

action significative fertilisation x complémentarisation sur les matières protéiques ( $P < 0,01$ ).

L'apport croissant de PDI sur prairies HN n'a pas modifié les taux et les matières sécrétées, mais a augmenté la production laitière (PL) de 1 kg de lait entre les niveaux extrêmes (27,4 vs 28,4 kg). Cet effet a évolué linéairement avec les apports de PDI (+ 0,13 kg/100 g PDI). Sur les prairies BN, la réponse a atteint 2 kg de lait (27,5 vs 29,5 kg ;  $P < 0,01$ ) et 60 g de matières protéiques. La production de lait et de matières protéiques a augmenté curvilinéairement avec les apports PDI. Selon ces évolutions, 50% et 90% des réponses de la production laitière et des matières protéiques sont obtenus avec le niveau 25% d'apport de TT. Les quantités de matières grasses produites et la production laitière 4% présentent une loi de réponse linéaire (+ 0,22 kg lait 4%/100 g PDI).

Ces réponses importantes mais variables selon la fertilisation indiquent que les conditions d'optimisation de la nutrition azotée au pâturage nécessitent d'être encore mieux définies.

**Effects of corn silage grain content on *in vivo* sheep digestibilities and dairy cow performance.** JC Émile, R Traineau, Y Barrière (INRA, Station d'Amélioration des Plantes Fourragères, 86600 Lusignan, France)

Corn silage is now one of the main sources of roughage used for dairy cow feeding. It is important to better understand the effects of the grain content on animal performances for both nutritionists and plant breeders.

The effects of a lower grain content in maize silage hybrids (resulting from discarding part of the ears at harvest) on dry matter (DM) intake, body weight variation, yield and composition of milk by high-yielding dairy cows were investigated. Mid-lactating cows were individually fed *ad libitum* with experimental or control roughage diets. They received concentrates according to their needs (trials 1–3) or less than their energy needs (trial 4). The experimental periods lasted for 10–14 weeks. Forage samples were simultaneously given *ad libitum* to sheep in digestibility crates (2 replications of 6 sheep each). The digestibility of organic matter (dOM) and digestibility of crude fiber (dCF) were then calculated and the energy value expressed in UFL (French fodder units).

Roughage DM intake (15.9 kg/cow/d for the experimental diet versus 16.0 kg/cow/d for the control), body weight gain (20 versus 26 kg/cow/d) and milk yield (22.9 versus 22.8 kg/cow/d) remained the same when the grain level was lowered from 48 (total DM basis) to 41%. Milk fat concentration and protein content were only affected by the experimental diet in trial 4. The lowering of the grain content did not have any effect on the cows' performances. This is probably linked with the rumen microbiological activity which is altered by the diet starch content. Ruminant negative interactions between grain and non-grain parts of the diets were lower with the experimental diet. The apparent net energy value of the non-grain part of the silage, estimated by the cows' performances, was higher when the grain content was lower (1.28 versus 1.17 Mcal/kg DM, or 0.71 versus 0.66 UFL/kg DM).

On the other hand, the mean energy value of the experimental diets measured in sheep was lower than the control (–0.06 UFL) corresponding to a lower dOM (68.1 versus 70.6%). In this case the estimated energy values were not pertinent for the prediction of the diet efficiency, according to the cows' performances.

Such results were obtained with high-producing dairy cows and it is not yet possible to extend them to animals with lower production levels. Specific silage maize hybrids with a higher total DM yield, but with a lower grain content (5–10 points) than the usual hybrids could be fit for dairy-cow feeding.

**Influence des variations intra-individuelles de l'état sanitaire de la mamelle sur la qualité protéique des laits.** Y Le Roux, O Colin, F Laurent (INRA-ENSAIA, laboratoire de sciences animales, 2, avenue de la Forêt-de-Haye, BP 172, 54505 Vandœuvre cedex, France)

Quatre-vingt-six laits de quartiers issus de 31 vaches laitières ont été regroupés en 4 classes en fonction de leur dénombrement cellulaire : classe 1 :  $< 10^5$  cellules/ml ( $n = 27$ ); classe 2 : entre  $10^5$  et  $3 \cdot 10^5$  cellules/ml ( $n = 23$ ); classe 3 : entre  $3 \cdot 10^5$  et  $6 \cdot 10^5$  cellules/ml ( $n = 21$ ) et classe 4 :  $> 6 \cdot 10^5$  cellules/ml ( $n = 15$ ). Pour estimer quartier par quartier l'intensité de la dégradation des protéines, la mesure de paramètres de la protéolyse a été réalisée.