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Quality of western Canadian wheat exports

February 1–July 31, 2005

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Canada

Quality Innovation Service

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Introduction

This bulletin reports quality data for cargoes of all classes of western Canadian wheat exported by ship from February 1 to July 31, 2005. 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 varieties of Wheat, Canada Western Red Spring grown are AC Barrie and Superb.

Table 1 - Moisture content, test weight and other grade determining factors[1]
Atlantic export cargoes of Wheat, Canada Western Red Spring
Third and fourth quarters 2004-2005

	No. 1 CWRS		No. 2 CWRS				
	Guaranteed Minimum Protein Content, %						No. 3 CWRS
	14.0	13.5	14.5	14.0	13.5	13.0	
Number of cargoes	2	3	1	4	15	8	26
Thousands of tonnes	19	12	8	29	99	69	399
Moisture content, %							
Weighted mean	11.8	11.8	12.1	13.8	13.9	13.7	14.0
Standard deviation	0.21	0.31	-	0.17	0.61	0.54	0.28
Minimum	11.7	11.6	12.1	13.6	12.5	12.7	13.6
Maximum	12	12.2	12.1	14	14.5	14.2	14.5
Test weight, kg/hL							
Weighted mean	84.1	83.8	83.3	81.8	82.3	82.7	81.8
Standard deviation	0.35	0.38	-	0.21	0.51	0.66	0.57
Minimum	83.8	83.4	83.3	81.7	81.1	81.3	80.7
Maximum	84.3	84.1	83.3	82.1	83.1	83.4	82.9
Wheats of other classes, %							
Weighted mean	0.27	0.17	0.20	0.28	0.20	0.26	0.57
Cereal grains other than wheat, %							
Weighted mean	0.11	0.10	0.21	0.09	0.12	0.11	0.16

[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 2004-05

Quality parameter[1]	No. 2 CWRS, Guaranteed minimum protein content, % 13.5	No. 2 CWRS, Guaranteed minimum protein content, % 13.0	No. 3 CWRS[2]
Wheat			
Weight per 1000 kernels, g	32.9	32.7	34.1
Protein content, %	13.6	13.3	13.2
Protein content, % (dry matter basis)	15.7	15.3	15.2
Ash content, %	1.59	1.61	1.59
Falling number, s	365	405	275
PSI	52	52	50
Milling			
Flour yield			
Clean wheat basis, %	76.1	76.3	75.7
0.50% ash basis, %	75.1	75.3	75.7
Flour			
Protein content, %	13.1	12.7	12.6
Wet gluten content, %	35.8	35.0	34.6
Ash content, %	0.52	0.52	0.50
Grade colour, Satake units	-0.4	-0.7	-0.3
AGTRON colour, %	61	64	61
Starch damage, %	9.2	9.3	9.3
Amylograph peak viscosity, BU	260	320	155
Maltose value, g/100g	3.1	3.0	3.2
Farinogram			
Absorption, %	68.3	67.8	68.5
Development time, min	5.75	5.75	5.25
Mixing tolerance index, BU	40	40	40
Stability, min	10.0	8.0	8.5
Extensogram			
Length, cm	20	20	19
Height at 5 cm, BU	315	310	305
Maximum height, BU	690	560	565
Area, cm^2	145	150	140
Alveogram			
Length, mm	100	90	90
P (height x 1.1), mm	142	145	147
W, x 10^{-4} joules	490	458	461
Baking (Canadian Short Process baking test)			
Absorption, %	74	73	74
Mixing energy, W-h/kg	6.5	6.3	6.2
Mixing time, min	4.1	4.2	4.0
Loaf volume, cm3/100 g flour	1075	1010	1015

[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 factors[1]
Pacific export cargoes of Wheat, Canada Western Red Spring
Third and fourth quarters 2004-2005

