Summary

These results were from composite samples of the Pacific Northwest soft white wheat and white club wheat harvest. Composite samples were prepared by production zone and protein levels. One composite sample was prepared from all club wheat samples. These composite samples were analyzed for wheat quality, flour quality, physical dough properties, and finished product characteristics. Harvest information is summarized as follows:

Wheat Quality

Wheat data indicated generally higher test weights at most protein levels in most production zones when compared to the three year average. Dockage levels were similar to the three year average in most soft white wheat production zones. In general, low wheat moisture at less than 10 percent prevailed in the major wheat producing zones of North Central, Central, Northeast, and Southeast. Average falling number values in North Central, Northeast, Central, Southeast, and Southwest production zones were greater than 300 seconds at all protein ranges. Low wheat ash contents were present in the North Central and Central Production Zones. Wheat samples from Central production zone had thousand kernel weights greater than last year.

Flour Quality

Flour quality parameters indicated wet gluten contents in samples with higher protein content. Falling number values were greater than 300 seconds at all protein ranges in all production zones. Amylograph peak viscosities above 450 BU were present in most protein ranges in samples from North Central, Northeast, Central, and Southwest production zones.

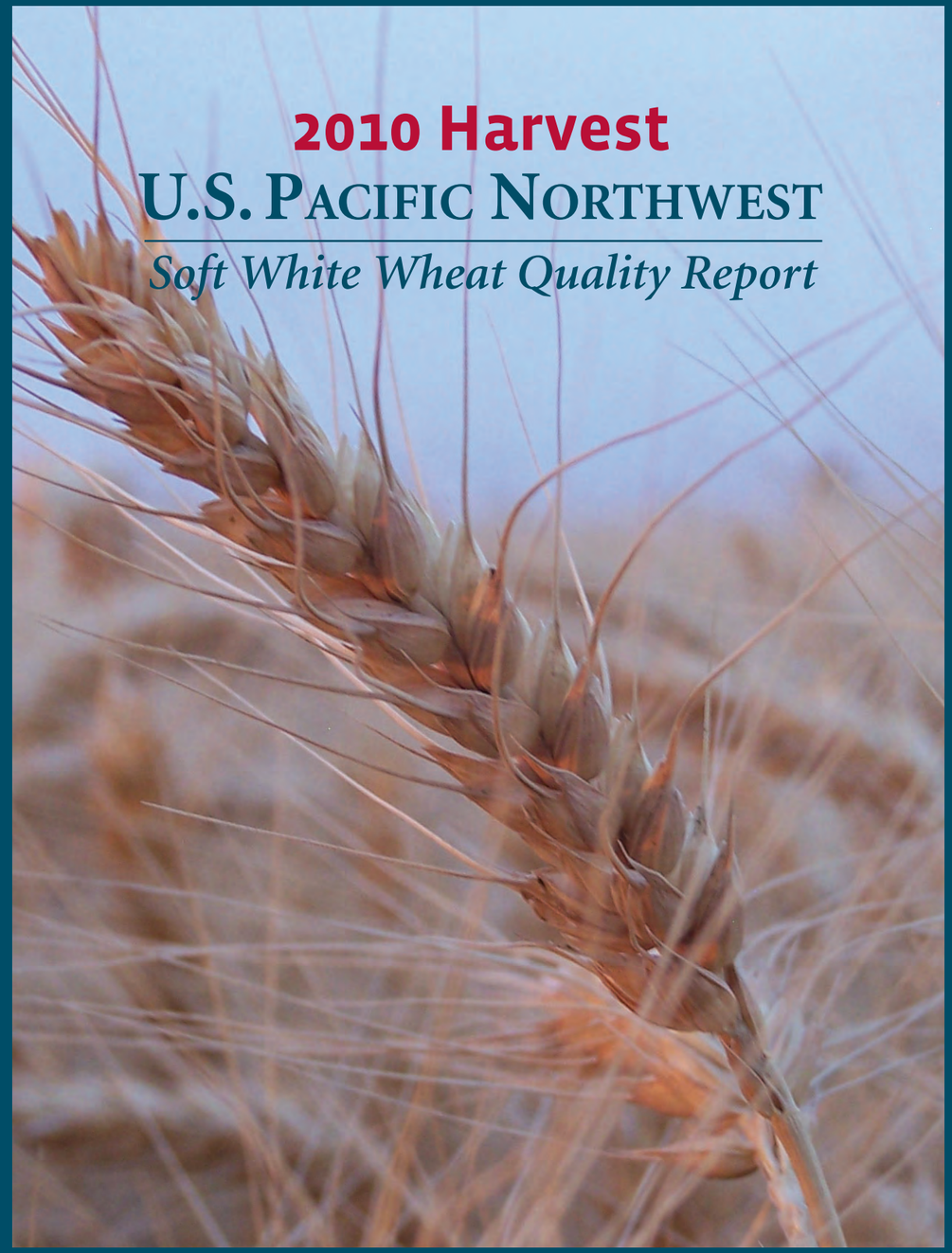
Physical Dough Properties

Physical dough property tests indicated low average water absorption values and weak gluten strength, as measured by the farinograph, in samples with lower protein content. Longer gluten extensibility, as shown by alveograph L values, was observed in samples with higher protein content. White club wheat had weaker gluten strength than most soft white wheat samples, as indicated by alveograph W values.

