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Quality of western Canadian wheat exports

February 1–July 31, 2004

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Quality of western Canadian wheat exports

February 1–July 31, 2004

Introduction

This bulletin reports quality data for cargoes of all classes of western Canadian wheat exported by ship from February 1 to July 31, 2004. Two types of information are presented:

- Distribution tables for moisture content, test weight and other grade determining factors assessed during grading of individual cargoes by Industry Services, Canadian Grain Commission (CGC), at time of vessel loading.
- Quality data (wheat and flour characteristics, milling, end-use quality) for weighted composite samples that represent all cargoes of a given grade (and protein segregate where appropriate) exported during the six-month period. For Wheat, Canada Western Red Spring and Wheat, No. 1, 2 and 3 Canada Western Amber Durum, composites representing Atlantic and Pacific shipments are prepared and tested. For the other wheat classes only one series of composites representing all cargoes (Atlantic and Pacific) exported from Canada during the period are reported. Quality data are not available for classes or protein segregates where insufficient sample was received for compositing due to low/no tonnage exported.

Variety registration and class designation lists ensure that a high degree of uniformity in quality is maintained in export shipments. Under the authority of the Canadian Grain Act, the CGC establishes and maintains lists of wheat varieties eligible to be graded into each wheat class. A listing of varieties included in the CGC variety designation list for each class may be found on the CGC website at

<http://grainscanada.gc.ca/Regulatory/Orders/orders-e.asp>.

Wheat, Canada Western Red Spring

Wheat, Canada Western Red Spring (CWRS) is well known for its excellent milling and baking quality. Four milling grades are available, the top two of which are further segregated according to protein content. Guaranteed minimum protein content is reported on a 13.5% moisture basis.

Higher protein CWRS wheat is highly suitable for blending and for the production of high volume pan bread. It is also commonly used alone or in blends with other wheat for the production of hearth bread, steamed bread, noodles, flat bread and common wheat pasta.

Currently, the predominant variety of Wheat, Canada Western Red Spring grown is AC Barrie.

**Table 1 - Moisture content, test weight and other grade determining factors¹
Atlantic export cargoes of Wheat, Canada Western Red Spring
Third and fourth quarters 2003-2004**

	No. 1 CWRS			No. 2 CWRS				No. 3 CWRS
	Guaranteed minimum protein content, %							
	14.5	14.0	13.5	15.0	14.5	14.0	13.5	
Number of cargoes	12	62	14	1	2	16	4	11
Thousands of tonnes	184	847	106	22	9	164	63	79
Moisture content, %								
Weighted mean	11.8	11.8	11.8	12.0	11.6	12.1	12.0	12.8
Standard deviation	0.26	0.28	0.39	—	0.07	0.45	0.42	0.51
Minimum	11.4	11.1	11.0	12.0	11.6	11.2	11.5	12.0
Maximum	12.2	12.4	12.4	12.0	11.7	12.7	12.4	13.8
Test weight, kg/hL								
Weighted mean	83.5	83.6	83.3	82.5	83.1	82.9	83.2	81.8
Standard deviation	0.51	0.54	0.43	—	0.49	0.62	0.52	0.87
Minimum	82.6	81.9	82.3	82.5	82.8	81.0	82.6	80.0
Maximum	84.0	84.4	83.9	82.5	83.5	83.6	83.8	82.4
Wheats of other classes, %								
Weighted mean	0.13	0.20	0.18	0.18	0.13	0.42	0.20	0.85
Cereal grains other than wheat, %								
Weighted mean	0.12	0.13	0.13	0.19	0.12	0.19	0.18	0.26

