

**Hard White Wheat Quality Targets**  
**Dual Purpose -- Chinese Noodles and Western Pan Bread**  
 Updated on March 2, 2001 at Hard White Wheat Quality Targets Workshop  
 Wheat Marketing Center, Portland, Oregon

	Chinese Hard-Bite Noodles (1)	Pan Bread
<b>Wheat Quality Parameter</b>		
Test Weight (lb/bu)	60 Minimum	60 Minimum
Kernel Hardness (SKCS 4100)	65 Minimum	65 Minimum
Kernel Diameter (mm) (SKCS 4100)	2.5 Minimum	2.5 Minimum
Falling Number (seconds)	300 Minimum	300 Minimum
Protein (% , 12% mb)	11-15.0	11.5-14.0
Ash (% , 14% mb)	1.4 Maximum	1.6 Maximum
PPO Level by L-DOPA (WWQL Method)	0-0.2	N/A
<b>Flour Quality Parameter</b>		
Protein (% , 14% mb)	10-13.5	10.2-11.5
Ash (14% mb)	0.38-0.45	N/A
Patent Flour Yield at 0.4% Ash (%)	60 (by Buhler)	N/A
Straight-Grade Flour Yield at 0.45% Ash (%)	70 (by Buhler)	N/A
L* (Minolta Colorimeter CR 310)	91 Minimum	N/A
Wet Gluten (% , 14% mb)	30 Minimum (2)	28
Farinograph Absorption (% , 14% mb)	60 Minimum (2)	60
Farinograph Stability (minutes)	12 Minimum (2)	12
Amylograph Peak Viscosity (Bu) (3)	500-850	500 minimum
Mixograph Peak Time (minutes)	N/A	3-7 @ 5.5 mm peak ht.
Mixograph Absorption (%)	N/A	60
<b>Chinese Raw Noodle Quality Parameter (Refer to WMC Protocol) (4)</b>		
Chinese Raw Noodle Dough Sheet L*24 h	72 Minimum	N/A
Chinese Raw Noodle Dough Sheet L*0-L*24	10 Maximum	N/A
Chinese Raw Noodle Dough Sheet b* 24 h	25 Maximum	N/A
Cooked Noodle Hardness (g)	1250 Minimum (2)	N/A
<b>Pan Bread Quality Parameter</b>		
Pup Loaf Volume (cc)	N/A	900 @ 11% flour protein

Notes:

- (1) Chinese raw, Chinese wet, Chinese instant fried, Philippine instant fried, Malaysia hokkien and Thai bamee noodles.
- (2) Straight-grade flour of 12% protein wheat.
- (3) Method: 65 g untreated flour + 450 ml deionized water.
- (4) Noodle formula: straight-grade flour, 100%; water, 28%; and sodium chloride, 1.2%.  
 Noodle sizes: 2.5 mm (width) x 1.2 mm (thickness).  
 Noodle textural measurement: cook 100 g noodles in 1000 ml deionized water for 5 min, rinse in 27°C water and drain. Measure noodle texture on five noodle strands by compressing to 70% of noodle thickness with a 5-mm flat probe attached to TA.XT2 Texture Analyzer.

**These end-use quality targets emphasize  
 the broadest possible utilization of hard white wheats.**

## Other Product Categories

(Based on hard white wheat protein levels and blends with other U.S. wheat classes)

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Wheat Marketing Center, Portland, Oregon