Finished Products

Within a production zone, lower protein samples made better sugar snap cookies. Average sponge cake volumes were higher in samples from the North Central, Northeast, Central, and Southwest production zones. Steamed bread specific volumes generally increased with increasing protein content.

2010 Harvest
U.S. Pacific Northwest
Soft White Wheat Quality Report



Idaho Wheat Commission — www.idahowheat.org

Washington Grain Commission — www.wawheat.com

Oregon Wheat Commission — www.owgl.org

U.S. Wheat Associates — www.uswheat.org

Wheat Marketing Center — www.wmcinc.org

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

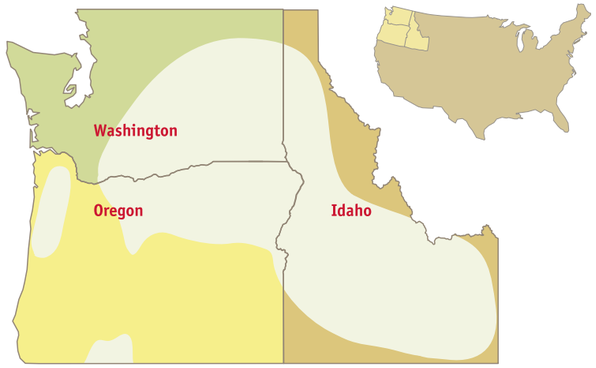
The Pacific Northwest

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. Soft white wheat is well suited for products such as cakes, pastries, cookies, crackers, pancakes, sponge cakes, snack foods, flat breads, and 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 the buyer and seller.

Wheat Growing Areas of the Pacific Northwest



Wheat Production Zones

Wheat Samples

At harvest, National Agricultural Statistics Service collected 354 soft white wheat and 60 white club wheat samples this year, based on wheat production. Federal Grain Inspection Service (FGIS) graded each sample. Wheat Marketing Center conducted wheat, flour, dough, and finished product tests on composites based on production zones and protein levels.

The major soft white wheat varieties were ORCF102, Eltan, Louise, ORCF101, Brundage, and Stephens.

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Weather

The Pacific Norwest had adequate soil moisture at planting. Most of the wheat production area received adequate rainfall during the winter and spring. Generally cool temperatures prevailed during the growing season with some limited periods of high temperatures. Dry conditions prevailed during the wheat harvest with some localized rain showers.

2010 Soft White and White Club Wheat Production

By production zone

Wheat production estimates courtesy of Washington Grain Commission

Production Zone	Million Metric Tons (MMT)	Million Bushels
North Central	1.92	70.5
Northeast	1.96	72.1
Central	1.50	55.2
Southeast	0.82	30.1
Southwest	0.51	18.6
Northwest	0.01	0.4
Total	**6.72**	**246.9**

