



2016 HARVEST

U.S. PACIFIC NORTHWEST *Soft White Wheat Quality Report*

*This project is funded by the Idaho Wheat Commission,
Oregon Wheat Commission, Washington Grain
Commission, U.S. Wheat Associates, and
Wheat Marketing Center, Inc.*



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Cover photo courtesy of Washington Grain Commission

EXECUTIVE SUMMARY

Pacific Northwest (PNW) soft white wheat and white club wheat production returned to more normal conditions after two years of very dry weather. Isolated rain in early summer in some production areas resulted in falling number values that were lower than last year and the three-year averages. Total production of both soft white and club wheat exceeded the three-year averages. Protein levels were lower than last year; soft white and white club kernels were larger and heavier with higher test weights than last year, indicating excellent milling quality. Milled flour had low ash content, sound falling number values, and acceptable amylograph peak viscosity. Dough testing indicated typically weak gluten strength for soft white and white club wheat flour. All production zone averages for sponge cake volumes were lower than last year; however, their total scores were equivalent to or greater than last year and the three-year averages. Chinese southern type steamed bread total scores of all production zones were similar to or higher than the three-year averages.

CONTENTS

Introduction	1
Wheat Production Area	
Summary	
Wheat Samples	
Weather	
Wheat Production Zones	
Wheat Quality	3
Flour Quality	4
Solvent Retention Capacity	5
Physical Dough Properties	6
Finished Products	7
Farinograph	8
Alveograph	9
Amylograph	10
Sponge Cake	11
Steamed Bread	12
Summary	13

PACIFIC NORTHWEST WHEAT PRODUCTION

U.S. soft white wheat is grown in the Pacific Northwest, which includes the states of Idaho, Oregon, and Washington.



Pacific Northwest soft white wheat is known for its white bran, low moisture content, and weak dough strength characteristics. Consequently, soft white wheat is well suited for products such as cakes, pastries, cookies, crackers, pancakes, snack foods, flat breads, and Chinese southern-type steamed breads.

The soft white wheat class includes the subclasses of white club wheat and western white wheat. White club wheat has very weak gluten characteristics. Western white wheat is a blend of the white club wheat subclass and soft white wheat. The amount of white club wheat in western white wheat ranges from 10 to 90 percent. The minimum percentage of white club wheat in western white wheat is 10 percent and any higher amounts are contract specifications that are negotiated between buyer and seller (typically 10-30%).

SOFT WHITE AND WHITE CLUB WHEAT SUMMARY

	Soft White		White Club	
	2016	3 yr av	2016	3 yr av
Test Weight (lb/bu)	61.1	60.4	60.8	60.4
Hectoliter Weight (kg/hl)	80.3	79.5	80.0	79.5
Grade	1SWH	1SWH	1WHCB	1WHCB
Dockage (%)	0.5	0.5	0.8	0.5
Wheat Moisture (%)	9.7	9.2	9.6	8.6
Wheat Protein (% , 12% mb)	10.1	10.6	9.9	11.2
Wheat Ash (% , 14% mb)	1.25	1.36	1.18	1.30
1000 Kernel Weight (g, 14% mb)	36.4	33.6	33.7	30.5
Wheat Falling Number (seconds, 14% mb)	320	351	301	348
Flour Extraction (%)	75.3	74.9	77.2	74.5
Flour Ash (% , 14% mb)	0.40	0.49	0.35	0.50
Flour Wet Gluten (% , 14% mb)	24.7	25.8	15.8	27.6
Farinograph: Absorption (% , 14% mb)	53.9	53.9	52.8	53.3
Peak Time (minutes)	2.6	2.6	1.6	1.8
Stability Time (minutes)	3.0	3.2	1.5	1.3
Alveograph: L (mm)	94	107	80	79
W (10 ⁻⁴ joules)	96	105	45	52
Production (mmt)	5.73	5.13	0.46	0.25



Photo courtesy of Washington Grain Commission

Weather

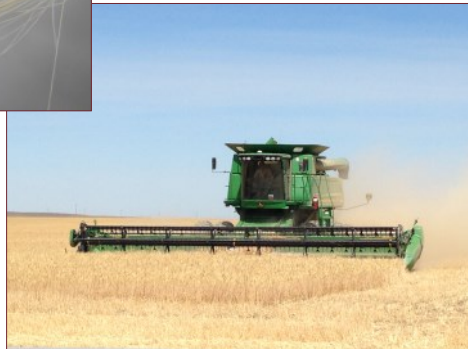
The Pacific Northwest had limited to adequate soil moisture at planting. Most of the wheat producing areas received short to adequate rainfall during the late winter and early spring. Generally, dry and warm weather conditions were reported in the later spring. Isolated rains and cold temperatures occurred in early summer in some areas, causing lower falling number values in those locations. Sustained high temperatures over 90 degrees Fahrenheit (°F) were reported in most wheat growing regions.

Wheat Samples

At harvest, wheat samples were collected from a number of sources, including state and private grain inspection agencies and commercial wheat handling operation throughout Pacific Northwest. Sample collection was based on wheat production in each location. For the 2016 harvest, Wheat Marketing Center received and tested 402 soft white wheat and 66 white club wheat samples from Idaho, Oregon, and Washington. Federal Grain Inspection Service (FGIS) graded each sample. Wheat Marketing Center conducted wheat, flour, Solvent Retention Capacity (SRC), dough, and finished product tests on composites based on production zones and protein levels.

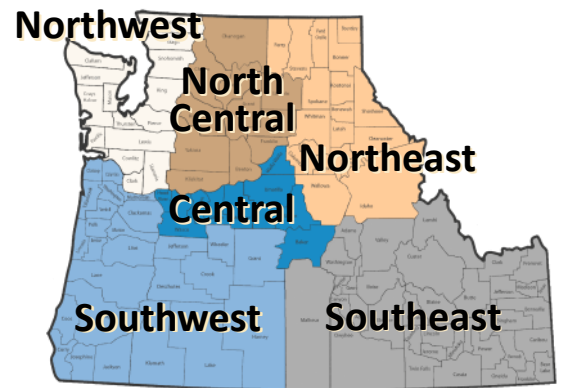


The major soft white wheat varieties were SY Ovation, Otto, ORCF-102, Curiosity CL+, and Xerpha. The major club wheat variety was Bruehl.



Photos courtesy of Wheat Marketing Center (top) and Oregon Wheat Commission (r)

Production Zones



2016 SOFT WHITE AND WHITE CLUB WHEAT

PRODUCTION by production zone

Production Zone	Million Metric Tons (mmt)	Million Bushels
North Central	1.79	65.8
Northeast	1.88	69.1
Central	1.33	49.0
Southeast	0.72	26.3
Southwest	0.47	17.2
Northwest	0.04	1.3
Total	6.23	228.7

Wheat production estimates courtesy of Washington Grain Commission.

