



HARD RED WINTER WHEAT

.....
2026 QUALITY SURVEY



HARD RED WINTER



COMPETITIVE ADVANTAGE

Hard red winter (HRW) wheat is the most widely grown class in the United States and is cultivated in the Great Plains, Pacific Northwest (PNW) and California. It has a medium-hard endosperm, red bran and medium gluten content with mellow gluten strength. HRW is considered a medium-protein wheat, with protein content ranging from 10.0% to 13.0% on a 12% moisture basis, or from 11.4% to 14.8% on a dry basis. Its broad protein range, adaptability and consistency make it a versatile, foundational wheat for millers and bakers.

Widely available for export, HRW is shipped through Gulf and Pacific ports. For the miller, HRW brings consistency to the grist and supports efficient flour extraction. Maintaining HRW as the foundation of the mill grist allows blending with other U.S. wheat classes, local wheat or wheat from other origins as cost advantages or product differentiation opportunities develop. For the baker, HRW supports dough stability, water absorption and consistent performance, whether used alone or in a blend.

MILLING ADVANTAGES:

HRW's medium-hard endosperm supports high extraction rates and efficient separation of endosperm from bran. Proper conditioning and tempering are essential for optimal milling, typically at 15.5% to 16.5% moisture for 16 to 24 hours, depending on mill location and environmental conditions.

The endosperm separates cleanly from the bran in the break system, enabling efficient semolina production and reducing the need for bran finishers. Purifiers enhance semolina cleanliness before reduction, while a longer reduction system helps produce low-ash flour with good color and finer granulation. HRW also provides a consistent grist that can be blended with other wheat classes or origins to manage cost and differentiate products.

BAKING AND PROCESSING ADVANTAGES:

HRW's wide protein range supports a variety of products. Medium-protein HRW flour is suitable for yeast breads, flatbreads and noodles, while higher-protein HRW flour performs well in artisan breads and non-durum pasta. Lower-protein HRW flour can be blended at low levels with soft white (SW) or soft red winter (SRW) wheat for cookies (biscuits) and crackers.

Whether used alone or in blends, HRW contributes to improved dough stability, water absorption and overall product consistency. Its reliable availability makes it a dependable foundational ingredient for most wheat-based products.

SOURCING OPPORTUNITIES:

HRW is widely available for export supporting broad accessibility and reliable supply chains. Its widespread cultivation and consistent production volumes make it a dependable option for millers and processors seeking a stable foundation for their wheat procurement strategies.

The availability of HRW at various protein levels allows buyers to select wheat for a range of end uses and to blend it strategically with other wheat classes or origins to meet specific product and cost requirements.

HARD RED WINTER

2026 PRODUCTION

FOR THE MAJOR PRODUCING STATES (MILLION METRIC TONS)

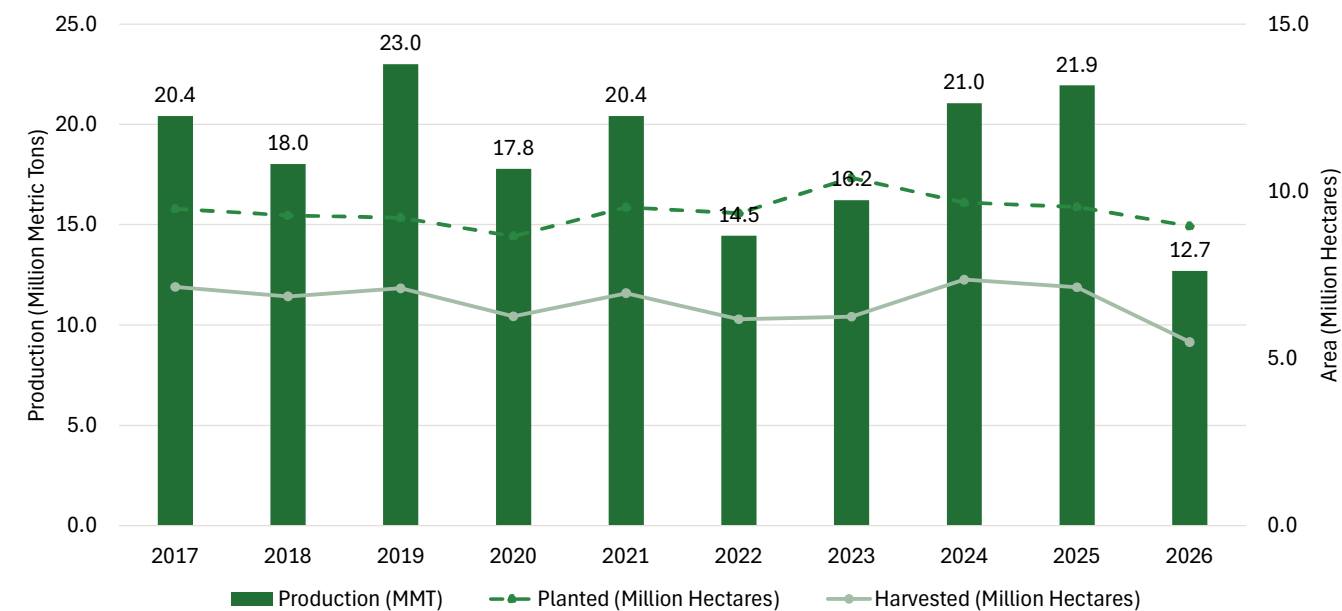
	2026	2025	2024	2023	2022
California	0.2	0.2	0.1	0.2	0.1
Colorado	0.5	1.8	1.7	1.9	0.9
Idaho	0.3	0.4	0.4	0.3	0.3
Kansas	5.2	9.0	7.9	5.1	6.2
Montana	2.0	2.7	2.5	2.3	1.6
Nebraska	0.4	1.0	1.2	0.9	0.7
Oklahoma	1.5	2.8	2.9	1.8	1.8
Oregon	0.0	0.1	0.1	0.1	0.1
South Dakota	0.7	0.9	1.3	0.9	1.0
Texas	1.3	2.2	2.1	2.1	1.0
Washington	0.3	0.3	0.3	0.3	0.3
Wyoming	0.0	0.1	0.1	0.1	0.0
Twelve-State Total	12.5	21.5	20.6	15.8	14.1
Gulf-Exportable	8.7	16.2	14.9	11.2	10.3
PNW-Exportable	3.6	5.1	5.5	4.5	3.8
Total HRW Production	12.7	21.9	21.0	16.2	14.5

Based on USDA crop estimates as of September 30, 2026.



10-YEAR TRENDS

PRODUCTION (MILLION METRIC TONS), PLANTED AND HARVESTED (MILLION HECTARES)



HARD RED WINTER

CROP SURVEY METHODS

SAMPLE COLLECTION AND ANALYSIS

Great Plains Analytical Laboratory in Kansas City, Missouri, collected, tested and analyzed 581 samples from elevators in 27 reporting areas across 11 states: 433 samples were from the Gulf-exportable states and 148 from the PNW-exportable states.

SAMPLE TESTING

Test weight, wheat moisture, wheat protein, 1000-kernel weight, wheat ash, falling number and DON were determined on individual samples. The remaining tests were conducted on 71 composite samples.

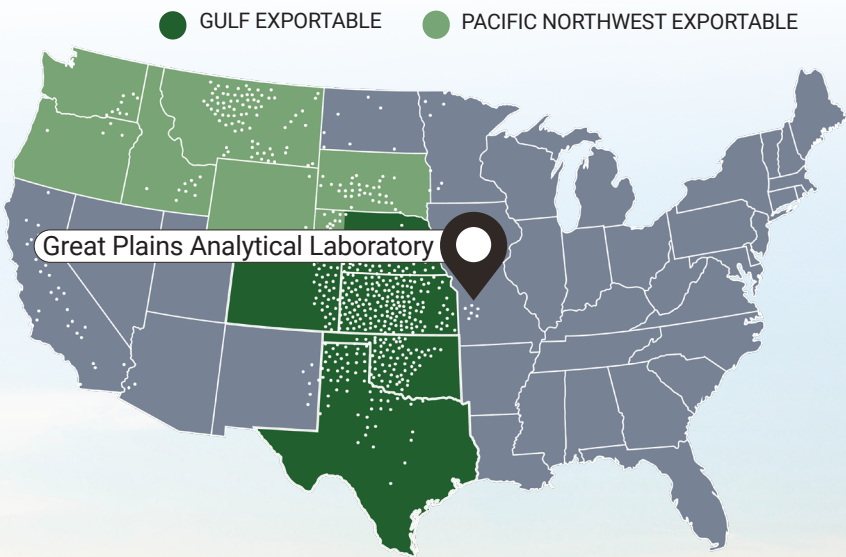
The results were weighted by the estimated production for each reporting area and combined into “Overall,” “Gulf” and “PNW” values. Gulf states include Texas, Oklahoma, Kansas, Colorado and a portion of Nebraska. PNW states include the Nebraska panhandle, South Dakota, Wyoming, Montana, Idaho, Washington and Oregon.

The surveyed Gulf states account for an estimated 69% of total 2026 U.S. HRW production, while the surveyed PNW states account for 28%. Together, the 11 surveyed states represent 98% of total production.