	No. 1 CWRS		No. 2 CWRS				No. 3 CWRS	Feed
	Guaranteed minimum protein content, %							
	13.5	13.0	14.0	13.5	13.0	12.5		
Number of cargoes	1	30	3	15	13	2	39	11
Thousands of tonnes	21	503	88	271	364	24	750	268
Moisture content, %								
Weighted mean	13.5	13.4	13.6	13.6	13.6	13.6	13.9	14.0
Standard deviation	-	0.16	0.26	0.10	0.08	0.07	0.13	0.28
Minimum	13.5	13.1	13.3	13.5	13.4	13.6	13.6	13.4
Maximum	13.5	13.7	13.8	13.8	13.7	13.7	14.2	14.2
Test weight, kg/hL								
Weighted mean	81.8	83.0	81.9	81.8	82.3	82.7	81.6	76.8
Standard deviation	-	0.45	0.32	0.61	0.55	0.14	0.53	1.03
Minimum	81.8	82.0	81.7	81.2	80.7	82.6	80.3	75.9
Maximum	81.8	83.8	82.3	83.1	83.0	82.8	82.9	79.1
Wheats of other classes, %								
Weighted mean	0.30	0.34	0.56	0.32	0.42	0.28	0.31	1.43
Cereal grains other than wheat, %								
Weighted mean	0.17	0.10	0.27	0.17	0.19	0.20	0.24	0.12

[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 2004-05

	No. 1 CWRS	No. 2 CWRS		No. 3 CWRS[2]	Feed
	Guaranteed minimum protein content, %				
Quality parameter[1]	13.0	13.5	13.0		
Wheat					
Weight per 1000 kernels, g	32.7	32.9	33.5	35.3	32.3
Protein content, %	13.2	13.8	13.2	13.4	13.2
Protein content, % (dry matter basis)	15.3	15.9	15.2	15.5	15.3
Ash content, %	1.52	1.54	1.53	1.55	1.66
Falling number, s	385	325	355	325	195
PSI	53	52	53	51	46
Milling					
Flour yield					
Clean wheat basis, %	76.9	75.9	76.4	75.0	68.1
0.50% ash basis, %	77.4	75.9	76.9	74.0	63.6
Flour					
Protein content, %	12.8	13.2	12.7	12.9	12.1
Wet gluten content, %	34.6	35.8	34.6	35.6	30.2
Ash content, %	0.49	0.50	0.49	0.52	0.59
Grade colour, Satake units	-1.5	-1.5	-1.4	-0.9	4.2
AGTRON colour, %	71	70	70	65	19
Starch damage, %	8.8	8.3	8.6	9.4	12.1
Amylograph peak viscosity, BU	455	290	280	160	60
Maltose value, g/100g	2.7	2.7	2.8	3.4	7.2
Farinogram					
Absorption, %	68.0	68.2	68.0	69.5	74.1
Development time, min	6.0	6.25	6.0	5.25	2.0
Mixing tolerance index, BU	30	30	30	30	65
Stability, min	9.0	9.0	9.0	8.5	2.0
Extensogram					
Length, cm	21	22	22	22	16
Height at 5 cm, BU	305	320	325	290	330
Maximum height, BU	550	590	580	500	360
Area, cm^2	150	165	170	140	85
Alveogram					
Length, mm	104	103	93	93	65
P (height x 1.1), mm	134	134	135	147	160
W, x 10^{-4} joules	477	471	438	464	428
Baking (Canadian Short Process baking test)					
Absorption, %	72	72	72	74	75
Mixing energy, W-h/kg	6.2	6.3	6.1	6.3	7.3
Mixing time, min	3.9	4.1	4.0	3.8	5.5
Loaf volume, cm^3/100 g flour	1085	1065	1090	1080	860

[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 factors[1]
Export cargoes of Wheat, Canada Western Amber Durum
Third and fourth quarters 2004-2005