Wheat Quality

Production Zone	Wheat Protein Range 12% mb %	Grade	Test Weight lb/bu	Dockage %	Whole Kernel Moisture %	Falling Number 14% mb seconds	Ash 14% mb %	Thousand Kernel Weight 14% mb g	SKCS Kernel Hardness Index	Whole Meal Wet Gluten 14% mb %
North Central	<8.5	2SWH	59.6	0.5	9.4	309	1.28	33.9	31	14.8
	8.5-9.4	1SWH	60.1	0.7	10.0	332	1.26	33.4	33	20.0
Soft White Wheat Estimated Production = 1.64 MMT	9.5-10.4	1SWH	60.3	0.5	9.0	379	1.22	32.1	33	25.4
	10.5-12.0	1SWH	60.8	0.3	9.2	342	1.35	35.7	36	25.9
	>12.0	2SWH	59.4	0.5	8.7	379	1.34	31.1	26	27.2
	2010 Average	**1SWH**	**60.1**	**0.5**	**9.3**	**349**	**1.28**	**33.2**	**32**	**22.5**
	2009 Average	1SWH	60.5	0.4	9.5	331	1.27	33.4	28	27.0
	3 Year Average	1SWH	60.1	0.5	9.3	330	1.27	32.9	30	24.5
Northeast	<8.5	1SWH	60.6	0.3	9.1	313	1.30	35.3	37	13.8
	8.5-9.4	1SWH	60.3	0.6	9.5	330	1.34	33.9	38	19.0
Soft White Wheat Estimated Production = 1.96 MMT	9.5-10.4	2SWH	59.2	0.8	9.5	336	1.44	31.4	37	21.6
	10.5-12.0	2SWH	59.3	0.4	9.1	337	1.46	29.3	39	24.7
	>12.0	3SWH	57.5	0.6	9.5	338	1.38	29.8	39	26.3
	2010 Average	**2SWH**	**59.5**	**0.6**	**9.4**	**334**	**1.41**	**31.5**	**38**	**21.7**
	2009 Average	1SWH	60.4	0.6	9.9	320	1.34	34.6	30	25.8
	3 Year Average	2SWH	59.2	0.6	9.7	325	1.37	32.5	33	27.0
Central	<8.5	2SWH	59.9	0.6	9.3	323	1.33	35.1	37	13.8
	8.5-9.4	1SWH	60.6	0.6	9.0	330	1.31	32.4	39	19.6
Soft White Wheat Estimated Production = 1.45 MMT	9.5-10.4	1SWH	61.0	0.4	9.5	361	1.37	36.4	36	23.1
	10.5-12.0	1SWH	60.3	0.9	8.9	358	1.34	34.3	36	26.3
	>12.0	1SWH	60.3	0.2	8.1	313	1.42	34.0	37	29.8
	2010 Average	**1SWH**	**60.4**	**0.6**	**9.1**	**337**	**1.34**	**34.3**	**37**	**20.1**
	2009 Average	2SWH	59.8	0.4	8.8	340	1.35	32.2	35	26.2
	3 Year Average	2SWH	59.6	0.5	9.1	333	1.34	34.8	37	24.7
Southeast	<8.5	1SWH	60.7	0.9	9.4	313	1.53	38.9	25	15.5
	8.5-9.4	1SWH	61.7	0.4	10.0	316	1.53	36.9	30	18.9
Soft White Wheat Estimated Production = 0.82 MMT	9.5-10.4	1SWH	60.6	0.9	9.9	304	1.57	35.6	30	20.1
	10.5-12.0	1SWH	60.5	0.6	9.7	338	1.57	35.2	34	27.1
	>12.0	3SWH	56.9	1.3	9.9	310	1.59	27.0	27	28.9
	2010 Average	**1SWH**	**60.4**	**0.7**	**9.8**	**317**	**1.56**	**35.3**	**30**	**21.9**
	2009 Average	1SWH	60.1	0.9	9.5	328	1.59	35.6	33	23.3
	3 Year Average	1SWH	60.0	1.1	9.4	323	1.58	36.6	30	22.9
Southwest	<8.5	1SWH	60.6	0.3	11.3	315	1.45	38.1	36	13.6
Soft White Wheat Estimated Production = 0.44 MMT	8.5-9.4	1SWH	61.4	0.6	11.3	322	1.44	34.9	37	17.3
	10.5-12.0	2SWH	59.8	0.6	10.1	341	1.52	32.2	38	26.5
	2010 Average	**1SWH**	**60.6**	**0.5**	**11.0**	**324**	**1.47**	**35.7**	**37**	**18.0**
	2009 Average	1SWH	61.4	0.5	10.6	337	1.37	38.6	36	18.7
White Club Wheat	**2010 Average**	**1WHCB**	**60.0**	**1.1**	**9.4**	**338**	**1.29**	**32.7**	**36**	**18.2**
	2009 Average	1WHCB	60.2	0.8	8.7	310	1.29	31.4	29	17.2
Estimated Production = 0.40 MMT	3 Year Average	1WHCB	59.7	0.9	9.0	317	1.29	30.7	33	19.6

