U.S. WHEAT ASSOCIATES

Dependable People. Reliable Wheat.

CALIFORNIA HARD RED WINTER

2024 QUALITY SURVEY

CALIFORNIA WHEAT COMMISSION

The California Wheat Commission Wheat Quality Laboratory, located in Woodland, California, began operating 30 years ago. It is capable of testing milling quality, chemical and physical analysis of wheat and flour, physical dough testing and semolina analysis. Final product testing is available for bread and cookie baking and noodle, tortilla and pasta analysis. The lab and its staff are respected in the domestic and international marketplace as a premiere source of technical information and assistance. The CWC is available to work for customers in the areas of quality assurance, problem solving, quality control training, product development and research.

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SAMPLES OF HARD RED WINTER

collected from grain elevators during local harvest.

SAMPLE METHODOLOGY

SAMPLE TESTING

California Wheat Commission Laboratory and Federal Grain Inspection Service (FGIS) conducted test quality testing.

SAMPLE ANALYSIS

Official grade and non-grade factors and functionality tests were determined on each sample. Results are weighted averages. The methods are described in the Analysis Methods section of this booklet.

CALIFORNIA HARD RED WINTER

California's wheat growing regions are defined by climate, value of alternative crops and distinct differences in variety selection. Most California hard wheat is planted from October to January and harvested in June and July. With the strong demand for new crop wheat in the domestic marketplace, importers are encouraged to express their interest in purchasing California wheat in early spring.

2024 WEATHER AND HARVEST

Precipitation totals for the 2023-24 season were above average in the main wheat-growing regions of California. Across the season (October through June), average rainfall total in the San Joaquin Valley growing region was 11.7 inches (112% of the 10-year average). In the Sacramento Valley growing areas, average rainfall was 20.0 inches (109% of average). Precipitation during the early season (October through February), accounted for 78% of the seasonal total in the San Joaquin Valley and 86% of the seasonal total in the Sacramento Valley, and these were 111% and 117% of average, respectively. From March through June, rainfall totals were 96% of average in the Sacramento Valley and 131% of average in the San Joaquin Valley and maximum daily temperatures during this period were slightly cooler than normal. Overall, 2023-24 conditions led to productive crops across the state. According to USDA survey data, there was a small increase in wheat acres harvested for grain (despite a 10% reduction in planted acres), and average wheat yields increased slightly compared to the previous season.

2024 CROP SUMMARY

California hard wheat varieties are known for their low moisture and large and uniform kernel size. Because wheat is predominantly grown under irrigation, growers achieve high yields and consistent quality. Overall, the majority of the 2024 crop has medium protein. Consistent with other years, the 2024 crop has low moisture, high flour extraction and strong baking performance — all of which make California wheat suitable for blending.

The overall **GRADE** sample average for the 2024 HRW harvest survey is U.S. No. 1 HRW.

TEST WEIGHTS average was 65.0 lb/bu, comparable to last year, and higher than the 5-year average of 63.3 lb/bu.

KERNEL DATA indicate uniform and dense kernels with 94% exhibiting large size, higher than last year, and 5-year average of 89%.

WHEAT MOISTURE average was 9.3% and was comparable to last year and 5-year average of 9.3%.

WHEAT PROTEIN content average was 12.0% (12% mb), 0.4% lower than last year, and comparable to 5-year average of 11.8%.

WHEAT FALLING NUMBER average was 350 seconds, slightly lower than last year and indicative of sound wheat.

Brabender Quad Senior **LAB MILL EXTRACTION** average was 69.9%, significantly higher than last year, and slightly higher than the 5-year average of 68.4%.

SOLVENT RETENTION CAPACITY GPI value was 0.71, comparable to last year and 5-year average of 0.71, and indicates good flour performance in baking applications.

DOUGH PROPERTIES suggested an acceptable crop that is comparable to the 5-year average.

ALVEOGRAPH W average value was 296, exceptionally high for dough strength and an L value of 101 mm indicating good extensibility.

FARINOGRAPH PEAK and **STABILITY** averages of 6.7 and 13.0 minutes, respectively, were comparable to 5-year average of 6.0 and 12.7, respectively.

Average **BAKE ABSORPTION** of 62.7% was higher than last year and the 5-year average of 61.8%.