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

**Table 2 - Wheat, Canada Western Red Spring
Atlantic export cargo composites
Third and fourth quarters 2003-2004**

Quality parameter ¹	No. 1 CWRS			No. 2 CWRS		No. 3 CWRS ²
	Guaranteed minimum protein content, %					
	14.5	14.0	13.5	14.0	13.5	
Wheat						
Weight per 1000 kernels, g	33.8	32.5	29.4	31.6	31.4	31.7
Protein content, %	14.8	14.4	13.9	14.3	13.8	14.0
Protein content, % (dry matter basis)	17.1	16.6	16.1	16.6	16.0	16.2
Ash content, %	1.56	1.54	1.52	1.57	1.56	1.61
Falling number, s	405	435	420	410	395	365
PSI	54	52	53	52	52	53
Milling						
Flour yield						
Clean wheat basis, %	76.8	76.6	76.4	76.9	76.3	76.1
0.50% ash basis, %	77.3	77.1	76.4	77.4	76.3	75.6
Flour						
Protein content, %	14.0	13.7	13.2	13.6	13.2	13.3
Wet gluten content, %	37.5	36.8	35.2	36.4	34.3	35.4
Ash content, %	0.49	0.49	0.50	0.49	0.50	0.51
Grade colour, Satake units	-1.7	-1.8	-1.8	-1.3	-1.6	-1.0
AGTRON colour, %	72	72	73	69	70	66
Starch damage, %	7.2	7.2	7.5	7.3	7.7	7.5
Amylograph peak viscosity, BU	655	670	630	500	470	320
Maltose value, g/100g	2.2	2.2	2.4	2.3	2.5	2.5
Farinogram						
Absorption, %	65.2	64.8	64.7	64.3	64.7	64.4
Development time, min	6.0	5.75	4.0	5.75	5.5	4.75
Mixing tolerance index, BU	25	30	25	30	25	30
Stability, min	11.5	10.5	10.0	9.5	12.5	9.0
Extensogram						
Length, cm	21	22	22	22	22	24
Height at 5 cm, BU	340	330	365	300	300	305
Maximum height, BU	675	800	820	665	640	705
Area, cm ²	185	210	220	175	180	215
Alveogram						
Length, mm	122	107	107	135	114	125
P (height x 1.1), mm	104	110	110	98	108	101
W, x 10 ⁻⁴ joules	412	432	419	441	432	418
Baking (Canadian Short Process baking test)						
Absorption, %	69	69	69	68	69	68
Mixing energy, W-h/kg	10.3	11.5	10.2	11.5	11.2	10.3
Mixing time, min	7.8	8.6	7.5	8.9	8.6	7.8
Loaf volume, cm ³ /100 g flour	1075	1130	1085	1075	1090	1080

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

² Not segregated by protein content

**Table 3 - Moisture content, test weight and other grade determining factors¹
Pacific export cargoes of Wheat, Canada Western Red Spring
Third and fourth quarters 2003-2004**

	No. 1 CWRS									
	Guaranteed minimum protein content, %							13.5		
	15.0	14.5	14.0	13.5	13.0	12.5	12.0			
Number of cargoes	4	36	55	18						
Thousands of tonnes	76	1408	1135	221						
Moisture content, %										
Weighted mean	12.1	12.3	12.2	12.1						
Standard deviation	0.26	0.40	0.44	0.47						
Minimum	11.6	11.5	11.3	11.1						
Maximum	12.2	12.9	13.1	12.9						
Test weight, kg/hL										
Weighted mean	81.8	82.5	82.5	82.6						
Standard deviation	0.36	0.93	0.47	0.68						
Minimum	81.4	81.0	81.3	81.1						
Maximum	82.2	87.2	83.3	83.5						
Wheats of other classes, %										
Weighted mean	0.23	0.20	0.19	0.17						
Cereal grains other than wheat, %										
Weighted mean	0.17	0.18	0.18	0.16						
	No. 2 CWRS							No. 3 CWRS	Feed	
	Guaranteed minimum protein content, %									
	15.0	14.5	14.0	13.5	13.0	12.5	12.0			
Number of cargoes	1	12	15	12	1	1	1	7	3	
Thousands of tonnes	15	183	254	137	16	36	33	69	24	
Moisture content, %										
Weighted mean	11.9	12.7	12.7	13.1	11.9	14.1	13.6	13.4	12.6	
Standard deviation	—	0.44	0.48	0.44	—	—	—	0.38	0.85	
Minimum	11.9	11.9	11.9	12.2	11.9	14.1	13.6	12.7	11.7	
Maximum	11.9	13.3	13.5	13.4	11.9	14.1	13.6	13.8	13.3	
Test weight, kg/hL										
Weighted mean	81.6	82.2	82.1	82.1	82.4	82.0	83.0	81.4	81.1	
Standard deviation	—	0.57	0.52	0.55	—	—	—	0.81	0.35	
Minimum	81.6	81.2	80.9	81.2	82.4	82.0	83.0	80.2	80.9	
Maximum	81.6	82.7	82.9	82.8	82.4	82.0	83.0	82.7	81.5	
Wheats of other classes, %										
Weighted mean	0.51	0.25	0.34	0.39	0.30	0.03	0.03	0.58	4.07	
Cereal grains other than wheat, %										
Weighted mean	0.37	0.28	0.29	0.27	0.29	0.23	0.14	0.43	1.81	