	OVERALL 2026				GULF EXPORTABLE 2026				PNW EXPORTABLE 2026			
	Low Pro	Med Pro	High Pro	Total	Low Pro	Med Pro	High Pro	Total	Low Pro	Med Pro	High Pro	Total
Number of samples	156	154	271	581	101	104	228	433	55	50	43	148
Number of composites	23	28	20	71	18	20	17	55	5	8	3	16
Production % of sampled area	19%	30%	51%	100%	15%	20%	40%	76%	3%	11%	11%	24%
Percent of samples	27%	27%	47%	100%	17%	18%	39%	75%	9%	9%	7%	25%

11
STATES SURVEYED

98%
OF TOTAL HRW
PRODUCTION
REPRESENTED



HARD RED WINTER

2026 CROP HIGHLIGHTS

PLANTING & EMERGENCE

The USDA estimated that 9.0 million hectares (22.1 million acres) of HRW wheat were seeded in fall 2025 for harvest in 2026, down 6% from the previous year's acreage. Lower wheat profitability relative to competing crops, together with dry planting conditions in parts of the Plains, likely contributed to the reduction in HRW acreage.

Planting in September began under mixed conditions, with drought concerns and limited soil moisture lingering across portions of the southern Plains. As the fall progressed, however, widespread rainfall improved soil moisture and supported establishment across much of the HRW region. Although wet weather delayed planting in some areas and created uneven crop development, overall conditions entering dormancy were viewed as more favorable than in recent years, with generally good stand establishment and improved yield potential.

Winter was generally mild across the HRW region. Above-normal temperatures during late winter and March accelerated crop development and increased moisture demand as the crop resumed active growth. Earlier development also increased vulnerability to subsequent spring freeze events in some production

areas.

Despite moisture concerns in portions of the southern Plains, the crop entered dormancy with generally adequate establishment, and attention shifted to spring weather and soil moisture conditions as key determinants of production potential.

GROWING SEASON & HARVEST

Dry, warm, and windy spring weather depleted soil moisture during critical stages of crop development across much of the HRW region. Yield prospects deteriorated most sharply in western Kansas and other drought-affected areas of the southern and central Plains, including portions of Oklahoma, Texas, Colorado, and Nebraska. In the northern HRW region, a dry April and May reduced top-end yield potential. Spring freeze events added to crop stress in parts of the central and northern Plains, although impacts varied depending on crop stage and local conditions.

Crop performance varied considerably across the region. Irrigated fields and areas that received timely rainfall generally maintained stronger yield potential, while prolonged drought reduced yield prospects and increased abandonment in many dryland

production areas. Conditions were generally more favorable in portions of the northern HRW region, although dry April and May weather and frost reduced top-end yield potential in Montana. Ample June moisture improved crop conditions and helped sustain the crop through later development.

Periodic rainfall delayed the start of harvest in parts of Texas, Oklahoma and Kansas, and created localized quality concerns. However, subsequent hot and dry conditions allowed harvest to progress rapidly across much of the Plains. Late-season precipitation improved soil moisture reserves in some areas but arrived too late to significantly improve yield potential.

PRODUCTION & MARKET OUTLOOK

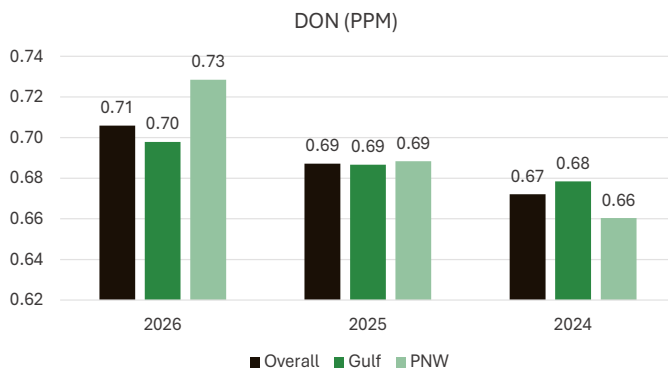
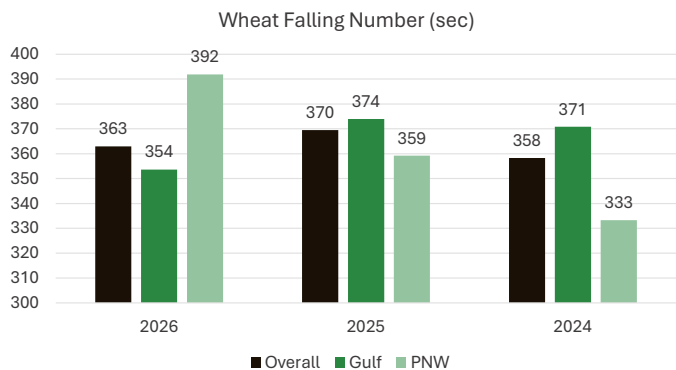
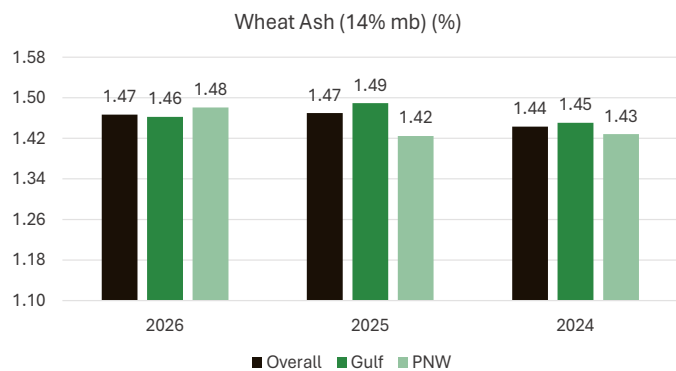
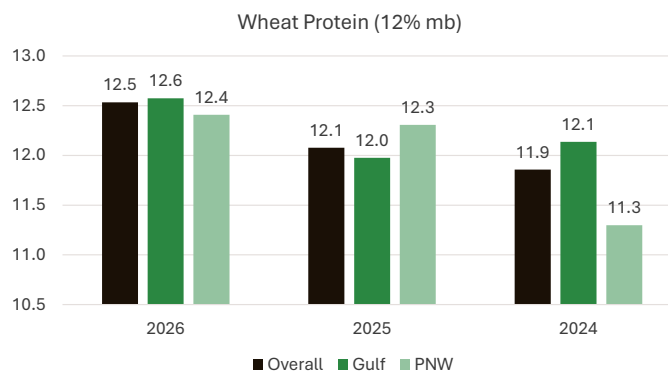
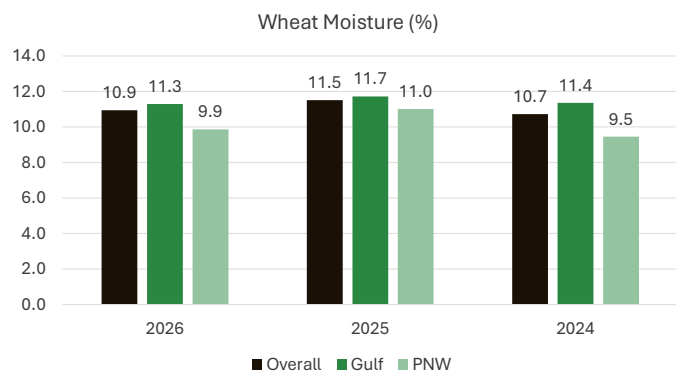
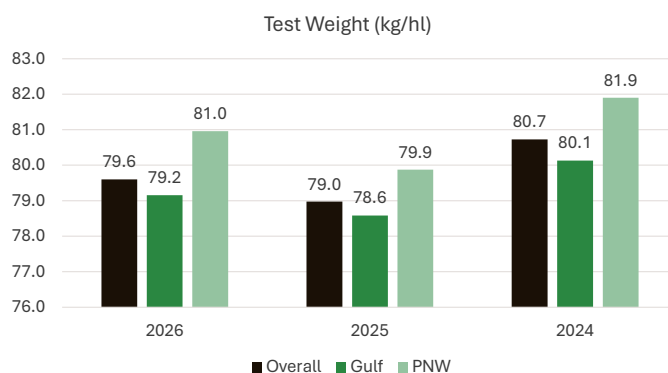
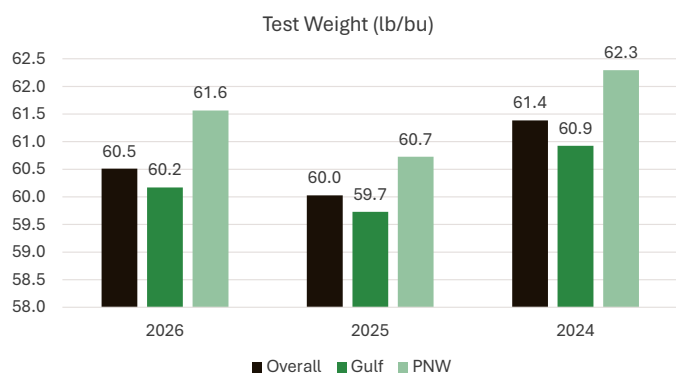
Production of the 2026 HRW crop totaled 12.7 MMT (466 million bushels), down 42% from the revised 2025 total. Lower planted area, drought-related yield losses and high abandonment all contributed to the smaller crop. USDA forecasts 2026/27 HRW exports at 5.3 MMT (195 million bushels), 15 million bushels below the August forecast.

