

Recent data on nitrogen utilization and requirements in dairy goats

J. BRUN-BELLUT *, S. GIGER **, D. SAUVANT **, G. BLANCHART *

* *E.N.S.A.I.A., Zootechnie, 2, av. de la Forêt-de-Haye, 54500 Vandœuvre (France)*

** *I.N.R.A., Station de Nutrition et Alimentation
I.N.A. P.G., 16, rue Claude-Bernard, 75231 Paris Cedex 05 (France)*

To improve the knowledge of nitrogen utilization in dairy goats to specify their nitrogen requirements, we used a model which expressed digested nitrogen (Dig. N) or limiting PDI (Lim. PDI : the lowest value between PDIN and PDIE) on the basis of various parameters correlated with maintenance, milk production and nitrogen losses in urine (excess of fermentable nitrogen in the rumen or digestible amino acids in animals). These losses were estimated using plasma urea level (PUL) or milk urea level (MUL).

Results

Two series of results were obtained :

1) With high level of nitrogen intake (Paris) : The diets were mainly made of lucerne hay and maize silage. They were fed to lactating or dry pregnant goats.

Lim. PDI = $1.04 + 8.48 \text{ milk N} + 3.08 \text{ N balance} + 6.26 \text{ PUL}$.

$r = 0.84$; $\sigma_r = 1.64$.

Dig. N = $0.11 + 1.36 \text{ milk N} + 0.82 \text{ N balance} + 1.48 \text{ PUL}$.

$r = 0.84$; $\sigma_r = 0.30$.

2) With medium or low level of nitrogen intake (Nancy) : The diets were mainly made of dried beet pulps or dried grass. Only positive nitrogen balances were kept :

Lim. PDI = $1.51 W^{0.75} + 3.7 \text{ N balance} + 8.5 \text{ milk protein N} + 0.6 \Delta \text{ PDI} + 168 \text{ MUL}$.

$r = 0.89$; $\sigma_r = 21.5$.

Dig. N = $0.32 W^{0.75} + 0.8 \text{ N balance} + 1.28 \text{ milk protein N} + 18.6 \text{ MUL}$.

$r = 0.997$; $\sigma_r = 4.07$.

The results obtained in Nancy showed that maintenance requirements were 0.32 g Dig. N/kg $W^{0.75}$ or 1.51 g PDI/kg $W^{0.75}$. The efficiency of milk protein nitrogen production was 0.78 on the basis of the digested nitrogen and 0.74 on the basis of PDI intake.

The results obtained in Paris did not allow to estimate maintenance requirements because the model did not take the weight into account. They showed that the efficiency of milk nitrogen production was 0.74 on the basis of the digested nitrogen or PDI intake.

Key words : Nitrogen requirement, dairy goat, balance.

Estimation of nitrogen nutritional status in dairy goats

J. BRUN-BELLUT, F. LAURENT, G. BLANCHART

E.N.S.A.I.A., Zootechnie, 2, av. de la Forêt-de-Haye, 54500 Vandœuvre (France)

Nitrogen nutritional status of dairy goats at maintenance or during lactation is difficult to determine. We were therefore interested in finding some indicators of this status and reviewed several parameters of nitrogen metabolism which could be measured in blood, milk or urine.