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

**Table 4 - Wheat, Canada Western Red Spring
Pacific export cargo composites
Third and fourth quarters 2003-2004**

Quality parameter ¹	No. 1 CWRS				No. 2 CWRS			No. 3 CWRS ²
	Guaranteed minimum protein content, %							
	15.0	14.5	14.0	13.5	14.5	14.0	13.5	
Wheat								
Weight per 1000 kernels, g	30.2	30.1	30.8	30.0	31.1	31.3	32.7	32.3
Protein content, %	15.3	14.8	14.4	13.9	14.8	14.3	13.8	13.3
Protein content, % (dry matter basis)	17.7	17.1	16.7	16.1	17.1	16.5	15.9	15.4
Ash content, %	1.49	1.53	1.51	1.49	1.55	1.52	1.51	1.41
Falling number, s	380	380	380	400	385	380	385	360
PSI	54	53	52	53	53	53	54	53
Milling								
Flour yield								
Clean wheat basis, %	75.8	75.9	76.2	76.4	75.4	75.6	75.4	75.3
0.50% ash basis, %	77.3	77.4	78.2	79.4	76.9	77.6	76.9	77.8
Flour								
Protein content, %	14.9	14.3	13.8	13.2	14.1	13.9	13.2	12.8
Wet gluten content, %	40.6	38.8	37.1	34.8	38.8	37.8	35.4	33.9
Ash content, %	0.47	0.47	0.46	0.44	0.47	0.46	0.47	0.45
Grade colour, Satake units	-1.9	-2.1	-2.1	-2.1	-1.9	-1.9	-2.2	-1.9
AGTRON colour, %	72	74	73	74	73	73	75	73
Starch damage, %	6.8	6.8	7.0	7.3	6.8	7.2	7.3	7.4
Amylograph peak viscosity, BU	640	595	615	605	610	510	585	330
Maltose value, g/100g	2.1	2.1	2.2	2.4	2.1	2.2	2.2	2.5
Farinogram								
Absorption, %	65.7	64.9	64.6	64.3	65.4	65.4	66.1	64.7
Development time, min	6.75	5.5	6.5	6.0	6.25	6.5	6.25	5.0
Mixing tolerance index, BU	20	25	25	20	20	30	25	25
Stability, min	15.0	12.0	15.5	15.5	15.5	12.5	9.0	12.5
Extensogram								
Length, cm	23	24	22	24	24	22	24	20
Height at 5 cm, BU	325	325	340	325	360	365	305	370
Maximum height, BU	760	795	795	735	750	710	650	770
Area, cm ²	215	235	220	225	230	205	195	195
Alveogram								
Length, mm	137	145	114	111	134	121	113	103
P (height x 1.1), mm	104	104	103	110	107	110	121	113
W, x 10 ⁻⁴ joules	487	497	419	425	491	471	477	405
Baking (Canadian Short Process baking test)								
Absorption, %	70	69	69	69	70	69	69	69
Mixing energy, W-h/kg	12.0	12.0	14.8	10.9	12.8	11.2	11.2	10.5
Mixing time, min	8.3	8.4	9.7	8.6	9.2	7.9	7.6	7.9
Loaf volume, cm ³ /100 g flour	1165	1180	1165	1135	1170	1115	1080	1110

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

² Not Segregated by protein content

Wheat, Canada Western Amber Durum

Canada has an international reputation as a reliable supplier of high quality durum wheat, furnishing about two thirds of the world's exports in recent years. The attributes of Canadian durum that attract demand are reliability of supply, cleanliness, uniformity and consistency within and between shipments, and excellent end-product quality.

Canada has a strong commitment to quality. This extends to strict varietal control to protect the inherent quality of all grades of amber durum wheat and to strict adherence to wheat grade standards. The requirement that only durum varieties of high intrinsic quality are registered is a cornerstone of the Canadian grading system.

Currently, the predominant varieties of Wheat, Canada Western Amber Durum grown are Kyle and AC Avonlea.