	Korean Instant Noodles	Chinese Northern-Type Steamed Bread	Hamburger/Hotdog Buns
<b>Wheat Quality Parameter</b>			
Test Weight (lb/bu)	60 Minimum	60 Minimum	60 Minimum
Kernel Hardness (SKCS 4100)	65 Minimum	65 Minimum	65 Minimum
Kernel Diameter (mm) (SKCS 4100)	2.5 Minimum	2.5 Minimum	2.5 Minimum
Falling Number (seconds)	300 Minimum	350-400	300 Minimum
Protein (% , 12% mb)	10-11.0	10-11.5	13-15.0
Ash (% , 14% mb)	1.4 Maximum	1.4 Maximum	1.6 Maximum
PPO Level by L-DOPA (WWQL Method)	0-0.2	0-0.2	N/A
<b>Flour Quality Parameter</b>			
Protein (% , 14% mb)	8.5-9.5	8.5-10.0	12.2-13.0
Ash (14% mb)	0.38-0.40	0.38-0.45	N/A
Patent Flour Yield at 0.4% Ash (%)	60 (by Buhler)	60 (by Buhler)	N/A
Straight-Grade Flour Yield at 0.45% Ash (%)	70 (by Buhler)	70 (by Buhler)	N/A
L* (Minolta Colorimeter CR 310)	91 Minimum	91 Minimum	N/A
Wet Gluten (% , 14% mb)	N/A	28-30	34.5
Farinograph Absorption (% , 14% mb)	58-60	60-62	64
Farinograph Stability (minutes)	7.5-8.5	4-6.0	15-18.0
Amylograph Peak Viscosity (Bu) (1)	800 Minimum	500 Minimum	500 Minimum
Amylograph Breakdown (Bu)	200 Minimum	N/A	N/A
Mixograph Peak Time (minutes)	N/A	N/A	4-7 @ 5.8 mm peak ht.
Mixograph Absorption (%)	N/A	N/A	64
<b>Pan Bread Quality Parameter</b>			
Pup Loaf Volume (cc)	N/A	N/A	980 @ 13% flour protein

Notes:

(1) Method: 65 g untreated flour + 450 ml deionized water.

# QUALITY TARGETS FOR HARD RED SPRING WHEAT

## Quality Targets Steering Committee

Adopted PNW WQC January 25th 2013, Scottsdale, Arizona

### HRS Targets

<b>Grain Quality Parameter</b>	
Test Weight (lb/bu)	≥60.0
Kernel Hardness (SKCS 4100)	60-80
Kernel Diameter (mm) (SKCS 4100)	2.8
Kernel Weight (mg) (SKCS 4100)	38
Falling Number (seconds) (in absence of sprout)	>300
Protein (% , 12% mb)	14.5
Ash (% , 12% mb) <sup>1</sup>	1.52

<b>Flour Quality Parameter</b>	
Protein (% , 14% mb) <sup>2</sup>	13.1
Flour Yield (%) <sup>3</sup>	67.4
Flour Ash (%) <sup>1</sup>	0.41
Mill Score <sup>1</sup>	81.3
Gluten Index (% , 14% mb)	
SDS Sedimentation (cc/g , 14% mb) <sup>4</sup>	27.4
Farinograph Absorption (% , 14% mb) <sup>5</sup>	63.4
Farinograph Peak (min , 14% mb) <sup>5</sup>	16.3
Farinograph Stability (minutes) <sup>5</sup>	20.7
Mixograph Absorption (%)	64.1
Mixograph Peak (min by Mixsmart)	4.9
Mixograph Tolerance (subjective by chart)	1.6

<b>Baking Quality Parameter</b>	
Bake Absorption (%)	67.2
Bake Mix Time (min)	4.7
Bread Loaf Volume (cc)	1021.6
Bread Crumb Grain (subjective, 1-good 9-poor)	3.2

<sup>1</sup> Adjusted for lower PNW whole wheat ash observed

<sup>2</sup> "Protein Differential" --the difference between wheat and flour is greater on the Western Wheat

<sup>3</sup> Western Wheat Quality Lab Quadrumat Milling System.

