

## **In Situ Procedure: Rumen Digestibility Studies**

### **Materials:**

Dacron Bags, 10 x 20 cm (forage samples) or 5 x 10 cm (concentrate samples)

Ankom Company, Fairport, NY (716-425-3940)

Mesh Bags (lingerie bags), 36 x 42 cm polyester with zipper

Heat Sealer, 8 inch

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Animals with rumen cannulas, 4 inch

At least 2 animals should be used. Animals should be adapted to the diets for a minimum of 10 days before incubations begin. Animals should remain on a normal feeding schedule and have free access to water.

### **Sample Preparation:**

Samples should be dried and ground through a 2 mm screen.

### **Procedure:**

1. Label bags, in duplicate, with a permanent black marker. Other colors fade in the rumen.
2. Weigh quadruplicate (one set of duplicate bags for each animal) 5 g sample for forages and 2-5 g sample for concentrates into Dacron bag. Record exact weight. Weigh one blank (empty) bag for every time point.
3. Seal bag with heat sealer. Seal bag near the top in 2 parallel lines.
4. Place bags in mesh bag and close.
5. All bags (within the mesh bag) should be pre-soaked in 39 °C water for 20 minutes before placing in the rumen.
6. Insert pre-soaked mesh bag with samples into the rumen under the hay mat. Lead string should be kept outside the rumen and rumen plug inserted.

**Note:** To achieve the various incubation times, bags are inserted in reverse order of the incubation length (for example: for incubation times of 2, 8, 16, 24, 48, and 96 hours, insert the 96 hour bags first, then the 48 hour, and so on). In this manner, all bags will be removed from the rumen at the same time. Any 0-hour bags may simply be soaked in the warm (39 °C) water prior to the washing sequence that follows.

### **Rinsing Sequence:**

1. Rinse bags with a hose to remove any large particulate matter from the rumen.
2. Remove heat-sealed bags from the mesh lingerie bag and place in a top loading washing machine.
3. Using the **delicate** cycle, fill the machine to as close to 45 liters (low level) as possible with **cold** water, agitate 1 minute, drain, and spin 2 minutes. Repeat this cycle at least 5-10 times.

### **Drying Procedure:**

1. Bags should be allowed to drip dry.

2. Place bags in forced air 60 °C oven for 8-16 hours.
3. Air equilibrate bags for about 2 hours prior to weighing. All weights should be obtained on an air-dry basis because the Dacron bags are hygroscopic and the ability to obtain accurate moisture-free weights are compromised.

**Calculations:**

*Blank correction = Blank bag Wt. before incubation – Blank bag Wt. after incubation*

$$\% \text{ Disappearance} = \text{Sample Wt.} - \frac{(\text{Bag} + \text{Sample}) - \text{Bag} - \text{Blank correction}}{\text{Sample Wt.}}$$