2026 HRW QUALITY DATA – TOTAL CROP OVERVIEW

	2026 BY PROTEIN'			2026	2025	5-Year
	Low	Med	High	Avg	Avg	Avg
WHEAT GRADE DATA:						
Test Weight (lb/bu)	60.5	60.8	60.4	60.5	60.0	60.5
(kg/hl)	79.6	79.9	79.4	79.6	79.0	79.6
Damaged Kernels (%)	0.5	0.3	0.4	0.4	0.3	0.7
Foreign Material (%)	0.1	0.2	0.1	0.1	0.1	0.1
Shrunken & Broken (%)	0.8	1.0	1.0	1.0	0.7	0.9
Total Defects (%)	1.5	1.4	1.6	1.5	1.1	1.4
Grade	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW
WHEAT NON-GRADE DATA:						
Dockage (%)	0.3	0.4	0.4	0.4	0.5	0.5
Moisture (%)	11.3	10.9	10.8	10.9	11.5	11.0
Protein (%) 12%/0% mb	10.9/12.4	12.1/13.7	13.4/15.3	12.5/14.2	12.1/13.7	12.3/14.0
Ash (%) 14%/0% mb	1.38/1.60	1.46/1.70	1.50/1.75	1.47/1.70	1.47/1.71	1.53/1.78
1000 Kernel Weight (g)	30.0	29.2	27.6	28.5	30.1	30.4
Kernel Size (%) lg/md/sm	78/21/01	67/33/01	61/38/01	66/33/01	68/32/00	66/33/01
Single Kernel: Hardness	59.8	61.8	63.9	62.5	58.8	61.6
Weight (mg)	31.3	30.6	29.5	30.2	31.2	31.5
Diameter (mm)	2.62	2.58	2.54	2.56	2.62	2.62
Sedimentation (cc)	31.8	40.8	54.4	46.2	51.4	51.4
Falling Number (sec)	332	370	370	363	370	363
DON (ppm)	0.1	0.0	0.0	0.0	0.0	0.0
FLOUR DATA:						
Lab Mill Extraction (%) ²	70.6	71.6	71.2	71.2	75.8	75.9
Color: L*	90.6	90.4	90.3	90.4	90.7	90.7
a*	-2.0	-1.9	-1.8	-1.9	-1.4	-0.9
b*	10.0	9.8	9.7	9.8	10.2	10.2
Protein (%) 14%/0% mb	9.5/11.1	10.6/12.4	11.9/13.8	11.1/12.9	11.0/12.8	11.2/12.8
Ash (%) 14%/0% mb	0.46/0.53	0.46/0.53	0.46/0.53	0.46/0.53	0.53/0.62	0.52/0.61
Wet Gluten (%) 14% mb	23.3	27.8	31.3	28.8	28.4	29.3
Falling Number (sec)	350	388	398	386	370	363
Amylograph Viscosity: 65g (BU)	521	656	739	675	724	749
RVA: Pasting Temp. (°C)/Peak Visc. (cP)	79.6/2223	75.2/2368	74.4/2551	75.6/2436	74.2/2283	—
Hot Paste Visc. (cP)/Final Visc. (cP)	1424/2567	1631/2847	1740/2965	1649/2857	1578/2785	—
Damaged Starch (%)	8.1	7.6	7.9	7.8	6.2	6.1
SRC: Water/50% Sucrose (%)	63/108	65/114	65/115	65/113	66/113	66/113
5% Lactic Acid/5% Na ₂ CO ₃ (%)	131/84	141/89	145/86	141/87	138/88	135/88
Gluten Performance Index (GPI)	0.68	0.69	0.72	0.71	0.69	0.67
DOUGH PROPERTIES:						
Farinograph: Peak Time (min)	5.4	6.3	7.5	6.8	4.9	5.2
Stability (min)	11.9	13.9	16.8	15.0	9.4	9.1
Absorption (%)	58.0	59.1	60.9	59.8	58.8	58.6
Alveograph: P (mm)	107	108	106	107	82	85
L (mm)	69	88	102	92	82	81
P/L Ratio	1.56	1.23	1.04	1.16	1.00	1.10
W (10 ⁻⁴ J)	282	338	380	350	228	229
Extensograph (45/135 min): Resistance ₅₀ (BU)	391/532	351/494	340/483	355/497	361/586	399/689
Resistance Max (BU)	599/700	566/699	617/716	596/707	496/801	—
Extensibility (cm)	15.3/13.5	17.1/14.3	17.6/15.4	16.9/14.6	15.0/13.8	14.7/13.2
Area (cm ²)	118/123	126/128	137/143	129/134	97/135	91/129
R ₅₀ /E Ratio	2.6/4.1	2.1/3.5	1.9/3.1	2.1/3.4	2.4/4.4	—
Rmax/E Ratio	3.9/5.3	3.3/4.9	3.5/4.7	3.5/4.9	3.3/5.9	—
BAKING EVALUATION:						
Pan Bread: Bake Absorption (%)	62.8	63.5	64.8	64.0	62.1	63.2
Loaf Volume (cc)	796	846	900	865	798	877
Specific Volume (cc/g)	5.2	5.4	5.8	5.6	5.3	—
SPAGHETTI EVALUATION:						
Color: L*	58.6	58.1	58.2	58.3	59.2	69.2
a*	3.5	3.7	3.4	3.5	4.9	4.1
b*	28.7	29.0	29.3	29.1	24.3	19.9
Cooked Weight (g)	30.8	31.6	29.9	30.6	32.6	31.6
Cooking Loss (%)	6.1	5.9	5.3	5.6	6.6	6.4
Cooked Firmness (g cm)	7.6	7.7	8.2	8.0	7.0	6.3
% OF SAMPLES:	27	27	46	100		

HARD RED WINTER

2026 CROP HIGHLIGHTS



GULF-EXPORTABLE REGION

2026 CROP HIGHLIGHTS

Drought, above-normal temperatures and uneven rainfall significantly affected the 2026 Gulf-exportable HRW crop grown in the Southern and Central Great Plains, reducing yield potential and increasing abandonment. Despite these environmental challenges, the crop achieved a U.S. No. 1 HRW grade, with sound grain, protein above last year and slightly above the five-year average, and test weight aligned with the five-year average. Smaller kernels reflect the dry growing conditions, while falling number results confirm minimal sprout damage. Loaf volumes are average to above average for the class, showing no loss of performance despite the difficult growing season. Overall, the crop offers dependable quality and good opportunities for blending with stronger wheats.

GRADE: The overall average for the Gulf-exportable crop is U.S. No. 1 HRW.

TEST WEIGHT: Values aligned with the five-year average, likely due to tighter packing of smaller kernels.

WHEAT PROTEIN: Values are higher than last year's and up slightly from the five-year average. Protein content is typical for the Gulf, with slightly higher protein reflecting drought conditions in most production areas.

WHEAT MOISTURE: Values are in line with the five-year average and typical for the Gulf.

KERNEL CHARACTERISTICS: Values show smaller kernels compared to last year and the five-year average, with Gulf samples showing smaller kernels and lower 1000 kernel weights that are consistent with slight drought stress.

WHEAT FALLING NUMBER: Average is similar to the five-year average, confirming a sound crop with minimal sprout damage.

BUHLER LABORATORY MILL: Extraction rates are consistent with smaller kernels milled on a standard Buhler MLU-202. Commercial mills should see better extractions.

Note: Beginning with the 2026 crop, laboratory milling was conducted on a Buhler MLU-202 mill rather than the tandem Buhler mill used in previous years. The MLU-202 has fewer break and reduction passages and a different milling flow than the tandem mill, which results in different flour extraction and flour characteristics. Therefore, 2026 laboratory milling, flour, dough and end-product results are not directly comparable with prior-year or five-year average values.

WET GLUTEN: Tracks with protein content and is typical of the class.

STARCH PASTING PROPERTIES: Amylograph and rapid visco analyzer (RVA) viscosities indicate the crop is suitable for noodle making, particularly clean bite noodles such as instant fried noodles.

DAMAGED STARCH: Values are higher this year and is a result of the change in laboratory milling rather than a characteristic of the crop. This is reflected in increased farinograph and bake absorptions.

SOLVENT RETENTION CAPACITY: Gluten performance index (GPI) values are above the 0.60 threshold which is desirable for bread making in hard wheats.

DOUGH PROPERTIES: Absorption and stability track with protein and are typical for the class, with a good balance of strength and extensibility that translates directly to baking results.

PAN BREAD: Bake absorption, bread volume and specific volume are typical for the class and reflect slightly higher protein and balanced dough rheology this year. Gulf HRW offers good opportunities for blending with stronger wheats.



