



# Quality Characteristics of Yanggaeng Manufactured by using Ginger Extract

<sup>1</sup>Eunbin Park<sup>1</sup>, Soo In Ryu<sup>2</sup>, Jean Kyung Paik<sup>1</sup>

<sup>1</sup>Department of Food & Nutrition, Eulji University, Gyeonggi-do, Korea

<sup>2</sup>Seongnam Food R&D Support Center, Gyeonggi-do, Korea

## Abstract

As more snack are made by adding unique health ingredients to traditional foods, and consumers preferences are also increasing as they appear in line with the consumption trend of ‘well-bing’. In addition, Ginger contains ingredients such as zingerone, gingerone, schogaol, they are known to help with antioxidant and anti-inflammatory properties. In this study, yanggaeng was manufactured using ginger extract containing antioxidants that helps prevent and relieve diseases and strengthen nutrition tailored to the preferences of the elderly. It was made by adding ginger extract in a ratio of 0%, 3%, 6%, 9%, and 12%. And the quality characteristics of color value, antioxidant, and mineral were evaluated. L-value, b-value of Color value were higher in the addition group than in the control group, and they were decreased as the amount of addition increased significantly in the addition group( $p<0.001$ ). And, Total polyphenol, DPPH, ABTS were higher in the addition group than in the control group, and they were increased as the amount of addition increased significantly( $p<0.001$ ). The potassium was increased as the amount of addition increased significantly except for the 6% addition group( $p=0.001$ ). Consequently, considering the antioxidant aspect, it is considered that the yanggaeng to which 9% of the ginger extract is added is most preferable. This study will be used as basic data for the development of snacks using ginger extract, and it is necessary to further research on the development of products that consider consumers’ preference through evaluation of preference in future.

## Objective

전통음식에 독특한 건강재료를 첨가하여 제조하는 간식들이 소비자들의 소비 트렌드인 ‘웰빙’에 맞춰 여러 등장하고 있음에 따라 전통음식에 대한 소비자들의 기호도 또한 증가하고 있다. 생강은 zingerone, gingerone, schogaol 등의 성분이 함유되어 있어 항산화 및 항염증에 효과가 있는 것으로 알려져 있다. 따라서 본 연구에서는 어르신들의 선호도에 맞춘 영양을 강화 시키고, 질환의 예방 및 완화에 도움을 주는 항산화성분이 함유 되어있는 생강 진액을 첨가한 양갱을 개발하고, 생강 진액 양갱의 품질특성을 평가해보고자 한다.

## Materials and Method

본 연구는 Table 1의 배합비율로 백앙금, 생강 진액, 물, 설탕, 올리고당, 한천, 소금을 사용하였다. 양갱은 생강 진액을 0%, 3%, 6%, 9%, 12%로 첨가하여 제조하였다. 품질특성은 색도(명도, 적색도, 황색도), 조직감(부착력, 경도, 응집력, 탄력성, 겉성, 씹힘성), 항산화(총 폴리페놀, DPPH 라디칼 소거능, ABTS 라디칼 소거능)을 측정하였다.