Flour Quality

Production Zone	Wheat Protein Range 12% mb %	Flour Yield %	Flour Ash 14% mb %	Flour Protein 14% mb %	Flour Color L*	Flour Color a*	Flour Color b*	Wet Gluten 14% mb %	Falling Number 14% mb seconds	Amylograph Peak Viscosity BU
North Central	8.5	72.3	0.44	6.6	92.3	-2.7	8.6	10.1	345	544
	8.5-9.4	71.2	0.45	7.6	92.5	-2.6	8.1	13.6	372	503
Soft White Wheat Estimated Production = 1.64 MMT	9.5-10.4	71.4	0.45	8.6	92.4	-2.5	8.2	18.5	372	490
	10.5-12.0	70.7	0.46	9.5	92.0	-2.4	7.9	24.5	353	549
	>12.0	70.9	0.50	10.7	92.4	-2.2	7.6	25.2	400	596
	2010 Av.	**71.3**	**0.45**	**8.4**	**92.3**	**-2.5**	**8.1**	**17.7**	**368**	**525**
	2009 Av.	70.6	0.43	9.0	92.9	-2.4	7.9	23.3	390	478
	3 Year Av.	69.6	0.41	9.0	92.7	-2.4	8.1	21.9	361	560
Northeast	<8.5	71.3	0.41	6.6	93.0	-2.6	8.5	11.3	364	473
	8.5-9.4	71.8	0.46	7.6	92.2	-2.6	8.4	17.3	351	454
Soft White Wheat Estimated Production = 1.96 MMT	9.5-10.4	71.5	0.48	8.6	91.5	-2.5	8.4	19.2	344	572
	10.5-12.0	70.8	0.48	9.6	91.9	-2.5	8.5	24.9	339	494
	>12.0	70.2	0.49	10.6	91.8	-2.3	8.6	28.6	384	543
	2010 Av.	**71.3**	**0.47**	**8.6**	**91.9**	**-2.5**	**8.4**	**20.7**	**347**	**505**
	2009 Av.	71.4	0.42	8.7	92.8	-2.3	7.6	23.6	338	427
	3 Year Av.	70.2	0.41	9.4	92.6	-2.3	7.9	24.6	331	514
Central	<8.5	71.6	0.48	6.6	92.0	-2.7	8.7	11.6	342	533
	8.5-9.4	71.2	0.48	7.6	92.0	-2.5	8.5	16.9	361	575
Soft White Wheat Estimated Production = 1.45 MMT	9.5-10.4	71.0	0.46	8.5	91.5	-2.5	8.0	23.4	362	573
	10.5-12.0	70.8	0.45	9.7	91.9	-2.3	8.0	23.3	379	607
	>12.0	70.9	0.51	11.1	91.9	-2.3	8.4	35.0	362	564
	2010 Av.	**71.2**	**0.47**	**8.0**	**91.9**	**-2.5**	**8.4**	**18.4**	**359**	**567**
	2009 Av.	70.3	0.47	9.2	92.6	-2.4	8.0	23.7	359	496
	3 Year Av.	69.7	0.43	9.2	92.6	-2.4	8.2	23.1	349	549
Southeast	<8.5	72.3	0.48	7.0	92.3	-2.6	8.5	15.7	313	481
	8.5-9.4	72.6	0.46	7.6	92.5	-2.5	8.4	18.1	315	355
Soft White Wheat Estimated Production = 0.82 MMT	9.5-10.4	71.3	0.46	8.2	92.4	-2.4	8.4	21.9	336	473
	10.5-12.0	70.2	0.50	9.5	92.0	-2.1	7.5	24.5	321	547
	>12.0	69.3	0.54	10.8	91.7	-2.2	8.4	29.4	376	490
	2010 Av.	**71.3**	**0.48**	**8.5**	**92.2**	**-2.4**	**8.2**	**21.7**	**329**	**462**
	2009 Av.	71.9	0.44	8.5	92.7	-2.4	7.9	19.2	377	360
	3 Year Av.	70.6	0.44	8.7	92.6	-2.3	7.8	21.4	341	492
Southwest	<8.5	69.3	0.49	6.3	92.0	-2.5	8.6	9.1	333	451
Soft White Wheat Estimated Production = 0.44 MMT	8.5-9.4	70.5	0.46	7.3	92.0	-2.1	7.3	15.8	328	582
	10.5-12.0	70.1	0.47	9.5	92.1	-2.2	7.9	23.2	320	530
	2010 Av.	**69.8**	**0.48**	**7.4**	**92.0**	**-2.3**	**8.1**	**14.6**	**328**	**507**
	2009 Av.	71.7	0.40	7.5	92.8	-2.3	7.6	17.5	341	376
White Club Wheat	**2010 Av.**	**71.7**	**0.48**	**8.7**	**91.9**	**-2.4**	**8.0**	**18.7**	**349**	**554**
	2009 Av.	71.3	0.47	9.0	92.1	-2.3	7.2	15.0	382	417
Estimated Production = 0.40 MMT	3 Year Av.	71.8	0.43	9.3	92.2	-2.2	7.6	19.4	348	520

