

## Student Project Paper for Final Class

University of Baghdad	Al-Khwarizmi college of Engineering	Biochemical Engineering Dept.	Project index:1	Date 25-6-2012
Project Name	Production of soya sauce			
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### Aim of the work

Plant Design of Manufacturing of soya sauce , Including: Material balance, Energy balance, layout of plant and design of some equipment in the plant.

### Summary

Brewing soya sauce is one of the original biotic industries.

In our work we choose the traditional way to ferment soya bean and wheat along with water (for about 6 months). Our work concentrated on single fermenter So that to be multiplied by bigger number for scale up and for large production. Equal amount of water and soya bean are mixed, then cooked to denature the protein to render it susceptible to enzyme action.

Wheat then introduced after roasting and mixed with defatted soy bean. A fungi (aspergillus oryzae and A.sojae) is added to complete the operation of converging the mixture to soya sauce, next step is the preparation for koji molding.

Then a fermentation process takes place for about 6 months

At then a total conversion of amino acid is done by two stage ,the first is by Lactic Acid – Bacteria (Pediococcus bacteria ) and the second is by Saccharomyces rouxi.

Finally soya sauce is filtered ,pasteurized ,and tightly bottled.

### Discussion

**Our mass balance results of soya sauce was satisfied, because the converging of protein was supposed to be 100% so that the our calculations will be an optimum estimation for product maximum mass.**

**The fermenter dimensions are acceptable and its suite for the highly viscous soya sauce. Using three impellers for optimum agitation of material in the fermenter which effect the power consumption rate for this 300 cps material, so a high power cost (more than 203 kw) must be take in consideration.**

**For a better calculations a lower percent of converging must be selected based on the yield of amino acid (because of absence of converging and yield data), so a reliable results are obtained and and can be applied in a process optimally.**

### Future Work

- Make use of soya bean available in Iraq to produce soya sauce in different food application.
- Make use of waste as animal feed with high protein content.
- The possibility of producing soya oil (by product) which can be used as food oil.