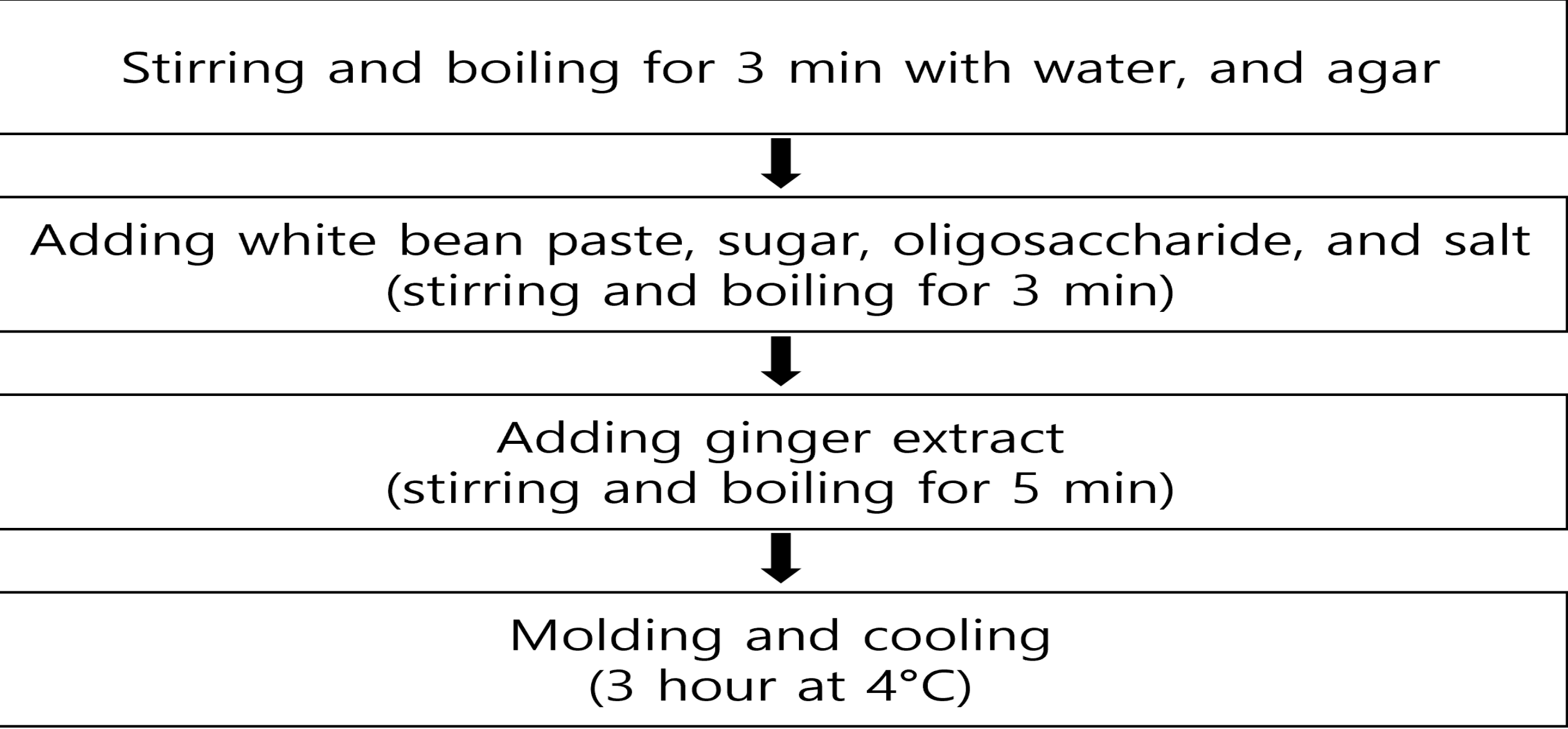


Figure 1. Preparation process for *Yanggaeng* added with Ginger extract

## Results

Table 1. Formulation for *Yanggaeng* at varied levels of Ginger extract

Ingredients (g)	Samples				
	GY1 <sup>1)</sup>	GY2	GY3	GY4	GY5
White bean paste	100	97	94	91	88
Ginger extract	0	3	6	9	12
Water	50	50	50	50	50
Sugar	10	10	10	10	10
Oligosaccharide	10	10	10	10	10
Agar	2	2	2	2	2
Salt	0.25	0.25	0.25	0.25	0.25

<sup>1)</sup>GY1: *Yanggaeng* added with Ginger extract 0%, <sup>2)</sup>GY2: *Yanggaeng* added with Ginger extract 3%, <sup>3)</sup>GY3: *Yanggaeng* added with Ginger extract 6%, <sup>4)</sup>GY4: *Yanggaeng* added with Ginger extract 9%, <sup>5)</sup>GY5: *Yanggaeng* added with Ginger extract 12%

## Conclusion

색도 L-value와 b-value는 대조군에 비해 첨가군에서 L-value가 더 높았으며, 첨가군에서는 첨가량이 증가할수록 유의적으로 감소하는 경향을 보였다( $p<0.001$ ). a-value는 일정한 양상은 보이지 않았으나, 각 군 간의 유의적인 차이를 보였다( $p<0.001$ ). 총 폴리페놀 함량은 9% 첨가군에서 가장 높고, 대조군에서 가장 낮았으며, 대조군에 비해 첨가군에서 총 폴리페놀 함량이 더 높았고, 첨가군에서는 첨가량이 증가함에 따라 총 폴리페놀 함량이 유의적으로 증가하는 경향을 보였으나( $p<0.001$ ), 6%와 12%에서는 유의적인 차이는 보이지 않았다. DPPH 라디칼 소거능과 ABTS 라디칼 소거능은 12% 첨가군에서 가장 높았고, 대조군에서 가장 낮았으며, 대조군에 비해 첨가군에서 DPPH 라디칼 소거능과 ABTS 라디칼 소거능이 더 높았으며, 첨가군에서는 첨가량이 증가함에 따라 DPPH 라디칼 소거능과 ABTS 라디칼 소거능이 유의적으로 증가하였다( $p<0.001$ ). DPPH 라디칼 소거능의 경우에는 3%~12% 첨가군 사이에서는 유의적인 차이는 보이지 않았다. 칼륨 함량은 12% 첨가군에서 가장 높고, 대조군에서 가장 낮았으며, 6% 첨가군을 제외하고 첨가량이 증가할수록 유의적으로 증가하였다( $p=0.001$ ). 본 연구의 결과에서 항산화 측면을 고려한다면 생강 진액을 9% 첨가한 제품이 가장 바람직할 것으로 사료되며, 본 연구는 생강 진액을 활용한 간식 개발에 대한 기초자료로 활용될 것이며, 앞으로 기호도 평가를 통해 소비자의 기호도 또한 고려된 제품 개발에 관한 연구를 더 진행할 필요가 있다.

