

S4-2

The Functional Properties of *Doenjang*

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According to the environmental conditions of each country, there are many kinds of traditional fermented foods all over the world. In Korea, there are many traditional soybean fermented foods including soy sauce, *Doenjang*, and *Kochujang*. These foods have been probably Koreans oldest prepared seasoning. These foods have played an important role for the supplement of protein when an animal protein was in short supply. These foods have supplied nutrients, such as essential amino acids and essential fatty acids.

Doenjang which consisted of protein, fat, and carbohydrate of soybean was decomposed by microorganism during fermentation. These components produced by microorganism were shown several functional properties such as antimutagenicity, anticancer, biodefensive power, and control of high blood pressure.

Recently, a lot of people come to increase their concern on health. In order to prevent diabetes, cancer, and high blood pressure, they have a tendency to take health food including functional properties.

The functional properties of foods are to be classified into 3 functions. Primary function is to have played an important role for the supplement of nutrients, secondary function is to meet the requirement on sensory acceptability such as taste and flavor, and third is a body modulation function. The major third functions are shown in Table 1.

Table 1 The third function of food.

Function	Examples
Biodefence power	decrease of allergy, immunity activity
Prevention against disease	prevention against blood pressure and diabetes, anticancer
Return of health	prevention against cholesterol production, blood-forming control the nervous system
Control of body rhythm	prevention against peroxide production
Prevention against aging	

<Major functions of *Doenjang*>

1. Anticancer

To investigate the change of aflatoxin during *Doenjang* fermentation, *Doenjang* was prepared with 2 kinds of *Meju*. One was prepared with *Aspergillus parasiticus* produced aflatoxin, the other was prepared with *Aspergillus parasiticus*, *A. oryzae*, and *Bacillus subtilis*. The results are shown in Fig. 1.

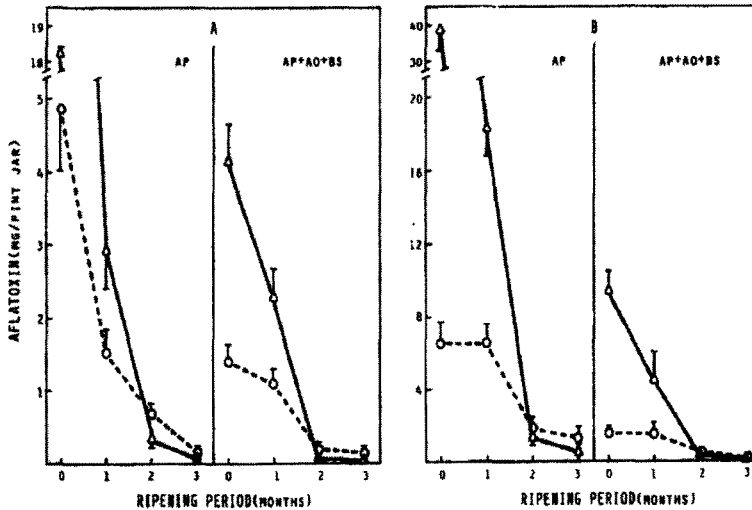


Fig 1. Aflatoxin B1(○—○) and C1 (△—△) present during ripening of fermented *Meju*, brine and charcoal mixtures. The *Meju* samples were fermented by single culture of *A. parasiticus* (AP) and mixed culture of *A. parasiticus* + *A. oryzae* + *B. subtilis* (AP+AO+BS) on *meju* cakes made with soybean varieties of Jangyeop (panel A) and Danyeop (panel B) by fermentation method 1. Each data point is the mean±SD for 3 samples

Source : Park, G. Y., Food Science and Industry, 30(2), 89-102(1997)]

2. Antimutagenicity

To investigate the antimutagenicity of *Doenjang*, 3 Samples included *Salmonella typhimurim* TA98 and mutagen were added *Doenjang* extract. The results are shown in Table 2.

Table 2. Antimutagenicity of *Doenjang*

Mutagen	Antimutagenicity (%)	
	Homemade	Commercial
2-Aminofluorene (2-AF)	79	75
Methanol extract of Charred saury pike (MECS)	68	48
Aflatoxin B1 (AFB1)	65	43

3. Antioxidative effect

To investigate the antioxidative effect of *Doenjang*, a sardine was soaked in salt and *Doenjang*. The results are shown in Table 3.

Table 3. Antioxidative effect of *Doenjang*

Parameters	POV (meq/kg)	Carbonyl value (mM/kg)
Raw sardine	3	< 3
Soaked in salt		
- 3 days	232	30
- 13 days	297	49
Soaked in <i>Doenjang</i>		
- 5 days	4	3
- 18 days	4	4