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)

clusão 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 nylong tube are clean.
2. Check the suction pump for its working condition.
3. Tight the all joints properly to prevent the 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

1. Restrain the animal with nose grips
2. Open the mouth by pulling the tongue to one side
3. Hold the head of the animal high & introduce the spiral sound
4. Collect the RF by operating the suction pump

<table>
<thead>
<tr>
<th>GOOD PASSAGE</th>
<th>BAD PASSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gurgling sounds heard</td>
<td>Coughing</td>
</tr>
<tr>
<td>Smell of rumen fluid (sour-sweet)</td>
<td>Air passage thru speculum is noted</td>
</tr>
</tbody>
</table>
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
  - Ruminal acidosis
- Slightly milky - Chronic rumen acidosis
- Miky 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/Feacal - Vagus indigestion
In Normal:

- Fine food particles begin to settle at once
- Larger & more fibrous particles carried upward
- Forming broad upper layer

4-8 minutes

- Frothy bloat
  - Vagus indigestion

- No sedimentation or floatation
- Very rapid < 3 min.

Inactive micro flora (Ruminal acidosis)
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
  - Methylene blue reduction test
- Digestion of fibers
  - Cellulose digestion test
- Digestion of carbohydrates
  - Glucose fermentation test
- Digestion of protein
  - 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.

**Mixture Of**
1 ml 0.03% MB
+ 12 ml rumen fluid

**Normal**
Decolonization in 3 min

**Abnormal**
Prolonged reduction
Up to 15 min.
- Rumen acidosis
- Indigestible roughage

**Time**
2-6 minutes
10+ minutes

**Interpretation**
Adequate bacteria are present
Inadequate bacteria are present
- 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/ 1 hour

2. Inactive microflora: little or no gas formation
## MICROSCOPIC EXMINATION

### Qualitative:

![22 x 50 cover](image)

<table>
<thead>
<tr>
<th>Motility</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Highly motile and very crowded</td>
<td>+++</td>
</tr>
<tr>
<td>-Motile and crowded</td>
<td>++</td>
</tr>
<tr>
<td>-Sluggish motility and low numbers</td>
<td>+</td>
</tr>
<tr>
<td>-No or sporadic alive fauna</td>
<td>0</td>
</tr>
</tbody>
</table>
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