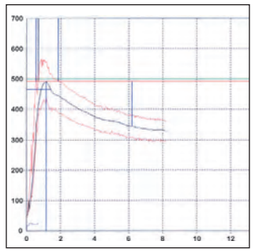
Physical Dough Properties

Production Zone	Wheat Protein Range 12% mb %	Farinograph Absorption 14% mb %	Farinograph Peak Time minutes	Farinograph Stability minutes	Alveograph P mm	Alveograph L mm	Alveograph P/L	Alveograph W 10^{-4} joules
North Central	<8.5	50.3	1.0	1.2	42	82	0.51	94
	8.5-9.4	51.0	1.5	4.6	43	108	0.40	124
Soft White	9.5-10.4	51.9	1.5	5.1	41	124	0.33	123
Wheat Estimated	10.5-12.0	52.5	2.5	4.9	38	140	0.27	116
Production =	>12.0	52.8	5.4	10.3	44	176	0.25	207
1.64 MMT	**2010 Average**	**51.6**	**2.1**	**5.0**	**42**	**122**	**0.36**	**128**
	2009 Average	56.1	2.1	5.0	69	109	0.70	190
	3 Year Average	54.9	2.1	4.9	55	113	0.54	158
Northeast	<8.5	52.2	1.4	1.8	50	60	0.83	91
	8.5-9.4	52.0	1.2	2.6	35	69	0.51	69
Soft White	9.5-10.4	51.9	1.7	3.7	37	126	0.29	106
Wheat Estimated	10.5-12.0	51.9	3.5	5.6	36	141	0.26	114
Production =	>12.0	53.9	2.7	3.5	33	171	0.19	106
1.96 MMT	**2010 Average**	**52.1**	**2.2**	**3.9**	**36**	**114**	**0.36**	**97**
	2009 Average	56.5	2.1	4.0	64	88	0.76	147
	3 Year Average	55.3	2.2	4.5	50	123	0.47	140
Central	<8.5	51.7	1.2	1.2	38	62	0.61	67
	8.5-9.4	52.1	1.3	2.3	37	84	0.44	84
Soft White	9.5-10.4	52.7	1.4	3.0	35	112	0.31	87
Wheat Estimated	10.5-12.0	52.3	2.3	5.6	36	142	0.25	113
Production =	>12.0	53.5	2.0	2.4	30	155	0.19	73
1.45 MMT	**2010 Average**	**52.2**	**1.5**	**2.7**	**36**	**96**	**0.43**	**84**
	2009 Average	56.1	2.1	3.3	55	104	0.67	132
	3 Year Average	55.6	2.0	3.2	51	96	0.59	116
Southeast	<8.5	51.1	1.2	1.2	24	79	0.30	40
	8.5-9.4	51.5	1.4	1.5	24	81	0.30	39
Soft White	9.5-10.4	51.3	1.2	1.8	26	99	0.26	48
Wheat Estimated	10.5-12.0	51.9	3.0	4.8	30	160	0.19	90
Production =	>12.0	52.5	2.0	2.7	30	126	0.24	65
0.82 MMT	**2010 Average**	**51.6**	**1.8**	**2.4**	**27**	**109**	**0.26**	**56**
	2009 Average	57.3	1.9	2.5	51	75	0.79	87
	3 Year Average	54.8	1.9	3.2	40	103	0.47	84
Southwest	<8.5	52.9	1.0	1.1	44	53	0.83	67
Soft White	8.5-9.4	51.2	1.5	3.3	34	109	0.31	81
Wheat Estimated	10.5-12.0	52.4	1.4	4.1	34	137	0.25	90
Production =	**2010 Average**	**52.3**	**1.2**	**2.5**	**39**	**90**	**0.54**	**77**
0.44 MMT	2009 Average	57.7	1.6	2.8	71	48	1.59	106
White Club Wheat	**2010 Average**	**50.7**	**2.0**	**2.5**	**24**	**112**	**0.21**	**53**
	2009 Average	56.0	1.3	2.1	58	56	1.04	81
Estimated	3 Year Average	53.2	1.4	2.1	36	75	0.55	56
Production = 0.40 MMT								