WHEAT QUALITY

Production Zone	Wheat Protein Range 12% mb %	Grade	Test Weight lb/bu	Dockage %	Whole Kernel Moisture %	Wheat Falling Number 14% mb seconds	Wheat Ash 14% mb %	Thousand Kernel Weight 14% mb g	SKCS Kernel Hardness Index	Whole Meal Wet Gluten 14% mb %
NORTH CENTRAL	<8.5	1SWH	61.3	0.3	9.5	280	1.15	36.6	33	14.0
Soft White	8.5-9.4	1SWH	61.9	0.4	9.7	310	1.15	37.1	31	19.9
Wheat Estimated	9.5-10.4	1SWH	61.2	0.5	9.8	328	1.18	35.8	33	22.0
Production	10.5-12.0	1SWH	61.3	0.6	9.7	325	1.24	34.7	33	25.5
1.50 MMT	>12.0	1SWH	61.9	0.4	9.2	326	1.32	35.3	29	30.1
	2016 Average	1SWH	61.4	0.5	9.7	317	1.20	35.8	32	22.1
	2015 Average	2SWH	59.2	0.5	8.3	364	1.39	29.0	35	25.5
	3 Year Average	1SWH	60.4	0.4	8.8	361	1.30	32.4	30	25.6
NORTHEAST	8.5-9.4	1SWH	62.2	0.5	9.6	274	1.28	37.6	27	19.1
Soft White	9.5-10.4	1SWH	62.3	0.5	9.5	299	1.25	38.3	33	22.1
Wheat Estimated	10.5-12.0	2SWH	62.0	0.5	9.5	338	1.20	36.9	34	25.6
Production	>12.0	2SWH	58.5	0.8	9.6	372	1.41	32.4	28	29.7
1.77 MMT	2016 Average	1SWH	61.9	0.5	9.5	314	1.25	37.4	32	23.4
	2015 Average	2SWH	58.8	0.7	8.7	351	1.41	30.3	28	25.2
	3 Year Average	1SWH	60.3	0.5	9.1	345	1.35	33.5	28	24.3
CENTRAL	<8.5	2SWH	59.4	1.4	10.7	306	1.03	36.1	29	17.1
Soft White	8.5-9.4	1SWH	60.6	0.5	10.2	310	1.16	34.9	31	20.4
Wheat Estimated	9.5-10.4	1SWH	61.0	0.6	9.7	316	1.17	35.2	30	23.0
Production	10.5-12.0	2SWH	59.4	0.6	9.6	333	1.18	32.7	32	26.6
1.27 MMT	>12.0	3SWH	57.7	0.7	9.8	365	1.21	31.4	33	31.4
	2016 Average	2SWH	59.7	0.6	9.8	330	1.17	33.7	31	25.1
	2015 Average	2SWH	59.5	0.6	8.5	348	1.35	29.5	35	24.0
	3 Year Average	1SWH	60.2	0.5	8.7	354	1.31	32.0	33	24.7
SOUTHEAST	<8.5	1SWH	60.5	0.6	9.5	317	1.38	40.6	27	15.0
Soft White	8.5-9.4	1SWH	61.9	0.4	9.5	318	1.41	40.6	33	18.2
Wheat Estimated	9.5-10.4	1SWH	61.5	0.5	9.2	327	1.41	38.9	37	19.6
Production	10.5-12.0	1SWH	61.8	0.7	9.4	327	1.45	36.4	39	19.7
0.72 MMT	2016 Average	1SWH	61.6	0.5	9.4	322	1.41	39.5	34	18.3
	2015 Average	1SWH	60.6	0.6	10.9	338	1.58	35.8	32	20.6
	3 Year Average	1SWH	60.9	0.5	9.9	340	1.55	36.1	32	19.5
SOUTHWEST	<8.5	2SWH	58.9	0.7	11.4	294	1.40	38.7	17	14.5
Soft White	8.5-9.4	2SWH	59.7	0.7	11.1	328	1.35	37.3	26	17.4
Wheat Estimated	9.5-10.4	1SWH	60.5	0.7	11.3	338	1.26	36.3	26	20.6
Production	2016 Average	2SWH	59.7	0.7	11.2	322	1.34	37.4	23	17.6
0.47 MMT	2015 Average	2SWH	59.8	0.7	10.7	342	1.47	36.7	28	21.6
	3 Year Average	1SWH	60.7	0.6	10.8	344	1.44	38.1	31	20.9
WHITE CLUB	2016 Average	1WHCB	60.8	0.8	9.6	301	1.18	33.7	35	19.4
WHEAT	2015 Average	1WHCB	58.3	0.8	8.0	363	1.39	25.7	37	19.7
Estimated	3 Year Average	1WHCB	60.2	0.5	8.6	343	1.31	30.6	34	17.1
Production										
0.46 MMT										

FLOUR QUALITY

Production Zone	Wheat Protein Range	Flour Yield	Flour Ash	Flour Protein	Flour Color			Flour Wet Gluten	Flour Falling Number	Amylograph Peak Viscosity
	12% mb		14% mb	14% mb	L*	a*	b*	14% mb	14% mb	
	%	%	%	%				%	seconds	BU
NORTH CENTRAL	<8.5	75.1	0.44	7.3	94.0	-2.3	7.8	15.3	297	188
Soft White	8.5-9.4	75.8	0.39	8.2	93.9	-2.1	7.1	15.5	328	318
Wheat Estimated	9.5-10.4	77.2	0.42	9.0	93.5	-1.9	6.9	23.4	370	348
Production	10.5-12.0	75.0	0.40	10.0	93.5	-1.9	7.0	25.8	355	501
1.50 MMT	>12.0	74.1	0.39	11.4	93.2	-1.8	6.4	32.8	367	520
	2016 Average	75.8	0.41	9.1	93.6	-2.0	7.1	22.1	347	379
	2015 Average	72.7	0.43	9.9	92.4	-2.3	7.6	26.6	391	599
	3 Year Average	73.9	0.47	9.7	92.1	-2.3	7.7	26.3	411	527
NORTHEAST	8.5-9.4	76.7	0.40	8.3	93.2	-2.0	6.8	21.3	309	257
Soft White	9.5-10.4	76.5	0.37	8.8	93.0	-1.9	6.7	21.6	330	292
Wheat Estimated	10.5-12.0	76.5	0.38	9.8	92.3	-1.8	6.7	26.2	343	344
Production	>12.0	73.3	0.41	11.4	92.3	-1.7	6.7	30.1	386	522
1.77 MMT	2016 Average	76.3	0.38	9.2	92.8	-1.9	6.7	23.7	336	320
	2015 Average	73.9	0.50	9.5	92.2	-2.3	7.7	24.7	390	610
	3 Year Average	75.5	0.49	9.6	92.1	-2.2	7.6	25.6	381	559
CENTRAL	<8.5	74.2	0.37	6.9	92.9	-2.2	7.4	15.2	308	515
Soft White	8.5-9.4	76.4	0.36	8.2	92.3	-2.1	7.4	20.6	336	458
Wheat Estimated	9.5-10.4	75.5	0.36	8.8	92.6	-2.1	6.6	23.6	308	445
Production	10.5-12.0	74.0	0.35	9.9	94.3	-1.9	6.9	24.4	358	498
1.27 MMT	>12.0	72.2	0.40	11.8	93.9	-1.9	6.9	34.3	359	489
	2016 Average	74.5	0.37	9.6	93.3	-2.0	6.9	25.3	337	474
	2015 Average	73.7	0.49	9.4	92.3	-2.4	7.7	25.9	407	596
	3 Year Average	74.4	0.49	9.6	92.0	-2.4	8.1	27.1	393	560
SOUTHEAST	<8.5	76.0	0.40	7.4	94.4	-2.0	6.6	13.9	353	426
Soft White	8.5-9.4	76.7	0.39	8.0	94.2	-2.0	7.0	18.4	350	442
Wheat Estimated	9.5-10.4	76.3	0.40	8.7	95.5	-1.9	6.8	21.8	347	398
Production	10.5-12.0	76.0	0.46	9.8	93.7	-2.0	7.2	27.4	369	443
0.72 MMT	2016 Average	76.4	0.41	8.4	94.5	-2.0	6.9	20.0	352	427
	2015 Average	76.9	0.55	9.1	92.2	-2.4	7.7	29.8	372	454
	3 Year Average	76.2	0.54	9.1	92.1	-2.4	7.9	26.5	379	459
SOUTHWEST	<8.5	75.9	0.41	7.0	94.0	-2.0	6.5	14.4	321	490
Soft White	8.5-9.4	77.2	0.39	7.7	93.8	-1.9	6.7	18.2	321	426
Wheat Estimated	9.5-10.4	76.6	0.31	8.8	94.0	-1.8	6.4	21.4	347	528
Production	2016 Average	76.7	0.37	7.8	93.9	-1.9	6.6	18.2	328	473
0.47 MMT	2015 Average	74.9	0.52	8.3	92.3	-2.4	7.5	21.6	356	612
	3 Year Average	75.8	0.52	8.1	92.1	-2.3	7.7	20.9	355	511
WHITE CLUB	2016 Average	77.2	0.35	8.8	91.6	-1.9	6.9	15.8	325	298
WHEAT	2015 Average	70.8	0.49	10.1	92.2	-2.2	7.3	28.1	417	647
Estimated	3 Year Average	74.5	0.50	9.9	91.9	-2.3	7.5	27.5	380	485
Production										
0.46 MMT										