	No. 1 CWAD		No. 2 CWAD		No. 3 CWAD	
	Atlantic	Pacific	Atlantic	Pacific	Atlantic	Pacific
Number of cargoes	8	4	29	12	24	6
Thousands of tonnes	81	74	382	91	363	46
Moisture content, %						
Weighted mean	11.8	12.9	13.8	13.2	13.8	13.5
Standard deviation	0.81	0.33	0.25	0.23	0.23	0.17
Minimum	10.8	12.5	13.2	13.0	13.3	13.1
Maximum	13.0	13.3	14.3	13.8	14.3	13.6
Test weight, kg/hL						
Weighted mean	82.6	82.8	83.2	82.5	82.5	82.1
Standard deviation	0.46	0.31	0.34	0.30	0.48	0.78
Minimum	82.0	82.5	82.3	81.9	81.7	80.3
Maximum	83.2	83.2	83.8	82.8	83.9	82.4
Vitreous kernels, %						
Weighted mean	87.1	85.7	71.4	74.6	67.0	63.2
Wheats of other classes, %						
Weighted mean	0.85	0.47	0.83	0.89	0.99	1.13
Cereal grains other than wheat, %						
Weighted mean	0.12	0.14	0.09	0.19	0.11	0.13

[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 2004-05

Quality parameter[1]	No. 1 CWAD		No. 2 CWAD		No. 3 CWAD	
	Atlantic	Pacific	Atlantic	Pacific	Atlantic	Pacific
Wheat						
Weight per 1000 kernels, g	40.4	42.6	44.2	41.6	44.7	43.5
Protein content, %	13.3	13.6	11.9	13.3	12.1	12.9
Protein content, % (dry matter basis)	15.4	15.7	13.7	15.4	14.0	14.9
SDS sedimentation, mL	41	42	31	43	33	41
Ash content, %	1.47	1.53	1.55	1.53	1.58	1.57
Yellow pigment content, ppm	8.0	8.0	7.5	8.0	7.6	7.9
Falling number, s	435	375	370	335	315	340
Milling yield, %	75.3	75.2	76.3	75.4	75.6	75.1
Semolina yield, %	66.3	66.2	66.1	66.1	65.8	65.8
PSI, %	37	37	38	37	38	37
Semolina						
Protein content, %	12.4	12.6	11.1	12.3	11.2	12.1
Wet gluten content, %	31.4	31.9	27.8	30.8	27.3	29.7
Dry gluten content, %	10.7	10.9	9.4	10.5	9.3	10.2
Ash content, %	0.62	0.64	0.62	0.66	0.64	0.65
Yellow pigment content, ppm	7.5	7.4	6.8	7.3	6.8	7.2
AGTRON colour, %	80	79	80	79	76	76
Minolta colour:						
L*	86.8	87.0	87.2	86.7	87.1	87.0
a*	-3.0	-3.1	-3.1	-3.2	-3.1	-3.1
b*	31.2	31.2	29.5	30.8	29.1	30.4
Speck count per 50 cm^2	18	30	36	26	31	25
Falling number, s	535	450	420	405	370	360
Spaghetti						
Dried at 70°C						
Minolta colour:						
L*	76.2	76.3	76.5	76.2	75.6	75.8
a*	2.0	1.7	1.5	1.9	1.9	1.9
b*	61.4	61.2	58.2	61.3	58.8	59.7
Firmness, g-cm	938	931	830	951	836	897

* 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 Hard White Spring

Wheat, Canada Western Hard White Spring (CWHWS) is a hard white spring wheat with superior milling quality producing flour with excellent colour. It is suitable for bread and noodle production.

There are three milling grades in the CWHWS class.

The most commonly grown variety of CWHWS is Snowbird.