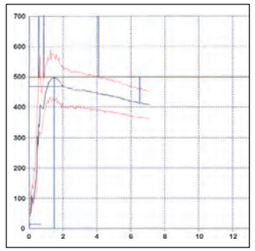
Finished Products

Production Zone	Wheat Protein Range 12% mb %	Sugar Snap Cookie Spread cm	Sugar Snap Cookie Spread Factor width/height	Sugar Snap Cookie Top Grain Score	Sponge Cake Volume cc	Sponge Cake Total Score	Chinese Southern Type Steamed Bread Specific Volume cc/g	Chinese Southern Type Steamed Bread Total Score
North Central	<8.5	9.1	12.1	6.0	1270	56	2.27	63
	8.5-9.4	9.1	11.7	2.5	1256	53	2.17	67
Soft White	9.5-10.4	8.9	11.2	3.5	1210	51	2.20	69
Wheat Estimated	10.5-12.0	8.9	11.2	3.5	1163	36	2.40	67
Production =	>12.0	8.8	11.1	4.0	1234	51	2.38	71
1.64 MMT	**2010 Average**	**9.0**	**11.5**	**3.7**	**1227**	**50**	**2.26**	**67**
	2009 Average	8.0	8.2	1.2	1172	53	2.02	69
	3 Year Average	8.1	8.2	1.4	1189	48	2.37	67
Northeast	<8.5	9.0	10.7	4.5	1201	49	2.12	67
	8.5-9.4	9.1	11.4	6.0	1220	51	2.13	69
Soft White	9.5-10.4	8.9	10.5	3.5	1209	49	2.35	68
Wheat Estimated	10.5-12.0	8.7	10.0	4.0	1238	52	2.18	69
Production =	>12.0	8.4	10.0	4.0	1242	53	2.48	68
1.96 MMT	**2010 Average**	**8.8**	**10.5**	**4.5**	**1223**	**51**	**2.23**	**68**
	2009 Average	8.0	8.0	0.8	1175	50	2.06	70
	3 Year Average	8.0	7.6	0.7	1196	50	2.44	68
Central	<8.5	9.1	11.4	7.5	1235	52	2.06	67
	8.5-9.4	9.3	11.7	7.0	1199	46	2.09	67
Soft White	9.5-10.4	8.9	10.5	4.0	1237	56	2.12	67
Wheat Estimated	10.5-12.0	8.8	10.4	3.0	1226	53	2.27	65
Production =	>12.0	8.8	10.4	2.0	1209	52	2.46	68
1.45 MMT	**2010 Average**	**9.0**	**11.1**	**5.7**	**1221**	**51**	**2.14**	**66**
	2009 Average	8.0	7.7	0.5	1157	44	2.17	66
	3 Year Average	8.0	7.4	0.8	1172	49	2.34	65
Southeast	<8.5	9.3	12.0	6.0	1227	55	2.18	66
	8.5-9.4	9.2	11.6	7.5	1239	59	2.22	67
Soft White	9.5-10.4	9.4	12.2	3.5	1195	50	2.07	66
Wheat Estimated	10.5-12.0	9.3	11.6	3.5	1206	55	2.33	72
Production =	>12.0	8.8	11.1	2.0	1186	50	2.39	67
0.82 MMT	**2010 Average**	**9.2**	**11.8**	**4.6**	**1211**	**54**	**2.22**	**67**
	2009 Average	8.0	7.7	1.0	1175	52	1.89	65
	3 Year Average	8.2	8.1	1.6	1199	53	2.25	66
Southwest	<8.5	8.9	11.2	5.0	1232	55	2.06	65
Soft White	8.5-9.4	9.2	10.8	6.0	1231	53	2.07	69
Wheat Estimated	10.5-12.0	9.0	10.6	3.5	1188	49	2.38	68
Production =	**2010 Average**	**9.0**	**10.9**	**4.9**	**1220**	**53**	**2.15**	**67**
0.44 MMT	2009 Average	7.9	7.3	0.9	1187	56	1.80	65
White Club Wheat	**2010 Average**	**9.5**	**13.4**	**7.5**	**1229**	**48**	**2.28**	**66**
	2009 Average	8.2	8.8	2.0	1177	52	2.17	67
Estimated	3 Year Average	8.4	9.5	2.7	1218	51	2.60	66
Production = 0.40 MMT								