SOLVENT RETENTION CAPACITY (SRC)

Production Zone	Wheat Protein Range 12% mb %	Water 14% mb %	50% Sucrose 14% mb %	5% Lactic Acid 14% mb %	5% Sodium Carbonate 14% mb %	Gluten Performance Index
NORTH CENTRAL	<8.5	64	90	113	108	0.57
Soft White	8.5-9.4	60	84	115	109	0.60
Wheat Estimated	9.5-10.4	61	84	112	108	0.58
Production	10.5-12.0	61	80	116	97	0.66
1.50 MMT	>12.0	58	85	117	106	0.62
	2016 Average	61	83	114	104	0.61
	2015 Average	60	116	130	85	0.65
NORTHEAST	8.5-9.4	57	82	107	107	0.57
Soft White	9.5-10.4	55	77	108	110	0.58
Wheat Estimated	10.5-12.0	59	79	118	113	0.62
Production	>12.0	56	86	95	111	0.48
1.77 MMT	2016 Average	57	79	111	111	0.58
	2015 Average	56	102	116	81	0.63
CENTRAL	<8.5	57	89	98	101	0.51
Soft White	8.5-9.4	57	85	101	103	0.54
Wheat Estimated	9.5-10.4	56	85	115	105	0.61
Production	10.5-12.0	58	114	101	83	0.51
1.27 MMT	>12.0	59	113	82	81	0.42
	2016 Average	57	99	101	93	0.52
	2015 Average	57	103	116	82	0.63
SOUTHEAST	<8.5	55	99	85	82	0.47
Soft White	8.5-9.4	59	105	83	81	0.45
Wheat Estimated	9.5-10.4	58	100	82	99	0.41
Production	10.5-12.0	57	83	96	99	0.53
0.72 MMT	2016 Average	58	99	85	89	0.45
	2015 Average	57	98	91	80	0.52
SOUTHWEST	<8.5	55	78	103	102	0.57
Soft White	8.5-9.4	56	82	100	106	0.53
Wheat Estimated	9.5-10.4	60	84	122	101	0.66
Production	2016 Average	57	81	107	103	0.58
0.47 MMT	2015 Average	58	103	117	80	0.63
WHITE CLUB	2016 Average	50	96	82	73	0.49
WHEAT	2015 Average	53	100	85	75	0.49
Estimated Production 0.46 MMT						

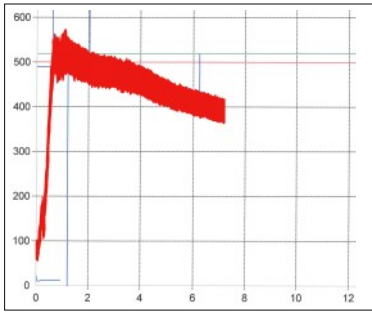
PHYSICAL DOUGH PROPERTIES

Production Zone	Wheat Protein Range 12% mb %	Farinograph			Alveograph			W 10 ⁻⁴ joules
		Absorption 14% mb %	Peak Time minutes	Stability minutes	P mm	L mm	P/L	
NORTH CENTRAL	<8.5	54.6	1.5	2.8	70	73	0.96	152
Soft White	8.5-9.4	54.1	2.0	4.2	55	100	0.55	143
Wheat Estimated	9.5-10.4	54.9	2.8	3.8	46	81	0.57	109
Production	10.5-12.0	54.3	3.7	3.7	41	140	0.29	138
1.50 MMT	>12.0	55.9	3.7	2.8	38	148	0.26	142
	2016 Average	54.6	2.8	3.6	49	106	0.51	132
	2015 Average	54.5	4.1	5.0	50	128	0.45	169
	3 Year Average	54.5	3.2	4.0	48	121	0.46	142
NORTHEAST	8.5-9.4	53.7	2.4	2.6	36	82	0.44	81
Soft White	9.5-10.4	54.0	2.8	3.1	32	88	0.36	89
Wheat Estimated	10.5-12.0	54.7	3.2	3.4	39	85	0.46	95
Production	>12.0	54.5	3.5	3.1	37	139	0.27	130
1.77 MMT	2016 Average	54.2	2.9	3.1	35	89	0.40	93
	2015 Average	53.2	2.9	3.9	37	116	0.33	109
	3 Year Average	53.7	2.6	3.3	39	116	0.35	104
CENTRAL	<8.5	51.9	1.5	3.1	39	72	0.54	77
Soft White	8.5-9.4	52.4	2.2	2.2	33	68	0.49	66
Wheat Estimated	9.5-10.4	52.3	2.7	2.9	35	89	0.39	85
Production	10.5-12.0	53.2	2.7	2.4	35	115	0.30	98
1.27 MMT	>12.0	54.9	2.8	2.6	35	124	0.28	100
	2016 Average	53.1	2.6	2.6	35	100	0.37	88
	2015 Average	53.5	2.5	2.9	39	91	0.51	94
	3 Year Average	53.8	2.3	2.5	38	102	0.42	89
SOUTHEAST	<8.5	52.6	1.7	2.1	26	56	0.46	44
Soft White	8.5-9.4	53.3	1.2	2.1	33	58	0.57	54
Wheat Estimated	9.5-10.4	54.2	2.0	1.5	38	78	0.49	58
Production	10.5-12.0	54.2	2.0	1.7	31	114	0.27	62
0.72 MMT	2016 Average	53.6	1.6	1.9	33	72	0.48	55
	2015 Average	54.6	2.2	2.9	37	70	0.55	63
	3 Year Average	54.0	1.8	2.3	36	79	0.48	64
SOUTHWEST	<8.5	51.1	1.2	1.4	30	91	0.33	62
Soft White	8.5-9.4	52.7	1.4	2.2	42	74	0.57	78
Wheat Estimated	9.5-10.4	51.7	3.4	5.8	35	102	0.34	103
Production	2016 Average	52.0	1.9	3.1	37	87	0.44	81
0.47 MMT	2015 Average	53.0	2.3	3.8	44	89	0.49	109
	3 Year Average	53.4	1.9	3.0	43	83	0.57	92
WHITE CLUB	2016 Average	52.8	1.6	1.5	26	80	0.33	45
WHEAT	2015 Average	53.6	2.0	1.3	31	65	0.48	53
Estimated	3 Year Average	53.3	1.8	1.3	30	79	0.39	52
Production								
0.46 MMT								

