

Rapid tests to assess concentrate feed acceptability by goats

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Several, or all, Alpin or Saanen goats of a flock often refuse partly or totally compound concentrate feeds and need a long time to get adapted to these feeds.

Rapid tests were developed to assess the acceptability of concentrate feeds for goats and the risk of refusal.

In two experiments (A and B) 8 and 3 compound feeds, respectively were allocated to 10 dairy goats either successively and separately for 4 and 10 days (long allocation test LAT) or several feeds simultaneously, once a day for 3 or 4 min (rapid acceptability test RAT) ; the choice of tested feeds changed every day. LAT and RAT classified feeds in the same order according to their level of intake (interfeed and intergoat correlation of ingested quantities of feeds in LAT and RAT = 0.87 and 0.93 in experiments A and B).

As it was shown that RAT could rapidly predict the responses of goats to more or less palatable feeds, we established the standard experimental conditions for improving the reproducibility of RAT. In an isolated cabin, each goat was simultaneously given 2 feeds, each one distributed in 2 containers (200 g a container) for 2 minutes divided into 4 times 30s in order to increase the number of choices. The place of the four containers in the trough was changed at each sequence to neutralize position habits of goats in the choice of containers. Goats used in RAT were selected for their capacity to discriminate feed acceptability and they were accustomed to RAT conditions. When several feeds had to be tested, all possible combinations of 2 feeds were presented to goats, but each goat was used for only one test a day. The acceptability of a feed is defined as the mean quantity ingested by all the goats in all the tests.

To assess the reproducibility of RAT, these experimental conditions were exactly applied in experiment C, where 4 feeds were tested in the 14 same goats in 6 trials which were repeated twice : in the first succession 138, 98, 66, 98 g/goat/test, and then : 134, 102, 68 and 98 g/goat/test. A good reproducibility of RAT (interfeed correlation = 0.98) was obtained.

Therefore, RAT seems to be useful in rapidly assessing the acceptability of feeds for dairy goats applied in strict standard conditions.

Key words : Goat, acceptability, concentrate, test.

Effect of amount offered on selection and intake of long untreated barley straw by goats

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The conventional method of measuring *ad libitum* intake of roughages involves offering sufficient to ensure that 15 to 20 % is left at the end of the feeding period. Preliminary evidence indicated that selection and hence intake would increase if more roughage was offered. Two experiments were undertaken with individually penned Saanen castrates, ranging in live weight from 15 to 65 kg, fed restricted concentrates (15 g dry matter (DM) per kg $W^{0.75}$ daily) and *ad libitum* long barley straw. Straw offered and refused was weighed and digestible organic matter *in vitro* (DOMD) (Tilley and Terry method) was measured in representative samples. In experiment

1 comprising 35 days adaptation and 21 days test, refusal rates of 20 and 50 % of straw offered were compared with 18 goats per treatment. Mean intakes of straw (g DM per kg $W^{0.75}$ daily, \pm s.e.) for the low and high refusal-rates were 33.1 and 43.7 ± 1.60 . DOMD of straw offered (g per kg DM) was 405 ± 2.3 . DOMD of straw refused for the low and high refusal-rates were 320 and $347, \pm 8.0$. The calculated DOMD's of ingested straw were 441 and 479 ± 8.6 for the low and high refusal-rate treatments. In experiment 2 (35 days adaptation, 42 days test), 12 goats per treatment were offered 18, 54 or 90 g straw DM per kg W daily. Straw intakes for increasing amounts on offer were 36.0, 54.2 and 62.3, ± 1.73 . These corresponded to refusal rates of 12.5, 56.6 and 70.3 % of straw offered. DOMD of straw offered was 443 ± 4.5 . DOMD of refusals also increased with increasing offering-rates ; 354, 370, 403 ± 10.2 . The calculated DOMD's of ingested straw were 463, 541, 537 ± 7.07 . Since the *in vitro* digestibility technique may lead to overestimation of straw digestibility and the negative effect of increased intake on digestibility, the results need to be confirmed by *in vivo* digestibility trials. If these prove positive, the experiments indicate a strategy for stall-feeding goats on straw, namely to feed generously and accept wastage. Refusals could be chemically upgraded and re-fed or be given to less selective animals.

Key words : Feeding behaviour, barley straw, goat.

Retention time of small feed particles and of water in the gut of dairy goats fed at different levels of intake

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The effect of feed intake on the mean retention time (MRT), in the entire gastrointestinal tract, and the rumen retention time (RRT) of water (Li-CoEDTA) and of small feed particles (Cr-labelled milled oat hulls) was studied in dairy goats. A total of six goats of the Swedish Landrace breed were used with a mean live weight of 48 kg. The goats were fed a diet composed of 400 g dry matter (DM) \cdot kg⁻¹ DM of chopped grass hay and 600 g DM \cdot kg⁻¹ DM of a concentrate mixture. They were fed three times a day. Feed intake was ad lib. in collection periods I and II, while in collection periods III et IV feed intake was reduced to a lower level. The experiment started at the beginning of lactation (week 6) and the subsequent collections were made in lactation weeks 11, 20 and 22, respectively.

A pulse dose of Cr-labelled oat hulls (30 g) and Li-CoEDTA (3.0 g) suspended in 250 ml of water was given orally to each animal. Faeces were collected every 4th or 8th h from 12 h up to 104 h after labelling MRT and RRT were calculated from the decline in marker concentration in the faeces.

Feed intake ranged from 19.6 g DM \cdot kg⁻¹ live weight (LW) to 45.2 g DM \cdot kg⁻¹ LW (48 g OM per kg $W^{0.75}$ to 109 g OM per $W^{0.75}$).

On average only minor differences were found between the MRT of water (Co) and small feed particles (Cr) and also between the RRT of water and small feed particles. The mean and standard deviation (SD) was 30.6 (5.2), 28.8 (5.9), 13.2 (2.3) and 14.3 (2.8) h for MRT_{Cr}, MRT_{Co}, RRT_{Cr} and RRT_{Co} respectively.

MRT and RRT of water and of small feed particles were all linearly ($P < 0.001$) related to feed intake (g DM \cdot kg⁻¹ LW).

Rumen outflow rate of small feed particles (Cr) was linearly ($P < 0.001$) related to rumen outflow rate of water (Co).

Key words : Retention time, level of intake, goat.