Efficiency of utilization of free amino acids given as dietary supplements to the rat. By B. A. ROLLS, A. P. WILLIAMS and J. W. G. PORTER, *National Institute for Research in Dairying, Shinfield, Reading*

Free amino acids are increasingly being used as supplements to animal feeds and it is an important question whether they are absorbed at the same rate as those of the feed protein.

We have made a study in which rats were given different proteins in isonitrogenous amounts as single meals, with and without supplements of their limiting amino acids. Samples of blood and gut contents were analysed as described by Buraczewski, Porter, Westgarth & Williams (1967).

The supplementary amino acids were added to make the total level equal to that in casein. If the free and the protein-bound amino acids were absorbed at the same rate, their levels in the blood would be similar to those found when casein alone was fed.

Table 1. *Plasma free amino acid levels (μmoles/100 ml plasma) 2 h after feeding*

	Portal plasma		Systemic plasma	
Diet	Lysine	Tryptophan	Lysine	Tryptophan
Control (fasted) animals	40·6	10·6	48·4	8·6
Casein	90·8	13·5	45·8	7·7
Zein	41·3	9·8	38·2	5·5
Zein+lysine+tryptophan	62·6	11·2	55·2	11·5

It is clear from the example given in the table that supplementation increased the plasma free amino acid levels in portal blood above those found when the protein alone was fed, but they were lower than those found when casein alone was given. In systemic (cardiac) blood, however, the levels were even higher than with casein. Other plasma amino acids were almost unaffected by supplementation. The significance of these observations will be discussed.

Supplementation caused only small increases in the nitrogen and dry-matter contents of the soluble and insoluble fractions of stomach and small intestine contents. When the soluble fractions of stomach and small intestine were analysed by filtration on G25 Sephadex gel (see Buraczewski, Buraczewska & Ford, 1967) no effect of the supplement on the course of digestion of the protein was observed. In the small intestine an increase in the free amino acid:protein ratio was found when the supplemented meals were fed, but no increase was detected in the level of free amino acids in the stomach 2 h after feeding.

REFERENCES

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