

## Enhancement of L-lysine production by strain development and optimization of fermentation conditions in *Corynebacterium glutamicum*

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Lysine is one of the essential amino acids which are not synthesized by human or animals, and therefore it has been widely used as the additives of foods or animal feeds.<sup>1)</sup> In order to minimize the reduction of lysine productivity by accumulation of lysine and byproducts in the end of fed-batch fermentations, the salt-tolerant mutants which were resistant to high concentrations of NaCl were isolated through mutagenesis from the *Corynebacterium glutamicum* strain I. The salt-tolerant mutant C14-49-3-15-7-3-20, isolated from the mother strain was able to grow in the presence of 9% of NaCl. In shake flask fermentations, the mutant strain C14-49-3-15-7-3-20 produced 61.2g/L of L-lysine with a yield of 61.0%, whereas the mother strain produced 53.1g/L of L-lysine with a yield of 52.7%. In the evaluation of L-lysine productivity by fed-batch fermentations using a 5L jar fermenter, the salt-tolerant mutant strain C14-49-3-15-7-3-20 displayed 130.6g/L of L-lysine concentration with 48.6% of yield. The results verified that the productivity of the mutant was greatly improved in comparison with the mother strain I produced L-lysine concentration 113.0g/L with a yield 41.8%.

Here, it was of great interest that the L-lysine productivity could be greatly improved by introduction of salt-tolerant character in a L-lysine producer, *Corynebacterium glutamicum*.

### References

1. Robert, D., Kiss, R., Stephanopoulos, G., Metabolic characterization of a L-lysine production strain by continuous culture(1992), *Biotechnol. Bioeng.*, 39;565-574
2. C. Varela, E. Agosin, M. Klapa, G. Stephanopoulos, Metabolic flux redistribution in *Corynebacterium glutamicum* in response to osmotic stress(2003), *Appl Microbiol Biotechnol*, 60;547-5552.