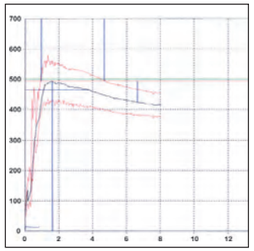
Farinograph



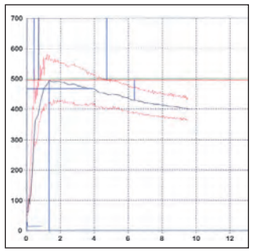
<8.5 % Wheat Protein Range



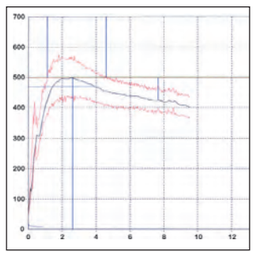
8.5-9.4% Wheat Protein Range



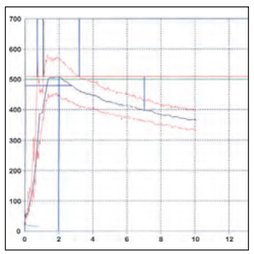
9.5-10.4% Wheat Protein Range



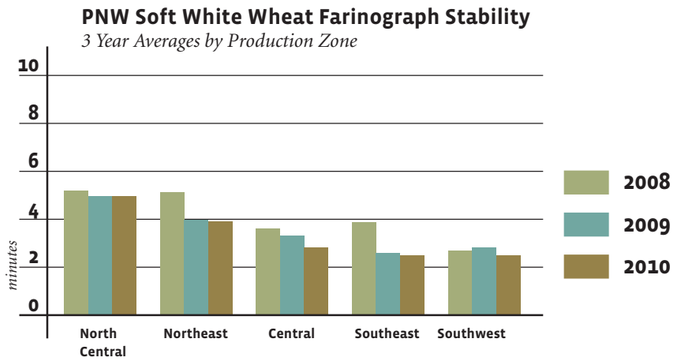
10.5-12.0% Wheat Protein Range

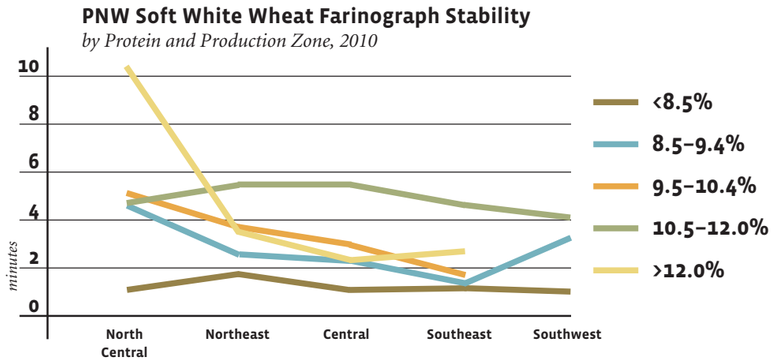


>12.0% Wheat Protein Range

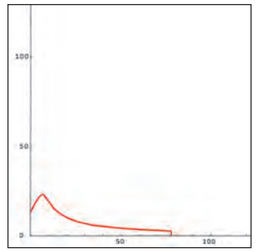


White Club Wheat

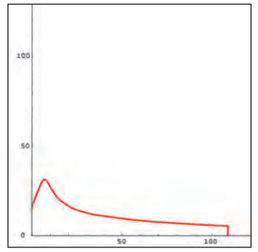




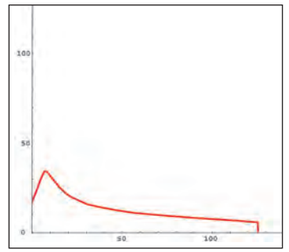
Alveograph



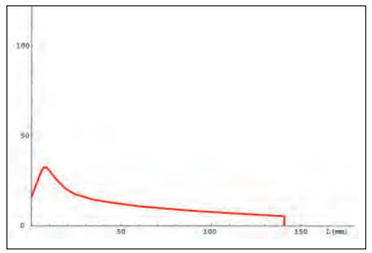
<8.5 % Wheat Protein Range



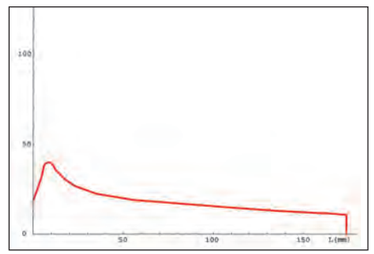
8.5-9.4% Wheat Protein Range



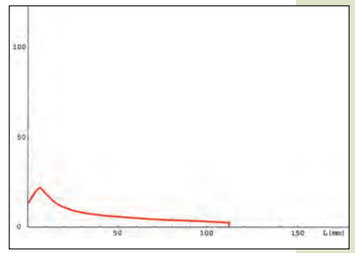
9.5-10.4% Wheat Protein Range



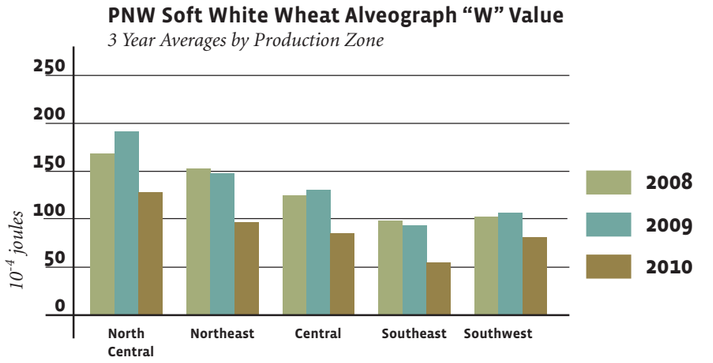
10.5-12.0% Wheat Protein Range

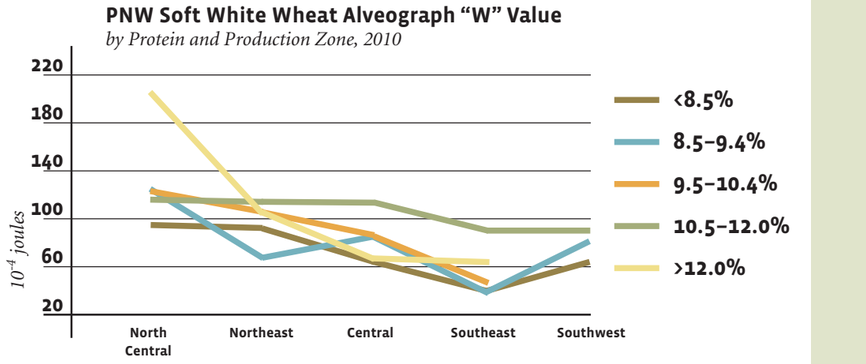


>12.0% Wheat Protein Range

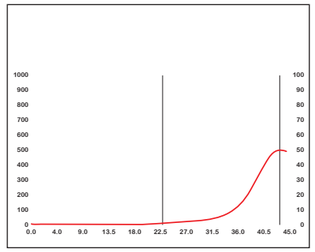


White Club Wheat