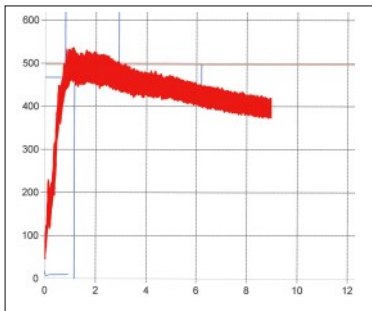
FINISHED PRODUCTS

Production Zone	Wheat Protein Range 12% mb %	Sugar Snap Cookie			Sponge Cake		Chinese Southern Type Steamed Bread	
		Spread	Spread Factor	Top Grain Score	Volume	Total Score	Specific Volume	Total Score
		cm	width/height		cc		cc/g	Control is 70
NORTH CENTRAL	<8.5	8.2	8.0	1.0	1224	54	1.48	61
Soft White	8.5-9.4	8.2	7.7	1.0	1207	54	1.62	68
Wheat Estimated	9.5-10.4	8.2	7.8	0.5	1165	40	1.91	68
Production	10.5-12.0	8.4	8.9	0.5	1152	43	1.99	70
1.50 MMT	>12.0	8.2	7.8	0.0	1164	38	2.04	70
	2016 Average	8.3	8.1	0.6	1176	45	1.83	68
	2015 Average	8.7	10.0	2.0	1233	39	2.34	70
	3 Year Average	8.6	9.5	2.4	1210	42	2.28	68
NORTHEAST	8.5-9.4	8.5	8.1	1.5	1195	49	1.80	66
Soft White	9.5-10.4	8.2	7.8	0.5	1177	49	1.89	68
Wheat Estimated	10.5-12.0	8.3	7.7	0.0	1157	43	2.10	69
Production	>12.0	8.2	8.0	0.0	1215	44	2.21	68
1.77 MMT	2016 Average	8.3	7.8	0.4	1175	47	1.97	68
	2015 Average	8.6	10.0	3.3	1268	41	2.34	67
	3 Year Average	8.6	9.7	3.0	1235	45	2.25	68
CENTRAL	<8.5	8.6	9.1	1.5	1244	54	1.78	67
Soft White	8.5-9.4	8.3	8.8	0.5	1204	49	2.01	68
Wheat Estimated	9.5-10.4	8.4	8.2	0.5	1178	49	1.99	68
Production	10.5-12.0	8.3	8.1	0.0	1216	49	2.19	70
1.27 MMT	>12.0	8.2	7.8	0.0	1177	40	2.14	68
	2016 Average	8.3	8.2	0.3	1195	47	2.07	68
	2015 Average	8.6	10.0	3.7	1286	45	2.34	67
	3 Year Average	8.5	9.6	3.2	1216	42	2.22	66
SOUTHEAST	<8.5	8.8	9.8	2.0	1227	56	1.74	67
Soft White	8.5-9.4	8.7	9.1	1.5	1201	47	1.88	69
Wheat Estimated	9.5-10.4	8.5	8.5	1.0	1217	56	1.98	67
Production	10.5-12.0	8.4	8.4	0.5	1180	46	2.04	66
0.72 MMT	2016 Average	8.6	8.9	1.3	1206	51	1.91	68
	2015 Average	8.7	9.4	3.8	1283	51	2.26	65
	3 Year Average	8.7	9.6	3.9	1241	49	2.17	64
SOUTHWEST	<8.5	8.9	9.9	4.5	1231	54	1.90	68
Soft White	8.5-9.4	8.3	7.5	1.0	1183	46	1.76	68
Wheat Estimated	9.5-10.4	8.4	7.8	0.5	1230	53	2.08	70
Production	2016 Average	8.5	8.2	1.8	1209	50	1.89	69
0.47 MMT	2015 Average	8.7	9.5	5.5	1264	47	2.39	67
	3 Year Average	8.6	9.2	4.3	1235	50	2.10	66
WHITE CLUB								
WHEAT	2016 Average	8.5	9.1	2.5	1233	49	2.12	65
Estimated	2015 Average	8.8	11.0	3.5	1267	39	2.39	66
Production	3 Year Average	8.8	10.8	3.8	1225	44	2.41	65
0.46 MMT								

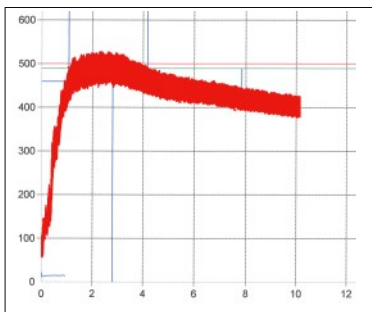
FARINOGRAPH



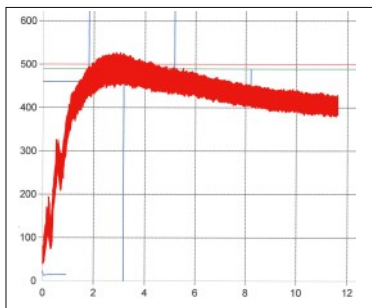
<8.5% Wheat Protein Range



8.5-9.4% Wheat Protein Range



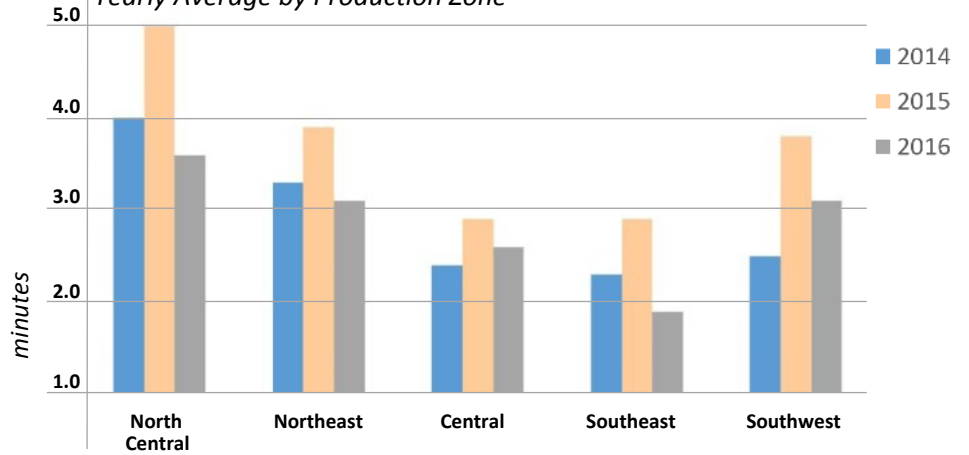
9.5-10.4% Wheat Protein Range



10.5-12.0% Wheat Protein Range

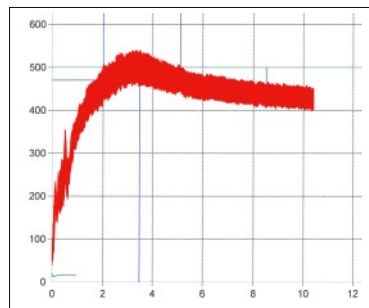
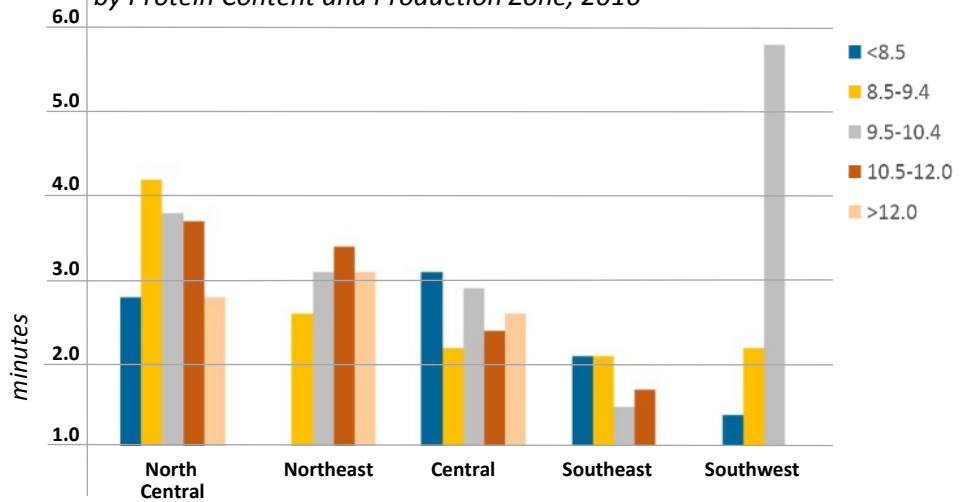
PNW Soft White Wheat Farinograph Stability

