



Effect of Fermentation on Allergenicity of Egg White Proteins

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Summary

Egg allergy occurs in 0.5% of the population and in around 5% of the children with allergy. It is the second most common food allergy in children beside cow's milk allergy.

The purpose of the study is to ferment egg white to reduce egg allergenicity. Our preliminary results showed that lactic acid bacteria, such as *Lactobacillus sakei*, *Lactobacillus sanfranciscensis*, and *Lactobacillus delbrueckii subsp. delbrueckii*, could grow in egg white. Our next goal is to determine the effects of fermentation on egg white allergenicity and protein profile.

Importance of Egg in Food Industry

In order to prolong the shelf life of eggs and make the transportation more easily, many egg suppliers use spray drying to produce egg white powder, which is an excellent protein source and could provide superb functional properties: emulsion and foaming capacity. More and more food manufacturers choose to use it in their products, such as baked good, sauces, candies, cookies, and creamy fillings.

Project Description

If we can reduce or even eliminate the allergenicity of egg white powders, the food products that contain them would become safer for the egg allergy patients. In other words, various types of food products with egg as an ingredient will have a larger market.

Related researches

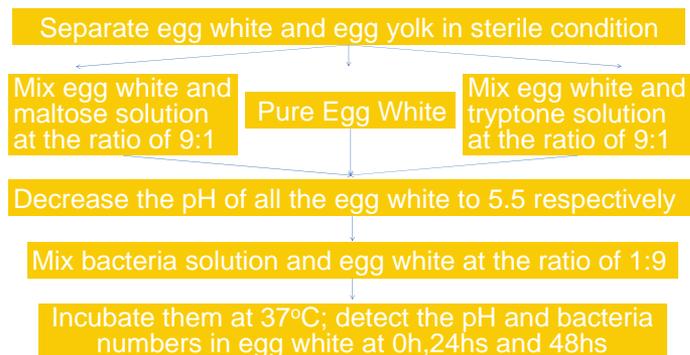
Disulfide bonds could strengthen the structure of proteins and make them stable to heat and chemical treatments. Some researchers have reported that thiol metabolism of *L. sanfranciscensis* contributes to breaking down the disulfide bounds of egg white proteins in sourdough.

Soybean is a food allergen that contains abundant proteins. Some researchers ferment soybean with various microorganisms, and the immunoreactivity of soybean proteins has been reduced ranging from 77% to 89% through fermentation. Based on these, we hope to grow bacteria in egg white and reduce its allergenicity during fermentation.

Egg White Proteins	Numbers of Disulfide bounds
Ovalbumin	0
Ovotransferrin	15
Ovomucoid	9
Ovomucin	9
Lysozyme	4

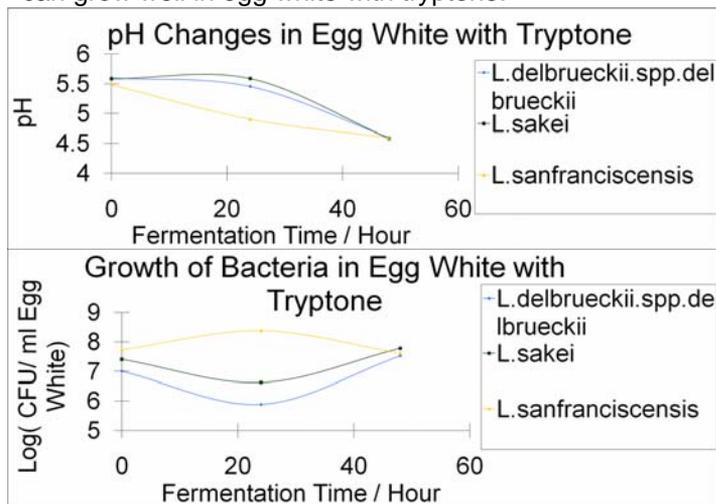
Our Approach

Before spray-drying, fresh egg white would be inoculated with various strains of bacteria.



Our Observations

After inoculated various bacteria separately in different types of egg white solution, we found that three strains can grow well in egg white with tryptone.



Discussion

As these bacteria can grow well in egg white, their thiol metabolism and proteolytic system are potential to modify structures of proteins, which favors the denaturation of the allergenic proteins in egg white. The ultimate purpose of this research is to eliminate the allergenicity of egg white powders.

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