EFFECT OF THE LEVEL OF SOLUBLE FIBRE ON ILEAL APPARENT DIGESTIBILITY AT DIFFERENT AGES

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ABSTRACT

The aim of this work was to study the effect of the level of soluble fibre on ileal apparent digestibility of dry matter and starch at different ages.

Three diets were formulated to meet or exceed nutrient requirements of growing rabbits. All diets were isonutritive (33% of neutral detergent fibre, 20% of crude protein and 20% of starch) for all the nutrients except for soluble fibre. Differences in soluble fibre were obtained by a partial substitution in a control diet of lucerne hay (28% of inclusion) by oat hulls (14.7% of inclusion) or a mixture of sugar beet pulp and apple pulp (15%-5%of inclusion, respectively), resulting in soluble fibre contents of 10.3, 7.9 and 13.1%, respectively. Heat processed wheat was introduced (32.3%) as the main source of starch in all diets.

Two parallel trials were conducted. Firstly, 84 growing rabbits weighting 527±65 g at 35 days of age (weaned at 25 days) were slaughtered by cervical dislocation between 19 and 21 p.m. and the digesta of 20 cm of the terminal ileum removed. A pool of 4 animals per treatment was done due to the small amount of sample. Besides, twenty-nine New-Zealand White × Californian doe rabbits were surgically fitted with a glass T-cannula at the terminal ileum. After a ten days period of adaptation to the diet, samples from the ileum were collected for 1 hour in the evening over a period of two consecutives days. In both trials animals were given *ad libitum* access to the experimental diets.

Ileal digestibility of dry matter was not affected by the level of soluble fibre in young animals (P>0.05) and was on average 46.8, 44.8 and 48.7% for oat hulls, lucerne hay and sugar beet-apple pulp diets, respectively. Despite source of starch was the same in all the experimental diets, significant differences were found in its ileal digestibility among treatments. Rabbits fed diet containing sugar beet pulp and apple pulp showed the highest value of ileal starch digestibility respect to the oat hulls diet (96.9 *vs.* 93.2%, P=0.002), whereas diet based on lucerne hay showed and intermediate value (95.0%). These results are in agreement with the longer length of the intestinal villi observed when level of soluble fibre increased, which varied from 722 to 492 μm (P<0.01) for pulps and oat hulls diets respectively.

As it was expected, ileal dry matter digestibility improved with age (P=0.007), but the effect was different depending on the diet. A significant increase was observed in diets with oat hulls or with a mix of sugar beet pulp and apple pulp which reached values of

53.8 and 57.1%, respectively. Diets with lucerne hay showed the lowest improvement of dry matter digestibility (48.2%). Ileal starch digestibility was almost complete in rabbit does independently of the treatment and averaged 98.3% (P = 0.6).

These results suggest the importance of using properly fibre sources during the post-weaning period.

Key words: soluble fibre, ileal digestibility, growing rabbits.