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Quality of western Canadian wheat exports

February 1–July 31, 2006

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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, 2006. 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 2005-2006

	No. 1 CWRS	No. 2 CWRS		
	Guaranteed Minimum Protein Content, %			No. 3 CWRS
	13.5	13.5	13.0	
Number of cargoes	3	22	10	24
Thousands of tonnes	16	180	152	418
Moisture content, %				
Weighted mean	12.1	14.0	14.0	14.0
Standard deviation	0.32	0.23	0.34	0.17
Minimum	11.8	13.4	13.1	13.8
Maximum	12.4	14.3	14.2	14.5
Test weight, kg/hL				
Weighted mean	83.9	82.0	81.9	80.9
Standard deviation	0.15	0.40	0.29	0.54
Minimum	83.8	81.2	81.5	79.8
Maximum	84.1	82.6	82.5	81.7
Wheats of other classes, %				
Weighted mean	0.24	0.31	0.20	0.01
Cereal grains other than wheat, %				
Weighted mean	0.10	0.15	0.17	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 2005-06

	No. 1 CWRS	No. 2 CWRS		
	Guaranteed minimum protein content, %			No. 3 CWRS[2]
Quality parameter[1]	13.5	13.5	13.0	
Wheat				
Weight per 1000 kernels, g	31.9	30.8	31.7	32.5
Protein content, %	14.0	13.8	13.4	13.0
Protein content, % (dry matter basis)	16.2	15.9	15.5	15.0
Ash content, %	1.53	1.70	1.64	1.61
Falling number, s	415	390	375	310
PSI	52	53	53	53
Milling				
Flour yield				
Clean wheat basis, %	76.5	76.2	76.0	75.1
0.50% ash basis, %	76.5	74.2	74.5	74.1
Flour				
Protein content, %	13.3	13.2	12.8	12.3
Wet gluten content, %	35.0	35.5	34.3	32.4
Ash content, %	0.50	0.54	0.53	0.52
Grade colour, Satake units	-1.8	-1.2	-1.3	-1.2
AGTRON colour, %	73	67	70	67
Starch damage, %	8.1	8.2	8.1	8.6
Amylograph peak viscosity, BU	670	445	435	215
Maltose value, g/100g	2.4	2.4	2.4	2.9
Farinogram				
Absorption, %	65.3	66.1	65.7	66.5
Development time, min	7.25	7.00	6.50	5.75
Mixing tolerance index, BU	25	35	30	40
Stability, min	10.5	8.5	9.0	7.5
Extensogram				
Length, cm	21	23	22	20
Height at 5 cm, BU	400	320	320	350
Maximum height, BU	755	640	600	590
Area, cm^2	205	195	175	155
Alveogram				
Length, mm	118	119	118	92
P (height x 1.1), mm	110	108	114	131
W, x 10^{-4} joules	435	396	435	402
Baking (Canadian Short Process baking test)				
Absorption, %	69	70	69	70
Mixing energy, W-h/kg	6.0	6.1	6.0	5.9
Mixing time, min	3.9	3.8	3.8	3.9
Loaf volume, cm3/100 g flour	1085	1115	1085	1065

[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 2005-2006

	No. 1 CWRS	No. 2 CWRS						
	Guaranteed minimum protein content, %						No. 3 CWRS	Feed
	13.0	14.0	13.5	13.0	12.5	12.0		
Number of cargoes	26	1	23	9	23	4	56	5
Thousands of tonnes	487	37	286	171	606	75	1129	38
Moisture content, %								
Weighted mean	12.9	13.9	13.8	13.9	13.7	13.3	14.2	13.8
Standard deviation	0.30	-	0.23	0.35	0.39	0.24	0.16	0.44
Minimum	12.1	13.9	13.4	13.2	13.1	12.9	13.7	13.3
Maximum	13.5	13.9	14.3	14.3	14.4	13.4	14.5	14.3
Test weight, kg/hL								
Weighted mean	82.7	81.5	81.9	81.6	82.1	82.2	80.6	79.4
Standard deviation	0.48	-	0.57	0.47	0.36	0.37	0.60	0.99
Minimum	81.3	81.5	80.6	80.6	81.3	82.0	79.2	78.5
Maximum	83.8	81.5	82.6	82.0	82.9	82.8	81.8	81.0
Wheats of other classes, %								
Weighted mean	0.31	0.25	0.28	0.26	0.29	0.46	0.05	0.03
Cereal grains other than wheat, %								
Weighted mean	0.10	0.10	0.17	0.20	0.19	0.12	0.37	0.84