**Table 5 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Western Amber Durum
Third and fourth quarters 2003-2004**

	No. 1 CWAD		No. 2 CWAD		No. 3 CWAD	
	Atlantic	Pacific	Atlantic	Pacific	Atlantic	Pacific
Number of cargoes	30	16	15	6	28	1
Thousands of tonnes	390	197	152	25	241	14
Moisture content, %						
Weighted mean	11.1	10.6	11.2	12.0	11.3	11.5
Standard deviation	0.23	0.22	0.30	1.12	0.37	—
Minimum	10.4	10.3	10.7	11.0	10.8	11.5
Maximum	11.4	11.0	11.9	13.7	12.2	11.5
Test weight, kg/hL						
Weighted mean	82.0	81.9	82.0	81.5	81.7	81.4
Standard deviation	0.33	0.41	0.42	0.78	0.52	—
Minimum	81.2	81.3	80.9	80.8	80.5	81.4
Maximum	82.5	82.8	82.5	82.9	83.1	81.4
Vitreous kernels, %						
Weighted mean	89.2	88.7	85.1	82.6	79.3	76.2
Wheats of other classes, %						
Weighted mean	1.01	0.90	1.47	1.02	2.57	1.80
Cereal grains other than wheat, %						
Weighted mean	0.13	0.19	0.17	0.25	0.18	0.36

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

**Table 6 - Wheat, Canada Western Amber Durum
Export cargo composites
Third and fourth quarters 2003-2004**

Quality parameter ¹	No. 1 CWAD		No. 2 CWAD		No. 3 CWAD
	Atlantic	Pacific	Atlantic	Pacific	Atlantic
Wheat					
Weight per 1000 kernels, g	39.7	36.6	39.0	37.5	37.8
Protein content, %	13.9	13.9	13.8	13.9	13.8
Protein content, % (dry matter basis)	16.1	16.1	15.9	16.1	16.0
SDS sedimentation, mL	46	50	44	45	44
Ash content, %	1.46	1.49	1.48	1.56	1.51
Yellow pigment content, ppm	8.4	8.6	8.4	8.2	8.2
Falling number, s	440	420	385	365	380
Milling yield, %	75.1	74.4	75.1	74.9	74.7
Semolina yield, %	66.7	65.4	66.1	65.9	65.7
PSI, %	36	36	38	39	37
Semolina					
Protein content, %	12.8	12.7	12.7	12.8	12.6
Wet gluten content, %	32.6	32.9	32.6	32.5	32.2
Dry gluten content, %	11.5	11.8	11.8	12.4	11.1
Ash content, %	0.66	0.65	0.63	0.67	0.65
Yellow pigment content, ppm	7.8	8.0	7.8	7.6	7.6
AGTRON colour, %	79	81	79	78	77
Minolta colour:					
L* (L)	87.3	87.3	87.4	86.4	87.0
a* (a)	-2.8	-2.9	-2.8	-2.8	-2.8
b* (b)	33.0	33.1	32.6	31.2	32.3
Speck count per 50 cm ²	17	24	26	29	23
Falling number, s	580	570	515	495	510
Spaghetti					
Dried at 70°C					
Minolta colour:					
L* (L)	77.1	76.8	76.8	76.4	76.7
a* (a)	2.1	2.2	2.1	2.3	2.1
b* (b)	62.7	63.3	61.9	59.7	60.3
Firmness, g-cm	993	981	990	991	940

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for semolina.

Wheat, Canada Western Experimental Hard White

Wheat, Canada Western Experimental Hard White (CWXHW) is a potential new Canadian wheat class grown in commercial quantities in 2003. It shows promise as a superior milling wheat producing flour with excellent colour. It is suitable for bread and noodle production.

The most commonly grown variety of CWXHW is Snowbird.

**Table 7 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Western Experimental Hard White
Third and fourth quarters 2003-2004**

	No. 1 CWXHW	No. 2 CWXHW
Number of cargoes	8	1
Thousands of tonnes	38	10
Moisture content, %		
Weighted mean	11.8	11.9
Standard deviation	0.53	—
Minimum	11.0	11.9
Maximum	12.5	11.9
Test weight, kg/hL		
Weighted mean	83.6	83.7
Standard deviation	0.40	—
Minimum	83.1	83.7
Maximum	84.3	83.7
Wheats of other classes, %		
Weighted mean	0.58	0.32
Cereal grains other than wheat, %		
Weighted mean	0.19	0.23