Table 7 - Moisture content, test weight and other grade determining factors[1]
Export cargoes of Wheat, Canada Western Hard White Spring
Third and fourth quarters 2004-2005

	No. 1 CWHWS	No. 2 CWHWS	No. 3 CWHWS
Number of cargoes	3	19	8
Thousands of tonnes	24	160	89
Moisture content, %			
Weighted mean	13.6	14.0	13.9
Standard deviation	0.21	0.26	0.18
Minimum	13.3	13.4	13.9
Maximum	13.7	14.4	14.4
Test weight, kg/hL			
Weighted mean	82.3	81.8	81.0
Standard deviation	0.40	0.66	0.55
Minimum	81.8	80.7	79.7
Maximum	82.6	83.0	81.5
Wheats of other classes, %			
Weighted mean	0.29	0.27	0.46
Cereal grains other than wheat, %			
Weighted mean	0.04	0.05	0.16

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

Table 8 - Wheat, Canada Western Hard White Spring
Export cargo composites
Third and fourth quarters 2004-2005

Quality parameter[1]	No. 1 CWHWS	No. 2 CWHWS	No. 3 CWHWS
Wheat			
Weight per 1000 kernels, g	32.5	32.0	32.2
Protein content, %	13.3	13.1	13.0
Protein content, % (dry matter basis)	15.3	15.1	15.1
Ash content, %	1.51	1.55	1.56
Falling number, s	365	335	305
PSI	51	51	49
Milling			
Flour yield			
Clean wheat basis, %	75.7	74.8	72.8
0.50% ash basis, %	76.2	74.8	72.3
Flour			
Protein content, %	12.6	12.4	12.4
Wet gluten content, %	35.1	34.0	33.6
Ash content, %	0.49	0.50	0.51
Grade colour	-2.3	-1.3	-0.3
AGTRON colour, %	77	67	58
Starch damage, %	8.8	8.8	10.1
Amylograph peak viscosity, BU	440	360	310
Maltose value, g/100g	2.8	2.9	3.6
Farinogram			
Absorption, %	68.0	68.7	71.1
Development time, min	5.25	5.25	1.75
Mixing tolerance index, BU	40	50	40
Stability, min	8.0	7.5	5.5
Extensogram			
Length, cm	19	21	20
Height at 5 cm, BU	300	285	285
Maximum height, BU	595	430	460
Area, cm^2	125	125	120
Alveogram			
Length, mm	84	78	54
P (height x 1.1), mm	141	148	165
W, x 10^{-4} joules	428	415	373
Baking (Canadian Short Process baking test)			
Absorption, %	72	72	74
Mixing energy, W-h/kg	6.4	6.8	6.9
Mixing time, min	4.1	4.6	5.0
Loaf volume, cm^3/100 g flour	1035	1045	1015

[1] Unless otherwise specified, data are reported on a 13.5% moisture basis for wheat and a 14.0% moisture basis fo

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 2004-05 crop year are AC Crystal and 5700PR.

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 AC Karma.

Table 9 - Moisture content, test weight and other grade determining factors[1]
Export cargoes of Wheat, Canada Prairie Spring Red and Wheat, Canada Prairie Spring White
Third and fourth quarters 2004-2005

	No. 2 CPSR	No. 2 CPSW
Number of cargoes	11	2
Thousands of tonnes	220	4
Moisture content, %		
Weighted mean	14.0	13.5
Standard deviation	0.17	0.64
Minimum	13.7	13.2
Maximum	14.2	14.1
Test weight, kg/hL		
Weighted mean	81.8	81.1
Standard deviation	0.39	0.35
Minimum	81.1	80.7
Maximum	82.3	81.2
Wheats of other classes, %		
Weighted mean	1.18	3.06
Cereal grains other than wheat, %		
Weighted mean	0.42	0.24