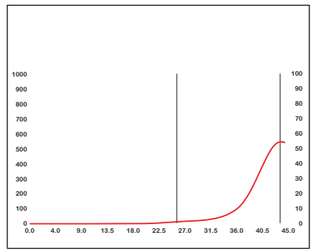




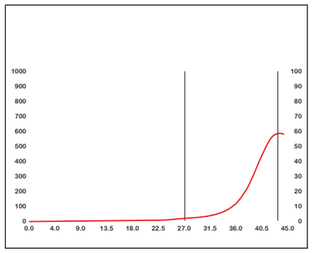
Amylograph



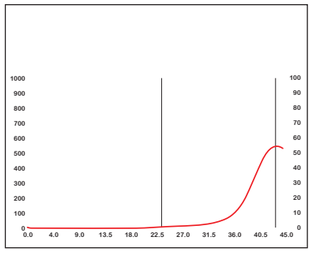
North Central Production Zone



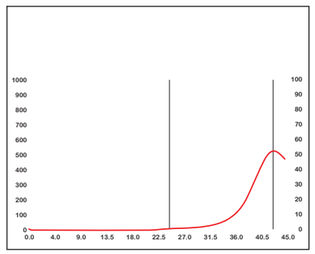
Northeast Production Zone



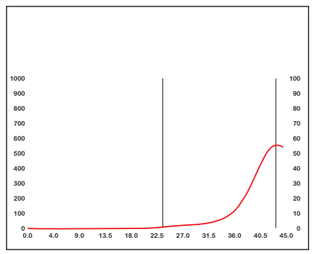
Central Production Zone



Southeast Production Zone

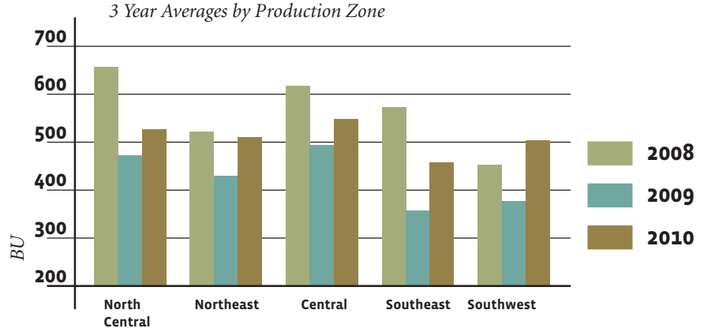


Southwest Production Zone



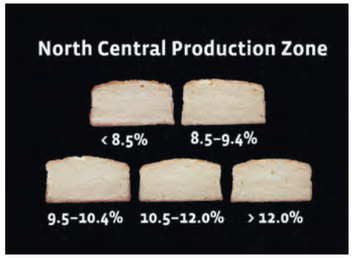
White Club Wheat

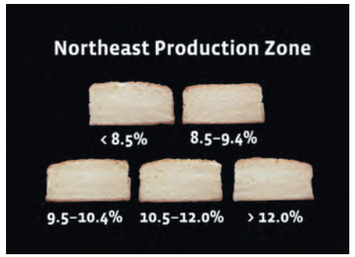
PNW Soft White Wheat Amylograph Peak Viscosity
3 Year Averages by Production Zone

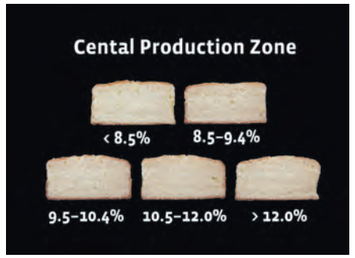


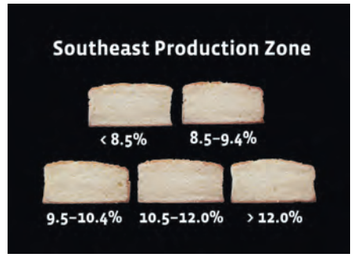
PNW Soft White Wheat Amylograph Peak Viscosity
by Protein and Production Zone, 2010

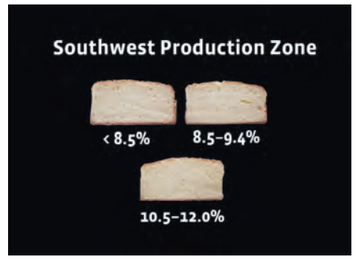
Sponge Cake



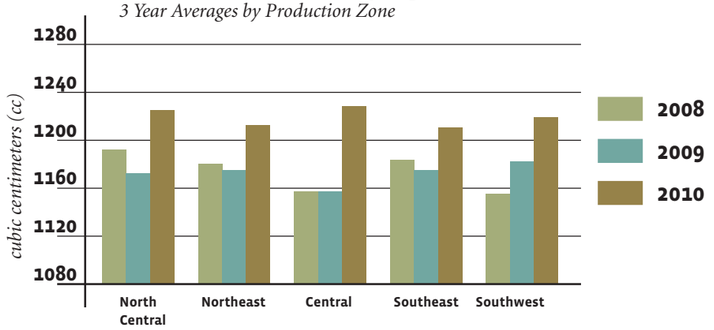








PNW Soft White Wheat Sponge Cake Volume
3 Year Averages by Production Zone



PNW Soft White Wheat Sponge Cake Volume
by Protein and Production Zone, 2010