2026 HRW QUALITY DATA – GULF-EXPORTABLE REGION

	2026 BY PROTEIN ¹			2026	2025	5-Year
	Low	Med	High	Avg	Avg	Avg
WHEAT GRADE DATA:						
Test Weight (lb/bu)	60.3	60.3	60.0	60.2	59.7	60.3
(kg/hl)	79.4	79.3	79.0	79.2	78.6	79.3
Damaged Kernels (%)	0.6	0.1	0.5	0.4	0.4	0.5
Foreign Material (%)	0.2	0.1	0.1	0.1	0.1	0.2
Shrunken & Broken (%)	0.9	1.1	1.1	1.0	0.6	0.9
Total Defects (%)	1.6	1.3	1.6	1.6	1.1	1.5
Grade	1 HRW	1 HRW	1 HRW	1 HRW	2 HRW	2 HRW
WHEAT NON-GRADE DATA:						
Dockage (%)	0.3	0.4	0.4	0.4	0.5	0.5
Moisture (%)	11.8	11.4	11.1	11.3	11.7	11.4
Protein (%) 12%/0% mb	11.0/12.5	12.1/13.7	13.5/15.3	12.6/14.3	12.0/13.6	12.3/14.0
Ash (%) 14%/0% mb	1.38/1.60	1.45/1.69	1.50/1.75	1.46/1.70	1.49/1.73	1.54/1.79
1000 Kernel Weight (g)	29.2	28.4	27.4	28.0	29.9	30.1
Kernel Size (%) 1g/md/sm	77/22/01	65/34/01	61/38/01	65/34/01	69/31/00	66/33/01
Single Kernel: Hardness	59.3	61.8	63.4	62.2	59.8	60.8
Weight (mg)	30.6	29.7	29.4	29.7	30.6	30.7
Diameter (mm)	2.59	2.56	2.54	2.55	2.62	2.61
Sedimentation (cc)	30.9	39.8	53.7	45.6	48.7	49.8
Falling Number (sec)	334	353	362	354	374	359
DON (ppm)	0.1	0.0	0.0	0.0	0.0	0.0
FLOUR DATA:						
Lab Mill Extraction (%) ²	70.1	70.6	70.8	70.6	75.7	76.0
Color: L*	90.6	90.3	90.3	90.3	90.7	90.7
a*	-2.0	-1.9	-1.8	-1.9	-1.4	-0.9
b*	10.0	9.8	9.6	9.7	10.2	10.1
Protein (%) 14%/0% mb	9.6/11.2	10.5/12.3	11.8/13.7	11.0/12.8	10.8/12.6	11.2/13.1
Ash (%) 14%/0% mb	0.46/0.54	0.47/0.55	0.46/0.54	0.46/0.54	0.54/0.63	0.53/0.62
Wet Gluten (%) 14% mb	23.2	27.6	31.1	28.6	28.1	28.9
Falling Number (sec)	345	376	396	380	374	359
Amylograph Viscosity: 65g (BU)	522	579	721	645	696	718
RVA: Pasting Temp. (°C)/Peak Visc. (cP)	82.1/2162	77.7/2284	76.0/2515	77.6/2386	73.4/2259	—
Hot Paste Visc. (cP)/Final Visc. (cP)	1369/2493	1487/2656	1692/2896	1575/2755	1540/2725	—
Damaged Starch (%)	8.0	7.9	8.0	8.0	6.2	6.0
SRC: Water/50% Sucrose (%)	61/108	63/113	64/113	63/112	66/113	66/113
5% Lactic Acid/5% Na ₂ CO ₃ (%)	127/82	134/85	142/84	137/84	138/88	135/87
Gluten Performance Index (GPI)	0.67	0.68	0.72	0.70	0.69	0.68
DOUGH PROPERTIES:						
Farinograph: Peak Time (min)	5.3	5.8	7.1	6.4	4.8	5.2
Stability (min)	12.0	13.5	16.6	14.9	9.4	9.2
Absorption (%)	57.8	58.8	60.6	59.6	58.9	58.4
Alveograph: P (mm)	107	103	104	104	83	82
L (mm)	69	87	102	92	78	83
P/L Ratio	1.55	1.19	1.02	1.14	1.06	1.04
W (10 ⁻⁴ J)	284	326	375	345	221	226
Extensograph (45/135 min): Resistance ₅₀ (BU)	398/519	370/480	340/483	360/490	360/576	397/684
Resistance Max (BU)	616/690	600/696	617/716	612/706	495/786	—
Extensibility (cm)	15.3/13.7	17.6/14.9	17.6/15.4	17.1/14.9	14.9/13.8	14.7/13.2
Area (cm ²)	121/123	137/133	137/143	134/136	97/133	91/126
R ₅₀ /E Ratio	2.6/3.9	2.1/3.3	1.9/3.1	2.1/3.3	2.4/4.3	—
Rmax/E Ratio	4.0/5.1	3.4/4.7	3.5/4.7	3.6/4.8	3.3/5.8	—
BAKING EVALUATION:						
Pan Bread: Bake Absorption (%)	62.7	63.6	64.8	64.1	62.0	63.1
Loaf Volume (cc)	802	849	899	867	803	884
Specific Volume (cc/g)	5.2	5.5	5.8	5.6	5.4	—
SPAGHETTI EVALUATION:						
Color: L*	58.9	59.1	58.3	58.6	59.7	69.3
a*	3.3	3.2	3.3	3.3	4.8	4.1
b*	28.6	28.4	29.0	28.7	23.6	19.6
Cooked Weight (g)	30.7	31.9	29.7	30.5	33.0	31.6
Cooking Loss (%)	6.2	5.8	5.2	5.6	6.6	5.7
Cooked Firmness (g cm)	7.6	7.7	8.3	8.0	6.8	7.0
% OF SAMPLES:	17	18	39	74		

PACIFIC NORTHWEST-EXPORTABLE REGION

2026 CROP HIGHLIGHTS

The 2026 PNW-exportable HRW crop developed under mixed growing conditions across the Northern Great Plains and Pacific Northwest. Dry April and May weather and localized frost reduced top-end yield potential in Montana, but ample June moisture helped sustain the crop through later development. Timely precipitation supported stronger performance in other northern and western production areas, particularly in irrigated fields, while prolonged drought constrained dryland yields. Despite this regional variability, the crop achieved a U.S. No. 1 HRW grade, with sound kernels, protein comparable to last year and the five-year average, and strong falling number results. Overall, the crop provides dependable milling and baking functionality, with good opportunities for blending and noodle applications.

GRADE: The overall average for the PNW-exportable crop is U.S. No. 1 HRW.

TEST WEIGHT: Values trended higher due to timely rainfall throughout the season, especially in Montana and the PNW states.

WHEAT PROTEIN: Values are comparable to last year and the five-year average.

WHEAT MOISTURE: Values were lower this year compared to last year due to drier conditions at maturity.

KERNEL CHARACTERISTICS: PNW kernels are similar in weight and size to last year, but with increased hardness that better aligns with the five-year average.

WHEAT FALLING NUMBER: Average is higher than last year and the five-year average, confirming a sound crop with minimal sprout damage.

BUHLER LABORATORY MILL: Extraction rates are consistent with average kernels milled on a standard Buhler MLU-202. Commercial mills should see better extractions.

Note: Beginning with the 2026 crop, laboratory milling was conducted on a Buhler MLU-202 mill rather than the tandem Buhler mill used in previous years. The MLU-202 has fewer break and reduction passages and a different milling flow than the tandem mill, which results in different flour extraction and flour characteristics. Therefore, 2026 laboratory milling, flour, dough and end-product results are not directly comparable with prior-year or five-year average values.

WET GLUTEN: Aligns with protein content and is typical for the class.

STARCH PASTING PROPERTIES: Amylograph and rapid visco analyzer (RVA) viscosities indicate the crop is suitable for noodle making, particularly clean bite noodles such as instant fried noodles.

DAMAGED STARCH: Values are higher this year and is a result of the change in laboratory milling rather than a characteristic of the crop. This is reflected in increased farinograph and bake absorptions.

SOLVENT RETENTION CAPACITY: Gluten performance index (GPI) values are above the 0.60 threshold desirable for bread making in hard wheats. Values above 0.70 suggest good strength for blending and baking applications.

DOUGH PROPERTIES: The PNW crop exhibits typical absorption and stability, with improved strength relative to extensibility this year that aligns with baking results.

PAN BREAD: Bake absorption, loaf volume, and specific loaf volume are typical for the class and align with GPI values and dough properties. This year's PNW HRW crop offers good opportunities for noodles and blends with stronger wheats.



