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Effect of essential and non-essential amino acid Effects of protein-free energy supplementation on blood metabolites, insulin and hepatic PEPCK gene expression in growing lambs offered rice straw-based diet

P. Dolešová, S. Nitrayová, P. Patráš, J. Heger

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Pigs fitted with ileal T-cannula in the terminal ileum were used to study the effect of synthetic amino acids (AA) added to a nitrogen-free diet on endogenous losses. We compared the obtained data with data from other research centres in the world that are focusing on these problems. In the present experiment, we used three synthetic diets – a nitrogen-free (NF) diet, a diet with added essential AA (E), a diet with the same amounts of essential AA and a mixture of non-essential AA (E+N) added. The diets, apart from the amount of AA, had the same composition. Chromium oxide was used as an indigestible marker. The supplementation of the NF diet with sulphur AA, threonine and tryptophan resulted in a reduction of the endogenous flow of all AA except for cysteine. However, the difference between the NF and E diet was significant only in the case of proline. The effect of the non-essential AA addition to diet E was negligible, even though the endogenous flow of most AA tended to decrease. In comparison with NF diet, the endogenous flow of total N in diets E and E+N was reduced by about 30%. This reduction was mainly due to the decreased endogenous flow of proline, which accounted for 59% in diet E and 55% in diet E+N. Proline was the most abundant AA in all diets, followed by glycine and glutamic acid. The sum of proline and glycine in diets NF, E and E+N amounted to 59, 44, and 46% of total AA flow, respectively. In contrast, the proportion of the sum of essential AA of total AA flow in diets NF, E and E+N was 21, 28 and 27%, respectively. Our data on the endogenous AA and N flow are in the range of previously published values.

Keywords:

pigs; ileal digestibility; amino acids; endogenous losses

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