

Digestibility evaluation of neutral sugars from hemicellulose of alfalfa hay by nylon capsule method

J Trináctý, B Svozil, M Simek

Research Institut of Animal Nutrition, Pohorelice, Videòská 699, Czech Republic

Utilization of forages energy with cattle depends on the digestibility of cellulose and hemicellulose. At our trial we evaluated the digestibility structural polysaccharides which occurred in hemicellulose of alfalfa hay. A new method of nylon capsule has been used for this goal.

The trial has been performed with two cows 495 and 558 kg live weight, mean daily yield of milk 17.2 and 15.3 litres. The cows consumed 30 kg of maize silage (28.07 % DM), 4 kg of alfalfa hay and 6 kg of feed mixture. The evaluation was performed in two periods. In each period 1260 capsules were applied to each cow. The capsules diameter was 10 mm. They were made of nylon cloth mesh size 42 microns. The capsules contained 0.0129 g alfalfa hay milled through a 1 mm screen. The capsules was introduced to the cows orally as a paper bolus. Excrements were collected in 3 hours intervals. We divided the capsules in three time intervals. When 270 capsules were found, one time interval was finished. In one period there were three time intervals. Once in 24 hours we washed excrements under running water at 4 mm screen and the found capsules were inserted in a freezing machine. After a period the capsules were rinsed in an

automatic washing machine. The whole sum of capsules was divided according to the analysis performed. When analysing neutral sugars we needed 32 % of all found capsules. The recovery of the capsules was higher than 90 %.

The content of arabinose, xylose, mannose, glucose and galactose was determined according Hartman (1982, Proc 7th World Cereal and Bread Congress, Prague, 471-476). The method has been based on the determination of neutral sugars using gas chromatography in the form O-trimethylsilylderivatives after hydrolysis by 1-M trifluoracetic acid.

The values of digestibility of neutral sugars increased with higher time interval. Relatively low mean digestibility was at mannose 56.98 % and xylose 61.33 %. High mean digestibility was at glucose 92.17 % and galactose 89.95 %. The results are similar as mentioned by Wedig and col (1986, J Dairy Sci, 69, 1309-1316). This author identifies the following values of digestibility with dried cows consuming alfalfa hay only - arabinose 72.4 %, xylose 48.5 %, mannose 33.8 %, glucose 64.6 % and galactose 72.4 %.

time interval	time of passage (hours)	digest. of arabinose (%)	digest. of xylose (%)	digest. of mannose (%)	digest. of glucose (%)	digest. of galactose (%)
1	24.51	76.01	51.79	46.59	90.23	87.24
2	33.30	83.10	64.91	60.94	92.29	90.07
3	50.35	84.90	67.30	63.40	94.00	92.53
mean	36.05	81.34	61.33	56.98	92.17	89.95