2026 HRW QUALITY DATA – PNW-EXPORTABLE REGION

	2026 BY PROTEIN'			2026	2025	5-Year
	Low	Med	High	Avg	Avg	Avg
WHEAT GRADE DATA:						
Test Weight (lb/bu)	61.4	61.7	61.5	61.6	60.7	60.9
(kg/hl)	80.8	81.1	80.9	81.0	79.9	80.1
Damaged Kernels (%)	0.2	0.5	0.0	0.2	0.1	0.2
Foreign Material (%)	0.0	0.2	0.2	0.2	0.0	0.1
Shrunken & Broken (%)	0.5	0.9	1.0	0.9	0.8	0.8
Total Defects (%)	0.6	1.6	1.2	1.3	0.9	1.2
Grade	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW
WHEAT NON-GRADE DATA:						
Dockage (%)	0.2	0.4	0.4	0.4	0.5	0.5
Moisture (%)	9.3	9.9	10.0	9.9	11.0	10.2
Protein (%) 12%/0% mb	10.5/11.9	12.0/13.7	13.4/15.2	12.4/14.1	12.3/14.0	12.3/14.0
Ash (%) 14%/0% mb	1.39/1.58	1.49/1.73	1.50/1.74	1.48/1.72	1.42/1.66	1.50/1.74
1000 Kernel Weight (g)	33.6	30.6	28.4	30.0	30.8	30.2
Kernel Size (%) lg/md/sm	81/18/01	70/30/01	59/40/01	66/33/01	66/34/00	62/37/01
Single Kernel: Hardness	62.1	61.9	65.9	63.7	56.5	63.8
Weight (mg)	34.6	32.2	30.0	31.5	32.6	32.6
Diameter (mm)	2.74	2.61	2.54	2.60	2.62	2.64
Sedimentation (cc)	36.3	42.6	57.3	48.2	57.6	55.0
Falling Number (sec)	323	401	403	392	359	365
DON (ppm)	0.0	0.0	0.1	0.0	0.1	0.0
FLOUR DATA:						
Lab Mill Extraction (%) ²	72.9	73.4	72.6	73.0	76.0	75.7
Color: L*	90.5	90.6	90.4	90.5	90.8	90.7
a*	-2.0	-2.0	-1.9	-2.0	-1.4	-0.9
b*	10.1	10.0	10.1	10.1	10.2	10.3
Protein (%) 14%/0% mb	9.4/10.9	10.8/12.6	12.2/14.2	11.2/13.1	11.3/13.2	11.5/13.5
Ash (%) 14%/0% mb	0.44/0.51	0.43/0.50	0.43/0.50	0.43/0.50	0.51/0.59	0.52/0.60
Wet Gluten (%) 14% mb	23.8	28.2	31.8	29.2	29.0	30.1
Falling Number (sec)	374	411	408	405	359	365
Amylograph Viscosity: 65g (BU)	516	795	810	765	790	771
RVA: Pasting Temp. (°C)/Peak Visc. (cP)	68.0/2509	70.6/2519	68.4/2688	69.3/2591	76.0/2338	—
Hot Paste Visc. (cP)/Final Visc. (cP)	1678/2908	1891/3192	1926/3234	1878/3173	1668/2926	—
Damaged Starch (%)	8.2	7.0	7.5	7.4	6.1	6.3
SRC: Water/50% Sucrose (%)	69/111	68/115	70/119	69/116	66/114	66/112
5% Lactic Acid/5% Na ₂ CO ₃ (%)	145/95	154/97	157/94	154/96	138/87	134/88
Gluten Performance Index (GPI)	0.71	0.73	0.74	0.73	0.69	0.67
DOUGH PROPERTIES:						
Farinograph: Peak Time (min)	5.6	7.2	9.2	7.9	5.1	5.4
Stability (min)	11.3	14.4	17.7	15.5	9.5	9.1
Absorption (%)	59.4	59.9	62.0	60.7	58.6	59.3
Alveograph: P (mm)	109	117	114	115	81	92
L (mm)	68	89	101	92	92	78
P/L Ratio	1.60	1.31	1.13	1.25	0.88	1.22
W (10 ⁻⁴ J)	275	360	398	365	246	244
Extensograph (45/135 min): Resistance ₅₀ (BU)	358/594	317/520	—	327/537	363/609	415/712
Resistance Max (BU)	517/751	504/705	—	507/716	499/834	—
Extensibility (cm)	15.1/12.4	16.2/13.3	—	15.9/13.1	15.0/13.8	14.7/13.1
Area (cm ²)	103/121	106/120	—	105/120	97/140	96/132
R ₅₀ /E Ratio	2.4/4.8	2.0/3.9	—	2.1/4.1	2.5/4.6	—
Rmax/E Ratio	3.4/6.1	3.1/5.3	—	3.2/5.5	3.4/6.2	—
BAKING EVALUATION:						
Pan Bread: Bake Absorption (%)	63.3	63.3	64.5	63.8	62.5	63.7
Loaf Volume (cc)	766	840	906	859	786	864
Specific Volume (cc/g)	4.9	5.4	5.7	5.5	5.2	—
SPAGHETTI EVALUATION:						
Color: L*	57.2	56.3	57.9	57.1	58.1	68.8
a*	4.4	4.5	3.7	4.1	5.0	4.1
b*	29.2	30.1	30.7	30.3	25.5	20.4
Cooked Weight (g)	31.6	31.0	30.8	31.0	31.8	31.5
Cooking Loss (%)	5.8	6.0	5.8	5.9	6.5	7.2
Cooked Firmness (g cm)	7.4	7.8	8.0	7.8	7.2	5.5
% OF SAMPLES:	10	9	7	26		

2026 HRW QUALITY DATA – BY STATE

	Texas Overall	Oklahoma Overall	Kansas Overall	Colorado Overall	Nebraska Overall	Wyoming* Overall	South Dakota Overall	Montana Overall	WA/ID/OR Overall
WHEAT GRADE DATA:									
Test Weight (lb/bu)	59.9	59.4	60.5	59.1	59.9	60.6	62.9	61.8	61.0
(kg/hl)	78.8	78.2	79.6	77.8	78.8	79.7	82.7	81.2	80.2
Damaged Kernels (%)	0.5	0.4	0.4	0.7	0.1	—	0.1	0.4	0.0
Foreign Material (%)	0.1	0.1	0.1	0.2	0.2	—	0.0	0.3	0.0
Shrunken & Broken (%)	1.0	1.0	1.0	1.5	1.0	—	1.0	1.0	0.5
Total Defects (%)	1.6	1.4	1.5	2.4	1.3	—	1.1	1.6	0.5
Grade	2 HRW	2 HRW	1 HRW	2 HRW	2 HRW	—	1 HRW	1 HRW	1 HRW
WHEAT NON-GRADE DATA:									
Dockage (%)	0.3	0.5	0.3	0.4	0.4	—	0.4	0.5	0.2
Moisture (%)	11.3	11.8	11.2	9.9	10.9	9.9	11.1	9.7	8.8
Protein (%) 12%/0% mb	12.8 / 14.6	12.6 / 14.3	12.4 / 14.1	13.6 / 15.5	13.2 / 15.0	13.3 / 15.1	12.4 / 14.1	12.7 / 14.5	10.9 / 12.4
Ash (%) 14%/0% mb	1.55 / 1.80	1.53 / 1.78	1.41 / 1.64	1.58 / 1.84	1.55 / 1.80	1.50 / 1.75	1.52 / 1.76	1.48 / 1.72	1.40 / 1.60
1000 Kernel Weight (g)	27.7	27.0	28.6	23.4	26.5	25.8	30.3	29.6	35.1
Kernel Size (%) lg/md/sm	66 / 32 / 01	63 / 35 / 02	67 / 33 / 01	37 / 61 / 01	56 / 43 / 01	—	66 / 33 / 01	65 / 34 / 01	84 / 15 / 01
Single Kernel: Hardness	62.6	63.4	61.8	61.3	59.7	—	62.6	64.9	63.2
Weight (mg)	30.0	29.2	29.8	27.4	28.0	—	31.6	30.9	36.4
Diameter (mm)	2.57	2.56	2.55	2.42	2.49	—	2.61	2.56	2.80
Sedimentation (cc)	45.6	45.0	45.9	36.9	53.2	—	50.8	50.5	35.9
Falling Number (sec)	349	334	358	381	360	328	392	419	329
DON (ppm)	0.0	0.0	0.0	0.0	0.2	—	0.0	0.0	—
FLOUR DATA:									
Lab Mill Extraction (%)	70.8	72.0	70.2	72.2	72.1	—	72.6	73.1	73.6
Color: L*	90.3	90.1	90.4	90.1	90.4	—	90.6	90.4	90.6
a*	-1.7	-1.7	-2.0	-1.9	-1.9	—	-1.9	-2.0	-1.9
b*	9.6	9.7	9.8	9.8	9.4	—	9.5	10.3	10.1
Protein (%) 14%/0% mb	11.4 / 13.2	11.1 / 12.9	10.8 / 12.6	12.2 / 14.1	11.7 / 13.6	—	11.0 / 12.8	11.7 / 13.6	9.7 / 11.2
Ash (%) 14%/0% mb	0.46 / 0.54	0.48 / 0.55	0.46 / 0.54	0.49 / 0.57	0.44 / 0.52	—	0.42 / 0.49	0.42 / 0.49	0.45 / 0.52
Wet Gluten (%) 14% mb	29.0	29.6	27.9	32.8	32.0	—	29.9	30.0	24.4
Falling Number (sec)	374	383	381	400	386	—	389	421	376
Amylograph Viscosity: 65g (BU)	600	685	638	846	714	—	837	833	488
RVA: Pasting Temp. (°C)/Peak Viscosity (cP)	69.9 / 2317	70.7 / 2496	81.7 / 2356	84.0 / 2751	71.2 / 2606	—	67.3 / 2642	69.4 / 2630	69.2 / 2398
Hot Paste Viscosity (cP)/Final Viscosity (cP)	1515 / 2626	1636 / 2842	1559 / 2754	1934 / 3133	1673 / 2850	—	1838 / 3139	1998 / 3334	1626 / 2829
Damaged Starch (%)	7.5	7.7	8.3	7.0	7.7	—	7.3	7.0	8.6
SRC: Water/50% Sucrose (%)	66 / 115	66 / 118	61 / 109	65 / 121	68 / 118	—	65 / 115	70 / 117	71 / 114
5% Lactic Acid/5% Na ₂ CO ₃ (%)	135 / 90	141 / 90	135 / 80	147 / 90	158 / 90	—	157 / 89	154 / 97	151 / 99
Gluten Performance Index (GPI) (%)	0.66	0.68	0.71	0.70	0.76	—	0.77	0.72	0.71
DOUGH PROPERTIES:									
Farinograph: Peak Time (min)	5.7	6.6	6.4	8.0	7.0	—	6.9	9.0	5.9
Stability (min)	13.6	12.8	16.0	12.8	15.5	—	14.9	16.4	12.2
Absorption (%)	59.6	58.5	59.8	59.4	59.5	—	58.9	61.6	60.6
Alveograph: P (mm)	108	98	107	83	86	—	91	125	123
L (mm)	95	104	85	118	115	—	112	91	64
P/L Ratio	1.13	0.94	1.25	0.71	0.75	—	0.81	1.37	1.92
W (10 ⁻⁴ J)	364	349	338	336	338	—	345	397	298
Extensograph (45 min): Resistance ₅₀ (BU)	310	311	349	331	322	—	304	349	395
Resistance Max (BU)	573	586	602	579	578	—	537	567	572
Extensibility (cm)	19.6	20.2	17.6	17.7	18.3	—	18.4	16.7	15.1
Area (cm ²)	145	151	136	132	137	—	127	122	113
R ₅₀ /E Ratio	1.6	1.6	2.0	1.9	1.7	—	1.7	2.1	2.7
Rmax/E Ratio	2.9	2.9	3.4	3.3	3.1	—	2.9	3.4	3.8
BAKING EVALUATION:									
Pan Bread: Bake Absorption (%)	63.9	64.0	64.2	64.3	63.4	—	63.1	64.0	64.1
Loaf Volume (cc)	886	891	851	896	926	—	904	858	775
Specific Volume (cc/g)	5.73	5.81	5.48	5.8	5.9	—	5.8	5.5	4.9
SAMPLES & PRODUCTION:									
Number of samples	45	38	273	36	58	2	34	26	69
Number of composites	8	7	28	6	8	0	3	2	9
Production % of sampled area	14.6%	11.1%	45.5%	2.5%	4.0%	0.5%	4.3%	13.3%	4.1%
Percent of samples	7.7%	6.5%	47.0%	6.2%	10.0%	0.3%	5.9%	4.5%	11.9%

*Composite data are not reported for Wyoming due to small sample size.