Yearly Average by Production Zone

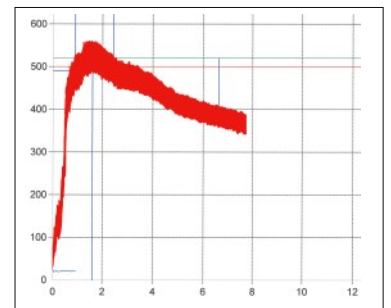


PNW Soft White Wheat Farinograph Stability

by Protein Content and Production Zone, 2016

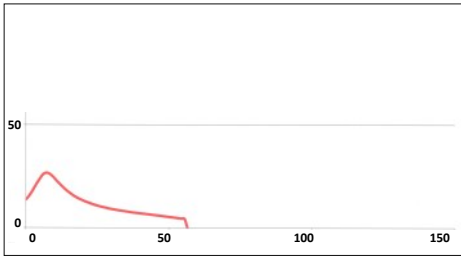


>12.0% Wheat Protein Range

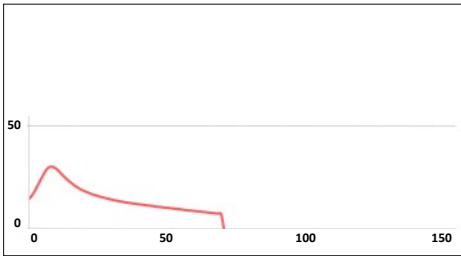


White Club Wheat

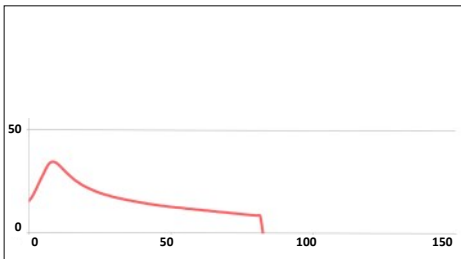
ALVEOGRAPH



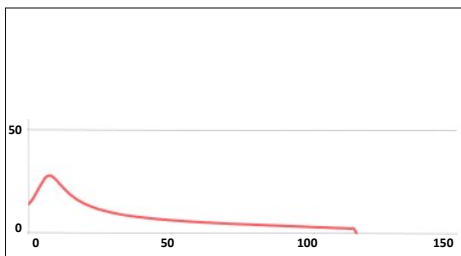
<8.5% Wheat Protein Range



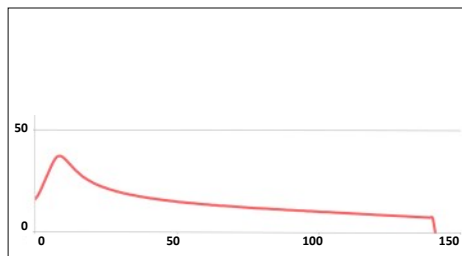
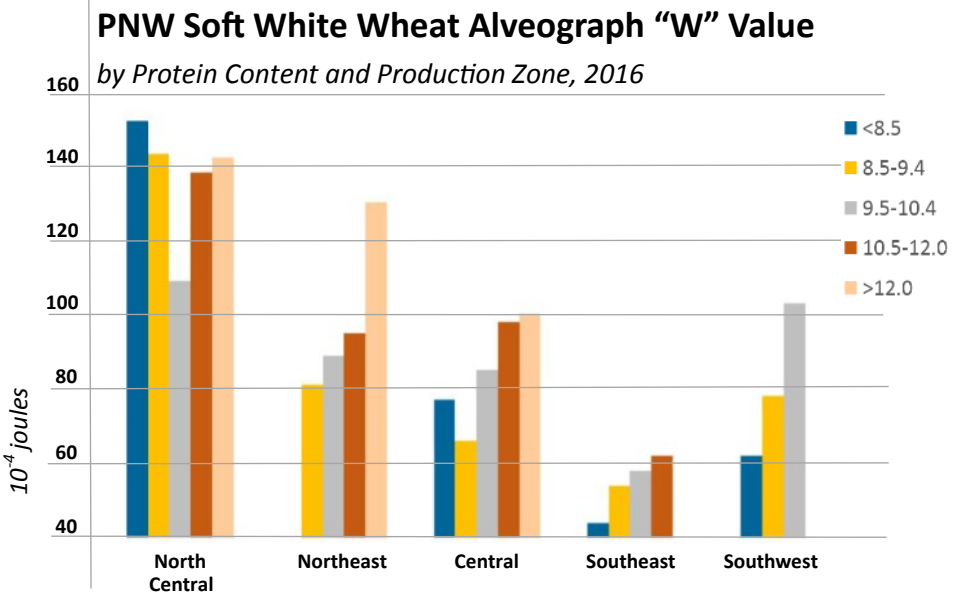
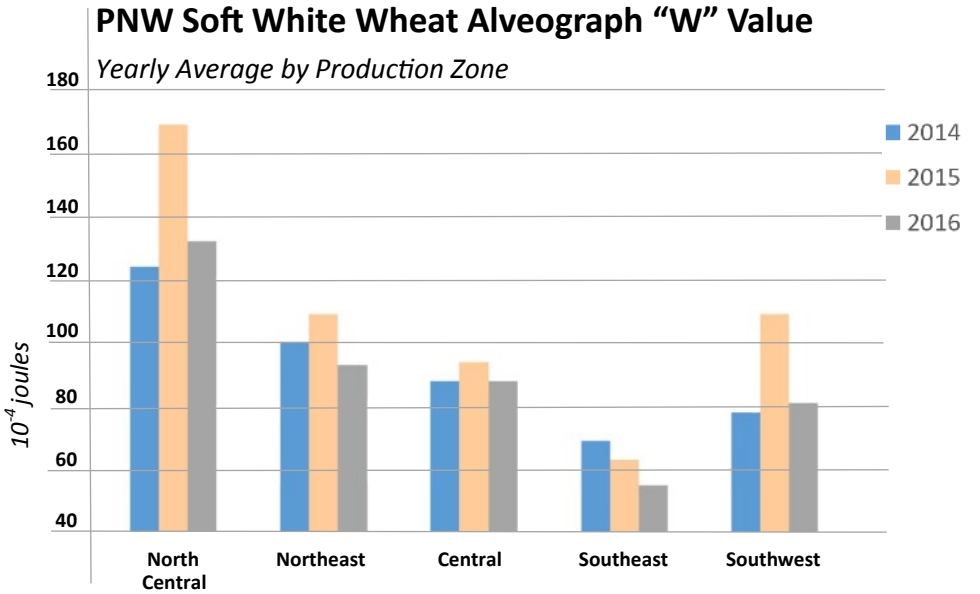
8.5-9.4% Wheat Protein Range