## References

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Table 2. Color value of *Yanggaeng* at varied levels of Ginger extract

	Samples <sup>1)</sup>					P-value
	GY1	GY2	GY3	GY4	GY5	
L-value	50.58 ± 0.05 <sup>a2)3)</sup>	59.97 ± 0.07 <sup>d</sup>	55.40 ± 0.05 <sup>c</sup>	51.26 ± 0.14 <sup>b</sup>	51.19 ± 0.03 <sup>b</sup>	<0.001
a-value	-0.75 ± 0.07 <sup>c</sup>	-0.34 ± 0.03 <sup>d</sup>	-0.97 ± 0.08 <sup>b</sup>	-0.91 ± 0.08 <sup>bc</sup>	-1.48 ± 0.02 <sup>a</sup>	<0.001
b-value	6.10 ± 0.10 <sup>a</sup>	10.43 ± 0.05 <sup>d</sup>	8.58 ± 0.06 <sup>c</sup>	8.38 ± 0.13 <sup>c</sup>	8.07 ± 0.04 <sup>b</sup>	<0.001

<sup>1)</sup> Sample are referred Table 1.

<sup>2)</sup> Mean±S.E. (Standard Error) of 3 times.

<sup>3)</sup> a~d means in a row by different superscripts are significantly different by LSD at P<0.05.

Table 3. Texture of *Yanggaeng* at varied levels of Ginger extract

	Samples <sup>1)</sup>					P-value
	GY1	GY2	GY3	GY4	GY5	
Adhesiveness (mJ)	1.18 ± 0.02 <sup>2)3)</sup>	1.16 ± 0.35	1.33 ± 0.18	1.33 ± 0.05	1.30 ± 0.09	0.922
Hardness (g)	214.17 ± 5.93	254.90 ± 42.89	215.00 ± 7.47	267.47 ± 16.81	244.77 ± 8.03	0.349
Cohesiveness (g)	0.34 ± 0.02	0.62 ± 0.07	0.73 ± 0.17	0.54 ± 0.13	0.51 ± 0.12	0.260
Springiness (mm)	4.11 ± 0.12	3.80 ± 0.74	2.98 ± 0.62	3.52 ± 0.51	3.70 ± 0.45	0.655
Gumminess (g)	151.57 ± 0.704	279.60 ± 47.59	296.77 ± 76.24	279.70 ± 51.39	251.13 ± 66.49	0.400
Chewiness (mJ)	6.11 ± 0.37	10.36 ± 2.89	7.75 ± 0.91	9.19 ± 0.48	8.52 ± 1.02	0.372

<sup>1)</sup> Sample are referred Table 1.

<sup>2)</sup> Mean±S.E. (Standard Error) of 3 times.

<sup>3)</sup> a~d means in a row by different superscripts are significantly different by LSD at P<0.05.

Table 4. Antioxidant activities of *Yanggaeng* at varied levels of Ginger extract

	Samples <sup>1)</sup>					P-value
	GY1	GY2	GY3	GY4	GY5	
Polyphenol (mg/mL)	0.00 ± 0.00 <sup>a2)3)</sup>	61.43 ± 0.62 <sup>b</sup>	63.93 ± 0.17 <sup>c</sup>	65.47 ± 0.22 <sup>d</sup>	65.33 ± 0.58 <sup>d</sup>	<0.001
DPPH (%)	0.47 ± 0.03 <sup>a</sup>	18.67 ± 0.48 <sup>b</sup>	24.88 ± 0.70 <sup>c</sup>	33.02 ± 0.77 <sup>d</sup>	40.49 ± 0.83 <sup>e</sup>	<0.001
ABTS (%)	0.46 ± 0.07 <sup>a</sup>	46.07 ± 0.94 <sup>b</sup>	65.42 ± 9.72 <sup>c</sup>	65.59 ± 0.37 <sup>c</sup>	72.70 ± 0.18 <sup>c</sup>	<0.001

<sup>1)</sup> Sample are referred Table 1.

<sup>2)</sup> Mean±S.E. (Standard Error) of 3 times.

<sup>3)</sup> a~d means in a row by different superscripts are significantly different by LSD at P<0.05.