

METABOLISM OF PEPTIDE AMINO ACIDS BY MUSCLE TISSUE EXPLANTS OF SHEEP

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Results of previous studies by McCormick and Webb (1982) and Jois et al. (1985) suggest that peptides of small molecular weight and circulating in blood may contribute amino acids for tissue metabolism. The present studies were conducted to establish whether skeletal muscle tissue of sheep is able to hydrolyse small molecular weight peptides and thereby utilise amino acids comprising the peptides.

The in vitro procedure described by Wijaysinghe et al. (1984) was used. Briefly, intercostal muscle tissue from three adult wethers was separated from fat and connective tissue and muscle fibre bundles (40-80 mg) were incubated in Krebs's Ringer bicarbonate buffer containing either 0.2, 0.4, or 0.6 mM L-leucine or similar concentrations of the dipeptide L-tyrosyl-L-leucine. Concentrations of the free amino acid L-leucine, and when appropriate L-tyrosine, present in the incubation medium were measured immediately after addition of muscle tissue then after 2 h of incubation at 37°C. Results are summarised below.

	Concentration of the free amino acid or dipeptide added to medium (mM)		
	0.2	0.4	0.6
Concentration of free amino acid (nmoles/ml) in medium after adding dipeptide			
leucine - 0 min	7.6	3.1	6.7
- 120 min	55.8	83.9	76.3
tyrosine - 0 min	0	0	0
- 120 min	48.9	79.0	66.1
Leucine uptake (nmoles/mg tissue) from medium containing			
- free amino acid	2.6	3.5	6.2
- dipeptide	2.1	1.6	1.7
Tyrosine uptake (nmoles/mg tissue) from medium containing			
- dipeptide	2.1	2.1	3.0

The results show hydrolysis of the dipeptide by muscle tissue and uptake of amino acids when the muscle tissue was incubated in the presence of free leucine or dipeptide. There was a tendency for uptake of leucine to increase as the concentration of free leucine increased but this trend was not seen when dipeptide was added to the medium. The data are consistent with tissues utilising amino acids circulating in peptide form.

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