[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 2005-06

	No. 1 CWRS	No. 2 CWRS			No. 3
	Guaranteed minimum protein content, %				CWRS[2]
Quality parameter[1]	13.0	13.5	13.0	12.5	
Wheat					
Weight per 1000 kernels, g	30.8	33.3	33.8	34.1	34.9
Protein content, %	13.3	13.8	13.2	12.8	12.8
Protein content, % (dry matter basis)	15.4	16.0	15.2	14.8	14.8
Ash content, %	1.55	1.63	1.56	1.53	1.54
Falling number, s	405	375	375	325	300
PSI	52	53	54	52	53
Milling					
Flour yield					
Clean wheat basis, %	76.9	76.3	76.3	76.7	75.5
0.50% ash basis, %	76.4	75.3	75.8	76.7	75.5
Flour					
Protein content, %	12.8	13.2	12.7	12.3	12.2
Wet gluten content, %	34.2	36.1	34.7	33.0	32.5
Ash content, %	0.51	0.52	0.51	0.50	0.50
Grade colour, Satake units	-1.8	-1.3	-1.5	-1.7	-1.3
AGTRON colour, %	72	67	68	72	66
Starch damage, %	8.4	8.2	8.5	8.7	8.9
Amylograph peak viscosity, BU	585	370	350	395	225
Maltose value, g/100g	2.5	2.6	2.7	2.7	3.0
Farinogram					
Absorption, %	65.8	66.3	67.0	66.6	68.2
Development time, min	7.00	5.75	6.50	5.75	5.25
Mixing tolerance index, BU	30	20	25	20	30
Stability, min	11.0	10.5	11.5	9.5	8.5
Extensogram					
Length, cm	20	23	21	19	20
Height at 5 cm, BU	355	300	320	340	340
Maximum height, BU	660	590	620	580	590
Area, cm^2	180	180	165	145	155
Alveogram					
Length, mm	101	108	100	98	77
P (height x 1.1), mm	118	118	131	130	152
W, x 10^{-4} joules	392	412	428	419	435
Baking (Canadian Short Process baking test)					
Absorption, %	70	69	70	71	72
Mixing energy, W-h/kg	5.6	5.1	5.2	5.8	5.7
Mixing time, min	3.7	3.4	3.5	3.7	3.8
Loaf volume, cm^3/100 g flour	1065	1070	1060	1090	1025

[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 2005-2006

	No. 1 CWAD		No. 2 CWAD		No. 3 CWAD	
	Atlantic	Pacific	Atlantic	Pacific	Atlantic	Pacific
Number of cargoes	20	6	20	10	24	11
Thousands of tonnes	207	111	253	123	364	103
Moisture content, %						
Weighted mean	12.7	12.3	13.3	13.0	13.7	13.7
Standard deviation	0.36	0.12	0.30	0.61	0.21	0.28
Minimum	12.0	12.2	12.6	12.4	13.3	13.1
Maximum	13.4	12.5	13.8	13.9	14.1	14.1
Test weight, kg/hL						
Weighted mean	82.4	82.0	82.3	82.1	81.7	81.5
Standard deviation	0.44	0.33	0.43	0.71	0.65	0.37
Minimum	81.4	81.5	81.5	81.5	80.9	81.0
Maximum	83.2	82.5	83.0	83.9	84.2	82.0
Vitreous kernels, %						
Weighted mean	82.2	84.0	67.2	69.9	54.1	56.7
Wheats of other classes, %						
Weighted mean	0.60	0.74	0.55	0.69	0.83	0.79
Cereal grains other than wheat, %						
Weighted mean	0.09	0.18	0.15	0.17	0.15	0.25

[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 2005-06

Quality parameter[1]	No. 1 CWAD		No. 2 CWAD		No. 3 CWAD	
	Atlantic	Pacific	Atlantic	Pacific	Atlantic	Pacific
Wheat						
Weight per 1000 kernels, g						
Protein content, %						
Protein content, % (dry matter basis)						
SDS sedimentation, mL						
Ash content, %						
Yellow pigment content, ppm						
Falling number, s						
Milling yield, %						
Semolina yield, %						
PSI, %						
Semolina						
Protein content, %						
Wet gluten content, %						
Dry gluten content, %						
Ash content, %						
Yellow pigment content, ppm						
AGTRON colour, %						
Minolta colour:						
L*						
a*						
b*						
Speck count per 50 cm^2						
Falling number, s						
Spaghetti						
Dried at 70°C						
Minolta colour:						
L*						
a*						
b*						
Firmness, g-cm						

Data not yet available

* 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 2005-2006

	No. 2 CWHWS	No. 3 CWHWS
Number of cargoes	17	15
Thousands of tonnes	271	226
Moisture content, %		
Weighted mean	13.9	14.0
Standard deviation	0.29	0.25
Minimum	13.4	13.4
Maximum	14.3	14.4
Test weight, kg/hL		
Weighted mean	81.8	81.2
Standard deviation	0.36	0.64
Minimum	80.9	80.3
Maximum	82.4	82.5
Wheats of other classes, %		
Weighted mean	0.45	0.39
Cereal grains other than wheat, %		
Weighted mean	0.16	0.21

