Degradation of β-carotene and of a mixture of vitamins A, D_3, E by rumen micro-organisms; influence of the nature of the diet. JP Jouany, B Lassalas *(INRA, Station de Recherche sur la Nutrition des Herbivores, Theix 63122, St Genès-Champanelle, France)*

Introduction

Feed supply of vitamins is generally not enough to cover the needs of ruminants, which at a high production level, have high vitamin requirements. That is why the addition of large amounts of vitamins to the diet (3–4 times the normal dose to take into account degradation in the rumen) or administration of vitamins by intramuscular injection, has been proposed (Rode *et al,* 1990). The distribution of vitamins in bypass form is one of the easiest methods to really control vitamin availability to the animal.

The present study was conducted to determine the *in sacco* degradation of a vitamin mixture, in a Biopass form, in the rumen of sheep fed different diets.

Material and Methods

Four adult male sheep fitted with a rumen fistula were fed one of the following diets: hay (H); H (70%) + pelleted barley grains (BG) (30%); dehydrated and pelleted lucerne (L) (90%) + wheat straw (10%); L(60%) + BG (30%) + straw (10%).

A mixture of vitamins A, D_3, E and β carotene in Biopass form were introduced into nylon bags (50 μm mesh size) in the rumen for 24 h. Losses in dry weight were assimilated to vitamin degradation.

The respective influences of the nature of the diet and of the tested product, as well as their interactions, were studied by variance analysis.

Results and Discussion (table I)

The disappearance of β-carotene from nylon bags was always low. The effectiveness of the tested Biopass procedure on the vitamin mixture depended on the nature of the diet. It is particularly recommended in the case of high-concentrate diets which set the most problems regarding vitamin deficiency (Rode *et al,* 1990).

Table I. *In sacco* degradation after a 24-h period in the rumen ($n = 8$).

Diet	*Hay*	*Hay and barley*	*Lucerne*	*Lucerne and barley*	*SDM*	*"Diet" effect*	*"Product" effect*	*Interaction "diet+ product"*
β-carotene	2.28 ^{a}	1.41 ^{b}	0.51 ^{c}	0.94 ^{d}	0.29	0.01	0.01	NS
Vitamins A, D_3, E	15.09 ^{a}	5.32 ^{b}	2.93 ^{c}	4.64 ^{bc}	1.61	0.01		

Different superscripts indicate that values on the same line are significantly different ($P < 0.05$); NS: not significant.

This experiment confirms the results carried out *in vitro* by Jouany and Lassalas (1989).

References

Jouany JP, Lassalas B (1989) *Rev Alim Anim* 431, 36-37, 48

Rode LM, McAllister TA, Cheng KJ (1990) *Can J Anim Sci* 70, 227-233