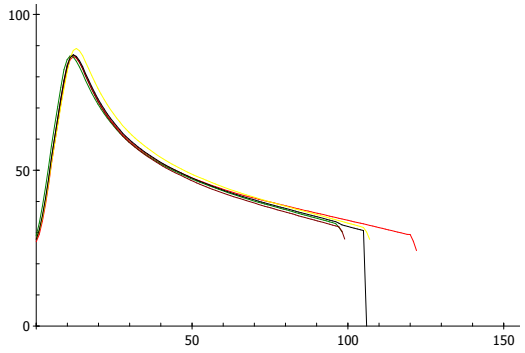
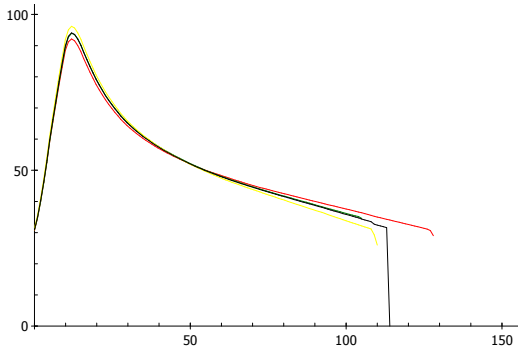
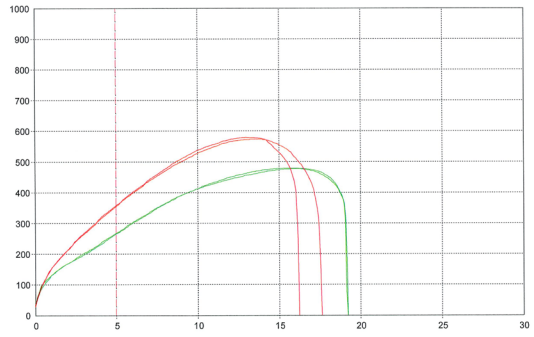
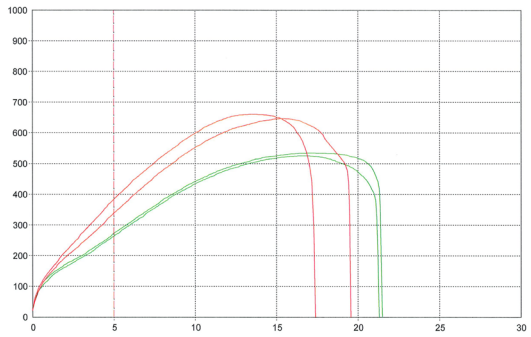
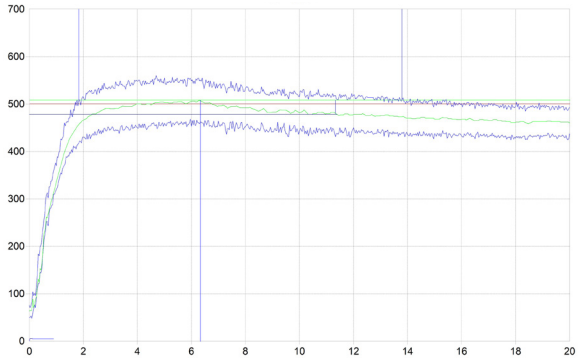
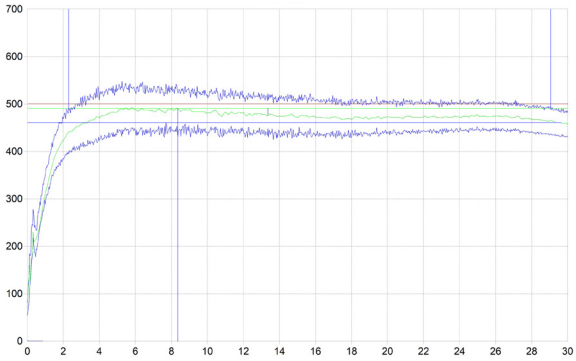
Average **LOAF VOLUME** was 902 cc, comparable to last year and the 5-year average of 902 cc and indicative of excellent baking quality.