[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 2005-2006

Quality parameter[1]	No. 2 CWHWS	No. 3 CWHWS
Wheat		
Weight per 1000 kernels, g	30.0	33.1
Protein content, %	13.4	13.0
Protein content, % (dry matter basis)	15.5	15.0
Ash content, %	1.60	1.51
Falling number, s	380	350
PSI	52	52
Milling		
Flour yield		
Clean wheat basis, %	75.9	74.9
0.50% ash basis, %	74.4	74.9
Flour		
Protein content, %	12.8	12.5
Wet gluten content, %	34.0	33.2
Ash content, %	0.53	0.50
Grade colour, Satake units	-1.8	-1.4
AGTRON colour, %	72	69
Starch damage, %	8.1	8.7
Amylograph peak viscosity, BU	530	425
Maltose value, g/100g	2.5	2.8
Farinogram		
Absorption, %	65.9	68.0
Development time, min	6.50	6.50
Mixing tolerance index, BU	30	40
Stability, min	9.00	8.25
Extensogram		
Length, cm	20	19
Height at 5 cm, BU	330	310
Maximum height, BU	545	525
Area, cm^2	145	130
Alveogram		
Length, mm	90	68
P (height x 1.1), mm	127	153
W, x 10^{-4} joules	412	412
Baking (Canadian Short Process baking test)		
Absorption, %	69	71
Mixing energy, W-h/kg	6.2	5.7
Mixing time, min	4.1	4.3
Loaf volume, cm^3/100 g flour	1075	1015

[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 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 5700PR and AC Crystal.

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 2005-2006

	No. 2 CPSR
Number of cargoes	8
Thousands of tonnes	133
Moisture content, %	
Weighted mean	14.1
Standard deviation	0.70
Minimum	12.4
Maximum	14.5
Test weight, kg/hL	
Weighted mean	80.2
Standard deviation	0.94
Minimum	78.8
Maximum	81.7
Wheats of other classes, %	
Weighted mean	0.46
Cereal grains other than wheat, %	
Weighted mean	0.39

[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 2005-06

Quality parameter[1]	No. 2 CPSR
Wheat	
Weight per 1000 kernels, g	39.1
Protein content, %	11.0
Protein content, % (dry matter basis)	12.7
Ash content, %	1.50
Falling number, s	265
Flour yield, %	74.7
PSI	54
Flour	
Protein content, %	10.3
Wet gluten content, %	24.7
Ash content, %	0.50
Grade colour, Satake units	-1.0
AGTRON colour, %	65
Starch damage, %	8.6
Amylograph peak viscosity, BU	215
Maltose value, g/100g	2.8
Farinogram	
Absorption, %	63.7
Development time, min	6.25
Mixing tolerance index, BU	35
Stability, min	10.0
Extensogram	
Length, cm	19
Height at 5 cm, BU	410
Maximum height, BU	755
Area, cm^2	185
Alveogram	
Length, mm	85
P (height x 1.1), mm	138
W, x 10^{-4} joules	392
Baking (Remix-to-Peak baking test)	
Absorption, %	60
Remix time, min	2.9
Loaf volume, cm^3/100 g flour	740

[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 2005-2006

	No 2 CWRW
Number of cargoes	5
Thousands of tonnes	68
Moisture content, %	
Weighted mean	12.5
Standard deviation	0.26
Minimum	12.2
Maximum	12.8
Test weight, kg/hL	
Weighted mean	82.4
Standard deviation	0.43
Minimum	82.2
Maximum	83.3
Wheats of other classes, %	
Weighted mean	0.66
Cereal grains other than wheat, %	
Weighted mean	0.30

[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 2005-06

Quality parameter[1]	No. 2 CWRW
Wheat	
Weight per 1000 kernels, g	30.9
Protein content, %	10.5
Protein content, % (dry matter basis)	12.1
Ash content, %	1.46
Falling number, s	305
Flour yield, %	76.3
PSI	58
Flour	
Protein content, %	9.7
Wet gluten content, %	24.0
Ash content, %	0.48
Grade colour, Satake units	-2.3
AGTRON colour, %	76
Starch damage, %	6.6
Amylograph peak viscosity, BU	265
Maltose value, g/100g	2.3
Farinogram	
Absorption, %	57.8
Development time, min	5.25
Mixing tolerance index, BU	45
Stability, min	7.50
Extensogram	
Length, cm	21
Height at 5 cm, BU	325
Maximum height, BU	520
Area, cm^2	145
Alveogram	
Length, mm	100
P (height x 1.1), mm	83
W, x 10^{-4} joules	268
Baking (Remix-to-Peak baking test)	
Absorption, %	55
Remix time, min	2.7
Loaf volume, cm^3/100 g flour	685

[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 2005-2006

	No. 2 CWSWS
Number of cargoes	1
Thousands of tonnes	6
Moisture content, %	
Weighted mean	13.0
Standard deviation	-
Minimum	13.0
Maximum	13.0
Test weight, kg/hL	
Weighted mean	80.7
Standard deviation	-
Minimum	80.7
Maximum	80.7
Wheats of other classes, %	
Weighted mean	0.20
Cereal grains other than wheat, %	
Weighted mean	0.01

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