Evaluation of White Salted Noodles and Bread Prepared from Korean Wheats with 1Dx2.2+1Dy12 Subunits in High Molecular Weight Glutenin

Honam Agricultural Research Institute : Chul Soo Park*, Mi-Ja, Lee, Ouk-Kyu Han, Yang-Kil Kim, Jae-Hwan Seo, Jong-Chul Park

Objectives

This study is aimed at the evaluation of white salted noodles and bread prepared from Korean wheats with 1Dx2.2+1Dy12 Subunits in high molecular weight glutenin, compared to the various U.S. wheats classes and commercial wheat flours.

Materials and Methods

- O Materials
    - 8 Korean wheat cultivars and lines,
    - 14 U.S. Wheat cultivars and 3 commercial flours from Western Wheat Quality Lab.
- O Methods
    - o Noodle Making Characteristics
        - : Water Absorption, Thickness of Noodle Dough, Color of Noodle Sheet Texture Profiles of Cooked Noodles
    - o Bread Baking Characteristics
        - : Mixing Time, Proof Height, Loaf Weight and Volume, Color of Crumb Crumb Firmness

Results

O Korean wheat flours showed similar water absorption (34.3%) to soft white winter wheats and thickness (1.78 mm) was between soft white winter and hard white spring wheats, which were similar to those of commercial noodle flours for noodles.

O Lightness of noodle dough from Korean wheats was lower than commercial flours for noodles and white wheat flours.

O Texture profiles of cooked noodles from Olgeurumil and Urimil were similar to those of commercial flours for noodles.

O Korean wheats showed shorter mixing time, lower proof height, bread loaf volume and higher crumb firmness compared hard wheat flours.

O Therefore, Korean wheats with 1Dx2.2+1Dy12 subunits in high molecular weight glutenin could be suitable for making noodles but showed improperable to baking bread.

Corresponding Author : Chul Soo Park   E-mail : pcs89@rda.go.kr   Tel : 063-840-2153

Table 1. Characteristics of White Salted Noodles Prepared from Korean Wheats and Lines, Club, Soft White Spring and Winter, Hard White Spring, Hard Red Spring and Commercial Flours for Making Noodle

Class	Flour	Abs[a] (%)	Thickness (mm)	Color of Noodle Sheet[b]			Texture Profiles of Cooked Noodles[c]			
				L*	a*	b*	HD (N)	AD (N*mm)	SP (Ratio)	CO (Ratio)
Korea	Eunpamil	33	1.83	75.74	1.40	18.11	5.58	-0.06	0.90	0.62
	Geurumil	35	1.79	73.54	1.21	16.40	5.47	-0.08	0.90	0.62
	Jinpoommil	35	1.76	78.86	0.94	17.17	4.93	-0.08	0.89	0.61
	Joeunmil	33	1.80	77.30	1.15	15.43	5.80	-0.10	0.90	0.60
	Olgeurumil	35	1.68	79.55	0.69	16.47	4.24	-0.05	0.91	0.63
	Urimil	37	1.69	79.23	0.87	16.92	4.15	-0.06	0.89	0.63
	Suwon278	33	1.86	77.19	1.21	17.61	5.88	-0.08	0.90	0.62
	Suwon280	33	1.80	76.33	1.22	16.41	5.63	-0.06	0.92	0.63
	Avg.	34.3	1.78	77.22	1.09	16.82	5.21	-0.07	0.90	0.62
Club[d]		36.3	1.62	80.34	0.39	19.05	4.18	-0.05	0.89	0.60
Soft White Spring		35.0	1.66	80.04	0.60	18.55	4.68	-0.06	0.90	0.61
Soft White Winter		34.5	1.70	78.17	0.90	22.39	5.03	-0.05	0.92	0.63
Hard White Spring		33.3	1.85	79.77	0.58	18.05	5.22	-0.06	0.91	0.64
Hard Red Spring		32.0	1.91	75.64	1.35	18.76	6.51	-0.08	0.91	0.61
Commercial[e]		35.0	1.69	81.37	0.06	18.13	3.95	-0.03	0.91	0.65

[a] Water absorption of noodle dough.
[b] L* = lightness, a* = redness-greenness, b* = yellowness-blueness.
[c] HD = hardness, AD = adhesiveness, SP = springiness, CO = cohessiveness.
[d] Data of Club, SWS, SWW, HWS, HRS and commercial were averaged from each flours.
[e] Commercial noodle flours from Japan.

Table 2. Characteristics of Bread Baked from Korean Wheats, Hard White Spring (HWS), Hard Red Spring (HRS) and Bread Wheat Flours from Western Wheat Quality Lab

Class	Flour	Mixing Time (Sec)	Proof Height (cm)	Bread Loaf		Color of Crumb[a]			Crumb Firmness (N)
				Weight (g)	Volume (ml)	L*	a*	b*	
Korea	Eunpamil	167.50	7.45	150.25	870	71.96	-0.63	11.16	2.46
	Geurumil	159.00	7.60	149.34	810	71.66	-0.51	11.62	2.94
	Jinpoommil	176.50	7.40	149.40	755	74.06	-0.65	12.35	3.37
	Joeunmil	149.00	7.70	153.49	820	71.79	-0.55	10.09	2.62
	Olgeurumil	189.50	7.80	146.07	840	71.79	-0.62	9.84	2.49
	Urimil	268.00	7.30	144.14	640	75.11	-0.49	13.31	6.23
	Suwon278	230.50	7.95	151.80	855	71.67	-0.65	10.73	2.74
	Suwon280	144.00	7.50	152.79	815	71.17	-0.69	9.49	2.11
	Avg.	188.50	7.59	149.66	800.6	72.40	-0.60	11.54	3.12
HWS	Winsome	232.00	8.05	146.18	885	69.83	-0.63	9.47	2.62
	Klasic	262.50	8.45	143.34	985	70.08	-0.67	8.40	1.31
HRS	WA7839	182.00	8.25	146.55	1113	70.17	-0.61	8.98	1.44
	WPB926	187.00	8.35	144.90	1085	70.69	-0.59	9.49	1.26
	STD[b]	226.50	7.55	147.58	1018	73.01	-0.51	9.66	1.80
	LSD[c]	12.87	0.28	1.59	57.86	3.65	0.07	0.56	0.31

[a] L* = lightness, a* = redness-greenness, b* = yellowness-blueness.
[b] Wheat flours for bread baking from Western Wheat Qulaity Lab.
[c] Least significant difference (P < 0.05). Difference between two means exceeding this value are significant.