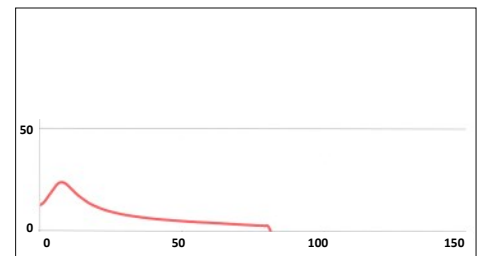
9.5-10.4% Wheat Protein Range



10.5-12.0% Wheat Protein Range

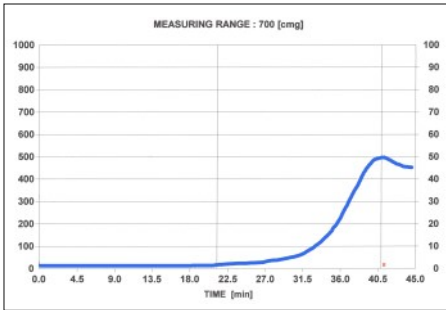


>12.0% Wheat Protein Range

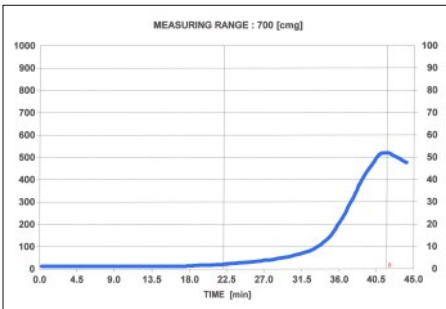


White Club Wheat

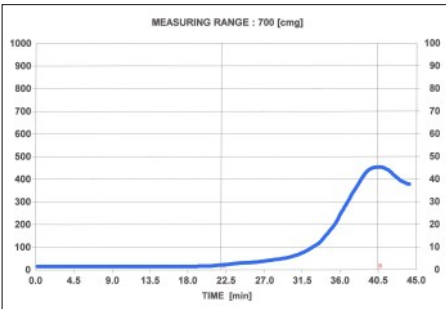
AMYLOGRAPH



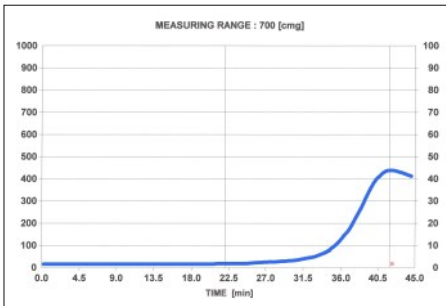
North Central Production Zone



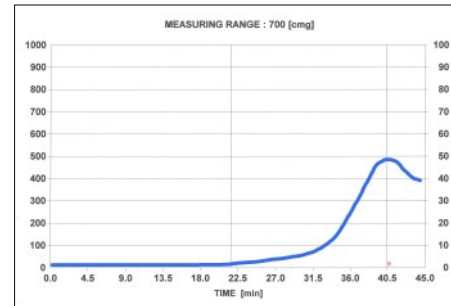
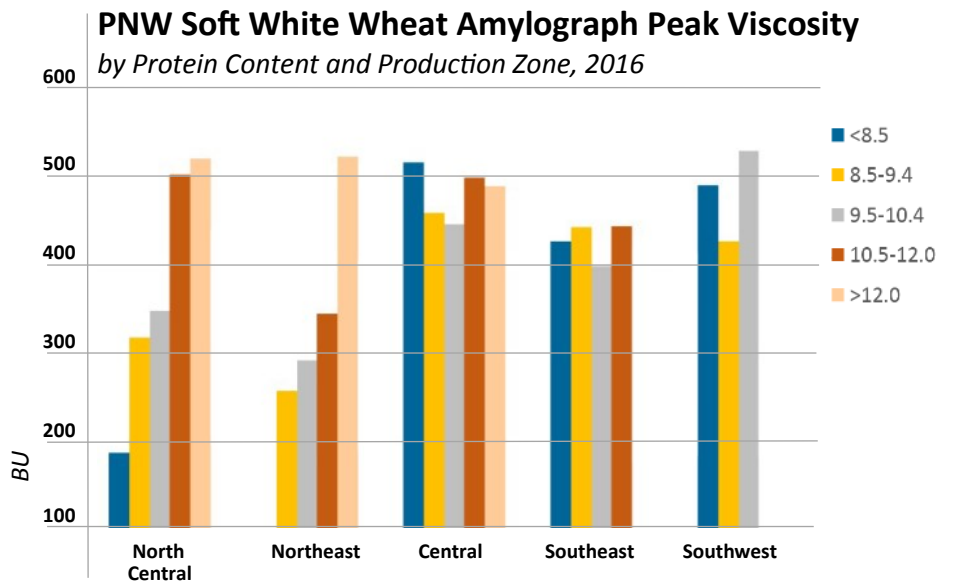
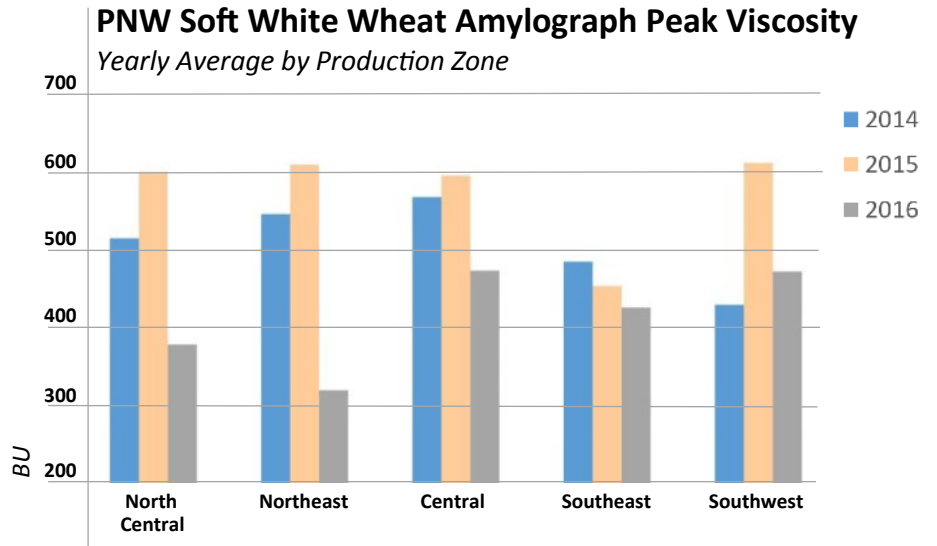
Northeast Production Zone



