

## **Effect of the Waxy Wheat Flour added to Common Wheat Flour on Baking Properties**

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### **찰성밀 혼합분의 제빵특성**

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### **Objectives**

This study was performed to verify the baking property of the composite flours of a Korean waxy wheat variety, Sinmichal, with the addition rates.

### **Materials and Methods**

- Preparation of composite flours :
  - Base flour : Keumgangmil, Jopummil, Commercial hard wheat flour
  - Addition rates of Sinmichal to base flour : 0, 10, 20, 30, 40% by weight basis
- Geumgang and Jopummil flours : Prepared from Buhler Pilot Mill (Buhler, Swiss)
- Bread was prepared by using 250g flour and necessary ingredients based on AACC method 10-11(Sponge-dough, pound-loaf method).
- Textures of bread were measure by Texture Analyser (TA. XT2 Stable Micro System, S Ltd UK).

### **Results and Discussion**

1. Water requirements for dough formation increased with the increase of Sinmichal addition rate. As the result, working conditions during dough proofing and molding were getting more or less deteriorated with the increase of Sinmichal addition rate due to the increase of dough stickiness.
2. Loaf weights and volumes after baking increased with increase of Sinmichal addition rates upto 30%, while decreased at 40% addition rate. Specific volumes of breads were also maintained similarly with those of control upto 30% addition rate of Sinmichal. However, crumb scores decreased with the addition of Sinmichal.
3. The addition of Sinmichal to the common flour for baking use makes the bread texture to be softer, moister and sticker. And it is expected that the addition of Sinmichal to a common flour can extend the shelf life of bread.
4. From the baking results of the composite flour of Sinmichal, it is thought that the optimal addition rates are in the range of 20 ~ 30% in weight basis.

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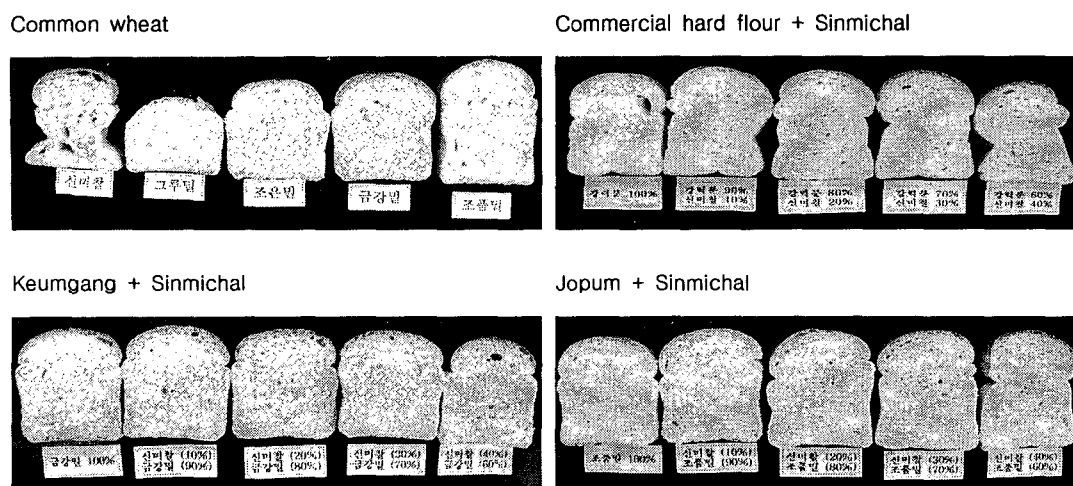


Figure 1. Sinmichal addition effects on bread properties of three kinds of wheat flour, commercial hard wheat, Keumgang, and Jopum.

Table 1. Bread properties made of two kinds of composite wheat flour at different Sinmichal addition rates.

Raw material	Bread loaf property		
	Weight (g)	Volume (ml)	Sp. volume (ml/g)
Sinmichal 100%	291.3	882	3.03
Commercial hard flour (CHF) 100%	298.0	1,223	4.11
CHF 90%+ Sinmichal 10%	301.5	1,227	4.07
CHF 80%+ Sinmichal 20%	302.3	1,237	4.09
CHF 70%+ Sinmichal 30%	298.9	1,227	4.10
CHF 60%+ Sinmichal 40%	298.3	1,175	3.94
Jopum 100%	285.5	1,150	4.03
Jopum 90%+ Sinmichal 10%	291.2	1,168	4.01
Jopum 80%+ Sinmichal 20%	293.5	1,188	4.05
Jopum 70%+ Sinmichal 30%	288.8	1,163	4.03
Jopum 60%+ Sinmichal 40%	288.6	1,138	3.94

Table 2. Bread loaf texture with addition rates of Sinmichal after 1 and 4 days of refrigerated storage

Raw material	Springiness	Gumminess	Cohesiveness	Hardness (g/3.14cm <sup>2</sup> )	Chewiness
After 1 days of storage at 4°C					
Commercial hard flour (CHF) 100%	0.775	233	0.369	635	181
CHF 90%+ Sinmichal 10%	0.521	635	0.295	2,122	337
CHF 80%+ Sinmichal 20%	0.501	504	0.279	1,825	252
CHF 70%+ Sinmichal 30%	0.515	495	0.277	1,782	274
CHF 60%+ Sinmichal 40%	0.484	519	0.253	2,014	249
After 4 days of storage at 4°C					
Commercial hard wheat(CHF) 100%	0.432	888	0.265	3,526	352
CHF 90%+ Sinmichal 10%	0.424	679	0.244	2,786	289
CHF 80%+ Sinmichal 20%	0.465	628	0.253	2,464	298
CHF 70%+ Sinmichal 30%	0.460	693	0.255	2,677	237
CHF 60%+ Sinmichal 40%	0.413	544	0.220	2,474	224