

## Comparison of the chemical composition and the particle size of alimentary bolus in goats and sheep fed various diets

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**Introduction** — Among the different factors accounting for the better utilization of poor forages by goats, compared with sheep, urea recycling and better mastication during ingestion have been reported (Masson *et al*, 1986; Morand-Fehr *et al*, 1987). Our purpose was to measure the particle size in the alimentary bolus and to indirectly assess urea recycling, by chemical analysis of alimentary bolus.

**Materials and Methods** — The chemical composition and the particle size of the offered forage and the alimentary bolus were measured on 3 wether goats and 3 sheep fitted with an esophagus cannula, for 3 wk after a 15 d pre-experimental period. Two forages were studied successively: orchard-lucerne hay and wheat straw (diet 1: 800 g lucerne + 200 g maize; diet 2: 1000 g wheat straw + 135 g soya bean cake + 150 g maize). For the measurements, the animals, fed at maintenance level, received a forage meal during a 30 min period. Water was removed just before this meal.

**Results et Discussion** — Regardless of the animal species, the straw diet alimen-

tary bolus had a greater ( $P < 0.05$ ) dry matter content than the lucerne alimentary bolus (table I). With the lucerne hay, the crude protein (CP) and ash contents were the same ( $P < 0.05$ ) for the offered hay and the alimentary bolus of both species. On the other hand, when goats and sheep ate straw, the CP and ash contents were greater ( $P < 0.05$ ) for the alimentary bolus than for the straw. The mean particle size of the esophagus bolus was the same ( $P < 0.05$ ) for both, regardless of the diet.

In fact it seems that diet quality can change saliva composition and especially its CP content. Other measurements of saliva urea content are needed to verify this hypothesis of better urea recycling.

Masson C, Alrahmoun W, Tisserand JL (1986)  
*Ann Zootech* 35, 49-60

Morand-Fehr P, Giger S, Sauvant D, Broqua B,  
de Simiane M (1987) *In: Les Fourrages  
Secs, Récolte, Traitement, Utilisation*. INRA,  
Versailles, 391-422

**Table I.** Chemical composition and particle size of offered forage and alimentary bolus.

	Goats		Sheep	
	lucerne	straw	lucerne	straw
Feed DM content	89.8 ± 2.3	93.8 ± 1.8	90.8 ± 2.1	92.2 ± 1.8
Bolus DM content	20.1 ± 2.6	33.7 ± 5.6	17.5 ± 2.3	33.4 ± 4.2
Feed ash content	9.3 ± 0.8	8.9 ± 1.4	8.9 ± 1.2	9.2 ± 1.2
Bolus ash content	10.7 ± 2.3	13.6 ± 1.8	12.0 ± 4.1	14.9 ± 1.7
Feed CP content	15.8 ± 1.4	3.1 ± 0.8	16.2 ± 1.2	3.4 ± 0.7
Bolus CP content	15.8 ± 2.1	9.5 ± 4.6	16.8 ± 1.3	12.3 ± 5.6
Feed particle size (mm)	1.73 ± 0.18	2.05 ± 0.10	1.75 ± 0.16	1.98 ± 0.15
Bolus particle size (mm)	1.05 ± 0.18	0.81 ± 0.09	1.21 ± 0.27	0.85 ± 0.09