2026 HRW QUALITY DATA – BY REPORTING AREA

	Texas		Oklahoma		Colorado	
	N. Central	Panhandle	Southwest	Northwest	South	North
WHEAT GRADE DATA:						
Test Weight (lb/bu)	60.8	58.7	59.0	59.9	60.2	58.9
(kg/hl)	79.9	77.3	77.7	78.8	79.3	77.5
Damaged Kernels (%)	0.4	0.6	0.7	0.0	0.7	0.7
Foreign Material (%)	0.0	0.2	0.1	0.1	0.0	0.2
Shrunken & Broken (%)	1.0	1.1	1.2	0.7	1.2	1.5
Total Defects (%)	1.4	1.9	2.0	0.9	1.9	2.5
Grade	1 HRW	2 HRW	2 HRW	2 HRW	1 HRW	2 HRW
WHEAT NON-GRADE DATA:						
Dockage (%)	0.3	0.3	0.7	0.3	0.5	0.4
Moisture (%)	11.4	11.2	11.7	12.0	10.3	9.8
Protein (%) 12%/0% mb	12.6 / 14.3	13.1 / 14.9	12.8 / 14.5	12.4 / 14.1	13.3 / 15.2	13.7 / 15.6
Ash (%) 14%/0% mb	1.54 / 1.79	1.55 / 1.81	1.57 / 1.83	1.48 / 1.72	1.53 / 1.78	1.60 / 1.86
1000 Kernel Weight (g)	28.1	27.1	25.8	28.3	26.5	22.8
Kernel Size (%) lg/md/sm	67 / 32 / 01	66 / 33 / 01	58 / 39 / 02	69 / 30 / 01	43 / 55 / 02	37 / 62 / 01
Single Kernel: Hardness	65.3	58.9	61.7	65.3	70.6	59.8
Weight (mg)	30.9	28.8	28.0	30.4	27.4	27.4
Diameter (mm)	2.60	2.53	2.51	2.61	2.44	2.42
Sedimentation (cc)	43.2	48.8	47.5	42.3	59.0	33.4
Falling Number (sec)	383	307	323	346	373	382
DON (ppm)	0.0	0.0	0.0	0.0	0.0	0.0
FLOUR DATA:						
Lab Mill Extraction (%)	70.5	71.3	70.5	73.6	72.7	72.1
Color: L*	90.3	90.3	90.2	89.9	89.4	90.3
a*	-1.6	-1.7	-1.7	-1.7	-1.8	-2.0
b*	9.5	9.7	9.5	9.9	10.6	9.7
Protein (%) 14%/0% mb	11.0 / 12.8	11.8 / 13.8	11.4 / 13.2	10.8 / 12.6	12.6 / 14.7	12.1 / 14.1
Ash (%) 14%/0% mb	0.47 / 0.54	0.46 / 0.53	0.47 / 0.54	0.49 / 0.57	0.50 / 0.58	0.49 / 0.57
Wet Gluten (%) 14% mb	28.5	29.8	30.0	29.3	32.1	32.9
Falling Number (sec)	385	359	368	400	444	393
Amylograph Viscosity: 65g (BU)	654	529	634	740	839	847
RVA: Pasting Temp. (°C)/Peak Viscosity (cP)	67.9 / 2539	72.5 / 2021	72.4 / 2397	68.8 / 2602	67.8 / 2929	86.6 / 2722
Hot Paste Viscosity (cP)/Final Viscosity (cP)	1685 / 2890	1289 / 2274	1552 / 2674	1726 / 3022	2225 / 3537	1888 / 3069
Damaged Starch (%)	7.9	6.9	7.6	7.8	6.2	7.1
SRC: Water/50% Sucrose (%)	66 / 114	66 / 117	64 / 118	69 / 119	71 / 127	64 / 121
5% Lactic Acid/5% Na ₂ CO ₃ (%)	129 / 91	144 / 88	142 / 87	140 / 93	147 / 96	147 / 89
Gluten Performance Index (GPI) (%)	0.63	0.70	0.69	0.66	0.66	0.70
DOUGH PROPERTIES:						
Farinograph: Peak Time (min)	5.5	6.1	6.7	6.4	7.7	8.0
Stability (min)	13.1	14.2	13.5	12.0	16.8	12.1
Absorption (%)	59.9	59.3	58.4	58.6	61.8	59.1
Alveograph: P (mm)	112	102	94	102	103	80
L (mm)	85	109	108	99	128	116
P/L Ratio	1.31	0.94	0.87	1.03	0.80	0.69
W (10-4 J)	346	387	347	351	468	316
Extensograph (45 min): Resistance ₅₀ (BU)	297	328	302	321	356	327
Resistance Max (BU)	534	625	580	593	672	564
Extensibility (cm)	19.3	20.0	21.2	19.0	20.5	17.3
Area (cm ²)	134	161	158	144	178	124
R ₅₀ /E Ratio	1.6	1.7	1.5	1.7	1.7	1.9
Rmax/E Ratio	2.8	3.1	2.7	3.1	3.3	3.3
BAKING EVALUATION:						
Pan Bread: Bake Absorption (%)	64.5	63.1	63.7	64.2	65.0	64.2
Loaf Volume (cc)	857	924	931	849	839	906
Specific Volume (cc/g)	5.55	5.97	6.07	5.5	5.4	5.9
SAMPLES & PRODUCTION:						
Number of samples	21	24	16	22	8	28
Number of composites	3	5	3	4	3	3
Production % of sampled area	8.2%	6.4%	5.8%	5.3%	0.4%	2.1%
Percent of samples	3.6%	4.1%	2.8%	3.8%	1.4%	4.8%