<sup>4</sup> Micro Method, 0.5g

<sup>5</sup> 50-gram mixing bowl. NOTE: Limited WWQL Data--Midwest numbers used

# QUALITY TARGETS FOR HARD RED WINTER WHEAT

## Quality Targets Steering Committee

Accepted PNW WQC January 25th 2007, Salt Lake City

<b>Grain Quality Parameter</b>	
Test Weight (lb/bu)	≥60
Kernel Hardness (SKCS 4100)	60-80
Kernel Diameter (mm) (SKCS 4100)	≥2.4
Kernel Weight (mg) (SKCS 4100)	≥30
Falling Number (seconds) (in absence of sprout)	≥ 300
Protein (% , 12% mb)	≥12.0
Ash (% , 12% mb) <sup>1</sup>	≤1.30

<b>Flour Quality Parameter</b>	
Protein (% , 14% mb) <sup>2</sup>	≥11.0
Flour Yield (%) <sup>3</sup>	≥68.0
Flour Ash (%) <sup>1</sup>	≤0.37
Mill Score <sup>1</sup>	≥85
Gluten Index (% , 14% mb)	≥95
SDS Sedimentation (cc/g, 14% mb) <sup>4</sup>	≥17.5
Farinograph Absorption (% , 14% mb) <sup>5</sup>	≥62.0
Farinograph Peak (min, 14% mb) <sup>5</sup>	4.0-8.0
Farinograph Stability (minutes) <sup>5</sup>	10.0-16.0
Mixograph Absorption (%)	≥60.2
Mixograph Peak (min by Mixsmart)	3.7-5.7
Mixograph Tolerance (subjective by chart)	≥1.1

<b>Baking Quality Parameter</b>	
Bake Absorption (%)	≥63.5
Bake Mix Time (min)	3.0-5.0
Bread Loaf Volume (cc)	≥870
Bread Crumb Grain (subjective, 1-good 9-poor)	≤5

<sup>1</sup> Adjusted for lower PNW whole wheat ash observed

<sup>2</sup> "Protein Differential" --the difference between wheat and flour is greater on the Western Wheat

<sup>3</sup> Western Wheat Quality Lab Quadrumat Milling System.

