Influence of folic acid, vitamin B2 and B6 supplementation on feed intake, body and organs weight, and liver fatty acids composition in rats subjected to severe protein deprivation

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Abstract

Growing rats fed for 3 months a low-protein (LP) diet (4.5% of energy from protein), possessed about 29% lower body weight than animals consuming adequate-protein diet (20% energy from protein). The LP diet feeding caused an increase in daily feed intake followed by a decrease in feed conversion efficiency. The enrichment of LP diet with folic acid, vitamin B2 and B6 (3 times above the level applied in the control diet) did not have any impact on rats BW and supplementation with these vitamins minimize the effect of LP diet on feed intake. The use of examined vitamins had a tendency to diminish an increase in feed conversion ratio caused by the LP nutrition. This effect was significant when all vitamins were added together.

Rats fed the LP diet had higher relative weights of lungs, heart, liver and testis. Vitamins enriching the LP diet were observed to decrease a relative weight of lungs (folic acid, vitamin B6 and vitamin mixture), and liver (vitamin B6 and vitamin mixture). A tendency of increasing relative testis weight was also revealed in rats given the LP diet enriched with vitamins.

The lower content of hepatic polyunsaturated fatty acids (FA) and a tendency for monounsaturated FA content to be higher were found in rats fed the LP diet. The LP diet enrichment with folic acid caused that these changes were more pronounced and statistically significant. Enrichment of LP diet with vitamins tested may cause a partial reverse of changes observed in the hepatic FA composition.

Key words: protein deprivation, rats, fatty acids composition, folic acid, vitamin B2, vitamin B6

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