2026 HRW QUALITY DATA – BY REPORTING AREA

	Kansas								
	Southwest	S. Central	Southeast	W. Central	Central	E. Central	Northwest	N. Central	Northeast
WHEAT GRADE DATA:									
Test Weight (lb/bu)	59.9	60.2	57.1	62.0	60.7	57.5	60.8	61.0	58.1
(kg/hl)	78.8	79.2	75.2	81.6	79.8	75.7	79.9	80.3	76.5
Damaged Kernels (%)	0.5	0.6	0.3	0.0	0.4	0.0	0.7	0.0	1.1
Foreign Material (%)	0.1	0.1	0.1	0.0	0.2	0.3	0.0	0.1	0.0
Shrunken & Broken (%)	1.3	0.9	1.1	0.9	1.0	0.6	1.2	0.9	1.1
Total Defects (%)	1.9	1.6	1.5	0.9	1.5	0.9	1.8	1.0	2.2
Grade	2 HRW	1 HRW	3 HRW	1 HRW	1 HRW	3 HRW	1 HRW	1 HRW	2 HRW
WHEAT NON-GRADE DATA:									
Dockage (%)	0.4	0.3	0.5	0.4	0.3	0.3	0.5	0.1	0.6
Moisture (%)	10.2	11.9	13.4	10.8	11.6	12.9	10.8	11.5	13.0
Protein (%) 12%/0% mb	12.8 / 14.6	11.5 / 13.1	10.5 / 12.0	12.9 / 14.7	12.3 / 14.0	10.4 / 11.8	13.7 / 15.5	12.6 / 14.3	11.6 / 13.2
Ash (%) 14%/0% mb	1.43 / 1.66	1.34 / 1.56	1.51 / 1.75	1.44 / 1.68	1.40 / 1.63	1.55 / 1.80	1.48 / 1.72	1.48 / 1.72	1.53 / 1.78
1000 Kernel Weight (g)	26.3	28.9	30.6	28.9	29.8	29.9	29.0	29.7	31.2
Kernel Size (%) lg/md/sm	53 / 46 / 01	72 / 27 / 01	79 / 20 / 01	65 / 35 / 01	72 / 28 / 00	82 / 18 / 00	66 / 33 / 01	66 / 33 / 01	81 / 18 / 00
Single Kernel: Hardness	61.0	60.6	49.1	72.1	58.9	51.5	59.9	64.9	49.4
Weight (mg)	28.4	29.8	31.1	30.5	30.7	31.9	30.1	30.5	31.6
Diameter (mm)	2.47	2.57	2.65	2.56	2.61	2.67	2.54	2.58	2.66
Sedimentation (cc)	52.1	36.7	25.9	54.9	40.1	21.0	58.7	49.7	31.5
Falling Number (sec)	385	329	293	373	360	343	378	371	352
DON (ppm)	0.0	0.0	0.7	0.0	0.1	0.9	0.0	0.0	0.8
FLOUR DATA:									
Lab Mill Extraction (%)	70.8	69.1	71.3	70.3	71.2	71.0	70.2	70.8	72.6
Color: L*	90.5	90.6	90.8	90.4	90.3	90.7	90.1	90.3	90.7
a*	-1.9	-2.0	-2.2	-1.9	-2.0	-2.1	-1.8	-2.0	-1.9
b*	9.7	9.9	9.8	9.9	9.7	9.7	9.6	9.9	9.1
Protein (%) 14%/0% mb	11.5 / 13.4	10.0 / 11.6	8.9 / 10.4	11.4 / 13.2	10.7 / 12.5	8.6 / 10.0	11.9 / 13.8	10.9 / 12.6	9.5 / 11.0
Ash (%) 14%/0% mb	0.48 / 0.56	0.46 / 0.54	0.46 / 0.54	0.48 / 0.55	0.45 / 0.52	0.50 / 0.58	0.44 / 0.52	0.44 / 0.52	0.46 / 0.54
Wet Gluten (%) 14% mb	30.9	24.5	19.0	29.3	26.5	19.2	32.2	30.3	23.0
Falling Number (sec)	403	332	308	428	392	337	420	404	355
Amylograph Viscosity: 65g (BU)	740	404	594	822	720	383	802	741	561
RVA: Pasting Temp. (°C)/Peak Viscosity (cP)	69.3 / 2590	84.4 / 1983	79.6 / 1932	84.8 / 2484	85.3 / 2471	69.4 / 2187	86.0 / 2698	85.7 / 2532	75.0 / 2418
Hot Paste Viscosity (cP)/Final Viscosity (cP)	1775 / 2994	1213 / 2296	1021 / 1975	1748 / 2998	1627 / 2890	1241 / 2257	1867 / 3155	1737 / 3085	1566 / 2790
Damaged Starch (%)	8.1	8.5	7.5	8.9	8.2	7.9	8.7	6.7	7.2
SRC: Water/50% Sucrose (%)	62 / 116	62 / 111	66 / 118	62 / 107	59 / 101	63 / 113	60 / 106	62 / 101	62 / 115
5% Lactic Acid/5% Na ₂ CO ₃ (%)	136 / 80	131 / 81	135 / 90	145 / 83	128 / 78	127 / 87	143 / 77	133 / 79	146 / 86
Gluten Performance Index (GPI) (%)	0.69	0.68	0.65	0.76	0.72	0.63	0.78	0.74	0.73
DOUGH PROPERTIES:									
Farinograph: Peak Time (min)	6.1	5.5	4.9	7.0	6.6	4.8	8.9	6.7	5.6
Stability (min)	17.9	11.1	7.4	22.7	19.8	7.8	16.9	17.1	8.8
Absorption (%)	60.4	58.3	56.7	61.4	59.2	55.6	62.3	60.0	56.9
Alveograph: P (mm)	103	107	88	118	109	91	101	109	96
L (mm)	104	71	69	93	78	70	96	86	76
P/L Ratio	0.99	1.50	1.28	1.27	1.40	1.30	1.05	1.27	1.26
W (10-4 J)	375	294	231	410	326	238	355	345	283
Extensograph (45 min): Resistance ₅₀ (BU)	340	359	313	356	347	356	314	392	345
Resistance Max (BU)	615	600	488	630	587	479	573	640	564
Extensibility (cm)	18.8	17.2	16.0	18.7	16.9	13.4	17.9	15.7	16.4
Area (cm ²)	149	133	101	152	126	85	129	127	119
R ₅₀ /E Ratio	1.8	2.1	2.0	1.9	2.2	2.7	1.8	2.5	2.1
Rmax/E Ratio	3.3	3.5	3.1	3.4	3.5	3.6	3.2	4.1	3.4
BAKING EVALUATION:									
Pan Bread: Bake Absorption (%)	63.1	63.5	60.4	66.6	64.3	58.5	65.8	64.7	61.0
Loaf Volume (cc)	887	803	815	902	864	826	860	871	868
Specific Volume (cc/g)	5.7	5.2	5.2	5.7	5.6	5.3	5.5	5.4	5.6
SAMPLES & PRODUCTION:									
Number of samples	38	59	16	26	44	16	36	26	12
Number of composites	3	5	3	4	3	2	2	3	3
Production % of sampled area	8.8%	15.1%	0.7%	5.6%	5.5%	0.3%	6.3%	3.2%	0.1%
Percent of samples	6.5%	10.2%	2.8%	4.5%	7.6%	2.8%	6.2%	4.5%	2.1%

2026 HRW QUALITY DATA – BY REPORTING AREA

	Nebraska					Wyoming*
	Southwest	Southeast	N. Central*	Northeast	Panhandle	
WHEAT GRADE DATA:						
Test Weight (lb/bu)	60.9	60.0	60.4	61.1	59.1	60.6
(kg/hl)	80.1	79.0	79.4	80.4	77.8	79.7
Damaged Kernels (%)	0.2	0.7	—	0.0	0.0	—
Foreign Material (%)	0.1	0.3	—	0.0	0.2	—
Shrunken & Broken (%)	0.8	1.2	—	1.0	1.1	—
Total Defects (%)	1.1	2.2	—	1.0	1.3	—
Grade	1 HRW	1 HRW	—	1 HRW	2 HRW	—
WHEAT NON-GRADE DATA:						
Dockage (%)	0.4	0.7	—	0.5	0.5	—
Moisture (%)	11.0	12.1	11.4	12.0	10.7	9.9
Protein (%) 12%/0% mb	13.5 / 15.4	13.8 / 15.6	12.5 / 14.2	13.0 / 14.8	13.0 / 14.8	13.3 / 15.1
Ash (%) 14%/0% mb	1.51 / 1.75	1.66 / 1.93	1.46 / 1.70	1.60 / 1.87	1.57 / 1.83	1.50 / 1.75
1000 Kernel Weight (g)	30.3	28.0	28.6	31.4	23.8	25.8
Kernel Size (%) lg/md/sm	75 / 24 / 01	73 / 25 / 01	—	79 / 20 / 01	43 / 57 / 00	—
Single Kernel: Hardness	59.9	61.7	—	63.8	59.5	—
Weight (mg)	30.3	31.1	—	32.8	26.3	—
Diameter (mm)	2.62	2.65	—	2.73	2.39	—
Sedimentation (cc)	54.6	63.0	—	55.0	51.5	—
Falling Number (sec)	358	369	333	327	364	328
DON (ppm)	0.2	0.0	—	0.0	0.3	—
FLOUR DATA:						
Lab Mill Extraction (%)	71.2	73.7	—	71.6	72.5	—
Color: L*	90.4	90.1	—	90.1	90.4	—
a*	-1.8	-1.6	—	-1.6	-2.0	—
b*	9.0	8.7	—	9.1	9.7	—
Protein (%) 14%/0% mb	11.8 / 13.8	12.1 / 14.0	—	11.7 / 13.6	11.6 / 13.5	—
Ash (%) 14%/0% mb	0.42 / 0.49	0.48 / 0.55	—	0.43 / 0.50	0.45 / 0.53	—
Wet Gluten (%) 14% mb	32.5	32.6	—	34.1	31.7	—
Falling Number (sec)	367	411	—	322	396	—
Amylograph Viscosity: 65g (BU)	726	601	—	675	714	—
RVA: Pasting Temp. (°C)/Peak Viscosity (cP)	69.0 / 2589	68.0 / 2680	—	84.6 / 2355	72.8 / 2612	—
Hot Paste Viscosity (cP)/Final Viscosity (cP)	1627 / 2762	1796 / 3071	—	1455 / 2545	1693 / 2890	—
Damaged Starch (%)	7.0	7.9	—	7.9	8.1	—
SRC: Water/50% Sucrose (%)	66 / 116	65 / 121	—	62 / 109	69 / 119	—
5% Lactic Acid/5% Na ₂ CO ₃ (%)	160 / 86	148 / 88	—	163 / 83	158 / 94	—
Gluten Performance Index (GPI) (%)	0.79	0.71	—	0.85	0.74	—
DOUGH PROPERTIES:						
Farinograph: Peak Time (min)	7.7	7.2	—	5.7	6.6	—
Stability (min)	13.8	12.5	—	9.1	16.8	—
Absorption (%)	59.6	60.1	—	58.8	59.4	—
Alveograph: P (mm)	78	102	—	71	90	—
L (mm)	126	107	—	126	108	—
P/L Ratio	0.62	0.95	—	0.56	0.83	—
W (10-4 J)	331	409	—	290	337	—
Extensograph (45 min): Resistance ₅₀ (BU)	272	329	—	254	352	—
Resistance Max (BU)	493	636	—	464	627	—
Extensibility (cm)	18.6	19.9	—	20.3	18.1	—
Area (cm ²)	118	161	—	123	147	—
R ₅₀ /E Ratio	1.5	1.7	—	1.3	1.9	—
Rmax/E Ratio	2.7	3.2	—	2.3	3.5	—
BAKING EVALUATION:						
Pan Bread: Bake Absorption (%)	62.8	64.0	—	63.0	63.8	—
Loaf Volume (cc)	917	935	—	910	932	—
Specific Volume (cc/g)	5.9	6.0	—	5.9	6.0	—
SAMPLES & PRODUCTION:						
Number of samples	22	12	3	4	17	2
Number of composites	2	2	0	2	2	0
Production % of sampled area	1.4%	0.2%	0.3%	0.0%	2.2%	0.5%
Percent of samples	3.8%	2.1%	0.5%	0.7%	2.9%	0.3%

*Composite data are not available for the North Central region of Nebraska or for Wyoming due to small sample sizes.