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

Table 10 - Wheat, Canada Prairie Spring Red Export cargo composites Third and fourth quarter 2004-05	
Quality parameter[1]	No. 2 CPSR
Wheat	
Weight per 1000 kernels, g	39.5
Protein content, %	11.7
Protein content, % (dry matter basis)	13.6
Ash content, %	1.50
Falling number, s	255
Flour yield, %	74.7
PSI	53
Flour	
Protein content, %	11.0
Wet gluten content, %	28.0
Ash content, %	0.50
Grade colour	-0.9
AGTRON colour, %	64
Starch damage, %	9.1
Amylograph peak viscosity, BU	175
Maltose value, g/100g	3.3
Farinogram	
Absorption, %	65.8
Development time, min	6.0
Mixing tolerance index, BU	35
Stability, min	8.0
Extensogram	
Length, cm	21
Height at 5 cm, BU	340
Maximum height, BU	630
Area, cm^2	170
Alveogram	
Length, mm	92
P (height x 1.1), mm	128
W, x 10^{-4} joules	399
Baking (Remix-to-Peak baking test)	
Absorption, %	61
Remix time, min	2.6
Loaf volume, cm^3/100 g flour	750

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

Wheat, Canada Western Red Winter

Wheat, Canada Western Red Winter (CWRW) is a hard wheat exhibiting excellent milling quality. It is available in two milling grades. Flour produced from high grade CWRW wheat performs well in the production of hearth bread (such as French-style bread) and certain types of noodles, and is also suitable for the production of various types of flat bread, steamed bread and related products.

Table 11 - Moisture content, test weight and other grade determining factors[1]
Export cargoes of Wheat, Canada Western Red Winter
Third and fourth quarters 2004-2005

	No 2 CWRW
Number of cargoes	7
Thousands of tonnes	83
Moisture content, %	
Weighted mean	14.1
Standard deviation	0.29
Minimum	13.6
Maximum	14.3
Test weight, kg/hL	
Weighted mean	82.2
Standard deviation	0.27
Minimum	81.7
Maximum	82.5
Wheats of other classes, %	
Weighted mean	1.72
Cereal grains other than wheat, %	
Weighted mean	0.11

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

Table 12 - Wheat, Canada Western Red Winter
Export cargo composites
Third and fourth quarter 2004-05

Quality parameter[1]	No. 2 CWRW
Wheat	
Weight per 1000 kernels, g	31.0
Protein content, %	10.3
Protein content, % (dry matter basis)	11.9
Ash content, %	1.42
Falling number, s	290
Flour yield, %	76.1
PSI	58
Flour	
Protein content, %	9.4
Wet gluten content, %	22.9
Ash content, %	0.48
Grade colour	-1.2
AGTRON colour, %	66
Starch damage, %	6.8
Amylograph peak viscosity, BU	210
Maltose value, g/100g	2.5
Farinogram	
Absorption, %	58.0
Development time, min	1.75
Mixing tolerance index, BU	60
Stability, min	4.75
Extensogram	
Length, cm	21
Height at 5 cm, BU	310
Maximum height, BU	485
Area, cm^2	140
Alveogram	
Length, mm	87
P (height x 1.1), mm	76
W, x 10^{-4} joules	232
Baking (Remix-to-Peak baking test)	
Absorption, %	53
Remix time, min	2.7
Loaf volume, cm^3/100 g flour	650

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

Wheat, Canada Western Soft White Spring

Wheat, Canada Western Soft White Spring (CWSWS) is a lower protein, soft wheat with weak dough properties. Flour milled from this wheat is suitable for producing cookies, cakes, biscuits and related products. Alone or in blends with stronger wheat, CWSWS wheat can also be used to produce crackers, flat bread, steamed bread and certain types of noodles.

Most CWSWS wheat is grown under irrigation to maximize yield and minimize protein content.

Table 13 - Moisture content, test weight and other grade determining factors[1]
Export cargoes of Wheat, Canada Western Soft White Spring
Third and fourth quarters 2004-2005

	No. 2 CWSWS
Number of cargoes	1
Thousands of tonnes	4
Moisture content, %	
Weighted mean	13.8
Standard deviation	-
Minimum	13.8
Maximum	13.8
Test weight, kg/hL	
Weighted mean	79.9
Standard deviation	-
Minimum	79.9
Maximum	79.9
Wheats of other classes, %	
Weighted mean	0.10
Cereal grains other than wheat, %	
Weighted mean	0.09

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