<sup>4</sup> Micro Method, 0.5g

<sup>5</sup> 50-gram mixing bowl. NOTE: Limited WWQL Data--Midwest numbers used

## QUALITY TARGETS FOR SOFT WHITE WHEAT

### Quality Targets Steering Committee

Adopted January 25, 2005, Portland, OR

WWQL Data N=1249

PNW WQC Data N=78

SRW WQC N=83

Quad Milled G&E Data

Miag Milled Released Varieties\*

Miag Milled

Means    STD

Means    STD

Means    STD

Varieties representing

80% of PNW Crop

Grain Quality Parameter		WWQL Data N=1249		PNW WQC Data N=78		SRW WQC N=83	
Test Weight (lb/bu)	>60	61.4	1.6	62.0	1.5		
Kernel Hardness (SKCS 4100)	≤ 45 ? <35?	31.2	10.5	28.2	10.3		
Kernel Diameter (mm) (SKCS 4100)	>2.5	2.67	0.27	2.73	0.1823		
Kernel Weight (mg) (SKCS 4100)	>35	37.93	5.7	39.07	5.4551		
Falling Number (seconds) (in absence of sprout)	≥ 300						
Protein (% , 12% mb)	10.5	10.6	1.7	11.0	1.4		
Ash (% , 12% mb)	≤1.30	1.37	0.16	1.34	0.1249		
Flour Quality Parameter		WWQL Data N=1249		PNW WQC Data N=78		SRW WQC N=83	
Protein (% , 14% mb) <sup>1</sup>	<8.71	9.0	1.6	9.3	1.3	8.6	1.2
Ash (% , 14% mb) at 67% extraction <sup>2</sup>	<0.38	0.39	0.05	0.45	0.05	0.40	0.40
Flour Yield (%) <sup>2</sup>	>68.15	68.2	2.6	77.2	1.0		
Break flour yield (%) <sup>2</sup>	>46.75	48.6	3.3	26.9	2.9		
Milling Score <sup>2</sup>	>83.47	83.0	3.9				
Wet Gluten (% , 14% mb)	<27						
Farinograph Absorption (% , 14% mb) @ 8.7% protein <sup>3</sup>	<55						
Farinograph Stability (minutes) <sup>3</sup>	<7.0						
Mixograph Absorption (%) @ 8.7% protein	<53.97	55.1	2.5	54.8	2.0	54.5	1.5
Color / Polyphenol Oxidase (L-DOPA A <sub>475</sub> )	<0.5	0.840	0.290	0.870	0.370		
Solvent Retention Capacity: Water (%)	<58	55.6	2.8	55.6	2.8	53.0	2.8
Solvent Retention Capacity: Carbonate (%)	<75	72.0	4.2	72.6	3.5	72.6	5.2
Solvent Retention Capacity: Sucrose (%)	<95	95.4	7.1	97.2	6.5	93.2	11.4
Solvent Retention Capacity: Lactic acid (%)	60-170	107.8	23.4	96.0	16.8	104.3	14.4
SDS Sedimentation Volume (mL/g) @ 8.7% protein	7.0-14.0	11.2	4.1	11.0	3.4	9.1	2.5
<b>Sugar-Snap Cookie Diameter (cm) @ 8.7% protein</b>	9.3	9.34	0.27	9.25	0.26	9.20	0.35
<b>Sponge Cake Volume (cc)</b>	1280	1274	69	1249	67	1314	62

<sup>1</sup> "Protein Differential" --the difference between wheat and flour is greater on the Western Wheat

<sup>2</sup> Western Wheat Quality Lab Quadrumat Milling System.

<sup>3</sup> 50-gram mixing bowl.

\* Varieties with over 10K acres

## QUALITY TARGETS FOR CLUB WHEAT

### Quality Targets Steering Committee

Adopted January 25, 2005, Portland, OR

<b>Grain Quality Parameter</b>	
Test Weight (lb/bu)	>58
Kernel Hardness (SKCS 4100)	≤ 45?35
Kernel Diameter (mm) (SKCS 4100)	>2.36
Kernel Weight (mg) (SKCS 4100)	>35
Falling Number (seconds) (in absence of sprout)	≥ 300
Protein (% , 12% mb)	<10
Ash (% , 14% mb)	≤1.30

<b>Flour Quality Parameter</b>	
Protein (% , 14% mb) <sup>1</sup>	<8.3
Ash (% , 14% mb) at 67% extraction <sup>2</sup>	<0.39
Flour Yield (%) <sup>2</sup>	>69.2
Break flour yield (%) <sup>2</sup>	>50.64
Milling Score <sup>2</sup>	>84.62
Wet Gluten (% , 14% mb)	<26
Farinograph Absorption (% , 14% mb) <sup>3</sup>	<52.0
Farinograph Stability (minutes) @ 8.3% protein <sup>3</sup>	<2.0
Mixograph Absorption (%) @ 8.3% protein	<50
Color / Polyphenol Oxidase (L-DOPA A <sub>475</sub> )	<0.5
Solvent Retention Capacity: Water (%)	<56.0
Solvent Retention Capacity: Carbonate (%)	<72.0
Solvent Retention Capacity: Sucrose (%)	<93
Solvent Retention Capacity: Lactic acid (%)	<72.0
SDS Sedimentation Volume (mL/g) @ 8.3% protein	< 5.0

<b>Sugar-Snap Cookie Diameter (cm) @ 8.3% protein</b>	9.4
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<b>Sponge Cake Volume (cc)</b>	1300
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<sup>1</sup> "Protein Differential" --the difference between wheat and flour is greater on the Western Wheat Quality Lab Quadrumat Milling System than typical of commercial mills.

<sup>2</sup> Western Wheat Quality Lab Quadrumat Milling System.

<sup>3</sup> 50-gram mixing bowl.