2026 HRW QUALITY DATA – BY REPORTING AREA

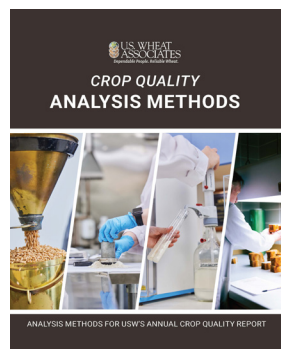
	South Dakota	Montana	PNW Tri-State (Washington, Oregon, Idaho)			
			N. Central	Central	North-East	South-East
WHEAT GRADE DATA:						
Test Weight (lb/bu)	62.9	61.8	61.7	62.4	61.9	59.5
(kg/hl)	82.7	81.2	81.2	82.1	81.4	78.3
Damaged Kernels (%)	0.1	0.4	0.0	0.0	0.1	0.0
Foreign Material (%)	0.0	0.3	0.0	0.0	0.0	0.0
Shrunken & Broken (%)	1.0	1.0	0.5	0.3	0.3	0.6
Total Defects (%)	1.1	1.6	0.5	0.3	0.3	0.6
Grade	1 HRW	1 HRW	1 HRW	1 HRW	1 HRW	2 HRW
WHEAT NON-GRADE DATA:						
Dockage (%)	0.4	0.5	0.2	0.3	0.3	0.2
Moisture (%)	11.1	9.7	8.8	9.4	8.9	8.7
Protein (%) 12%/0% mb	12.4 / 14.1	12.7 / 14.5	10.6 / 12.1	11.7 / 13.3	9.7 / 11.0	11.6 / 13.1
Ash (%) 14%/0% mb	1.52 / 1.76	1.48 / 1.72	1.40 / 1.58	1.09 / 1.27	1.34 / 1.56	1.47 / 1.71
1000 Kernel Weight (g)	30.3	29.6	36.2	39.0	34.9	33.3
Kernel Size (%) lg/md/sm	66 / 33 / 01	65 / 34 / 01	86 / 14 / 00	85 / 14 / 01	82 / 17 / 01	82 / 17 / 01
Single Kernel: Hardness	62.6	64.9	60.9	58.8	61.2	67.0
Weight (mg)	31.6	30.9	37.1	41.4	34.9	35.5
Diameter (mm)	2.61	2.56	2.80	2.92	2.78	2.80
Sedimentation (cc)	50.8	50.5	42.2	51.5	29.0	29.5
Falling Number (sec)	392	419	329	318	299	341
DON (ppm)	0.0	0.0	—	—	—	—
FLOUR DATA:						
Lab Mill Extraction (%)	72.6	73.1	73.6	73.2	72.4	74.0
Color: L*	90.6	90.4	90.9	90.6	90.4	90.4
a*	-1.9	-2.0	-1.9	-1.8	-2.0	-2.0
b*	9.5	10.3	9.8	9.6	10.1	10.6
Protein (%) 14%/0% mb	11.0 / 12.8	11.7 / 13.6	9.5 / 11.0	10.3 / 12.0	8.6 / 10.0	10.2 / 11.8
Ash (%) 14%/0% mb	0.42 / 0.49	0.42 / 0.49	0.44 / 0.51	0.42 / 0.49	0.44 / 0.52	0.46 / 0.54
Wet Gluten (%) 14% mb	29.9	30.0	24.7	28.1	19.2	25.4
Falling Number (sec)	389	421	397	393	345	363
Amylograph Viscosity: 65g (BU)	837	833	568	562	428	414
RVA: Pasting Temp. (°C)/Peak Viscosity (cP)	67.3 / 2642	69.4 / 2630	67.5 / 2977	75.0 / 2192	68.5 / 2056	70.6 / 1913
Hot Paste Viscosity (cP)/Final Viscosity (cP)	1838 / 3139	1998 / 3334	2078 / 3460	1554 / 2791	1288 / 2377	1262 / 2307
Damaged Starch (%)	7.3	7.0	8.0	8.3	9.0	9.1
SRC: Water/50% Sucrose (%)	65 / 115	70 / 117	69 / 114	71 / 116	71 / 110	74 / 116
5% Lactic Acid/5% Na ₂ CO ₃ (%)	157 / 89	154 / 97	155 / 97	156 / 100	137 / 94	151 / 103
Gluten Performance Index (GPI) (%)	0.77	0.72	0.73	0.72	0.67	0.69
DOUGH PROPERTIES:						
Farinograph: Peak Time (min)	6.9	9.0	5.5	5.7	5.1	6.7
Stability (min)	14.9	16.4	11.4	12.7	10.9	13.6
Absorption (%)	58.9	61.6	60.0	61.8	60.3	61.2
Alveograph: P (mm)	91	125	119	125	120	128
L (mm)	112	91	69	77	48	63
P/L Ratio	0.81	1.37	1.73	1.63	2.49	2.04
W (10-4 J)	345	397	307	355	246	300
Extensograph (45 min): Resistance ₅₀ (BU)	304	349	342	338	402	459
Resistance Max (BU)	537	567	554	580	605	579
Extensibility (cm)	18.4	16.7	17.1	17.4	15.0	12.7
Area (cm ²)	127	122	123	129	118	98
R ₅₀ /E Ratio	1.7	2.1	2.0	2.0	2.7	3.6
Rmax/E Ratio	2.9	3.4	3.2	3.3	4.0	4.6
BAKING EVALUATION:						
Pan Bread: Bake Absorption (%)	63.1	64.0	63.6	65.5	64.0	64.5
Loaf Volume (cc)	904	858	752	816	714	820
Specific Volume (cc/g)	5.8	5.5	4.8	5.1	4.5	5.2
SAMPLES & PRODUCTION:						
Number of samples	34	26	30	9	28	2
Number of composites	3	2	2	2	3	2
Production % of sampled area	4.3%	13.3%	1.7%	0.3%	0.6%	1.5%
Percent of samples	5.9%	4.5%	5.2%	1.5%	4.8%	0.3%

ANALYSIS METHODS

HARD RED WINTER LABORATORY TESTING

All quality data contained in this report is the result of testing and analysis conducted by Great Plains Analytical Laboratory in Kansas City, Missouri.

TEST:	METHODOLOGY:
WHEAT GRADE FACTORS	
Grade	Official U.S. Standards for Grain.
Test Weight	AACCI 55-10.01.
	Official U.S. Standards for Grain.
Foreign Material	Official U.S. Standards for Grain.
Shrunken and Broken	Official U.S. Standards for Grain.
Total Defects	Official U.S. Standards for Grain.
WHEAT NON-GRADE FACTORS	
Dockage	Official USDA procedures.
Moisture	AACCI 44-15.02. • Wheat: DICKEY-john GAC® 2500-UGMA Grain Analysis Computer. • Flour: air oven method.
Protein (12% mb)	AACCI 46-30.01 (Dumas combustion nitrogen analysis or CNA method).
Ash (14% mb)	AACCI 08-01.01 expressed on a 14% mb.
1000 Kernel Weight	Based on a 10 g clean wheat sample counted by an electronic counter, results converted to express weight by 1000 kernels
Kernel Size	Wheat is sifted with a RoTap sifter using Tyler No. 7 (2.82 mm) and No. 9 (2.00 mm) screens.
Single Kernel Characterization System (SKCS)	AACCI 54-31.01 using Perten SKCS 4100.
Sedimentation	AACCI 56-61.02, Zeleny.
Falling Number	AACCI 56-81.04; 2019 FGIS barometric pressure correction procedure; average value is a simple mean of sample results.
DON	Neogen ELISA.



SCAN THIS QR CODE TO ACCESS USW'S ANALYSIS METHODS FOR CROP QUALITY TESTING.

This report provides a summary of the testing methods used for crop quality evaluation. For complete testing procedures, definitions and laboratory protocols for each wheat class, refer to the Analysis Methods booklet.

ANALYSIS METHODS

HARD RED WINTER LABORATORY TESTING

TEST:	METHODOLOGY:
FLOUR FACTORS	
Laboratory Milling Extraction	AACCI 26-10.02, AACCI 26-21.02. Samples are milled on a Buhler Laboratory mill (MLU 202) using a 183-micron (μ) sieve.
Color	CIE 1976 L*a*b* color system. Minolta Chroma Meter with Granular-Materials attachment CR- A50 and CR-410 colorimeter.
Protein (14% mb)	AACCI 46-30.01 (Dumas CNA method).
Ash (14% mb)	AACCI 08-01.01 expressed on a 14% mb.
Wet Gluten	AACCI 38-12.02 expressed on a 14% mb.
Falling Number	AACCI 56-81.04; 2019 FGIS barometric pressure correction procedure; average value is a simple mean of sample results.
Amylograph Viscosity	AACCI 22-10.01 modified to use 65 g flour (14% mb) and 450 ml distilled water with pins.
Damaged Starch	AACCI 76-30.02 (Enzymatic hydrolysis).
Solvent Retention Capacity	AACCI 56-11.02.
DOUGH PROPERTY FACTORS	
Farinograph	AACCI 54-21.02 (constant flour weight method) with 50 g bowl.
Alveograph	AACCI 54-30.02, Chopin-Alveolab.
Extensograph	AACCI 54-10.01; 45 min rest.
EVALUATION OF END-PRODUCTS	
Bread	AACCI 10-10.03 ("pup loaf" method); producing two loaves per batch using dry yeast and ascorbic acid. After mixing, the dough is divided into two equal portions, fermented for 160 min, molded and panned in pup loaf pans before proofing and baking. Loaf volume is measured immediately after baking by rapeseed displacement.
Spaghetti	Spaghetti (or pasta) was made using the laboratory procedure described by Walsh, Ebeling, and Dick, Cereal Sci. Today: 16(11) 385, 1971.





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