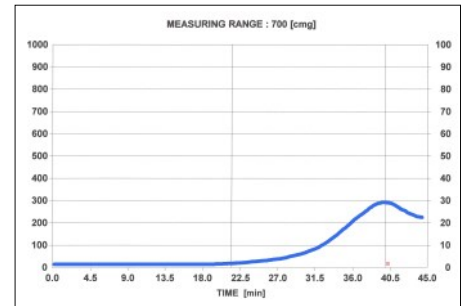
Central Production Zone



Southeast Production Zone

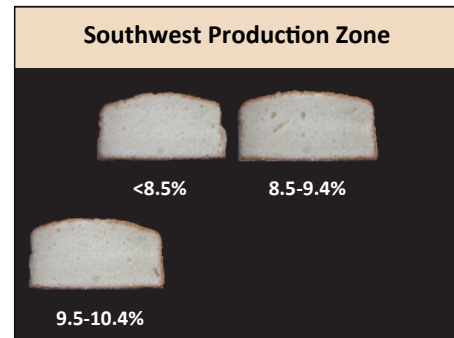
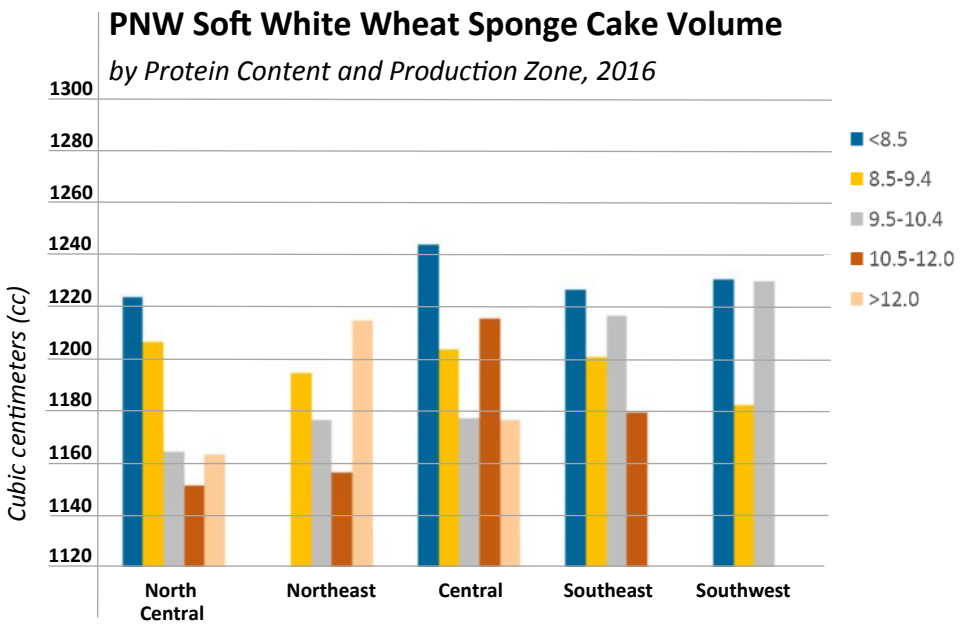
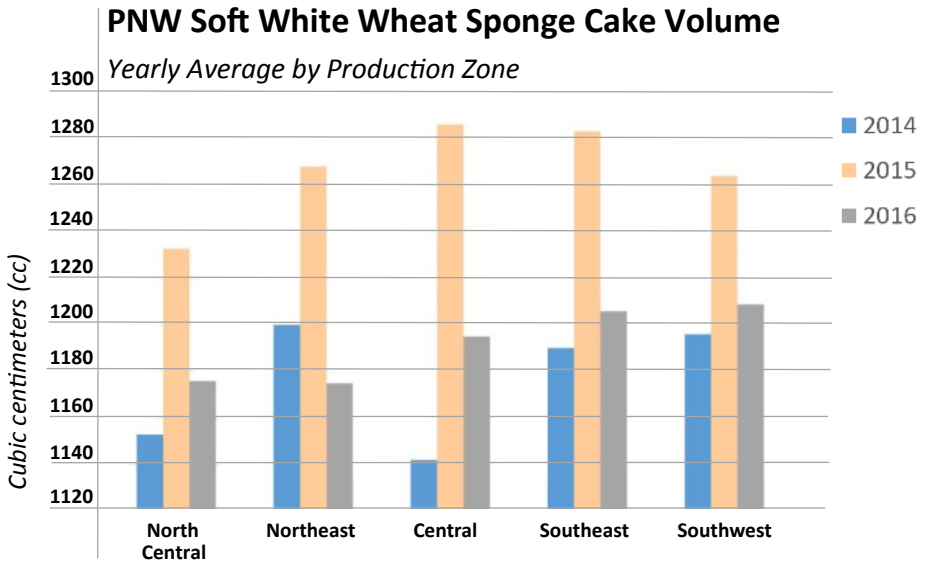
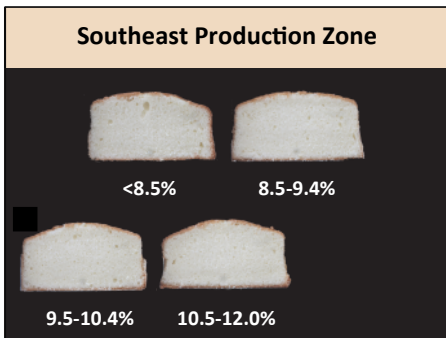
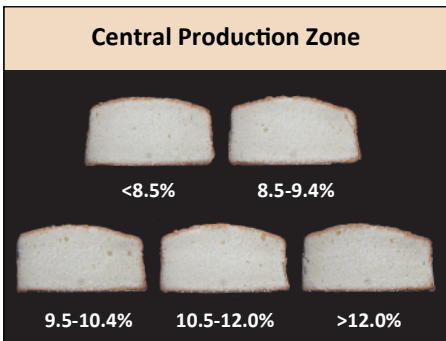
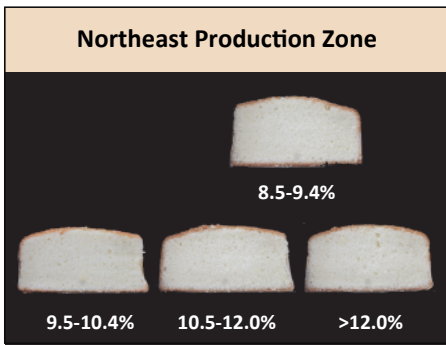
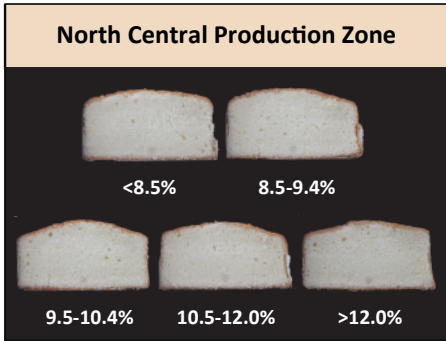