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

**Table 8 - Wheat, Canada Western Experimental Hard White
Export cargo composites
Third and fourth quarters 2003-2004**

Quality parameter ¹	No. 1 CWXHW ²
Wheat	
Weight per 1000 kernels, g	30.5
Protein content, %	13.7
Protein content, % (dry matter basis)	15.8
Ash content, %	1.45
Falling number, s	435
PSI	51
Milling	
Flour yield	
Clean wheat basis, %	76.0
0.50% ash basis, %	76.5
Flour	
Protein content, %	13.3
Wet gluten content, %	35.1
Ash content, %	0.49
Grade colour, Satake units	-2.7
AGTRON colour, %	79
Starch damage, %	7.4
Amylograph peak viscosity, BU	995
Maltose value, g/100g	2.3
Farinogram	
Absorption, %	65.2
Development time, min	5.75
Mixing tolerance index, BU	30
Stability, min	9.5
Extensogram	
Length, cm	21
Height at 5 cm, BU	310
Maximum height, BU	635
Area, cm ²	170
Alveogram	
Length, mm	91
P (height x 1.1), mm	128
W, x 10 ⁻⁴ joules	432
Baking (Canadian Short Process baking test)	
Absorption, %	69
Mixing energy, W-h/kg	11.0
Mixing time, min	8.9
Loaf volume, cm ³ /100 g flour	1055

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.

² Not segregated by protein content

Wheat, Canada Prairie Spring Red and Wheat, Canada Prairie Spring White

Wheat, Canada Prairie Spring Red (CPSR), used alone or in blends, has quality characteristics suitable for the production of various types of hearth bread, flat bread, noodles and related products.

The most commonly grown varieties eligible for milling grades of CPSR for the 2003-04 crop year are AC Crystal and AC Foremost.

Wheat, Canada Prairie Spring White (CPSW), used alone or in blends, has the quality characteristics suitable for the production of various types of flat bread, noodles, chapatis, crackers and similar products.

The most commonly grown varieties eligible for milling grades of CPSW are AC Vista and Genesis.

**Table 9 - Moisture content, test weight and other grade determining factors¹
Export cargoes of Wheat, Canada Prairie Spring Red and Wheat, Canada Prairie Spring White
Third and fourth quarters 2003-2004**

	No. 1 CPSR	No. 2 CPSR	No. 2 CPSW
Number of cargoes	6	7	4
Thousands of tonnes	89	58	7
Moisture content, %			
Weighted mean	13.7	13.4	12.5
Standard deviation	0.14	0.19	0.55
Minimum	13.5	13.0	12.0
Maximum	13.8	13.6	13.2
Test weight, kg/hL			
Weighted mean	81.6	81.7	82.5
Standard deviation	0.40	0.40	1.16
Minimum	81.0	81.2	81.1
Maximum	82.1	82.2	83.7
Wheats of other classes, %			
Weighted mean	0.78	1.63	1.80
Cereal grains other than wheat, %			
Weighted mean	0.33	0.54	0.09

¹ Canadian Grain Commission, Industry Services data for official loading samples tested at time of loading.

**Table 10 - Wheat, Canada Prairie Spring Red and Wheat, Canada Prairie Spring White
Export cargo composites
Third and fourth quarters 2003-2004**

Quality parameter ¹	No. 1 CPSR	No. 2 CPSR	No. 2 CPSW
Wheat			
Weight per 1000 kernels, g	38.5	37.9	35.1
Protein content, %	12.0	12.3	12.8
Protein content, % (dry matter basis)	13.9	14.2	14.8
Ash content, %	1.44	1.47	1.51
Falling number, s	360	350	335
Flour yield, %	76.0	75.6	74.9
PSI	57	57	57
Flour			
Protein content, %	11.3	11.5	11.7
Wet gluten content, %	28.2	28.2	31.8
Ash content, %	0.47	0.47	0.50
Grade colour, Satake units	-1.8	-1.7	-1.8
AGTRON colour, %	73	70	71
Starch damage, %	6.4	6.4	6.9
Amylograph peak viscosity, BU	545	595	330
Maltose value, g/100g	2.0	2.1	2.4
Farinogram			
Absorption, %	60.2	61.1	63.4
Development time, min	6.0	6.5	4.5
Mixing tolerance index, BU	30	30	50
Stability, min	8.0	8.0	5.0
Extensogram			
Length, cm	22	22	22
Height at 5 cm, BU	365	360	280
Maximum height, BU	820	775	505
Area, cm ²	220	210	130
Alveogram			
Length, mm	133	122	101
P (height x 1.1), mm	79	92	101
W, x 10 ⁻⁴ joules	317	334	301
Baking (Remix-to-Peak baking test)			
Absorption, %	59	60	60
Remix time, min	2.4	2.6	2.0
Loaf volume, cm ³ /100 g flour	780	795	775

¹ Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis for flour.