

# Performance Verification of an ELISA-based Assay Fish Allergen in Asian Matrices

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## Objective

The “Big Eight” Food allergens mainly includes Fish, Crustaceans, Egg, Milk and Wheat. These allergy are known as IgE- Mediated Food allergies, causing the immune system to react abnormally when exposed.

The consumption of fish has dramatically increased in many vitamins and minerals to yield a healthy diet. In Asia, the prevalence of Fish allergy is more frequent than other part of the worlds, ranging up to 7%.

Small quantity of fish proteins could be introduced due to the change of recipes in manufacturing plants, this causes the possibility of fish proteins to be found in matrices that do not contain Fish. Similarly, consumers with Fish allergy could rely solely on the food labels to determine the fish allergens.

In this study, several types of Asian Food and condiments are tested with AgraQuant Fish ELISA test kit to quantify the amount of fish found in these matrices.

## Methods

Different of type of foods and condiments are sourced locally. Food and Condiments such as Sambal Shrimp Paste, Oyster Sauce, Korean Chili Paste, Luncheon Meat and Rice cake that are not labelled with allergen information are bought. Kimchi declared with “may contains fish, shrimp and soybean” allergen labeling is also bought.

All of the foods and condiments are tested against our AgraQuant Fish ELISA test kit to get a quantification of fish allergen presence. The non-detectable matrices are further fortified with low level ppm and high level ppm of fish.

ALLERGENS  
**AgraQuant®**  
Allergen ELISA Test Kits



## Results and Conclusion

### ELISA Results

Matrix	Declaration	Result
Sambal Shrimp Paste	Does not contain Fish	<LOD
Kimchi	May contains Fish	<LOD
Oyster Sauce	No Fish as one of the ingredient	<LOD
Korean Chilli Paste		<LOD
Luncheon Meat (Spam)		<LOD
Rice Cake		<LOD

### Spiked ELISA Results

Matrix	Neat	Low Level	Recovery %	High	Recovery %
Sambal Shrimp Paste	<LOD	4.25	94.4	8.91	94.7
Kimchi	<LOD	4.83	107.3	8.66	92.0
Oyster Sauce	<LOD	4.27	94.9	8.92	94.8
Korean Chilli Paste	<LOD	4.17	92.7	8.9	94.6
Luncheon Meat (Spam)	<LOD	3.83	85.1	7.48	79.5
Rice Cake	<LOD	4.38	97.3	9.48	100.7

### Result:

Shrimp Paste, Oyster sauce, Chili Paste, Luncheon and Rice cake “do not contain any fish as their main ingredients” while Kimchi ‘may contain fish’ due to fish sauce are being used. All the food and condiments were tested with AgraQuant® Fish ELISA. They were found to be <LOD. These ND sample are further spiked with low and high level ppm of Fish allergen. The average recoveries of these fortified samples were between 80%- 120%.

**Conclusion:** Kimchi has very little amount of fish sauce as the ingredient and is fermented dish. Pure fish sauce is clear brown liquid hydrolysate from salted fish. This could explain why no fish allergen protein could be found in packaged kimchi. Sambal Shrimp paste contains high level of dried shrimp in the paste which is crustacean. This clearly shows the fish kit does not cross react with crustacea

**Significance:** The AgraQuant® Fish Allergen plus offers a rapid and reliable tool for testing fish allergen in simple food and complex Asian food matrices.

## Protocol

- 1 • Weigh 1 g homogenate in a 50 mL centrifuge tube and add 20 mL extraction buffer. Vortex until all the solid is suspended
- 2 • Incubate the suspension for 15 minutes
- 3 • Centrifuge samples for 10 minutes at 2000 g to obtain a clear supernatant. If there still are particles in the supernatant, filter it and collect the filtrate.
- 4 • Samples are ready for testing.