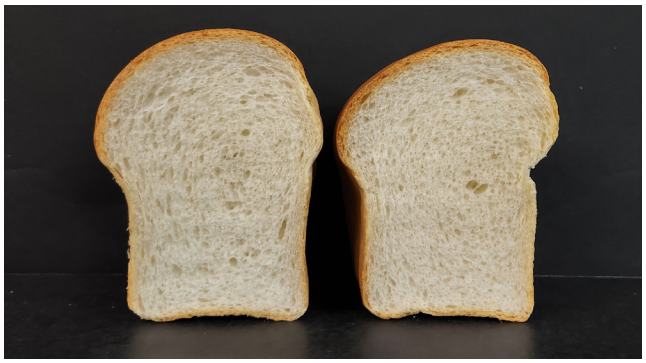
2024 HARVEST DATA

	Medium Protein[1]		High Protein[1]	
	2024 Avg	2023 Avg	2024 Avg	2023 Avg
WHEAT GRADE DATA:				
Test Weight (lb/bu)	63.8	65.3	63.5	64.5
(kg/hl)	83.8	85.8	83.5	84.7
Damaged Kernels (%)	0.0	0.0	0.0	0.0
Foreign Material (%)	0.0	0.1	0.1	0.0
Shrunken & Broken (%)	0.4	0.4	0.4	0.3
Total Defects (%)	0.4	0.4	0.4	0.3
Grade	1 HAD	1 HAD	1 HAD	1 HAD
WHEAT NON-GRADE DATA:				
Dockage (%)	0.8	1.2	1.0	0.8
Moisture (%)	9.3	9.9	9.5	10.0
Protein (%) 12%/0% mb	11.6/13.2	11.8/13.4	12.6/14.4	13.30/15.1
Ash (%) 14%/0% mb	1.47/1.71	1.46/1.69	1.52/1.76	1.49/1.73
1000 Kernel Weight (g)	43.7	40.5	43.3	42.2
Kernel Size (%) lg/md/sm	92/8/0	90/10/0	92/8/0	91/9/0
Single Kernel: Hardness	62	70	64	68
Weight (mg)	42.3	38.8	42.4	40.5
Diameter (mm)	3.06	2.97	3.09	3.1
Sedimentation (cc)	43.0	58.0	46.0	61.0
Falling Number (sec)	378	323.0	408	357
DON (ppm)	<0.25	0.80	<0.25	<0.5
FLOUR DATA:				
Lab Mill Extraction (%)	68.0	66.0	69.0	67.1
Color: L*	92.7	92.8	92.6	92.7
a*	-1.2	-1.2	-1.3	-1.1
b*	8.8	8.7	9.3	8.2
Protein (%) 14%/0% mb	10.3/12.0	10.5/12.2	11.7/13.6	11.8/13.7
Ash (%) 14%/0% mb	0.43/0.5	0.47/0.54	0.43/0.5	0.45/0.52
Wet Gluten (%)	28.4	24.3	32.5	30.0
Falling Number (sec)	404	346	444	401
Amylograph Viscosity: 65g (BU)	875	599	936	791
RVA: Pasting Temp (°C)/Peak Viscosity (cP)	71.9/2732	73.5/2685	70.2/2992	72.5/2918
Hot Paste Viscosity (cP)/Final Viscosity (cP)	2036/2803	2116/2800	2118/2984	2291/3070
Damaged Starch (%)	7.0	6.2	7.4	7.4
SRC: Water/50% Sucrose (%)	63/102	64/102	66/107	68/104
5%Lactic Acid/5% Na_2CO_3 (%)	132/81	133/82	140/82	137/81
Gluten Performance Index (GPI) (%)	0.72	0.72	0.74	0.74
DOUGH PROPERTIES:				
Farinograph: Peak Time (min)	6.3	6.0	8.4	6.5
Stability (min)	12.0	10.3	20.0	16.0
Absorption (%)	61.6	60.1	63.4	61.4
Alveograph: P (mm)	96	87	104	90
L (mm)	109	106	114	142
P/L Ratio	0.91	0.82	0.91	0.63
W (10^{-4} J)	340	308	389	389
Extensograph (45/135 min): Resistance (BU)	478/576	577/706	530/654	552/597
Extensibility (cm)	19.2/16.9	18.5/17.4	21.4/18.5	21.5/18.1
Area (cm^2)	120/126	136/153	148/154	150/137
BAKING EVALUATION:				
Pan Bread: Bake Absorption (%)	62.5	60.0	63.4	61.5
Loaf Volume (cc)	920	920	955	985
Specific Volume (mL/g)	6.52		6.95	

