Musty/Feecal  | - Vagus indigestio                     |

# -Sedimentation activity test

(Evaluation of microfloral activity)



# Ruminal fluid pH

**Normal:** ranged between 5.5 –6.5 (grain feeders) and 6 –7 (green fodders)

**Abnormal:**

**Elevated pH (Rumen alkalosis)-upto 8.5**

- Simple indigestion
- Urea indigestion
- Putrefaction of ruminal content

**Lowered pH (Rumen acidosis) - 4.0-5.5**

- Grain overfeeding
- Chronic ruminal acidosis

# Ruminal flora and fauna

Anaerobic  
fermentation

Digestion of  
fibers

Digestion of  
carbohydrates

Digestion of  
protein

Methylene  
blue reduction  
test

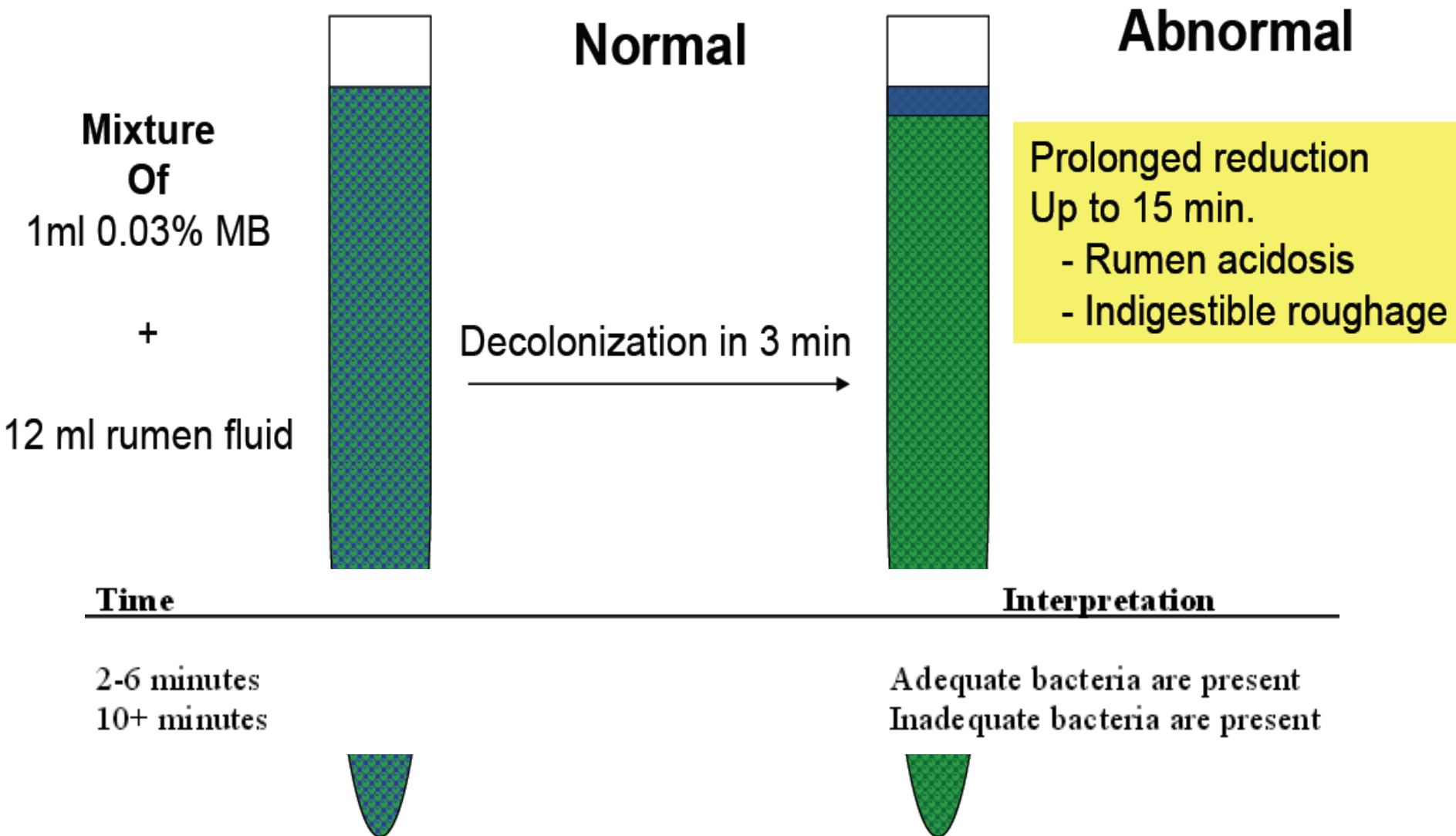
Cellulose  
digestion  
test

Glucose  
fermentation  
test

Nitrate  
reduction  
test

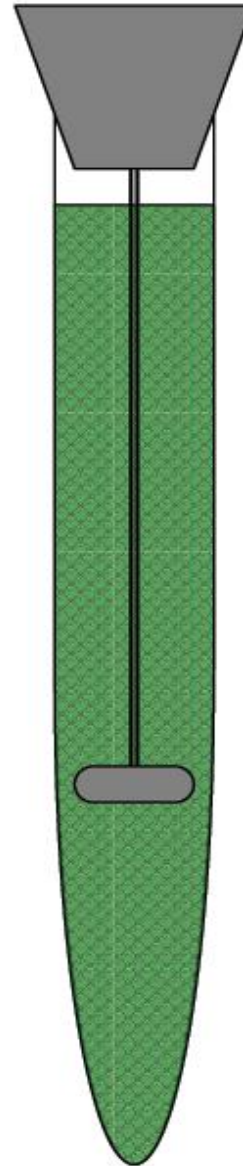
# - Methylene blue reduction test

Blue Reduction tests may be done to assess the number of functional anaerobic bacteria available within the rumen

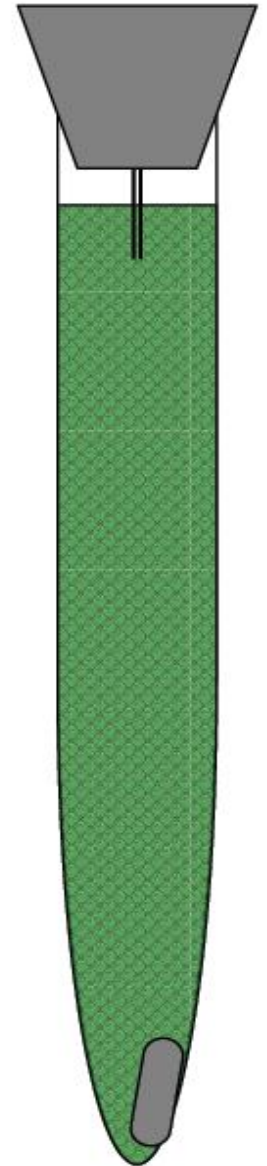


# - Cellulose digestion test

**Mixture  
Of**  
0.3 ml 16% glucose  
+  
10 ml rumen fluid



(48 hrs.)



