

The Influence of Nitrate and Ammonia Nitrogen on the Formation of Different Nitrogen Fractions in *Torula utilis*

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Low-nitrogen *Torula* suspended in nitrate solution under strong aeration takes rapidly up nitrate nitrogen. The uptake of ammonia nitrogen occurs at a still higher speed in corresponding experiment from ammonium sulphate suspension. The fate of the nitrogen taken up is in both cases somewhat different. This appears clearly from Fig. 1.

The nitrogen fraction first formed from ammonia nitrogen in the cells is almost entirely soluble in trichloroacetic acid (soluble N-fraction). During the first half an hour the difference between the increase of total nitrogen in the cells and that of the soluble nitrogen is still very small. Not until after about an hour does the protein synthesis intensively begin. The results are thus in agreement with the findings by Roine¹. In the nitrate solution, on the other hand, the accumulation of soluble nitrogen in the cells is relatively small, while the protein synthesis is intensive right from the start. During 75 minutes nitrate nitrogen produced nearly twice as much protein nitrogen as soluble nitrogen (100 mg or 62 % protein N of the total uptake 162 mg N) while ammonia nitrogen produced nearly three times as much soluble nitrogen as protein nitrogen (91 mg or 29 % protein N of the total uptake 344 mg N). In spite of the much smaller uptake of nitrate nitrogen in comparison to ammonia nitrogen the forma-

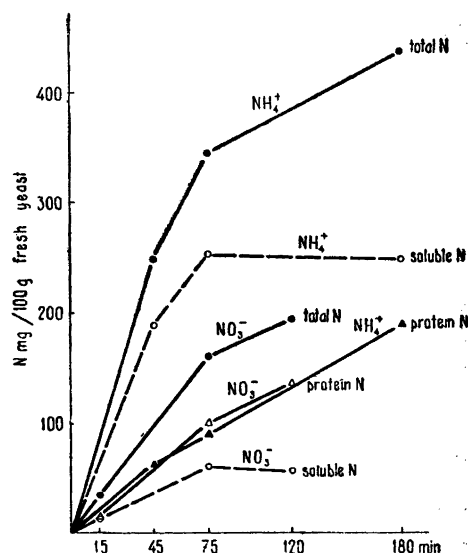


Fig. 1. Low-nitrogen *Torula* suspended in ammonia and nitrate solutions. Different N-fractions during 180 minutes.

tion of protein was in both cases practically equal.

The soluble N-fraction formed in the cells of low-nitrogen *Torula* both in ammonium and nitrate solutions has to a great extent similar composition in spite of its different amount. The amino dicarboxylic acids, in the first place glutamic acid, their amides, alanine and some ammonia as well as a very small quantity of oxime nitrogen² constitute in the nitrate experiment during experimental times of 15 and 30 minutes practically the entire soluble N-fraction. In the ammonia experiment no oxime-N is formed but otherwise the composition of the soluble N-fraction is similar to that found in the nitrate experiment.

A detailed report on this work with discussion will be published in *Biochimica et Biophysica Acta*.

1. Roine, P. *Ann. Acad. Sci. Fennicae Ser. A. II. Chem.* (1947) no. 26.
2. Virtanen, A. I., and Csáky, T. Z. *Nature* 144 (1948) 597.

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