[1]*California HRW Protein Range: Med, 11.0 - 12.5%; High, >12.5%.*

COMPOSITE DOUGH PROPERTIES

	Medium Protein	High Protein
Alveograph		
Extensograph		
Farinograph		



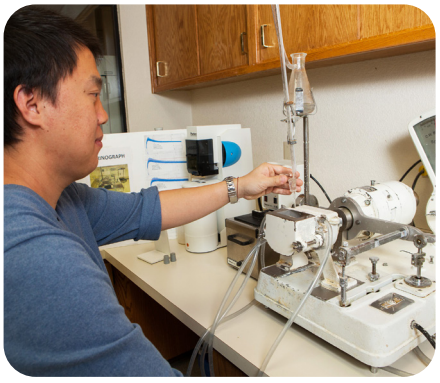
High Protein **Medium Protein**

ANALYSIS METHODS

CALIFORNIA WHEAT COMMISSION LABORATORY TESTING

All quality data contained in this report is the result of testing and/or analysis conducted by the California Wheat Commission Laboratory.

TEST:	METHODOLOGY:
WHEAT GRADE FACTORS	
Grade	Official U.S. Standards for Grain.
Test Weight	AACCI 55-10.01.
Damaged Kernels	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 44-15.01, Air oven method.
Protein (12% mb)	AACCI 46-30.01 expressed on a 12% mb. Dumas combustion nitrogen analysis (CNA) method, ground wheat.
Ash (14% mb)	AACCI 08-01.01 expressed on a 14% mb. Methodology is same for wheat and flour.
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	Cereal Foods World (Cereal Science Today) 5:(3), 71 (1960). Wheat is sifted with a RoTap sifter using U.S. No. 7 (2.82 mm) and No. 10 (2.00 mm) screens.
Single Kernel Characterization System (SKCS)	AACCI 54-31.01 using Perten SKCS 4100.
Sedimentation	AACCI 56-63.01, Micro sedimentation.
Falling Number	AACCI 56-81.04. Methodology is same for flour and wheat falling number.
DON	Neogen ELISA. All analysis is on ground wheat.



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ANALYSIS METHODS

CALIFORNIA WHEAT COMMISSION LABORATORY TESTING

TEST:	METHODOLOGY:
FLOUR FACTORS	
Laboratory Milling Extraction	Laboratory samples are cleaned and tempered according to AACCI 26-10.02. All extraction rates are calculated against total products on an "as is" mb. Brabender® Quadrumat Senior Mill using the Brabender® procedure.
Color	CIE 1976 L*a*b* color system. Minolta Chroma Meter with Granular-Materials attachment CR- A50 and CR-200 colorimeter.
Protein (14% mb)	AACCI 46-30.01 expressed on a 14% mb. Dumas combustion nitrogen analysis (CNA) method.
Ash (14% mb)	AACCI 08-01.01 expressed on a 14% mb. Methodology is same for wheat and flour.
Wet Gluten	AACCI 38-12.02 (Glutomatic procedure).
Falling Number	AACCI 56-81.04. Methodology is same for flour and wheat falling number.
Amylograph Viscosity	AACCI 22-10.01.
Damaged Starch	AACCI 76-30.02 (Enzymatic hydrolysis).
Solvent Retention Capacity	AACCI 56-11.02.
DOUGH PROPERTY FACTORS	
Farinograph	AACCI 54-21.02.
Alveograph	AACCI 54-30.02 (Chopin-Alveolab).
Extensograph	AACCI 54-10.01, modified 45 and 135-min rest.
EVALUATION OF END-PRODUCTS	
Bread	AACCI 10-10.03 ("pup loaf" method). • Producing two loaves per batch. 200 g flour at 14% mb with optimized water absorption is mixed to optimum development with other ingredients (6% sugar, 3% shortening, 1.5% salt, 2.12% instant dry yeast and 0.02% Doh-Tone®) in a 200 g Swanson pin mixer with head speed of 100 to 120 rpm and 90 min fermentation. • Loaf volume is measured 1 hour after baking. • Grain and texture are scored on a scale of 1 to 10 with higher numbers indicating preferred quality.

U.S. WHEAT ASSOCIATES

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ABOUT U.S. WHEAT ASSOCIATES: U.S. Wheat Associates (USW) is the industry's market development organization working in more than 100 countries. Its mission is to "develop, maintain, and expand international markets to enhance the profitability of U.S. wheat producers and their customers." USW activities are funded by producer checkoff dollarsmanaged by 17 state wheat commissions and through cost-share USDA Foreign Agricultural Service market development programs. For more information, visit www.uswheat.org or contact your state wheat commission.

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