# Glucose fermentation test

**10ml Rumen fluid + 0.5ml of 16% Glucose**



**Place the mixture in a fermentation saccharometer**



**Keep the saccharometer at 39°C**



**Read the results after 30-60 min**

(The test measure indirectly the ability of ruminal flora to ferment glucose through measuring the volume of formed gas)

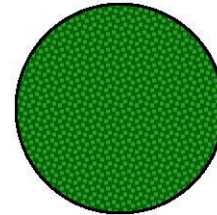
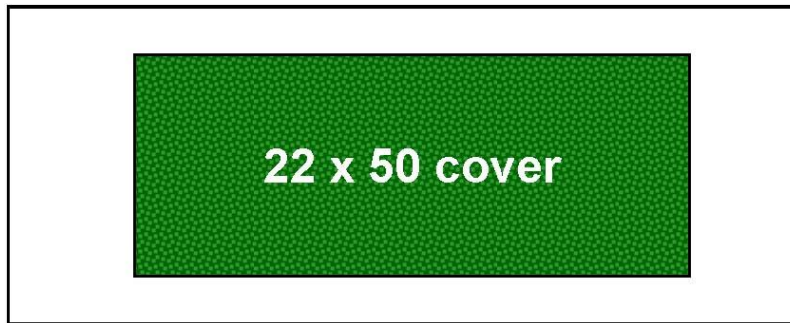


1. Normal microflora: **1-2 ml** gas production/ 1hour

2. Inactive microflora: little or no gas formation

# MICROSCOPIC EXMINATION

Qualitative:



| Motility                           | Activity |
|------------------------------------|----------|
| -Highly motile and very crowded    | +++      |
| -Motile and crowded                | ++       |
| -Sluggish motility and low numbers | +        |
| -No or sporadic alive fauna        | 0        |



Quantitative:

TBC- plating with serial dilutions

# THANK YOU

## Coronavirus: How to stay safe



Wash your  
hands  
regularly



Sneeze/  
cough into  
a tissue



Bin it!  
Throw your  
tissues away  
immediately



Sneeze/  
cough inside  
your elbow