Southwest Production Zone

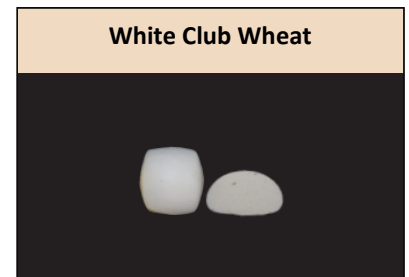
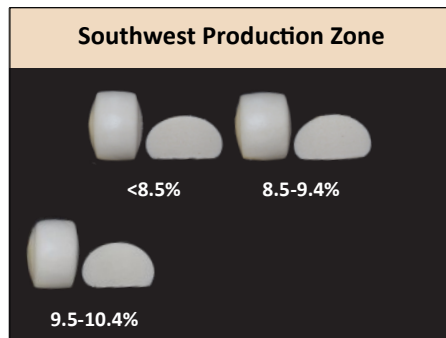
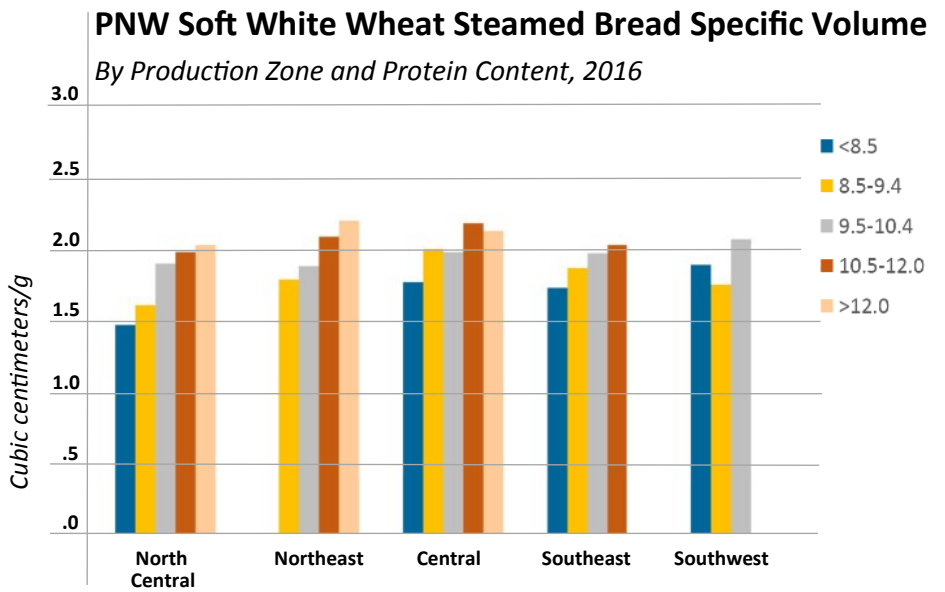
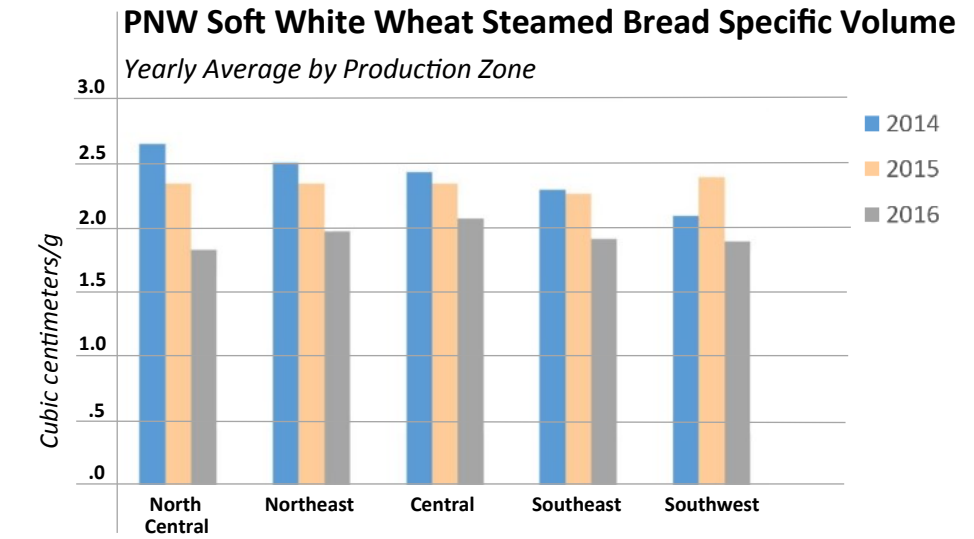
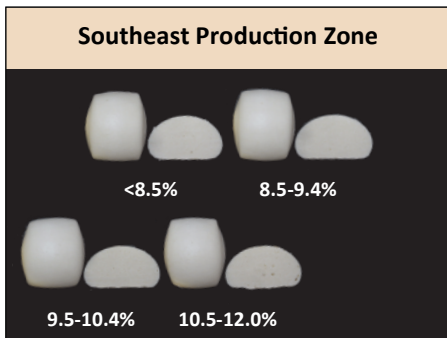
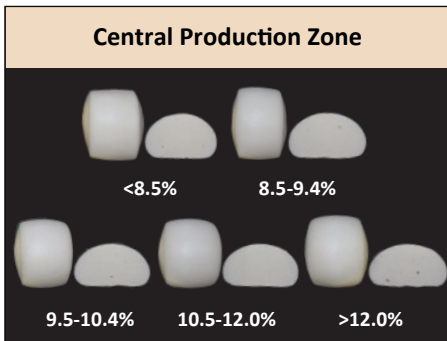
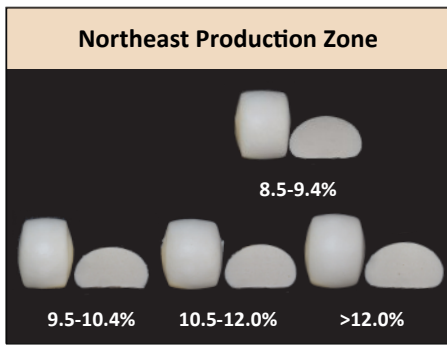
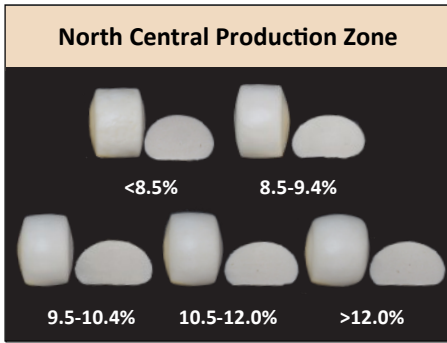


White Club Wheat

SPONGE CAKE



CHINESE SOUTHERN TYPE STEAMED BREAD



SUMMARY

These results were derived from composite samples of the Pacific Northwest soft white wheat and white club wheat harvest. Soft white wheat composites were prepared by production zone and protein levels, and all white club wheat samples were made into one composite. These composite samples were analyzed for wheat quality, flour quality, solvent retention capacity, physical dough properties, and finished product characteristics. Harvest information is summarized as follows:

Wheat Quality

Average test weights were over 60 pounds per bushel (lbs/bu) at most protein levels in most production zones. Dockage averages were similar to last year and the three-year averages in all production zones. Wheat moisture averages were less than 10 percent in the major wheat producing zones of North Central, Northeast, Central, and Southeast. Average falling number values for lower protein levels in North Central, Northeast, and Southwest were below 300 seconds. Average wheat ash content was lower than last year in all production zones. Thousand kernel weights were heavier than last year in all production zones. SKCS kernel hardness index values were similar to last year and the three-year averages in all production zones. Whole meal wet gluten averages were lower than last year and the three-year averages in production zones of North Central, Northeast, Southeast, and Southwest.

Flour Quality

Average flour yields were higher than last year and the three-year averages in all production zones. White club wheat had much higher flour yield than last year and the three-year averages, probably due to higher thousand kernel weight. Average flour ash contents were lower than last year and the three-year averages in all production zones. Flour color averages were slightly whiter than last year and the three-year averages in all production zones. Flour quality parameters indicated higher wet gluten contents in samples with higher protein contents. Flour falling number values were greater than 300 seconds in

all production zones for all protein levels, except for <8.5% in North Central. Amylograph peak viscosity averages were lower than last year and the three-year averages in all production zones.

Solvent Retention Capacity (SRC)

Water SRC average values were similar to last year. North Central, Northeast, Central, and Southwest Sucrose SRC average values were lower than last year. Lactic acid SRC averages were lower than last year due to lower protein contents in all production zones. Sodium carbonate SRC averages were higher than last year in all production zones, indicating higher damaged starch content. Gluten performance index values were lower than last year in all production zones.

Physical Dough Properties

Physical dough property tests indicated generally lower water absorption values and generally weaker gluten strength, as measured by the farinograph, in samples with lower protein content in each production zone. Longer dough extensibility, as shown by alveograph L value, was observed in samples with higher protein content. White club wheat had weaker gluten strength than soft white wheat samples, as indicated by much lower Alveograph W values.

Finished Products

In general, lower protein soft white wheat samples, within each production zone, made better sugar snap cookies as measured by spread factor and top grain scores. Average sponge cake volumes were smaller than last year and the three-year averages in all production zones. However, sponge cake total score averages were either similar to or greater than last year and the three-year averages. Steamed bread specific volumes generally increased with increasing protein content within each production zone. Steamed bread specific volume averages were lower than last year and the three-year averages in all production zones. White club wheat composite sample followed the same trend as soft white wheat.

Wheat Marketing Center thanks the many individuals
and organizations that provided samples for
the 2016 Annual Pacific Northwest Crop Quality Survey,
and recognizes with gratitude the project's funding partners:



www.idahowheat.org



www.wagrain.org



www.owgl.org



www.uswheat.org



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