Influence of dietary amino acids on L-threonine-degrading enzyme activities in rat liver. F Dufour-Etienne, V Schaeffer, J Porteron, D Bercovici (*Laboratoire de Recherche Eurolysine, Parc Club Orsay Université, Bât E, 91893 Orsay Cedex, France*)

L-Threonine dehydratase (TDH) activity is known to increase according to the dietary protein level in rats. However, the influence of individual amino acid levels of the diet on TDH activity is not well established. Wistar rats were adapted to a 12% crude protein (CP) casein-based diet (C12) from 50–150g body weight. In Exp A, groups of 5 animals each were fed *ad libitum* with isoenergetic diets containing increasing levels (12, 18, 25, 50% CP) of casein (C) or egg protein (E). In Exp B, C25-like diets (named respectively HC25 and AA25) were prepared by adding hydrolyzed casein or a free amino acid mixture to C12. In Exp C, C12 was supplemented with individual L-amino acids to match their concentration in the C25 diet. Thr, ser, met and glu were tested separately while other amino acids were pooled as M1 (lys, trp, leu, cys) and M2 (ala, gly, val, ile, tyr, phe, his, arg, asp). After 6 d, the livers were removed and TDH and TDG were assayed according to Chu and Hegsted (1976) and Bird and Nunn (1983) respectively. As shown in table I, TDH activity was sensitive to the dietary protein level for both casein and egg protein. A 50-fold increase in TDH activity was observed when crude protein was raised from 12 to 25% of the diet. The same TDH response was obtained for HC25 and AA25 (Exp B). Among all the test amino acids (Exp C), only glutamic acid was found to have a significant effect** on TDH activity (10-fold increase; table II). TDG activity remained stable in all animals (4.9 ± 0.4 nmol amino acetone formed/mg protein/min). Hepatic degra-

Table I. Experiment A.

Diet	FI	BWG	TDH *
C12	20.3 $\pm$ 1.4	7.7 $\pm$ 1.0	0.9 $\pm$ 0.1
C18	17.8 $\pm$ 0.5	7.9 $\pm$ 0.6	7.6 $\pm$ 2.0
C25	16.8 $\pm$ 0.6	8.2 $\pm$ 0.5	48.5 $\pm$ 8.0
E25	13.6 $\pm$ 0.5	6.1 $\pm$ 0.3	50.6 $\pm$ 4.0
C50	13.2 $\pm$ 0.5	5.5 $\pm$ 0.4	393.2 $\pm$ 32.4
E50	11.3 $\pm$ 0.3	3.2 $\pm$ 0.3	196.3 $\pm$ 32.0

Values are expressed as mean $\pm$ SEM ($n = 5$). * TDH activity is expressed as nmol ketobutyrate formed/mg protein/min. ** $P < 0.05$.

Table II. Experiments B, C.

Diet	TDH *
C12	0.8 $\pm$ 0.2
C25	52.6 $\pm$ 2.7
Thr	2.6 $\pm$ 0.7
Ser	3.3 $\pm$ 0.6
Glu	7.7 $\pm$ 2.3
Met	1.2 $\pm$ 0.5
M1	1.8 $\pm$ 0.4
M2	3.6 $\pm$ 1.0
AA25	62.4 $\pm$ 10.7
HC25	61.7 $\pm$ 14.7

ation of L-thr seems to be mainly regulated through the TDH pathway in the rat.

References

- Bird MI, Nunn PB (1983) *Biochem J* 214-687
 Chu SW, Hegsted DM (1976) *J Nutr* 106-1089