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RUMEN DIGESTION PARAMETERS IN LAMBS FED WITH PELLETED DIET

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The experiments were carried out with 4 rumen fistulated lambs (Bulgarian aboriginal sheep) aged 20 days-7 months. The lambs were fitted with rumen fistulae at the age of 15 days. After 20 days, the lambs were separated from their mothers. They were allowed to suckle for 20 minutes (at 07.30 h. and at 13.30 h.) and the rest of the time they were fed with pelleted feed containing 25 % alfalfa meal, 35 % maize, 9.9 % barley, 7.2 % wheat, 21.5 % sunflower oil meal, 0.5 % limestone, 0.5 % vitamin mixture and 0.4 % salt. At one month of age, the average daily ration was 0.200 kg pelleted feed and at the age of 4 months, 0.400 kg. The pelleted feed was given twice daily at 07.30 h. and at 13.30 h. At the age of 3 months, the lambs were weaned. When the lambs were 5 months old, the pellets were replaced with 0.4 kg meadow hay and 0.400 kg concentrate mixture (30 % oats, 40 % barley, 15 % maize and 15 % sunflower oil meal). Water was constantly available. Ammonia and volatile fatty acids (V F A) concentration, pH value, number and generic composition of protozoa in the rumen were measured in lambs at the age of 1, 2, 4, 6 and 7 months ; before feeding, 2, 4 and 6 hours after feeding.

Results

It was determined that the ammonia concentration reached its highest level in one month old lambs, 13.31 ± 1.90 to 20.23 ± 21.00 mg/100 ml (fig. 1). Ammonia concentration decreased sharply at the second month of age ($P < 0.001$). Up to 4 months of age (feeding with pelleted feed) no significant changes in the ammonia concentration were noticed at the times mentioned above. During the next period (6-7 months) ammonia concentration increased the second hour after feeding. V F A concentration was at a minimum at 1 month (2.40 ± 0.26 to 3.05 ± 0.27 mmol/100 ml) (fig. 2) and later, it increased gradually with age. V F A concentration was lowest at the first sampling time, i.e. before feeding, and after feeding, the concentration was higher.

At 4 months of age, the molar percentage of acetic acid (C_2) was between 40.57 and 57.88, and at 6 months, it was between 59.34 and 63.63 (fig. 3). The molar percentage of propionic acid (C_3) was highest in 3 month old lambs. 4 hours after feeding, it was almost equal to the molar percentage of acetic acid, especially at the age of 3 and 4 months when the consumption of pelleted feed was high. The molar

percentage of butyric acid (C_4) tends inversely to that of propionic acid. The molar percentage of isovaleric acid (iso- C_5) is rather high at 2 months of age, when milk is used as feed, and a considerable part of it goes into the rumen (fig. 3).

The pH value increased sharply in comparison with the ordinary diet (fig. 4), when the pelleted diet was offered.

The number of protozoa at 1 month of age was $136,890 \pm 12$ to $222,220 \pm 25$ /ml. From 2 to 4 months of age, protozoa in rumen con-

tents were absent. In 6-7 month old lambs fed an ordinary ration, the protozoa number was $179,670 \pm 24$ to $486,000 \pm 88$ /ml (fig. 5).

The greatest percentage of total protozoa was for *Entodinium*, (86.15 to 96.03 %), followed by *Diplodinium*, (1.41 to 10.15 %). *Isotricha* were 0.83 to 3.99 %, and *Dasitricha* from 0.75 to 2.58 %. *Ophryoscolex* was found only in 7 month old lambs (0.25 to 1.0 %).

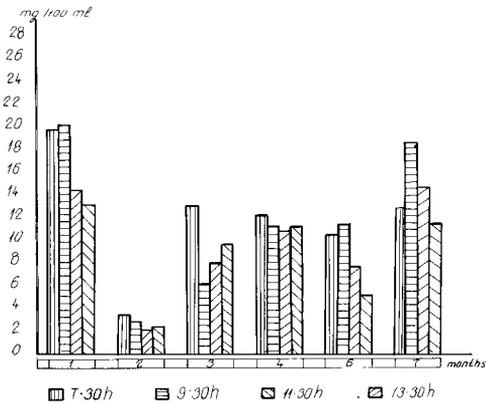


Fig. 1. — Ammonia concentration in rumen liquid.

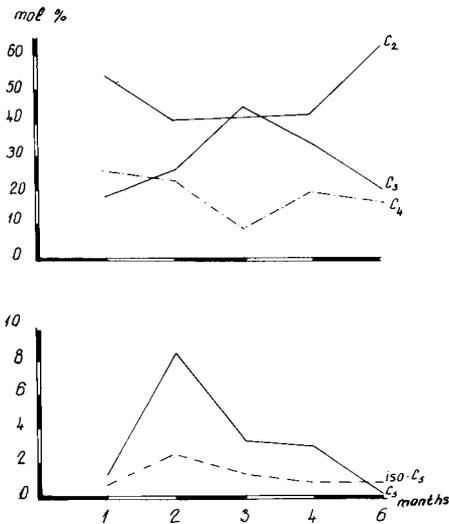


Fig. 3. — Molar proportion of volatile fatty acids in rumen liquid 2 hours after feeding.

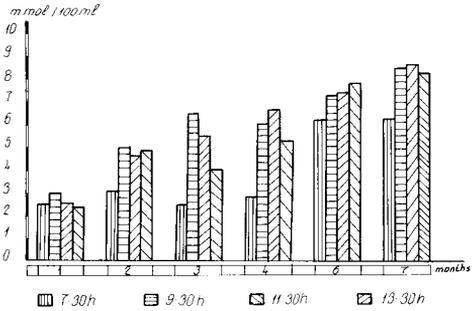


Fig. 2. — Total VFA concentration in rumen liquid.

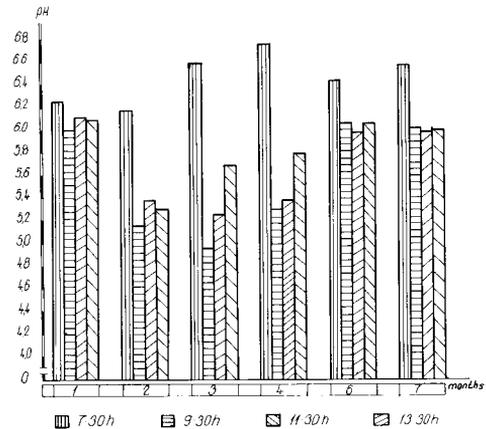


Fig. 4. — pH value of rumen liquid.

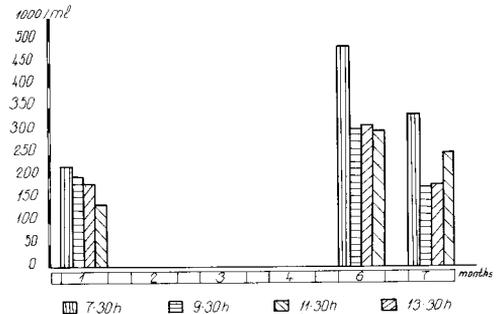


Fig. 5. — Number of protozoa in rumen liquid.